0070117

SAF-RC-047
100 & 300 Area Component of the RCBRA Sediment and Tissues
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 JE 06/28/06
INITIAL/DATE

COMMENTS:

SDG K0235 SAF-RC-047

Waste Site: Sediment in Cr 1, Cr 2, Cr 3, Cr 4, Cr 7, Cr 8

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JUL 11 2006
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Date: 7 June 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Sediment & Tissue
Subject: Inorganic - Data Package No. K0235-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0235 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11298	2/21/06	Solid	C	See note 1
J11299	2/21/06	Solid	C	See note 1
J112B0	2/21/06	Solid	C	See note 1
J112B1	2/21/06	Solid	C	See note 1
J116L6	2/21/06	Solid	C	See note 1
J116L7	2/21/06	Solid	C	See note 1
J11733	2/21/06	Solid	C	See note 1

1 - ICP metals (6010B) and mercury by 7471A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Sampling & Analysis Plan (DOE/RL-2005-42, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the tin results in all detected samples were qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 79% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less

than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (52%), all antimony result were qualified as an estimate and flagged "J".

Due to an LCS recovery outside QC limits (63%), all silicon result were qualified as an estimate and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J116L7/J11733) were submitted for analysis. Field duplicate samples are compared using the same criteria as for laboratory duplicates. The RPD for vanadium (44%) was outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 and 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K0235 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be

valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the tin results in all detected samples were qualified as an estimate and flagged "UJ".
- Due to a matrix spike recovery outside QC limits (52%), all antimony result were qualified as an estimate and flagged "J".
- Due to an LCS recovery outside QC limits (63%), all silicon result were qualified as an estimate and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005-42, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Sampling & Analysis Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K0235	REVIEWER: Project: RCBRA, TL	PAGE 1 OF 1
COMMENTS:		

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tin	UJ	J11298, J11299 J112B1, J116L7	Blank contamination
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD

Laboratory: LLI SDG: K0235

Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	1	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Aluminum	5	6090		5930		3890		3400		3090		3140		4000	
Arsenic	10	4.6		4.7		2.0		1.6		2.1		2.0		2.4	
Boron		0.81		0.88		0.89		0.60		1.2		1.6		2.0	
Barium	2	61.9		66.8		47.1		75.1		55.2		63.8		70.9	
Beryllium	0.5	0.55		0.62		0.83		0.77		0.78		0.74		1.0	
Bismuth		0.54	U	0.54	U	0.52	U	0.51	U	0.52	U	0.53	U	0.52	U
Calcium		3530		3660		6230		5300		4620		4740		5450	
Cadmium	1	1.4		1.6		0.07	U	0.07	U	0.15		0.07		0.07	U
Cobalt		5.8		6.0		6.3		5.8		5.6		5.1		6.7	
Chromium	1	19.3		18.1		5.5		3.8		5.3		7.3		9.6	
Copper	6	19.9		20.7		17.1		14.2		13.8		13.5		15.1	
Iron	5	15500		16300		18900		17700		17600		16200		21400	
Mercury	0.2	0.02		0.02		0.02	U	0.02	U	0.01	U	0.02	U	0.02	U
Potassium	400	876		830		804		791		800		742		877	
Lithium		8.0		7.8		4.3		3.8		3.4		3.2		4.2	
Magnesium		3790		3820		3360		3280		3070		2820		3580	
Manganese	5	250		261		329		250		262		223		283	
Molybdenum		0.50		0.43		0.40		0.42		0.45		0.38		0.50	
Sodium		135		130		116		91.4		104		81.9		114	
Nickel	4	13.6		13.1		8.0		7.2		7.8		5.6		7.6	
Phosphorous	5	710		794		1160		1250		1260		1190		1370	
Lead	5	33.6		31.5		3.9		3.6		10.7		7.9		9.1	
Antimony	6	0.47	UJ	0.46	UJ	0.45	UJ	0.44	UJ	0.45	UJ	0.45	UJ	0.45	UJ
Selenium		3.9	U	3.8	U	3.7	U	3.7	U	3.7	U	3.8	U	3.7	U
Silicon		804	J	783	J	725	J	410	J	415	J	425	J	453	J
Tin	10	1.2	UJ	1.3	UJ	1.1	U	1.1	UJ	1.1	U	1.5	UJ	1.1	U
Strontium		20.7		20.4		20.4		18.0		17.4		19.2		21.9	
Thallium		0.75	U	0.74	U	0.71	U	0.70	U	0.71	U	0.72	U	0.71	U
Uranium	30	0.94	U	0.93	U	0.89	U	0.89	U	0.89	U	0.91	U	0.89	U
Vanadium	2.5	30.6		31.7		38.0		34.7		38.9		32.1		50.4	
Zinc	1	286		270		38.0		36.4		82.3		60.7		74.1	

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11298	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	6090	MG/KG	3.1	1.0
		Arsenic, Total	4.6	MG/KG	0.65	1.0
		Boron, Total	0.81	MG/KG	0.26	1.0
		Barium, Total	61.9	MG/KG	0.02	1.0
		Beryllium, Total	0.55	MG/KG	0.02	1.0
		Bismuth, Total	0.54 u	MG/KG	0.54	1.0
		Calcium, Total	3530	MG/KG	1.7	1.0
		Cadmium, Total	1.4	MG/KG	0.07	1.0
		Cobalt, Total	5.8	MG/KG	0.15	1.0
		Chromium, Total	19.3	MG/KG	0.14	1.0
		Copper, Total	19.9	MG/KG	0.13	1.0
		Iron, Total	15500	MG/KG	3.7	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	876	MG/KG	82.3	1.0
		Lithium, Total	8.0	MG/KG	0.03	1.0
		Magnesium, Total	3790	MG/KG	1.0	1.0
		Manganese, Total	250	MG/KG	0.03	1.0
		Molybdenum, Total	0.50	MG/KG	0.31	1.0
		Sodium, Total	135	MG/KG	2.7	1.0
		Nickel, Total	13.6	MG/KG	0.26	1.0
		Phosphorus, Total	710	MG/KG	0.96	1.0
		Lead, Total	33.6	MG/KG	0.33	1.0
		Antimony, Total	0.47 u J	MG/KG	0.47	1.0
		Selenium, Total	3.9 u	MG/KG	3.9	1.0
		Silicon, Total	804 J	MG/KG	2.4	1.0
		Tin, Total	1.2 UJ	MG/KG	1.1	1.0
		Strontium, Total	20.7	MG/KG	0.01	1.0
		Thallium, Total	0.75 u	MG/KG	0.75	1.0
		Uranium, Total	0.94 u	MG/KG	0.94	1.0
		Vanadium, Total	30.6	MG/KG	0.1	1.0
		Zinc, Total	286	MG/KG	0.17	1.0

4/4/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J11299	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5930	MG/KG	3.0	1.0
		Arsenic, Total	4.7	MG/KG	0.64	1.0
		Boron, Total	0.88	MG/KG	0.25	1.0
		Barium, Total	66.8	MG/KG	0.02	1.0
		Beryllium, Total	0.62	MG/KG	0.02	1.0
		Bismuth, Total	0.54 u	MG/KG	0.54	1.0
		Calcium, Total	3660	MG/KG	1.7	1.0
		Cadmium, Total	1.6	MG/KG	0.07	1.0
		Cobalt, Total	6.0	MG/KG	0.15	1.0
		Chromium, Total	18.1	MG/KG	0.14	1.0
		Copper, Total	20.7	MG/KG	0.13	1.0
		Iron, Total	16200	MG/KG	3.7	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	830	MG/KG	81.3	1.0
		Lithium, Total	7.8	MG/KG	0.03	1.0
		Magnesium, Total	3820	MG/KG	1.0	1.0
		Manganese, Total	261	MG/KG	0.03	1.0
		Molybdenum, Total	0.43	MG/KG	0.31	1.0
		Sodium, Total	130	MG/KG	2.6	1.0
		Nickel, Total	13.1	MG/KG	0.25	1.0
		Phosphorus, Total	794	MG/KG	0.95	1.0
		Lead, Total	31.5	MG/KG	0.33	1.0
		Antimony, Total	0.46 u J	MG/KG	0.46	1.0
		Selenium, Total	3.8 u	MG/KG	3.8	1.0
		Silicon, Total	783 J	MG/KG	2.4	1.0
		Tin, Total	1.3 UJ	MG/KG	1.1	1.0
		Strontium, Total	20.4	MG/KG	0.01	1.0
		Thallium, Total	0.74 u	MG/KG	0.74	1.0
		Uranium, Total	0.93 u	MG/KG	0.93	1.0
		Vanadium, Total	31.7	MG/KG	0.09	1.0
		Zinc, Total	270	MG/KG	0.17	1.0

