

H1098

0054401

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-068 H1098

DATE RECEIVED: 10/18/00

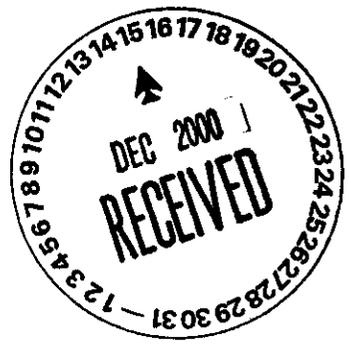
RFW LOT # :0010L972

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10F86						
% SOLIDS	001	S	00L&S166	10/13/00	10/19/00	10/20/00
% SOLIDS	001 REP	S	00L&S166	10/13/00	10/19/00	10/20/00
NITRATE BY IC	001	S	00LBC070	10/13/00	11/13/00	11/13/00
NITRATE BY IC	001 REP	S	00LBC070	10/13/00	11/13/00	11/13/00
NITRATE BY IC	001 MS	S	00LBC071	10/13/00	11/14/00	11/14/00
TOTAL CYANIDE	001	S	00LC106	10/13/00	10/24/00	10/24/00
TOTAL CYANIDE	001 REP	S	00LC106	10/13/00	10/24/00	10/24/00
TOTAL CYANIDE	001 MS	S	00LC106	10/13/00	10/24/00	10/24/00
PH	001	S	00LPH088	10/13/00	10/19/00	10/19/00
PH	001 REP	S	00LPH088	10/13/00	10/19/00	10/19/00
SULFIDE	001	S	00LSD050	10/13/00	10/25/00	10/25/00
SULFIDE	001 REP	S	00LSD050	10/13/00	10/25/00	10/25/00
SULFIDE	001 MS	S	00LSD050	10/13/00	10/25/00	10/25/00

LAB QC:

NITRATE BY IC	MB1	S	00LBC070	N/A	11/13/00	11/13/00
NITRATE BY IC	MB1 BS	S	00LBC070	N/A	11/13/00	11/13/00
NITRATE BY IC	MB1	S	00LBC071	N/A	11/14/00	11/14/00
NITRATE BY IC	MB1 BS	S	00LBC071	N/A	11/14/00	11/14/00
TOTAL CYANIDE	LCS L	S	00LC106	N/A	10/24/00	10/24/00
TOTAL CYANIDE	LCS L	S	00LC106	N/A	10/24/00	10/24/00
TOTAL CYANIDE	MB1	S	00LC106	N/A	10/24/00	10/24/00
SULFIDE	MB1	S	00LSD050	N/A	10/25/00	10/25/00
SULFIDE	MB1 BS	S	00LSD050	N/A	10/25/00	10/25/00

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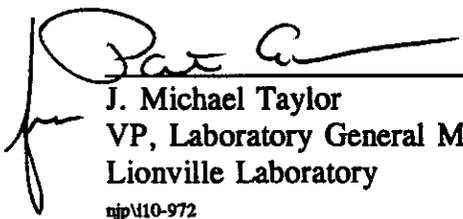
**Recra LabNet Philadelphia
Analytical Report**

**Client : TNU-HANFORD B00-068 H1098
RFW# : 0010L972**

**W.O. # : 10985-001-001-9999-00
Date Received: 10-18-00**

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.
2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met with the exception of Sulfide.
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.
7. The matrix spike recoveries were within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
9. The results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory
njp\110-972

11-16-00
Date

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 11 pages.

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	___ D2216-80		
% Moisture	___ D2216-80		___ ILMO4.0 (e)
% Solids	___ D2216-80		___ ILMO4.0 (e)
% Volatile Solids	___ D2216-80		
ASTM Extraction in Water	___ D3987-81/85		
BTU	___ D240-87		
CEC		___ 9081	___ c
Chromium VI		___ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		___ 1110(mod) ___ 9045C	
Cyanide, Total		___ 9010B/7.14	___ ILMO4.0 (e)
Cyanide, Reactive		___ Section 7.3/9014	
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)
Oxygen Bomb Prep for Anions	___ D240-87(mod)	___ 5050	
Petroleum Hydrocarbons, Total Recoverable		___ 9071	___ EPA 418.1
pH, Soil		___ 9045C	
Sulfide, Reactive		___ Section 7.3/9030B	
Sulfide		___ 9030B(mod)	
Specific Gravity	___ D1429-76C/	___ D5057-90	
Sulfur, Total		___ 9056	
Synthetic Preparation Leach		___ 1312	
Paint Filter		___ 9095A	
Other: <i>Nitrate</i>		Method: <i>EPA 200.0 (mod)</i>	
Other:		Method	

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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.

L-WI-034/D-6/99

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INORGANICS DATA SUMMARY REPORT 11/16/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10F86	% Solids	63.3	%	0.01	1.0
		Nitrate by IC	2.0	u MG/KG	2.0	1.0
		Cyanide, Total	0.62	u MG/KG	0.62	1.0
		pH	8.8	SOIL PH	0.01	1.0
		Sulfide	57.5	u MG/KG	57.5	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LBC070-MB1	Nitrate by IC	1.2	u MG/KG	1.2	1.0
BLANK10	00LBC071-MB1	Nitrate by IC	1.2	u MG/KG	1.2	1.0
BLANK1	00LC106-MB1	Cyanide, Total	0.50	u MG/KG	0.50	1.0
BLANK10	00LSD050-MB1	Sulfide	40.0	u MG/KG	40.0	1.0

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INORGANICS ACCURACY REPORT 11/16/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	SPIKED	INITIAL	SPIKED	%RECOV	DILUTION FACTOR (SPK)
			SAMPLE	RESULT	AMOUNT		
-001	B10F86	Nitrate by IC	39	2.0 u	39	99.3	1.0
		Cyanide, Total	6.0	0.62u	5.6	106.8	1.0
		Sulfide	490	17.3	514	91.9	1.0
BLANK10	00LBC070-MB1	Nitrate by IC	25	1.2 u	25	99.3	1.0
BLANK10	00LBC071-MB1	Nitrate by IC	24	1.2 u	25	97.2	1.0
BLANK10	00LSD050-MB1	Sulfide	345	40.0 u	379	91.0	1.0

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INORGANICS PRECISION REPORT 11/16/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (RSP)
			RESULT	REPLICATE RPD		
-001REP	B10F86	‡ Solids	63.3	61.5	2.9	1.0
		Nitrate by IC	2.0 u	2.0 u	NC	1.0
		Cyanide, Total	0.62u	0.67u	NC	1.0
		pH	8.8	8.8	0.2	1.0
		Sulfide	57.5 u	59.4 u	NC	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/16/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	SPIKED		UNITS	%RECOV
			SAMPLE	AMOUNT		
LCSS1	00LC106-LCS1	Cyanide, Total LCS	2.1	2.0	MG/KG	104.9
LCSS2	00LC106-LCS2	Cyanide, Total LCS	9.3	10	MG/KG	93.3

00106972

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					B00-068-81		Page 1 of 1		
Collector Thomas		Company Contact D Weekes		Telephone No. 372-9524		Project Coordinator TRENT, SJ		Price Code 8L		Data Turnaround 21 Days	
Project Designation 200 Area Groundwater Well Drilling Waste Designation for		Sampling Location 200 West		SAF No. B00-068		Air Quality <input type="checkbox"/>					
Ice Chest No. RT 1917/00 ERC-49-035 ERC 96058		Field Logbook No. EL - 1518		COA JRCRA03200		Method of Shipment Fed-EX					
Shipped To TMA/RECRA		Offsite Property No. A010009			Bill of Lading/Air Bill No. 47357953-9849						
POSSIBLE SAMPLE HAZARDS/REMARKS Samples have potential TO contain Radioactivity Special Handling and/or Storage				Preservation	B Cool 4C	A Cool 4C	D None	C None	E None		
				Type of Container	aG	aG	aG	aG	aG		
				No. of Container(s)	1	1	1	1	1		
				Volume	250mL	250mL	250mL	250mL	250mL		
SAMPLE ANALYSIS				Semi-VDA - 8270A (TCL); Semi-VDA -- 8270A (Add-On) (m-Cresol)	VOA - 8260A (TCL)	IC Anions - 300.0 (Nitrate); Sulfides - 9030; Total Cyanide - 9010	ICP Metals - 6010A (Supernatant); Mercury - 7471 - (CV)	pH (Soil) - 9045	TIA TO		
Sample No.	Matrix *	Sample Date	Sample Time								
B10F86	SOIL	10-13-00	1415	x	x	x	x	x		BOYD 10/10/00 BOYD 12	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By Greg Thomas		Date/Time 10/13/00 17:50		Received By RT		Date/Time 10/13/00		Samples stored in Ref. # 2C at the 3728 Shipping Facility on 10/13/00 Collector not available to relinquish samples on 10/17/00 for shipment. RT 10/13/00			
Relinquished By Removed from		Date/Time 0800		Received By R. Thoren		Date/Time 0800					
Relinquished By R. Thoren		Date/Time 10/17/00 0800		Received By FED EX		Date/Time					
Relinquished By Fed Ex		Date/Time 10/18/00 0930		Received By Kid Thoren		Date/Time 10/18/00 0930					
Relinquished By		Date/Time		Received By		Date/Time					
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Temp 4°



Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD B00-068 H1098

DATE RECEIVED: 10/18/00

RFW LOT # :0010L972

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10F86						
SILVER, TOTAL	001	S	99L1690	10/13/00	11/07/00	11/07/00
SILVER, TOTAL	001 REP	S	99L1690	10/13/00	11/07/00	11/07/00
SILVER, TOTAL	001 MS	S	99L1690	10/13/00	11/07/00	11/07/00
ARSENIC, TOTAL	001	S	99L1690	10/13/00	11/07/00	11/07/00
ARSENIC, TOTAL	001 REP	S	99L1690	10/13/00	11/07/00	11/07/00
ARSENIC, TOTAL	001 MS	S	99L1690	10/13/00	11/07/00	11/07/00
BARIUM, TOTAL	001	S	99L1690	10/13/00	11/07/00	11/07/00
BARIUM, TOTAL	001 REP	S	99L1690	10/13/00	11/07/00	11/07/00
BARIUM, TOTAL	001 MS	S	99L1690	10/13/00	11/07/00	11/07/00
CADMIUM, TOTAL	001	S	99L1690	10/13/00	11/07/00	11/07/00
CADMIUM, TOTAL	001 REP	S	99L1690	10/13/00	11/07/00	11/07/00
CADMIUM, TOTAL	001 MS	S	99L1690	10/13/00	11/07/00	11/07/00
CHROMIUM, TOTAL	001	S	99L1690	10/13/00	11/07/00	11/07/00
CHROMIUM, TOTAL	001 REP	S	99L1690	10/13/00	11/07/00	11/07/00
CHROMIUM, TOTAL	001 MS	S	99L1690	10/13/00	11/07/00	11/07/00
MERCURY, TOTAL	001	S	00C0366	10/13/00	11/08/00	11/08/00
MERCURY, TOTAL	001 REP	S	00C0366	10/13/00	11/08/00	11/08/00
MERCURY, TOTAL	001 MS	S	00C0366	10/13/00	11/08/00	11/08/00
LEAD, TOTAL	001	S	99L1690	10/13/00	11/07/00	11/07/00
LEAD, TOTAL	001 REP	S	99L1690	10/13/00	11/07/00	11/07/00
LEAD, TOTAL	001 MS	S	99L1690	10/13/00	11/07/00	11/07/00
SELENIUM, TOTAL	001	S	99L1690	10/13/00	11/07/00	11/07/00
SELENIUM, TOTAL	001 REP	S	99L1690	10/13/00	11/07/00	11/07/00
SELENIUM, TOTAL	001 MS	S	99L1690	10/13/00	11/07/00	11/07/00