6/4/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J112E0	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	3890	MG/KG	2.9	1.0
		Arsenic, Total	2.0	MG/KG	0.62	1.0
		Boron, Total	0.89	MG/KG	0.24	1.0
		Barium, Total	47.1	MG/KG	0.02	1.0
		Beryllium, Total	0.83	MG/KG	0.02	1.0
		Bismuth, Total	0.52 u	MG/KG	0.52	1.0
		Calcium, Total	6230	MG/KG	1.7	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	6.3	MG/KG	0.14	1.0
		Chromium, Total	5.5	MG/KG	0.13	1.0
		Copper, Total	17.1	MG/KG	0.12	1.0
		Iron, Total	18900	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	804	MG/KG	78.2	1.0
		Lithium, Total	4.3	MG/KG	0.03	1.0
		Magnesium, Total	3360	MG/KG	0.98	1.0
		Manganese, Total	329	MG/KG	0.03	1.0
		Molybdenum, Total	0.40	MG/KG	0.29	1.0
		Sodium, Total	116	MG/KG	2.5	1.0
		Nickel, Total	8.0	MG/KG	0.24	1.0
		Phosphorus, Total	1160	MG/KG	0.91	1.0
		Lead, Total	3.9	MG/KG	0.31	1.0
		Antimony, Total	0.45 u J	MG/KG	0.45	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	725 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	20.4	MG/KG	0.01	1.0
		Thallium, Total	0.71 u	MG/KG	0.71	1.0
		Uranium, Total	0.89 u	MG/KG	0.89	1.0
		Vanadium, Total	38.0	MG/KG	0.09	1.0
		Zinc, Total	38.0	MG/KG	0.16	1.0

6/4/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J112B1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	3400	MG/KG	2.9	1.0
		Arsenic, Total	1.6	MG/KG	0.61	1.0
		Boron, Total	0.60	MG/KG	0.24	1.0
		Barium, Total	75.1	MG/KG	0.02	1.0
		Beryllium, Total	0.77	MG/KG	0.02	1.0
		Bismuth, Total	0.51 u	MG/KG	0.51	1.0
		Calcium, Total	5300	MG/KG	1.7	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	5.8	MG/KG	0.14	1.0
		Chromium, Total	3.8	MG/KG	0.13	1.0
		Copper, Total	14.2	MG/KG	0.12	1.0
		Iron, Total	17700	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	791	MG/KG	77.6	1.0
		Lithium, Total	3.8	MG/KG	0.03	1.0
		Magnesium, Total	3280	MG/KG	0.98	1.0
		Manganese, Total	250	MG/KG	0.03	1.0
		Molybdenum, Total	0.42	MG/KG	0.29	1.0
		Sodium, Total	91.4	MG/KG	2.5	1.0
		Nickel, Total	7.2	MG/KG	0.24	1.0
		Phosphorus, Total	1250	MG/KG	0.91	1.0
		Lead, Total	3.6	MG/KG	0.31	1.0
		Antimony, Total	0.44 u J	MG/KG	0.44	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	410 J	MG/KG	2.3	1.0
		Tin, Total	1.1 UJ	MG/KG	1.1	1.0
		Strontium, Total	18.0	MG/KG	0.01	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.89 u	MG/KG	0.89	1.0
		Vanadium, Total	34.7	MG/KG	0.09	1.0
		Zinc, Total	36.4	MG/KG	0.16	1.0

6/4/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J116L6	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	3090	MG/KG	2.9	1.0
		Arsenic, Total	2.1	MG/KG	0.62	1.0
		Boron, Total	1.2	MG/KG	0.24	1.0
		Barium, Total	55.2	MG/KG	0.02	1.0
		Beryllium, Total	0.78	MG/KG	0.02	1.0
		Bismuth, Total	0.52 u	MG/KG	0.52	1.0
		Calcium, Total	4620	MG/KG	1.7	1.0
		Cadmium, Total	0.15	MG/KG	0.07	1.0
		Cobalt, Total	5.6	MG/KG	0.14	1.0
		Chromium, Total	5.3	MG/KG	0.13	1.0
		Copper, Total	13.8	MG/KG	0.12	1.0
		Iron, Total	17600	MG/KG	3.5	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	800	MG/KG	78.1	1.0
		Lithium, Total	3.4	MG/KG	0.03	1.0
		Magnesium, Total	3070	MG/KG	0.98	1.0
		Manganese, Total	262	MG/KG	0.03	1.0
		Molybdenum, Total	0.45	MG/KG	0.29	1.0
		Sodium, Total	104	MG/KG	2.5	1.0
		Nickel, Total	7.8	MG/KG	0.24	1.0
		Phosphorus, Total	1260	MG/KG	0.91	1.0
		Lead, Total	10.7	MG/KG	0.31	1.0
		Antimony, Total	0.45 u J	MG/KG	0.45	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	415 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	17.4	MG/KG	0.01	1.0
		Thallium, Total	0.71 u	MG/KG	0.71	1.0
		Uranium, Total	0.89 u	MG/KG	0.89	1.0
		Vanadium, Total	38.9	MG/KG	0.09	1.0
		Zinc, Total	82.3	MG/KG	0.16	1.0

R 6/4/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J116L7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	3140	MG/KG	3.0	1.0
		Arsenic, Total	2.0	MG/KG	0.63	1.0
		Boron, Total	1.6	MG/KG	0.25	1.0
		Barium, Total	63.8	MG/KG	0.02	1.0
		Beryllium, Total	0.74	MG/KG	0.02	1.0
		Bismuth, Total	0.53 u	MG/KG	0.53	1.0
		Calcium, Total	4740	MG/KG	1.7	1.0
		Cadmium, Total	0.07	MG/KG	0.07	1.0
		Cobalt, Total	5.1	MG/KG	0.14	1.0
		Chromium, Total	7.3	MG/KG	0.13	1.0
		Copper, Total	13.5	MG/KG	0.12	1.0
		Iron, Total	16200	MG/KG	3.6	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	742	MG/KG	79.5	1.0
		Lithium, Total	3.2	MG/KG	0.03	1.0
		Magnesium, Total	2820	MG/KG	1.0	1.0
		Manganese, Total	223	MG/KG	0.03	1.0
		Molybdenum, Total	0.38	MG/KG	0.30	1.0
		Sodium, Total	81.9	MG/KG	2.6	1.0
		Nickel, Total	5.6	MG/KG	0.25	1.0
		Phosphorus, Total	1190	MG/KG	0.93	1.0
		Lead, Total	7.9	MG/KG	0.32	1.0
		Antimony, Total	0.45 u J	MG/KG	0.45	1.0
		Selenium, Total	3.8 u	MG/KG	3.8	1.0
		Silicon, Total	425 J	MG/KG	2.3	1.0
		Tin, Total	1.5 UJ	MG/KG	1.1	1.0
		Strontium, Total	19.2	MG/KG	0.01	1.0
		Thallium, Total	0.72 u	MG/KG	0.72	1.0
		Uranium, Total	0.91 u	MG/KG	0.91	1.0
		Vanadium, Total	32.1	MG/KG	0.09	1.0
		Zinc, Total	60.7	MG/KG	0.16	1.0