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L1690	N/A	11/07/00	11/07/00
SILVER, TOTAL	MB1	S	99L1690	N/A	11/07/00	11/07/00
ARSENIC LABORATORY	LC1 BS	S	99L1690	N/A	11/07/00	11/07/00
ARSENIC, TOTAL	MB1	S	99L1690	N/A	11/07/00	11/07/00
BARIUM LABORATORY	LC1 BS	S	99L1690	N/A	11/07/00	11/07/00
BARIUM, TOTAL	MB1	S	99L1690	N/A	11/07/00	11/07/00
CADMIUM LABORATORY	LC1 BS	S	99L1690	N/A	11/07/00	11/07/00
CADMIUM, TOTAL	MB1	S	99L1690	N/A	11/07/00	11/07/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-068 H1098

DATE RECEIVED: 10/18/00

RFW LOT # :0010L972

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM LABORATORY	LC1 BS	S	99L1690	N/A	11/07/00	11/07/00
CHROMIUM, TOTAL	MB1	S	99L1690	N/A	11/07/00	11/07/00
MERCURY LABORATORY	LC1 BS	S	00C0366	N/A	11/08/00	11/08/00
MERCURY, TOTAL	MB1	S	00C0366	N/A	11/08/00	11/08/00
LEAD LABORATORY	LC1 BS	S	99L1690	N/A	11/07/00	11/07/00
LEAD, TOTAL	MB1	S	99L1690	N/A	11/07/00	11/07/00
SELENIUM LABORATORY	LC1 BS	S	99L1690	N/A	11/07/00	11/07/00
SELENIUM, TOTAL	MB1	S	99L1690	N/A	11/07/00	11/07/00



**Recra LabNet Philadelphia
Analytical Report**

Client: TNU-HANFORD B00-068
RFW#: 0010L972
SDG/SAF#: H1098/B00-068

W.O.#: 10985-001-001-9999-00
Date Received: 10-18-00

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to form 7.
10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Pat A

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

gmb/m10-972

Date 12-6-05



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Recra Lot#: 0010L972

Leaching Procedure: 1310 1311 1312 Other: _____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A 3050B 3051 200.7 SS17
Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Antimony	<u>6010B</u> <u>7041</u> ⁵	<u>200.7</u> <u>204.2</u>			<u>99</u>
Arsenic	<input checked="" type="checkbox"/> <u>6010B</u> <u>7060A</u> ⁵	<u>200.7</u> <u>206.2</u>	<u>3113B</u>		<u>99</u>
Barium	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Beryllium	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Bismuth	<u>6010B</u> ¹	<u>200.7</u> ¹		<u>1620</u>	<u>99</u>
Boron	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Cadmium	<input checked="" type="checkbox"/> <u>6010B</u> <u>7131A</u> ⁵	<u>200.7</u> <u>213.2</u>			<u>99</u>
Calcium	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Chromium	<input checked="" type="checkbox"/> <u>6010B</u> <u>7191</u> ⁵	<u>200.7</u> <u>218.2</u>			<u>SS17</u>
Cobalt	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Copper	<u>6010B</u> <u>7211</u> ⁵	<u>200.7</u> <u>220.2</u>			<u>99</u>
Iron	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Lead	<input checked="" type="checkbox"/> <u>6010B</u> <u>7421</u> ⁵	<u>200.7</u> <u>239.2</u>	<u>3113B</u>		<u>99</u>
Lithium	<u>6010B</u> <u>7430</u> ⁴	<u>200.7</u>		<u>1620</u>	<u>99</u>
Magnesium	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Manganese	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Mercury	<u>7470A</u> ³ <input checked="" type="checkbox"/> <u>7471A</u> ³	<u>245.1</u> ² <u>245.5</u> ²			<u>99</u>
Molybdenum	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Nickel	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Potassium	<u>6010B</u> <u>7610</u> ⁴	<u>200.7</u> <u>258.1</u> ⁴			<u>99</u>
Rare Earths	<u>6010B</u> ¹	<u>200.7</u> ¹		<u>1620</u>	<u>99</u>
Selenium	<input checked="" type="checkbox"/> <u>6010B</u> <u>7740</u> ⁵	<u>200.7</u> <u>270.2</u>	<u>3113B</u>		<u>99</u>
Silicon	<u>6010B</u> ¹	<u>200.7</u>		<u>1620</u>	<u>99</u>
Silica	<u>6010B</u>	<u>200.7</u>		<u>1620</u>	<u>99</u>
Silver	<input checked="" type="checkbox"/> <u>6010B</u> <u>7761</u> ⁵	<u>200.7</u> <u>272.2</u>			<u>99</u>
Sodium	<u>6010B</u> <u>7770</u> ⁴	<u>200.7</u> <u>273.1</u> ⁴			<u>99</u>
Strontium	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Thallium	<u>6010B</u> <u>7841</u> ⁵	<u>200.7</u> <u>279.2</u> <u>200.9</u>			<u>99</u>
Tin	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Titanium	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Uranium	<u>6010B</u> ¹	<u>200.7</u> ¹		<u>1620</u>	<u>99</u>
Vanadium	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Zinc	<u>6010B</u>	<u>200.7</u>			<u>99</u>
Zirconium	<u>6010B</u> ¹	<u>200.7</u> ¹		<u>1620</u>	<u>99</u>

Other: _____

Method: _____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

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

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

Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/06/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B10F86	Silver, Total	0.13 u	MG/KG	0.13	1.0
		Arsenic, Total	11.2	MG/KG	0.41	1.0
		Barium, Total	109	MG/KG	0.02	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	9.2	MG/KG	0.11	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	10.7	MG/KG	0.26	1.0
		Selenium, Total	0.52 u	MG/KG	0.52	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/06/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK1	99L1690-MB1	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Barium, Total	0.03	MG/KG	0.02	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.09 u	MG/KG	0.09	1.0
		Lead, Total	0.21 u	MG/KG	0.21	1.0
		Selenium, Total	0.43 u	MG/KG	0.43	1.0
BLANK1	00C0366-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recre LabNet - Lionville

INORGANICS ACCURACY REPORT 12/06/00

CLIENT: TNUHANFORD B00-068 H1098
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0010L972

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B10F86	Silver, Total	5.5	0.13u	6.1	90.2	1.0
		Arsenic, Total	227	11.2	243	88.7	1.0
		Barium, Total	332	109	243	91.8	1.0
		Cadmium, Total	5.4	0.04u	6.1	88.5	1.0
		Chromium, Total	32.8	9.2	24.3	97.1	1.0
		Mercury, Total	0.20	0.02u	0.20	103.6	1.0
		Lead, Total	64.6	10.7	60.8	88.7	1.0
		Selenium, Total	208	0.52u	243	85.6	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/06/00

CLIENT: TNUHANFORD B00-068 H1098

RECRA LOT #: 0010L972

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (RBP)
			RESULT	REPLICATE	RPD	
-001REP	B10F86	Silver, Total	0.13u	0.13u	NC	1.0
		Arsenic, Total	11.2	11.8	5.2	1.0
		Barium, Total	109	104	4.0	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	9.2	9.4	2.2	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Lead, Total	10.7	10.9	1.9	1.0
		Selenium, Total	0.52u	0.51u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/06/00

CLIENT: TNUHANFORD B00-068 H1098

RECRA LOT #: 0010L972

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	99L1690-LC1	Silver, LCS	47.1	50.0	MG/KG	94.2
		Arsenic, LCS	912	1000	MG/KG	91.2
		Barium, LCS	469	500	MG/KG	93.7
		Cadmium, LCS	23.8	25.0	MG/KG	95.2
		Chromium, LCS	48.2	50.0	MG/KG	96.4
		Lead, LCS	234	250	MG/KG	93.7
		Selenium, LCS	886	1000	MG/KG	88.6
LCS1	00C0366-LC1	Mercury, LCS	0.78	0.7	MG/KG	109.1



0010L972

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client <u>TAN - HANFORD SAFA B00-068</u>	Refrigerator #	A	B	C	D	E	
Est. Final Proj. Sampling Date _____	#/Type Container	Liquid					
Project # <u>10985-001-001-9999-00</u>	Solid	IAG	IAG	IAG	IAG	IAG	
Project Contact/Phone # _____	Volume	Liquid					
RECRA Project Manager <u>aj</u>	Solid	250	250	250	250	250	
QC <u>Spec</u> Del <u>Std</u> TAT <u>21 day</u>	Preservatives	-	-	-	-	-	
Date Rec'd <u>10-18-00</u> Date Due <u>11-8-00</u>	ANALYSES REQUESTED	ORGANIC				INORG	
Account # _____		VOA	BNA	Pest/PCB	Herb	Metal	CN

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DB - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (S)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only									
			MS	MSD				CL2H	CL2SH	MPCRATO	ICNO3	ISED	ICNTO	IPH			
	001	B10 F86	✓	✓	S	10/13/00	1415	1	1	1	1	✓		1			

Special Instructions: Saf B00-068

DATE/REVISIONS:

- _____
- _____
- _____
- _____
- _____
- _____

RECRA LabNet Use Only

- Samples were: Shipped or Hand Delivered
- Airflow: Backward
- 2) Ambient or Chilled
- 3) Received in Good Condition or N
- 4) Labels Indicate Properly Preserved or N
- 5) Received Within Holding Times or N
- COC Tape was:
- 1) Present on Outer Package or N
- 2) Unbroken on Outer Package or N
- 3) Present on Sample or N
- 4) Unbroken on Sample or N
- COC Record Present Upon Sample Rec't or N
- Cooler Temp. 4 °C

12

Relinquished by	Received by	Date	Time
<u>Fed Ep</u>	<u>Paul Henry</u>	<u>10/18/00</u>	<u>0930</u>

Relinquished by	Received by	Date	Time

COMPOSITE WASTE ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 4235 79539849

00106972

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B00-068-81	Page 1 of 1
Collector <i>Thomas</i>	Company Contact D Weekes	Telephone No. 372-9524	Project Coordinator TRENT, SJ		Price Code 8L	Data Turnaround 21 Days	
Project Designation 200 Area Groundwater Well Drilling Waste Designation for		Sampling Location 200 West		SAF No. B00-068	Air Quality <input type="checkbox"/>		
Ice Chest No. <i>RT 1917/00</i> <i>ERC-49-035 ERC 96058</i>	Field Logbook No. EL - 1518	COA JRCRA03200	Method of Shipment Fed-EX		Bill of Lading/Air Bill No. <i>47357953-9849</i>		
Shipped To <u>TMA/RECRA</u>		Offsite Property No. <i>A010009</i>					
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Samples have potential TO contain Radioactivity</i>	Preservation	B Cool 4C	A Cool 4C	D None	C None	E None	
	Type of Container	aG	aG	aG	aG	aG	
	No. of Container(s)	1	1	1	1	1	
	Volume	250mL	250mL	250mL	250mL	250mL	
SAMPLE ANALYSIS		Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) (a-Cresol)	VOA - 8260A (TCL)	IC Anions - 300.0 (Nitrate); Sulfides - 9830; Total Cyanide - 9010	ICP Metals - 6010A (Supertrace); Mercury - 7471 - (CV)	pH (Soil) - 9045	
Sample No.	Matrix *	Sample Date	Sample Time				
B10F86	SOIL	10-13-00	1415	X	X	X	X
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS			Matrix *
Relinquished By <i>Greg Thomas</i>		Date/Time 10/13/00 17:50		Received By <i>RT</i>		Date/Time 10/13/00	
Relinquished By <i>Thomas</i>		Date/Time 10/13/00 17:50		Received By <i>Ref 2C</i>		Date/Time 10/13/00 17:50	
Relinquished By <i>Removed from Ref 2C 3728</i>		Date/Time 10/17/00 0800		Received By <i>R. Thoren</i>		Date/Time 10/17/00 0800	
Relinquished By <i>R. Thoren</i>		Date/Time 10/17/00 0800		Received By <i>FED EX</i>		Date/Time 10/17/00	
Relinquished By <i>Fed Ex</i>		Date/Time 10/18/00 0930		Received By <i>Kit Thoren</i>		Date/Time 10/18/00 0930	
Relinquished By		Date/Time		Received By		Date/Time	
Relinquished By		Date/Time		Received By		Date/Time	
LABORATORY SECTION				SPECIAL INSTRUCTIONS			Matrix *
Received By		Title		Samples stored in Ref.# <i>2C</i> at the 3728 Shipping Facility on <i>10/13/00</i> Collector not available to relinquish samples on <i>10/17/00</i> for shipment.			<ul style="list-style-type: none"> S=Soil SE=Settlement SD=Solid S=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trace WT=Wipe L=Liquid V=Vegetation X=Other
Disposed By		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By			Date/Time