6/4/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J11733	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4000	MG/KG	2.9	1.0
		Arsenic, Total	2.4	MG/KG	0.62	1.0
		Boron, Total	2.0	MG/KG	0.24	1.0
		Barium, Total	70.9	MG/KG	0.02	1.0
		Beryllium, Total	1.0	MG/KG	0.02	1.0
		Bismuth, Total	0.52 u	MG/KG	0.52	1.0
		Calcium, Total	5450	MG/KG	1.7	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	6.7	MG/KG	0.14	1.0
		Chromium, Total	9.6	MG/KG	0.13	1.0
		Copper, Total	15.1	MG/KG	0.12	1.0
		Iron, Total	21400	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	877	MG/KG	78.1	1.0
		Lithium, Total	4.2	MG/KG	0.03	1.0
		Magnesium, Total	3580	MG/KG	0.98	1.0
		Manganese, Total	283	MG/KG	0.03	1.0
		Molybdenum, Total	0.50	MG/KG	0.29	1.0
		Sodium, Total	114	MG/KG	2.5	1.0
		Nickel, Total	7.6	MG/KG	0.24	1.0
		Phosphorus, Total	1370	MG/KG	0.91	1.0
		Lead, Total	9.1	MG/KG	0.31	1.0
		Antimony, Total	0.45 u J	MG/KG	0.45	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	453 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	21.9	MG/KG	0.01	1.0
		Thallium, Total	0.71 u	MG/KG	0.71	1.0
		Uranium, Total	0.89 u	MG/KG	0.89	1.0
		Vanadium, Total	50.4	MG/KG	0.09	1.0
		Zinc, Total	74.1	MG/KG	0.16	1.0

6/4/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-047
LVL#: 0603L325
SDG/SAF#: K0235/RC-047

W.O.#: 11343-606-001-9999-00
Date Received: 02-23-06

METALS CASE NARRATIVE

1. This narrative covers the analyses of 7 solid samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were rerun for Potassium, Sodium, Selenium, and Phosphorous due to high concentrations and sample matrix.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 63.4%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

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 34 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J11298	Iron	22,000	92.2
	Antimony	100	96.2
	Silicon	2,100	91.3
	Zinc	1,200	95.3

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

15. 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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/6/06
Date

jjw/m02-325

LVLI LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-18	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 1, SEDIMENT		SAF No.: RC-047
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1596 7 AJD1310	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060292		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 9N

Air Quality ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

Sample No.	Matrix *	Sample Date	Sample Time										
J11298	OTHER SOLID	2-21-06	1100				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0830 2-22-06	Received By/Stored In: RZ Steffler R.J. Steffler Date/Time: 0830 2-22-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler Date/Time: 1600 2-22-06	Received By/Stored In: Fed EX Date/Time:
Relinquished By/Removed From: Fed Ex Date/Time: 2-23-06 0915	Received By/Stored In: [signature] Date/Time: 2-23-06 0915
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}

(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-19	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N / Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 2, SEDIMENT	SAF No. RC-047	Air Quality ☐
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7 HP 12/06 / COA BESRAS6520	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060292	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D, TPH-Gasoline Range - WTPH-G	
J11299	OTHER SOLID	2-21-06	1200				X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JAMES BERNHARD	2-21-06 1900	EAS LOCKED STORAGE	2-21-06 1900
EAS LOCKED STORAGE	2-22-06 0830	RZ Steffler	2-22-06 0830
RZ Steffler	2-22-06 1600	Fed Ex	
Fed Ex	2-23-06 0915	D. Smith	2-23-06 0915

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

000022

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-20	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 3, SEDIMENT		SAF No.: RC-047
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1596 7 [illegible] 1310 C	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060292		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 9N

Air Quality ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

000023

Sample No.	Matrix *	Sample Date	Sample Time										
J112B0	OTHER SOLID	2-21-06	1300				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0830 2-22-06	Received By/Stored In: R2 Steffler R.J. Steffler Date/Time: 0830 2-22-06
Relinquished By/Removed From: R2 Steffler R.J. Steffler Date/Time: 1600 2-22-06	Received By/Stored In: Fed Ex Date/Time:
Relinquished By/Removed From: Fed Ex Date/Time: 2-23-06 0915	Received By/Stored In: [illegible] Date/Time: 2-23-06 0915
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}

(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-21	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 4, SEDIMENT		SAF No. RC-047
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7 DA 13106	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC

Price Code 9N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

000024

Sample No.	Matrix *	Sample Date	Sample Time										
J112B1	OTHER SOLID	2-21-06	1400				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From JAMES BERNHARD	Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler R.J. Steffler	Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler R.J. Steffler	Date/Time 1600 WCH 2-22-06	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 2-23-06 0915	Received By/Stored In D. Smith	Date/Time 2-23-06 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In 2-23-06	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) Strontium-89,90 – Total Sr; Isotopic Thorium (Thorium-232); Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)

(3) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-047-35

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr SEDIMENT		SAF No.: RC-047
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1597	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060292		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
Sample No. / Matrix * / Sample Date / Sample Time										
J116L6 / OTHER SOLID / 2-21-06 / 1445			X	X	X	X	X	X		

000025

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JAMES BERNHARD	1900 2-21-06	EAS LOCKED STORAGE	1900 2-21-06
EAS LOCKED STORAGE	0830 2-22-06	RZ Stiffler RJ Stiffler	0830 2-22-06
RZ Stiffler RJ Stiffler	1600 2-22-06	Fed Ex	
Fed Ex	2-23-06 0915	[illegible]	2-23-06 0915

SPECIAL INSTRUCTIONS

Matrix *

SoSoil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-36	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr VI SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES/LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On; TPH-Gasoline Range - WTPH-G		
Sample No.	Matrix *	Sample Date	Sample Time							
J116L7	OTHER SOLID	2-21-06	1530			X	X	X	X	X	X

000026

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From JAMES BERNHARD Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE Date/Time 1900 2-21-06	
Relinquished By/Removed From EAS LOCKED STORAGE Date/Time 0830 2-22-06	Received By/Stored In RZ Stoffler R.J. Stoffler Date/Time 0830 2-22-06	
Relinquished By/Removed From RZ Stoffler R.J. Stoffler Date/Time 1600 2-22-06	Received By/Stored In Fed Ex Date/Time	
Relinquished By/Removed From Fed Ex Date/Time 2.23.06 0915	Received By/Stored In Date/Time 2.23.06 0915	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-99	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: SEE 2-21-06 REF, SEDIMENT C-#8	SAF No.: RC-047	
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1597	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060292	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		

000027

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Gamma Spec - (Full List)	Strontium-89,90 – Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
J11733	OTHER SOLID	2-21-06	1630			X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From: JAMES BERNHARD — Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE — Date/Time: 1900 2-21-06	
Relinquished By/Removed From: EAS LOCKED STORAGE — Date/Time: 0830 2-22-06	Received By/Stored In: RZ Stoffler R.J. Stoffler — Date/Time: 0830 2-22-06	
Relinquished By/Removed From: RZ Stoffler R.J. Stoffler — Date/Time: 1600 2-22-06	Received By/Stored In: Fed Ex — Date/Time:	
Relinquished By/Removed From: Fed Ex — Date/Time: 2-23-06 0915	Received By/Stored In: [illegible] — Date/Time: 2-23-06 0915	
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:	
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:	

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCRA SVT			DATA PACKAGE: K0235		
VALIDATOR: TLI		LAB: LLI		DATE: 6/3/06	
			SDG: K0235		

ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX
J11298 J11299 J112B0 J112B1 J116L6
J116L7 J11733
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICP interference checks acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

tin - all detects - UJ

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

MS - antimony 52.4% - J all

LCS - Silicon 63.4% - J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: Vanadium - 44% RPD in FD