TIE TO

BOYD RT 10
BOYD W 12

RT
10/13/00

13

Temp 4°

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-068 H1098

DATE RECEIVED: 10/18/00

RFW LOT # :0010L972

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10F86	001	S	00LE1337	10/13/00	10/19/00	11/15/00
B10F86	001 MS	S	00LE1337	10/13/00	10/19/00	11/15/00
B10F86	001 MSD	S	00LE1337	10/13/00	10/19/00	11/15/00

LAB QC:

SBLKEH	MB1	S	00LE1337	N/A	10/19/00	11/15/00
SBLKEH	MB1 BS	S	00LE1337	N/A	10/19/00	11/15/00



Client: TNU-HANFORD B00-068
RFW #: 0010L972
SDG/SAF #: H1098/B00-068

W.O. #: 10985-001-001-9999-00
Date Received: 10-18-00

SEMIVOLATILE

One (1) soil sample was collected on 10-13-00.

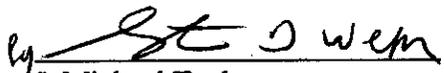
The sample and its associated QC samples were extracted on 10-19-00 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 11-15-00.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The sample was extracted and analyzed within required holding times.
3. Non-target compounds were detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. Six (6) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
6. Two (2) of eleven (11) blank spike recoveries were outside EPA QC limits.
7. The method blank contained the common laboratory contaminants Bis(2-Ethylhexyl)phthalate at a level less than the CRQL.
8. Low recoveries were reported for the spike compound, Pentachlorophenol. The presence of Pentachloromethoxy Benzene in the Chromatograms indicated that a conversion had occurred during the extraction process. Pentachlorophenol conversion was not detected in the unspiked sample analyses. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
9. Manual integrations are performed according to OP L-QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in Section III ("Technical Flags For Manual Integration"); hard copies of the integrations have been included with the quantitation data.



10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."


J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

pef\group\data\bna\lmu-hanford-10-972.doc

12-13-00
Date



Initiator: John W. Smith Batch: 00106972 Parameter: BNA
 Date: 11/16/00 Samples: MS + T + MBI S Matrix: SOIL
 Client: TNU Hazardous Sub-068 Method: SVES30MCAWW/CLP1 Prep Batch: 00L41337
 H1099

1. Reason for SDR

- a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____
- b. General Discrepancy
 Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold
 Improper Bottle Type Not Amenable to Analysis

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

c. Problem (Include all relevant specific results; attach data if necessary)
Several spikes fail low in MS. Pentachlorophenol fails low in MS/MSD w BS.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

Other Description:

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

Report + Narrative

[Signature] 11/16/00

4. Project Manager Instructions...signature/date:

- Concur with Proposed Action
- Disagree with Proposed Action; See Instruction
- Include in Case Narrative
- Client Contacted:
- Date/Person Donkersner 11/16/00
- Add
- Cancel

5. Final Action...signature/date:

DT 11/21/00

Other Explanation:

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

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
<input checked="" type="checkbox"/>	Initiator	<input type="checkbox"/>	Metals: Doughty
<input checked="" type="checkbox"/>	Lab General Manager: M. Taylor	<input type="checkbox"/>	Inorganic: Perrone
<input checked="" type="checkbox"/>	Project Mgr: Stone/Johnson	<input type="checkbox"/>	GC/LC: Pastor
<input checked="" type="checkbox"/>	Technical Mgr: Wesson/Daniels	<input type="checkbox"/>	MS: Rycklak/Layman
<input checked="" type="checkbox"/>	QA (file): Popp	<input type="checkbox"/>	Log-in: Keppel
<input type="checkbox"/>	Data Management: Feldman	<input type="checkbox"/>	Admin: Soos
<input type="checkbox"/>	Sample Prep: Doughty/Kiger	<input type="checkbox"/>	Other: _____

GLOSSARY OF BNA DATA

ABBREVIATIONS

- BS** - Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** - Indicates blank spike duplicate.
- MS** - Indicates matrix spike.
- MSD** - Indicates matrix spike duplicate.
- DL** - Suffix added to sample number to indicate that results are from a diluted analysis.
- NA** - Not Applicable.
- DF** - Dilution Factor.
- NR** - Not Required.
- SP, Z** - Indicates Spiked Compound.