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

MSA performed as required? ..... Yes No N/A

MSA results acceptable? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0130-MB1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	2.9 u	MG/KG	2.9	1.0
		Arsenic, Total	0.61 u	MG/KG	0.61	1.0
		Boron, Total	0.24 u	MG/KG	0.24	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Bismuth, Total	0.51 u	MG/KG	0.51	1.0
		Calcium, Total	1.6 u	MG/KG	1.6	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.14 u	MG/KG	0.14	1.0
		Chromium, Total	0.13 u	MG/KG	0.13	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	3.5 u	MG/KG	3.5	1.0
		Potassium, Total	77.1 u	MG/KG	77.1	1.0
		Lithium, Total	0.04	MG/KG	0.03	1.0
		Magnesium, Total	0.97 u	MG/KG	0.97	1.0
		Manganese, Total	0.03 u	MG/KG	0.03	1.0
		Molybdenum, Total	0.29 u	MG/KG	0.29	1.0
		Sodium, Total	2.5 u	MG/KG	2.5	1.0
		Nickel, Total	0.24 u	MG/KG	0.24	1.0
		Phosphorus, Total	0.90 u	MG/KG	0.90	1.0
		Lead, Total	0.34	MG/KG	0.31	1.0
		Antimony, Total	0.44 u	MG/KG	0.44	1.0
		Selenium, Total	3.6 u	MG/KG	3.6	1.0
		Silicon, Total	2.3 u	MG/KG	2.3	1.0
		Tin, Total	1.4	MG/KG	1.1	1.0
		Strontium, Total	0.01 u	MG/KG	0.01	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.88 u	MG/KG	0.88	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.16 u	MG/KG	0.16	1.0
BLANK1	06C0036-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J11298	Silver, Total	4.7	0.07u	5.3	88.7	1.0
		Aluminum, Total	6280	6090	211	88.3*	1.0
		Arsenic, Total	188	4.6	211	86.9	1.0
		Boron, Total	90.9	0.81	106	85.2	1.0
		Barium, Total	259	61.9	211	93.3	1.0
		Beryllium, Total	5.8	0.55	5.3	99.0	1.0
		Bismuth, Total	480	0.54u	528	90.8	1.0
		Calcium, Total	6470	3530	2640	111.3	1.0
		Cadmium, Total	6.6	1.4	5.3	98.1	1.0
		Cobalt, Total	55.8	5.8	52.9	94.5	1.0
		Chromium, Total	40.1	19.3	21.1	98.6	1.0
		Copper, Total	44.6	19.9	26.4	93.6	1.0
		Iron, Total	15800	15500	106	264.2*	1.0
		Mercury, Total	0.18	0.02	0.14	106.9	1.0
		Potassium, Total	3050	876	2640	82.3	1.0
		Lithium, Total	113	8.0	106	99.4	1.0
		Magnesium, Total	5830	3790	2640	77.3	1.0
		Manganese, Total	298	250	52.9	90.0*	1.0
		Molybdenum, Total	101	0.50	106	94.8	1.0
		Sodium, Total	2440	135	2640	87.3	1.0
		Nickel, Total	62.7	13.6	52.9	92.8	1.0
		Phosphorus, Total	1360	710	528	122.0	1.0
		Lead, Total	77.2	33.6	52.9	82.4	1.0
		Antimony, Total	27.7	0.47u	52.9	52.4	1.0
		Selenium, Total	194	3.9 u	211	91.9	1.0
		Silicon, Total	1270	804	106	438.0*	1.0
		Tin, Total	100	1.2	106	93.5	1.0
		Strontium, Total	121	20.7	106	94.5	1.0
		Thallium, Total	183	0.75u	211	86.8	1.0
		Uranium, Total	233	0.94u	~~528~~ 264	~~44.1~~ 88.2	1.0
		Vanadium, Total	81.2	30.6	52.9	95.7	1.0
		Zinc, Total	313	286	52.9	49.3*	1.0

corrected entries pw 4/5/06

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD		DILUTION FACTOR(REP)
-001REP	J11298	Silver, Total	0.07u	0.07u	NC		1.0
		Aluminum, Total	6090	5290	14.0		1.0
		Arsenic, Total	4.6	4.7	2.2		1.0
		Boron, Total	0.81	0.71	13.6		1.0
		Barium, Total	61.9	60.9	1.6		1.0
		Beryllium, Total	0.55	0.49	12.3		1.0
		Bismuth, Total	0.54u	0.54u	NC		1.0
		Calcium, Total	3530	3260	7.9		1.0
		Cadmium, Total	1.4	1.4	0.00		1.0
		Cobalt, Total	5.8	5.2	10.9		1.0
		Chromium, Total	19.3	17.2	11.5		1.0
		Copper, Total	19.9	19.3	3.1		1.0
		Iron, Total	15500	13500	13.5		1.0
		Mercury, Total	0.02	0.03	7.7		1.0
		Potassium, Total	876	769	12.9		1.0
		Lithium, Total	8.0	6.8	16.2		1.0
		Magnesium, Total	3790	3320	13.3		1.0
		Manganese, Total	250	232	7.6		1.0
		Molybdenum, Total	0.50	0.56	11.5		1.0
		Sodium, Total	135	110	20.8		1.0
		Nickel, Total	13.6	12.6	7.6		1.0
		Phosphorus, Total	710	680	4.3		1.0
		Lead, Total	33.6	31.8	5.5		1.0
		Antimony, Total	0.47u	0.47u	NC		1.0
		Selenium, Total	3.9 u	3.9 u	NC		1.0
		Silicon, Total	804	959	17.7		1.0
		Tin, Total	1.2	1.1 u	~~NC~~	200 correct entry	1.0
		Strontium, Total	20.7	19.5	6.0		1.0
		Thallium, Total	0.75u	0.75u	NC		1.0
		Uranium, Total	0.94u	0.94u	NC		1.0
		Vanadium, Total	30.6	26.5	14.4		1.0
		Zinc, Total	286	270	5.9		1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/05/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0130-LC1	Silver, LCS	47.1	50.0	MG/KG	94.2
		Aluminum, LCS	467	500	MG/KG	93.4
		Arsenic, LCS	876	1000	MG/KG	87.6
		Boron, LCS	449	500	MG/KG	89.7
		Barium, LCS	475	500	MG/KG	95.1
		Beryllium, LCS	24.6	25.0	MG/KG	98.4
		Bismuth, LCS	479	500	MG/KG	95.9
		Calcium, LCS	2380	2500	MG/KG	95.4
		Cadmium, LCS	23.7	25.0	MG/KG	94.8
		Cobalt, LCS	241	250	MG/KG	96.4
		Chromium, LCS	50.0	50.0	MG/KG	100
		Copper, LCS	121	125	MG/KG	96.8
		Iron, LCS	491	500	MG/KG	98.3
		Potassium, LCS	2260	2500	MG/KG	90.5
		Lithium, LCS	483	500	MG/KG	96.6
		Magnesium, LCS	2290	2500	MG/KG	91.7
		Manganese, LCS	75.2	75.0	MG/KG	100.3
		Molybdenum, LCS	495	500	MG/KG	99.0
		Sodium, LCS	2260	2500	MG/KG	90.5
		Nickel, LCS	190	200	MG/KG	94.9
		Phosphorus, LCS	457	500	MG/KG	91.4
		Lead, LCS	233	250	MG/KG	93.2
		Antimony, LCS	277	300	MG/KG	92.4
		Selenium, LCS	925	1000	MG/KG	92.5
		Silicon, LCS	317	500	MG/KG	63.4
		Tin, LCS	487	500	MG/KG	97.5
		Strontium, LCS	473	500	MG/KG	94.6
		Thallium, LCS	911	1000	MG/KG	91.1
		Uranium, LCS	235	~~500~~ 250 *	MG/KG	* ~~47.0~~ 94.1
		Vanadium, LCS	247	250	MG/KG	98.9
		Zinc, LCS	92.5	100	MG/KG	92.5
LCS1	06C0036-LC1	Mercury, LCS	6.8	6.2	MG/KG	110.0

* corrected entries
pw 4/5/06

Date: 7 June 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Sediment & Tissues
Subject: Wet Chemistry - Data Package No. K0235-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0235 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11298	2/21/06	Solid	C	See note 1
J11299	2/21/06	Solid	C	See note 1
J112B0	2/21/06	Solid	C	See note 1
J112B1	2/21/06	Solid	C	See note 1
J116L6	2/21/06	Solid	C	See note 1
J116L7	2/21/06	Solid	C	See note 1
J11733	2/21/06	Solid	C	See note 1

1 – Petroleum hydrocarbons by 9071/418.1.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Sampling & Analysis Plan (DOE/RL-2005-42, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times & Sample Preservation**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 14 days for petroleum hydrocarbons.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and

"UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all petroleum hydrocarbon results were qualified as estimates and flagged "J".

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

Due to the lack of a matrix spike analysis, the petroleum hydrocarbon result in sample J11298 was qualified as an estimate and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to the lack of a duplicate analysis, the petroleum hydrocarbon result in sample J11298 was qualified as an estimate and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J116L7/J11733) were submitted for analysis. Field duplicate samples are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0235 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less than twice the limit, all petroleum hydrocarbon results were qualified as estimates and flagged "J".

- Due to the lack of a duplicate or matrix spike analysis, the petroleum hydrocarbon result in sample J11298 was qualified as an estimate and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005-42, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Sampling & Analysis Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0235	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Petroleum hydrocarbon	J	All	No MS or duplicate
Petroleum hydrocarbons	J	All	Holding time

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

GENERAL CHEMISTRY ANALYSIS, SOLID MATRIX, (MG/KG)

Project: WASHINGTON CLOSURE HANFORD															
Laboratory: Lionville Laboratory Inc.															
Case	SDG: K0235														
Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
General Chemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Petroleum Hydrocarbons	5	146	UJ	146	UJ	139	UJ	139	UJ	138	UJ	141	UJ	139	UJ

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/30/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11298	% Solids	91.0	%	0.01	1.0
		Petroleum Hydrocarbons	146 u J	MG/KG	146	1.0
-002	J11299	% Solids	91.2	%	0.01	1.0
		Petroleum Hydrocarbons	146 u J	MG/KG	146	1.0
-003	J112B0	% Solids	95.7	%	0.01	1.0
		Petroleum Hydrocarbons	139 u J	MG/KG	139	1.0
-004	J112B1	% Solids	95.5	%	0.01	1.0
		Petroleum Hydrocarbons	139 u J	MG/KG	139	1.0
-005	J116L6	% Solids	95.8	%	0.01	1.0
		Petroleum Hydrocarbons	138 u J	MG/KG	138	1.0
-006	J116L7	% Solids	94.2	%	0.01	1.0
		Petroleum Hydrocarbons	141 u J	MG/KG	141	1.0
-007	J11733	% Solids	95.8	%	0.01	1.0
		Petroleum Hydrocarbons	139 u J	MG/KG	139	1.0

6/4/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-047 K0235
LVL#: 0602L325

W.O.#: 11343-606-001-9999-00
Date Received: 02-23-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 7 solid samples.

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

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks for Petroleum Hydrocarbons (PHC) were within the method criteria.

6. The Laboratory Control Samples (LCS) for PHC were within the laboratory control limits.

7. The matrix spike recovery for PHC was within the 75-125% control limits.

8. The replicate analysis for PHC was within the 20% Relative Percent Difference (RPD) control limit.

9. 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 package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

3/31/06
Date

njp\i02-325

The results presented in this report relate to the analytical testing and conditions of the samples upon 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 18 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

RECEIVED
APR 2006

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-047 K0235

DATE RECEIVED: 02/23/06 LVL LOT # :0602L325

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J11298						
% SOLIDS	001	SO	06L%S016	02/21/06	02/26/06	02/27/06
PETROLEUM HYDROCARBO	001	SO	06LHC021	02/21/06	03/08/06	03/10/06
J11299						
% SOLIDS	002	SO	06L%S016	02/21/06	02/26/06	02/27/06
PETROLEUM HYDROCARBO	002	SO	06LHC022	02/21/06	03/16/06	03/17/06
PETROLEUM HYDROCARBO	002 REP	SO	06LHC022	02/21/06	03/16/06	03/17/06
PETROLEUM HYDROCARBO	002 MS	SO	06LHC022	02/21/06	03/16/06	03/17/06
J112B0						
% SOLIDS	003	SO	06L%S016	02/21/06	02/26/06	02/27/06
PETROLEUM HYDROCARBO	003	SO	06LHC022	02/21/06	03/16/06	03/17/06
J112B1						
% SOLIDS	004	SO	06L%S016	02/21/06	02/26/06	02/27/06
PETROLEUM HYDROCARBO	004	SO	06LHC022	02/21/06	03/16/06	03/17/06
J116L6						
% SOLIDS	005	SO	06L%S016	02/21/06	02/26/06	02/27/06
PETROLEUM HYDROCARBO	005	SO	06LHC022	02/21/06	03/16/06	03/17/06
J116L7						
% SOLIDS	006	SO	06L%S016	02/21/06	02/26/06	02/27/06
PETROLEUM HYDROCARBO	006	SO	06LHC022	02/21/06	03/16/06	03/17/06
J11733						
% SOLIDS	007	SO	06L%S016	02/21/06	02/26/06	02/27/06
PETROLEUM HYDROCARBO	007	SO	06LHC022	02/21/06	03/16/06	03/17/06

LAB QC:

PETROLEUM HYDROCARBO	MB1	S	06LHC021	N/A	03/08/06	03/10/06

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-047 K0235

DATE RECEIVED: 02/23/06 LVL LOT # :0602L325

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PETROLEUM HYDROCARBO	MB1 BS	S	06LHC021	N/A	03/08/06	03/10/06
PETROLEUM HYDROCARBO	MB1	S	06LHC022	N/A	03/16/06	03/17/06
PETROLEUM HYDROCARBO	MB1 BS	S	06LHC022	N/A	03/16/06	03/17/06

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-18	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 1, SEDIMENT		SAF No.: RC-047
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1596 7 4/D13100	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060292		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 9N

Air Quality: ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000016

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D, TPH-Gasoline Range - WTPH-G	

Sample No.	Matrix *	Sample Date	Sample Time										
J11298	OTHER SOLID	2-21-06	1100				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0830 2-22-06	Received By/Stored In: RZ Steffler R.J. Steffler Date/Time: 0830 2-22-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler Date/Time: 1600 2-22-06	Received By/Stored In: Fed Ex Date/Time:
Relinquished By/Removed From: Fed Ex Date/Time: 2-23-06 0915	Received By/Stored In: [signature] Date/Time: 2-23-06 0915
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) Strontium-89,90 – Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}

(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-19	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 2, SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-15967 HP 13106	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000017

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1	1		
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G		
Sample No.	Matrix *	Sample Date	Sample Time								
J11299	OTHER SOLID	2-21-06	1200				X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From JAMES BERNHARD		1900 2-21-06	EAS LOCKED STORAGE	1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE		0830 2-22-06	Received By/Stored In RZ Steffler	0830 2-22-06
Relinquished By/Removed From RZ Steffler		1600 2-22-06	Received By/Stored In Fed Ex	
Relinquished By/Removed From Fed Ex		2-23-06 0915	Received By/Stored In D. Smith	2-23-06 0915
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)
(3) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-20	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 9N	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 3, SEDIMENT		SAF No. RC-047
Ice Chest No. AFS-04-120	Field Logbook No. EL-1598 7	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000018

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1	1		
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G		
Sample No.	Matrix *	Sample Date	Sample Time								
J112B0	OTHER SOLID	2-21-06	1300				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From JAMES BERNHARD		1900 2-21-06	EAS LOCKED STORAGE	1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE		0830 2-22-06	RZ Stoffler	0830 2-22-06
Relinquished By/Removed From RZ Stoffler		1600 2-22-06	FED EX	
Relinquished By/Removed From FED EX		2-23-06 0915		2-23-06 0915
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-21	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9N; Data Turnaround: 45 Days
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 4, SEDIMENT	SAF No.: RC-047	Air Quality ☐
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1596 7 [illegible] 13106; COA: BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060292	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000019

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G			
No. of Container(s)	1	1	1	1	1	1	1	1	1			
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G			