GLOSSARY OF BNA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- A** = Indicates that a TIC is a suspected aldol-condensation product.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP** - Missed Peak: manually added peak not found by automatic quan program.
- PA** - Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 11/17/00 10:18

RFW Batch Number: 0010L972

Client: TNUHANFORD B00-068 H1098

Work Order: 10985001001

Page: 1a

Sample Information	Cust ID:	B10F86	B10F86	B10F86	SBLKEH	SBLKEH BS
	RFW#:	001	001 MS	001 MSD	00LE1337-MB1	00LE1337-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate	Nitrobenzene-d5	89 %	38 %	91 %	81 %	84 %
Recovery	2-Fluorobiphenyl	84 %	66 %	100 %	84 %	89 %
	Terphenyl-d14	97 %	104 %	105 %	116 %	130 %
	Phenol-d5	76 %	42 %	73 %	70 %	73 %
	2-Fluorophenol	76 %	27 %	76 %	75 %	72 %
	2,4,6-Tribromophenol	40 %	78 %	81 %	46 %	101 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====						
	Phenol	520 U	41 %	78 %	330 U	77 %
	bis(2-Chloroethyl) ether	520 U	520 U	520 U	330 U	330 U
	2-Chlorophenol	520 U	31 %	76 %	330 U	73 %
	1,3-Dichlorobenzene	520 U	520 U	520 U	330 U	330 U
	1,4-Dichlorobenzene	520 U	19 * %	64 %	330 U	71 %
	1,2-Dichlorobenzene	520 U	520 U	520 U	330 U	330 U
	2-Methylphenol	520 U	520 U	520 U	330 U	330 U
	2,2'-oxybis(1-Chloropropane)	520 U	520 U	520 U	330 U	330 U
	3- and/or 4-Methylphenol	520 U	520 U	520 U	330 U	330 U
	N-Nitroso-di-n-propylamine	520 U	36 * %	80 %	330 U	79 %
	Hexachloroethane	520 U	520 U	520 U	330 U	330 U
	Nitrobenzene	520 U	520 U	520 U	330 U	330 U
	Isophorone	520 U	520 U	520 U	330 U	330 U
	2-Nitrophenol	520 U	520 U	520 U	330 U	330 U
	2,4-Dimethylphenol	520 U	520 U	520 U	330 U	330 U
	bis(2-Chloroethoxy) methane	520 U	520 U	520 U	330 U	330 U
	2,4-Dichlorophenol	520 U	520 U	520 U	330 U	330 U
	1,2,4-Trichlorobenzene	520 U	36 * %	81 %	330 U	79 %
	Naphthalene	520 U	520 U	520 U	330 U	330 U
	4-Chloroaniline	520 U	520 U	520 U	330 U	330 U
	Hexachlorobutadiene	520 U	520 U	520 U	330 U	330 U
	4-Chloro-3-methylphenol	520 U	74 %	86 %	330 U	94 %
	2-Methylnaphthalene	520 U	520 U	520 U	330 U	330 U
	Hexachlorocyclopentadiene	520 U	520 U	520 U	330 U	330 U
	2,4,6-Trichlorophenol	520 U	520 U	520 U	330 U	330 U
	2,4,5-Trichlorophenol	1300 U	1300 U	1300 U	830 U	830 U

*= Outside of EPA CLP QC limits.

20

Cust ID:	B10F86	B10F86	B10F86	SBLKEH	SBLKEH BS
RFW#:	001	001 MS	001 MSD	00LE1337-MB1	00LE1337-MB1
2-Chloronaphthalene	520 U	520 U	520 U	330 U	330 U
2-Nitroaniline	1300 U	1300 U	1300 U	830 U	830 U
Dimethylphthalate	520 U	520 U	520 U	330 U	330 U
Acenaphthylene	520 U	520 U	520 U	330 U	330 U
2,6-Dinitrotoluene	520 U	520 U	520 U	330 U	330 U
3-Nitroaniline	1300 U	1300 U	1300 U	830 U	830 U
Acenaphthene	520 U	74 %	100 %	330 U	91 %
2,4-Dinitrophenol	1300 U	1300 U	1300 U	830 U	830 U
4-Nitrophenol	1300 U	69 %	71 %	830 U	75 %
Dibenzofuran	520 U	520 U	520 U	330 U	330 U
2,4-Dinitrotoluene	520 U	87 %	103 * %	330 U	109 * %
Diethylphthalate	520 U	520 U	520 U	330 U	330 U
4-Chlorophenyl-phenylether	520 U	520 U	520 U	330 U	330 U
Fluorene	520 U	520 U	520 U	330 U	330 U
4-Nitroaniline	1300 U	1300 U	1300 U	830 U	830 U
4,6-Dinitro-2-methylphenol	1300 U	1300 U	1300 U	830 U	830 U
N-Nitrosodiphenylamine (1)	520 U	520 U	520 U	330 U	330 U
4-Bromophenyl-phenylether	520 U	520 U	520 U	330 U	330 U
Hexachlorobenzene	520 U	520 U	520 U	330 U	330 U
Pentachlorophenol	1300 U	1 * %	0 * %	830 U	2 * %
Phenanthrene	520 U	520 U	520 U	330 U	330 U
Anthracene	520 U	520 U	520 U	330 U	330 U
Carbazole	520 U	520 U	520 U	330 U	330 U
Di-n-butylphthalate	41 J	520 U	520 U	330 U	31 J
Fluoranthene	520 U	520 U	520 U	330 U	330 U
Pyrene	520 U	91 %	100 %	330 U	123 %
Butylbenzylphthalate	520 U	520 U	520 U	330 U	330 U
3,3'-Dichlorobenzidine	520 U	520 U	520 U	330 U	330 U
Benzo(a)anthracene	520 U	520 U	520 U	330 U	330 U
Chrysene	520 U	520 U	520 U	330 U	330 U
bis(2-Ethylhexyl)phthalate	560 B	340 JB	310 JB	63 J	91 JB
Di-n-octyl phthalate	520 U	520 U	520 U	330 U	330 U
Benzo(b)fluoranthene	520 U	520 U	520 U	330 U	330 U
Benzo(k)fluoranthene	520 U	520 U	520 U	330 U	330 U
Benzo(a)pyrene	520 U	520 U	520 U	330 U	330 U
Indeno(1,2,3-cd)pyrene	520 U	520 U	520 U	330 U	330 U
Dibenz(a,h)anthracene	520 U	520 U	520 U	330 U	330 U
Benzo(g,h,i)perylene	520 U	520 U	520 U	330 U	330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B10F86