Sample No.	Matrix *	Sample Date	Sample Time										
J112B1	OTHER SOLID	2-21-06	1400				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: JAMES BERNHARD; Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE; Date/Time: 1900 2-21-06
Relinquished By/Removed From: EAS LOCKED STORAGE; Date/Time: 0830 2-22-06	Received By/Stored In: RZ Steffler R.J. Steffler; Date/Time: 0830 2-22-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler; Date/Time: 1600 WCH 2-22-06	Received By/Stored In: Fed Ex; Date/Time:
Relinquished By/Removed From: Fed Ex; Date/Time: 2-23-06 0915	Received By/Stored In: D. [illegible]; Date/Time: 2-23-06 0915
Relinquished By/Removed From: ; Date/Time:	Received By/Stored In: [illegible] 2-23-06; Date/Time:
Relinquished By/Removed From: ; Date/Time:	Received By/Stored In: ; Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) Strontium-89,90 – Total Sr; Isotopic Thorium (Thorium-232); Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)

(3) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-047-35

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 9N	Data Turnaround 45 Days *	Air Quality ☐	
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr ☑SEDIMENT		SAF No. RC-047
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

020000

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		

SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
Sample No. / Matrix * / Sample Date / Sample Time										
J116L6 / OTHER SOLID / 2-21-06 / 1445			X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From JAMES BERNHARD Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE Date/Time 0830 2-22-06	Received By/Stored In RZ Stiffler Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Stiffler Date/Time 1600 2-22-06	Received By/Stored In Fed Ex Date/Time
Relinquished By/Removed From Fed Ex Date/Time 2-23-06 0915	Received By/Stored In Date/Time 2-23-06 0915
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time 2-23-06
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time

SPECIAL INSTRUCTIONS

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-36	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr & SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000021

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
Sample No. / Matrix * / Sample Date / Sample Time										
J116L7 / OTHER SOLID / 2-21-06 / 1530			X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From JAMES BERNHARD Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE Date/Time 1900 2-21-06	
Relinquished By/Removed From EAS LOCKED STORAGE Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler Date/Time 0830 2-22-06	
Relinquished By/Removed From RZ Steffler Date/Time 1600 2-22-06	Received By/Stored In Fed Ex Date/Time	
Relinquished By/Removed From Fed Ex Date/Time 2-23-06 0915	Received By/Stored In Date/Time 2-23-06 0915	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-99	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location JEA 2-21-06 REF, SEDIMENT Cr #8		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 – Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
Sample No.	Matrix *	Sample Date	Sample Time								
J11733	OTHER SOLID	2-21-06	1630			X	X	X	X	X	X

000022

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From [signature] Date/Time 1900 JAMES BERNHARD 2-21-06	Received By/Stored In [signature] Date/Time 1900 EAS LOCKED STORAGE 2-21-06	
Relinquished By/Removed From [signature] Date/Time 0830 EAS LOCKED STORAGE 2-22-06	Received By/Stored In Date/Time 0830 RZ Stoffle R.J. Stoffle 2-22-06	
Relinquished By/Removed From RZ Stoffle R.J. Stoffle Date/Time 1600 2-22-06	Received By/Stored In Fed Ex Date/Time	
Relinquished By/Removed From Fed Ex 2-23-06 0915	Received By/Stored In [signature] Date/Time 2-23-06 0915	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

Matrix *
S=Soil
SD=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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA SAT			DATA PACKAGE: K0235		
VALIDATOR: TLI		LAB: LLI		DATE: 6/3/06	
			SDG: K0235		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	~~Chromium-VI~~ Grease	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J11298 J11299 J112B0 J112B1 J11LL6					
J11LL7 J11LL8					
					5 of 18

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A

Spike standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

J11298 - NO MS - J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no 298 duplicate – J all

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

HT 24 days – J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?..... Yes No N/A

Results supported in the raw data? (Levels D, E)..... Yes No N/A

Samples properly prepared? (Levels D, E)..... Yes No N/A

Detection limits meet RDL?..... Yes No N/A

Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: all over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/30/06

CLIENT: TNUHANFORD RC-047 K0235

LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LHC021-MB1	Petroleum Hydrocarbons	133	u	MG/KG	133	1.0
BLANK10	06LHC022-MB1	Petroleum Hydrocarbons	133	u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/30/06

CLIENT: TNUHANFORD RC-047 K0235 LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT		SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J11299	Petroleum Hydrocarbons	709	48.7		614	107.5	1.0
BLANK10	06LHC021-MB1	Petroleum Hydrocarbons	595	133	u	560	106.2	1.0
BLANK10	06LHC022-MB1	Petroleum Hydrocarbons	641	133	u	560	114.5	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/30/06

CLIENT: TNUHANFORD RC-047 K0235

LVL LOT #: 0602L325

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT		REPLICATE		RPD	DILUTION FACTOR(REP)
-002REP	J11299	Petroleum Hydrocarbons	146	u	146	u	NC	1.0

Date: 7 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Sediment & Tissues
Subject: Radiochemistry - Data Package No. K0235-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0235 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Matrix	Validation	Date
J11298	2/21/06	Solid	C	See note 1 & 2
J11299	2/21/06	Solid	C	See note 1 & 2
J112B0	2/21/06	Solid	C	See note 1 & 2
J112B1	2/21/06	Solid	C	See note 1 & 2
J116L6	2/21/06	Solid	C	See note 1
J116L7	2/21/06	Solid	C	See note 1
J11733	2/21/06	Solid	C	See note 1

1 – Total strontium, isotopic thorium, isotopic uranium, gamma spectroscopy.
2 – Carbon-14.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate

analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J116L7/J11733) were submitted for analysis. Field duplicate samples are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the 100 & 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. Two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0235 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0235	REVIEWER: TJ	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228 Thorium-232	J	All	No LCS

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD															
Laboratory: EB															
Case	SDG: K0235														
Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Carbon-14	50	0.143	U	80.4		3.61		230		NA		NA		NA	
Total Strontium	1	0.001	U	-0.006	U	0.005	U	0.024	U	0.404		0.004	U	0.020	U
Thorium-228		0.799	J	0.798	J	0.572	UJ	0.346	UJ	0.941	J	0.422	UJ	0.734	UJ
Thorium-230		0.489		0.641		0.443	U	0.172	U	0.839		0.280	U	0.732	
Thorium-232		0.856	J	0.791	J	0.443	UJ	1.09	J	1.09	J	0.350	UJ	0.266	UJ
Uranium-233/234	1	0.574		0.516		0.479		0.513		0.504		0.541		0.482	
Uranium-235	1	0	U	0.035	U	0.026	U	0.098	U	0.087	U	0	U	0.024	U
Uranium-238	1	0.474		0.286		0.479		0.324		0.414		0.672		0.482	
Potassium-40		25.3		13.9		20.7		9.47		20.6		11.5		10.2	
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Cesium 137	0.1	0.520		0.290		0.060		U	U	0.217		0.131		0.105	
Radium-226		1.11		0.603		0.772		0.382		0.900		0.478		0.514	
Radium-228		1.45		0.761		1.14		0.559		1.32		0.640		0.650	
Europium 152		U	U	U	U	U	U	U	U	U	U	U	U	U	U
Europium 154		U	U*	U	U	U	U	U	U	U	U	U	U	U	U
Europium 155		U	U	U	U	U	U	U	U	U	U*	U	U	U	U
Thorium-228		1.69		0.660		1.10		0.510		1.23		0.560		0.567	
Thorium-232		1.45		0.761		1.14		0.559		1.32		0.640		0.650	
Uranium-235(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ruthenium-106		U	U	U	U	U	U	U	U	U	U	U	U	U	U
Antimony-125		U	U	U	U	U	U	U	U	U	U	U	U	U	U
Beryllium-7		U	U	U	U	U	U	U	U	U	U	U	U	U	U
Cesium-134		U	U	U	U	U	U	U	U	U	U	U	U	U	U