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNUHANFORD B00-068 H1098

Matrix: (soil/water) SOIL Lab Sample ID: 0010L972-001

Sample wt/vol: 30.3 (g/mL) G Lab File ID: A111508

Level: (low/med) LOW Date Received: 10/18/00

% Moisture: 37 decanted: (Y/N) Date Extracted: 10/19/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/15/00

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	10.71	100	J
2.	UNKNOWN	11.29	200	J
3.	ORGANIC ACID	19.27	200	J
4.	ALKANE	19.70	100	J
5.	UNKNOWN	20.26	900	JB
6.	UNKNOWN	20.71	100	J
7.	ORGANIC ACID	20.81	300	J
8.	UNKNOWN	21.64	200	J
9.	UNKNOWN	21.69	200	J
10.	UNKNOWN	21.98	1000	J
11.	UNKNOWN	23.00	100	J
12.	UNKNOWN	23.23	100	J
13.	ADIPATE	23.30	200	J
14.	UNKNOWN	23.91	200	J
15.	UNKNOWN	24.92	1000	J
16.	UNKNOWN	25.30	1000	J
17.	UNKNOWN	25.45	1000	J
18.	UNKNOWN	26.87	800	J
19.	UNKNOWN	34.29	100	J

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKEH

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNUHANFORD B00-068 H1098

Matrix: (soil/water) SOIL

Lab Sample ID: 00LE1337-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A111506

Level: (low/med) LOW

Date Received: 10/19/00

% Moisture: decanted: (Y/N)

Date Extracted: 10/19/00

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 11/15/00

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH:

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	20.26	500	J

RECRA LabNet Use Only
0010L972

Custody Transfer Record/Lab Work Request Page 1 of 1



ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client <u>TNU - HANFORD SAF# B00-068</u>	Refrigerator #	A	B	C	D	E			
Est. Final Proj. Sampling Date _____	#/Type Container	Liquid							
Project # <u>10985-001-001-9999-00</u>	Solid	1AG	1AG	1AG	1AG-1	1AG			
Project Contact/Phone # _____	Volume	Liquid							
RECRA Project Manager <u>aj</u>	Solid	250	250	250	250-1	250			
QC Spec <u>Del Std TAT 21 day</u>	Preservatives	-	-	-	-	-			
Date Rec'd <u>10-18-00</u> Date Due <u>11-8-00</u>	ANALYSES REQUESTED	ORGANIC			INORG				
Account # _____		VOA	BNA	Pest/PCB	Herb	Metal	Zn	IC	PH

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only										
			MS	MSD				VOA	BNA	Pest/PCB	Herb	MRCRATO	ICNO3	ISED	ICNTO	IPH		
	001	B10 F86	✓	✓	3	10/3/00	1415	1	1					1	1	✓		1

Special Instructions: Saf B00-068

DATE/REVISIONS:

- _____
- _____
- _____
- _____
- _____
- _____

RECRA LabNet Use Only

Samples were:
 1) Shipped or Hand Delivered _____
 2) Ambient or Chilled
 3) Received in Good Condition or N
 4) Labels Indicate Properly Preserved or N
 5) Received Within Holding Times or N

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

Relinquished by	Received by	Date	Time
<u>Fred Ep</u>	<u>Paul Henry</u>	<u>10/16/00</u>	<u>0930</u>

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:
4235 7953 9849

00106972

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					B00-068-81		Page 1 of 1					
Collector <u>Thomas</u>		Company Contact D Weekes		Telephone No. 372-9524		Project Coordinator TRENT, SJ		Price Code 8L		Data Turnaround 21 Days				
Project Designation 200 Area Groundwater Well Drilling Waste Designation for		Sampling Location 200 West			SAF No. B00-068		Air Quality <input type="checkbox"/>							
Ice Chest No. <u>RT 1017100</u> <u>ERC-99-035 ERC 96058</u>		Field Logbook No. EL - 1518		COA JRCRA03200		Method of Shipment Fed-EX								
Shipped To TMA/RECRA		Offsite Property No. <u>A010009</u>			Bill of Lading/Air Bill No. <u>42351953-9849</u>									
POSSIBLE SAMPLE HAZARDS/REMARKS <u>Samples have potential TO contain RADIOACTIVITY</u>				Preservation		B Cool 4C	A Cool 4C	D None	C None	E None				
				Type of Container		aG	aG	aG	aG	aG				
				No. of Container(s)		1	1	1	1	1				
				Volume		250mL	250mL	250mL	250mL	250mL				
Special Handling and/or Storage				SAMPLE ANALYSIS		Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) (m-Cresol)		VOA - 8260A (TCL)		IC Anions - 300.0 (Nitrate); Sulfides - 9030; Total Cyanide - 9010				
						ICP Metals - 6010A (Supertrace); Mercury - 7471 - (CV)		pH (Soil) - 9045						
Sample No.		Matrix *		Sample Date		Sample Time								
B10F86		SOIL		10-13-00		1415		x x x x x		TIE TO BOYRILL BOYW12				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *						
Relinquished By <u>Greg Thomas</u>		Date/Time <u>10/13/00 17:50</u>		Received By <u>RT</u>		Date/Time <u>10/13/00</u>		Samples stored in Ref. # <u>2C</u> at the 3728 Shipping Facility on <u>10/13/00</u> Collector not available to relinquish samples on <u>10/17/00</u> for shipment. <u>RT</u> <u>10/13/00</u>						
Relinquished By <u>Greg Thomas</u>		Date/Time <u>10/13/00 17:50</u>		Received By <u>RT</u>		Date/Time <u>10/13/00 17:50</u>								
Relinquished By <u>Removed from Ref 2C 3728</u>		Date/Time <u>10/17/00 0800</u>		Received By <u>R. Thoren</u>		Date/Time <u>10/17/00 0800</u>								
Relinquished By <u>R. Thoren</u>		Date/Time <u>10/17/00 0800</u>		Received By <u>FED EX</u>		Date/Time								
Relinquished By <u>Fed Ex</u>		Date/Time <u>10/18/00 0930</u>		Received By <u>Kid Thoren</u>		Date/Time <u>10/18/00 0930</u>								
Relinquished By		Date/Time		Received By		Date/Time								
Relinquished By		Date/Time		Received By		Date/Time								
LABORATORY SECTION		Received By		Title				Date/Time						
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time						