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-01 J11298

DATA SHEET

SDG	7393	Client/Case no	Hanford	SDG K0235	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602162-01	Client sample id	J11298		
Dept sample id	7393-001	Location/Matrix	Cr 1, SEDIMENT	SOLID	
Received	02/23/06	Collected/Weight	02/21/06 11:00	556 g	
% solids	100.0	Custody/SAF No	RC-047-18	RC-047	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.143	1.6	2.6	50	U	C
Total Strontium	SR-RAD	0.001	0.10	0.21	1.0	U	SR
Thorium 228	14274-82-9	0.799	0.50	0.47	1.0	J	TH
Thorium 230	14269-63-7	0.489	0.37	0.47	1.0		TH
Thorium 232	TH-232	0.856	0.50	0.47	1.0	J	TH
Uranium 233/234	U-233/234	0.574	0.25	0.19	1.0		U
Uranium 235	15117-96-1	0	0.060	0.23	1.0	U	U
Uranium 238	U-238	0.474	0.20	0.19	1.0		U
Potassium 40	13966-00-2	25.3	1.3	0.36			GAM
Cobalt 60	10198-40-0	U		0.035	0.050	U	GAM
Cesium 137	10045-97-3	0.520	0.044	0.043	0.10		GAM
Radium 226	13982-63-3	1.11	0.073	0.063	0.10		GAM
Radium 228	15262-20-1	1.45	0.16	0.14	0.20		GAM
Europium 152	14683-23-9	U		0.085	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	1.69	0.078	0.071			GAM
Thorium 232	TH-232	1.45	0.16	0.14			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		4.0		U	GAM
Americium 241	14596-10-2	U		0.30		U	GAM
Beryllium 7	13966-02-4	U		0.34		U	GAM
Ruthenium 106	13967-48-1	U		0.28		U	GAM
Antimony 125	14234-35-6	U		0.075		U	GAM
Cesium 134	13967-70-9	U		0.044		U	GAM

100&300Area Compnt RCBRA Sediment&Ti

6/14/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-02 J11299

DATA SHEET

SDG	7393	Client/Case no	Hanford	SDG K0235	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602162-02	Client sample id	J11299		
Dept sample id	7393-002	Location/Matrix	Cr 2, SEDIMENT	SOLID	
Received	02/23/06	Collected/Weight	02/21/06 12:00	501 g	
% solids	100.0	Custody/SAF No	RC-047-19	RC-047	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	80.4	3.0	2.8	50		C
Total Strontium	SR-RAD	-0.006	0.10	0.22	1.0	U	SR
Thorium 228	14274-82-9	0.798	0.39	0.36	1.0	J	TH
Thorium 230	14269-63-7	0.641	0.38	0.29	1.0		TH
Thorium 232	TH-232	0.791	0.38	0.29	1.0	J	TH
Uranium 233/234	U-233/234	0.516	0.23	0.22	1.0		U
Uranium 235	15117-96-1	0.035	0.069	0.27	1.0	U	U
Uranium 238	U-238	0.286	0.17	0.22	1.0		U
Potassium 40	13966-00-2	13.9	0.64	0.15			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	0.290	0.020	0.018	0.10		GAM
Radium 226	13982-63-3	0.603	0.035	0.028	0.10		GAM
Radium 228	15262-20-1	0.761	0.072	0.063	0.20		GAM
Europium 152	14683-23-9	U		0.037	0.10	U	GAM
Europium 154	15585-10-1	U		0.045	0.10	U	GAM
Europium 155	14391-16-3	U		0.046	0.10	U	GAM
Thorium 228	14274-82-9	0.660	0.023	0.018			GAM
Thorium 232	TH-232	0.761	0.072	0.063			GAM
Uranium 235	15117-96-1	U		0.054		U	GAM
Uranium 238	U-238	U		2.4		U	GAM
Americium 241	14596-10-2	U		0.078		U	GAM
Beryllium 7	13966-02-4	U		0.15		U	GAM
Ruthenium 106	13967-48-1	U		0.11		U	GAM
Antimony 125	14234-35-6	U		0.034		U	GAM
Cesium 134	13967-70-9	U		0.020		U	GAM

100&300Area Compnt RCBRA Sediment&Ti

JR 6/4/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-03 **J112B0**

DATA SHEET

SDG	7393	Client/Case no	Hanford	SDG K0235	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602162-03	Client sample id	J112B0		
Dept sample id	7393-003	Location/Matrix	Cr 3, SEDIMENT	SOLID	
Received	02/23/06	Collected/Weight	02/21/06 13:00	921 g	
% solids	100.0	Custody/SAF No	RC-047-20	RC-047	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	3.61	1.8	2.8	50		C
Total Strontium	SR-RAD	0.005	0.10	0.21	1.0	U	SR
Thorium 228	14274-82-9	0.572	0.51	0.61	1.0	U J	TH
Thorium 230	14269-63-7	0.443	0.38	0.48	1.0	U	TH
Thorium 232	TH-232	0.443	0.38	0.48	1.0	U J	TH
Uranium 233/234	U-233/234	0.479	0.22	0.17	1.0		U
Uranium 235	15117-96-1	0.026	0.053	0.20	1.0	U	U
Uranium 238	U-238	0.479	0.22	0.17	1.0		U
Potassium 40	13966-00-2	20.7	1.1	0.15			GAM
Cobalt 60	10198-40-0	U		0.015	0.050	U	GAM
Cesium 137	10045-97-3	0.060	0.020	0.019	0.10		GAM
Radium 226	13982-63-3	0.772	0.040	0.026	0.10		GAM
Radium 228	15262-20-1	1.14	0.082	0.066	0.20		GAM
Europium 152	14683-23-9	U		0.038	0.10	U	GAM
Europium 154	15585-10-1	U		0.049	0.10	U	GAM
Europium 155	14391-16-3	U		0.078	0.10	U	GAM
Thorium 228	14274-82-9	1.10	0.032	0.022			GAM
Thorium 232	TH-232	1.14	0.082	0.066			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	U		5.3		U	GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Beryllium 7	13966-02-4	U		0.16		U	GAM
Ruthenium 106	13967-48-1	U		0.12		U	GAM
Antimony 125	14234-35-6	U		0.035		U	GAM
Cesium 134	13967-70-9	U		0.024		U	GAM

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Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-04 **J112B1**

DATA SHEET

SDG	7393	Client/Case no	Hanford	SDG K0235	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602162-04	Client sample id	J112B1		
Dept sample id	7393-004	Location/Matrix	Cr 4, SEDIMENT	SOLID	
Received	02/23/06	Collected/Weight	02/21/06 14:00	1080 g	
% solids	100.0	Custody/SAF No	RC-047-21	RC-047	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	230	4.4	2.7	50		C
Total Strontium	SR-RAD	0.024	0.12	0.23	1.0	U	SR
Thorium 228	14274-82-9	0.346	0.35	0.55	1.0	U J	TH
Thorium 230	14269-63-7	0.172	0.35	0.44	1.0	U	TH
Thorium 232	TH-232	1.09	0.47	0.44	1.0	J	TH
Uranium 233/234	U-233/234	0.513	0.22	0.21	1.0		U
Uranium 235	15117-96-1	0.098	0.13	0.25	1.0	U	U
Uranium 238	U-238	0.324	0.16	0.21	1.0		U
Potassium 40	13966-00-2	9.47	0.24	0.12			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Radium 226	13982-63-3	0.382	0.021	0.020	0.10		GAM
Radium 228	15262-20-1	0.559	0.050	0.049	0.20		GAM
Europium 152	14683-23-9	U		0.025	0.10	U	GAM
Europium 154	15585-10-1	U		0.036	0.10	U	GAM
Europium 155	14391-16-3	U		0.045	0.10	U	GAM
Thorium 228	14274-82-9	0.510	0.014	0.014			GAM
Thorium 232	TH-232	0.559	0.050	0.049			GAM
Uranium 235	15117-96-1	U		0.052		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Americium 241	14596-10-2	U		0.087		U	GAM
Beryllium 7	13966-02-4	U		0.11		U	GAM
Ruthenium 106	13967-48-1	U		0.084		U	GAM
Antimony 125	14234-35-6	U		0.022		U	GAM
Cesium 134	13967-70-9	U		0.014		U	GAM

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R 4/4/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-05 J116L6