RT 1017100

Temp 4°

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-068 H1098

DATE RECEIVED: 10/18/00

RFW LOT # :0010L972

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10F86	001	S	00LVX328	10/13/00	N/A	10/22/00
B10F86	001 MS	S	00LVX328	10/13/00	N/A	10/22/00
B10F86	001 MSD	S	00LVX328	10/13/00	N/A	10/22/00

LAB QC:

VBLKXR	MB1	S	00LVX328	N/A	N/A	10/22/00
VBLKXR	MB1 BS	S	00LVX328	N/A	N/A	10/22/00

11-16-00



**Recra LabNet Philadelphia
Analytical Report**

Client: TNU-HANFORD B00-068
RFW #: 0010L972
SDG/SAF #: H1098/B00-068

W.O. #: 10985-001-001-9999-00
Date Received: 10-18-00

GC/MS VOLATILE

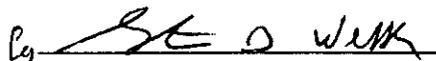
One (1) soil samples were collected on 10-13-00.

The sample and its associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260B for TCL Volatile target compounds on 10-22-00.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The sample was analyzed within required holding time.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone and the target compounds Bromomethane, 2-Hexanone, and 1,1,2,2-Tetrachloroethane at levels less than the CRQL.
8. The sample was reported on an "as received" basis due to the high water content of its matrix.
9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."




J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

11-17-00
Date

pef\group\data\voa\tnu-hanford-10-972.doc

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 9 pages.

RECRA

Sample Discrepancy Report (SDR)

SDR #: 00VT219

Initiator: N. Schrenker Batch: 00104972 Parameter: SLZ4
 Date: 10/25/00 Samples: 001 (0.2) Matrix: Soil
 Client: Thyssen Corp Method: SV7846/MCAWW/CLP/ Prep Batch: —
(800-018)

1. Reason for SDR

- a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____
- b. General Discrepancy
 Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold
 Improper Bottle Type Not Amenable to Analysis

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

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

Sample was ~ $\frac{80}{25}$ % H₂O (~1 in. of soil/sediment in jar).

2. Known or Probable Causes(s) (To be used for trend analysis)

- Lack of Organization Other (Please explain):
 Lack of Training
 Lack of Discipline Sample Matrix
 Lack of Resources
 Lack of Time
 Lack of Management Support

3. Discussion and Proposed Action

Other Description:

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

was analyzed using as best a
"uniform" aliquot as possible (mixed)
would like to report on a "wet weight" basis
narrate

4. Project Manager Instructions...signature/date:

[Signature] 10/25/00

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

5. Final Action...signature/date:

[Signature] 10/25/00

Other Explanation:

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

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

Route/Distribution of SDR

Route Distribution of Completed SDR

- Initiator
 Lab Manager: M. Taylor
 Project Mgr: Stone/Carey/Johnson
 Section Mgr: Wesson/Daniels
 QA (file): Schrenker
 Data Management: Feldman
 Sample Prep: Bickel/Kauffman

- Metals: Doughty
 Inorganic: Perrone
 GC/LC: Pastor
 MS: Layman/Ryckliak
 Log-in: Keppel
 Admin: Soos
 Other: _____

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF VOA DATA

ABBREVIATIONS

- BS** - Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** - Indicates blank spike duplicate.
- MS** - Indicates matrix spike.
- MSD** - Indicates matrix spike duplicate.
- DL** - Suffix added to sample number to indicate that results are from a diluted analysis.
- NA** - Not Applicable.
- DF** - Dilution Factor.
- NR** - Not Required.
- SP, Z** - Indicates Spiked Compound.



Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 11/16/00 09:40

RFW Batch Number: 0010L972

Client: TNUHANFORD B00-068 H1098 Work Order: 10985001001 Page: 1a

6

Sample Information	Cust ID:	B10F86	B10F86	B10F86	VBLKXR	VBLKXR BS
	RFW#:	001	001 MS	001 MSD	00LVX328-MB1	00LVX328-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.980	0.962	0.926	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate	Toluene-d8	105 %	115 %	111 %	103 %	101 %
Recovery	Bromofluorobenzene	79 %	84 %	84 %	95 %	93 %
	1,2-Dichloroethane-d4	100 %	114 %	110 %	101 %	102 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====						
Chloromethane		10 U	10 U	9 U	10 U	10 U
Bromomethane		10 U	10 U	9 U	3 J	10 U
Vinyl Chloride		10 U	10 U	9 U	10 U	10 U
Chloroethane		10 U	10 U	9 U	10 U	10 U
Methylene Chloride		7 B	7 B	6 B	2 J	3 JB
Acetone		12 B	14 B	11 B	4 J	10 U
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	100 %	89 %	5 U	81 %
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	5 U	5 U	5 U
Chloroform		5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U
2-Butanone		10 U	10 U	9 U	10 U	10 U
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	102 %	94 %	5 U	94 %
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U
Benzene		5 U	103 %	99 %	5 U	95 %
Trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	9 U	10 U	10 U
2-Hexanone		10 U	10 U	9 U	2 J	10 U
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	1 J	5 U
Toluene		5 U	107 %	105 %	5 U	97 %

*= Outside of EPA CLP QC limits.

9/11/00

Cust ID: B10F86 B10F86 B10F86 VBLKXR VBLKXR BS

RFW#: 001 001 MS 001 MSD 00LVX328-MB1 00LVX328-MB1

Chlorobenzene	5 U	96 %	96 %	5 U	97 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