DATA SHEET

SDG	7393	Client/Case no	Hanford	SDG K0235	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602162-05	Client sample id	J116L6		
Dept sample id	7393-005	Location/Matrix	Cr 7, SEDIMENT	SOLID	
Received	02/23/06	Collected/Weight	02/21/06 14:45	684 g	
% solids	100.0	Custody/SAF No	RC-047-35	RC-047	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.404	0.18	0.27	1.0		SR
Thorium 228	14274-82-9	0.941	0.50	0.38	1.0	J	TH
Thorium 230	14269-63-7	0.839	0.50	0.38	1.0		TH
Thorium 232	TH-232	1.09	0.50	0.38	1.0	J	TH
Uranium 233/234	U-233/234	0.504	0.18	0.14	1.0		U
Uranium 235	15117-96-1	0.087	0.087	0.17	1.0	U	U
Uranium 238	U-238	0.414	0.18	0.14	1.0		U
Potassium 40	13966-00-2	20.6	1.4	0.28			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	0.217	0.022	0.023	0.10		GAM
Radium 226	13982-63-3	0.900	0.064	0.051	0.10		GAM
Radium 228	15262-20-1	1.32	0.12	0.10	0.20		GAM
Europium 152	14683-23-9	U		0.067	0.10	U	GAM
Europium 154	15585-10-1	U		0.080	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	1.23	0.047	0.037			GAM
Thorium 232	TH-232	1.32	0.12	0.10			GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		3.2		U	GAM
Americium 241	14596-10-2	U		0.25		U	GAM
Beryllium 7	13966-02-4	U		0.29		U	GAM
Ruthenium 106	13967-48-1	U		0.21		U	GAM
Antimony 125	14234-35-6	U		0.061		U	GAM
Cesium 134	13967-70-9	U		0.035		U	GAM

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6/4/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-06 J116L7

DATA SHEET

SDG	7393	Client/Case no	Hanford	SDG K0235	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602162-06	Client sample id	J116L7		
Dept sample id	7393-006	Location/Matrix	Cr 8, SEDIMENT	SOLID	
Received	02/23/06	Collected/Weight	02/21/06 15:30	616 g	
% solids	100.0	Custody/SAF No	RC-047-35	RC-047	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.004	0.17	0.35	1.0	U	SR
Thorium 228	14274-82-9	0.422	0.42	0.67	1.0	U J	TH
Thorium 230	14269-63-7	0.280	0.28	0.54	1.0	U	TH
Thorium 232	TH-232	0.350	0.28	0.54	1.0	U J	TH
Uranium 233/234	U-233/234	0.541	0.19	0.14	1.0		U
Uranium 235	15117-96-1	0	0.045	0.17	1.0	U	U
Uranium 238	U-238	0.672	0.23	0.14	1.0		U
Potassium 40	13966-00-2	11.5	0.56	0.16			GAM
Cobalt 60	10198-40-0	U		0.017	0.050	U	GAM
Cesium 137	10045-97-3	0.131	0.020	0.020	0.10		GAM
Radium 226	13982-63-3	0.478	0.037	0.032	0.10		GAM
Radium 228	15262-20-1	0.640	0.087	0.082	0.20		GAM
Europium 152	14683-23-9	U		0.042	0.10	U	GAM
Europium 154	15585-10-1	U		0.052	0.10	U	GAM
Europium 155	14391-16-3	U		0.052	0.10	U	GAM
Thorium 228	14274-82-9	0.560	0.024	0.021			GAM
Thorium 232	TH-232	0.640	0.087	0.082			GAM
Uranium 235	15117-96-1	U		0.061		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Americium 241	14596-10-2	U		0.089		U	GAM
Beryllium 7	13966-02-4	U		0.17		U	GAM
Ruthenium 106	13967-48-1	U		0.12		U	GAM
Antimony 125	14234-35-6	U		0.039		U	GAM
Cesium 134	13967-70-9	U		0.023		U	GAM

100&300Area Compnt RCBRA Sediment&Ti

K 6/4/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-07 J11733

DATA SHEET

SDG	7393	Client/Case no	Hanford	SDG K0235
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R602162-07	Client sample id	J11733	
Dept sample id	7393-007	Location/Matrix	Cr 8, SEDIMENT	SOLID
Received	02/23/06	Collected/Weight	02/21/06 16:30	704 g
% solids	100.0	Custody/SAF No	RC-047-99	RC-047

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.020	0.15	0.30	1.0	U	SR
Thorium 228	14274-82-9	0.734	0.67	0.89	1.0	U J	TH
Thorium 230	14269-63-7	0.732	0.54	0.51	1.0		TH
Thorium 232	TH-232	0.266	0.27	0.51	1.0	U J	TH
Uranium 233/234	U-233/234	0.482	0.20	0.15	1.0		U
Uranium 235	15117-96-1	0.024	0.049	0.19	1.0	U	U
Uranium 238	U-238	0.482	0.20	0.15	1.0		U
Potassium 40	13966-00-2	10.2	0.34	0.17			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	0.105	0.012	0.014	0.10		GAM
Radium 226	13982-63-3	0.514	0.035	0.033	0.10		GAM
Radium 228	15262-20-1	0.650	0.069	0.070	0.20		GAM
Europium 152	14683-23-9	U		0.035	0.10	U	GAM
Europium 154	15585-10-1	U		0.052	0.10	U	GAM
Europium 155	14391-16-3	U		0.053	0.10	U	GAM
Thorium 228	14274-82-9	0.567	0.019	0.018			GAM
Thorium 232	TH-232	0.650	0.069	0.070			GAM
Uranium 235	15117-96-1	U		0.055		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Americium 241	14596-10-2	U		0.055		U	GAM
Beryllium 7	13966-02-4	U		0.15		U	GAM
Ruthenium 106	13967-48-1	U		0.12		U	GAM
Antimony 125	14234-35-6	U		0.034		U	GAM
Cesium 134	13967-70-9	U		0.020		U	GAM

100&300Area Compnt RCBRA Sediment&Ti

6/4/06

Lab id	EBRLNE
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Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0235 was composed of seven solid (other solid) samples designated under SAF No. RC-047 with a Project Designation of: 100 & 300 Area Component of the RCBRA Sediment and Ti.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on April 11, 2006.

2.0 ANALYSIS NOTES

2.1 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.1 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.2 Isotopic Thorium Analysis

The relative percent difference in the original and duplicate Th-232 result was 125%, greater than the 3σ limit of 114%, and the DER was 3.3.

No other problems were encountered during the course of the analyses.

2.3 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.4 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

4/14/6

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-18	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N / Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 1, SEDIMENT K0235 (7393)	SAF No. RC-047	Air Quality
Ice Chest No. ERC-99-027	Field Logbook No. EL-1596 7 AN 13/06 / COA BESRAS6520	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060306	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

~~COOL 4C~~ RZS 2-22-06
None

020000

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1	1		
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G		
Sample No. / Matrix * / Sample Date / Sample Time											
J11298 / OTHER SOLID / 2-21-06 / 1100	X	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JAMES BERNHARD	2-21-06 1900	EAS LOCKED STORAGE	2-21-06 1900
EAS LOCKED STORAGE	2-22-06 0830	RZ Stoffler RJ Hill	2-22-06 0830
RZ Stoffler RJ Hill	2-22-06 1600	Fed Ex	
FED EX		Flex Returned	2/28/06 10:00

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-19	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9N; Data Turnaround: 45 Days
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 2, SEDIMENT K0235 (7393)	SAF No.: RC-047	Air Quality ☐
Ice Chest No.: ERC-99-027	Field Logbook No.: EL-1596-7 HP 1310C; COA: BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060306	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

~~COOL 4C~~ RZS 2-22-06

None

000021

Preservation				None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container				G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)				1	1	1	1	1	1	1	1	1	
Volume				750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	
Sample No.	Matrix *	Sample Date	Sample Time										
J11299	OTHER SOLID	2-21-06	1200	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: JAMES BERNHARD; Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE; Date/Time: 1900 2-21-06
Relinquished By/Removed From: EAS LOCKED STORAGE; Date/Time: 0830 2-22-06	Received By/Stored In: RZ Steffler R.J. Steffler; Date/Time: 0830 2-22-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler; Date/Time: 1600 WH 2-22-06	Received By/Stored In: Fed Ex; Date/Time:
Relinquished By/Removed From: FED EX; Date/Time:	Received By/Stored In: Alex Kilund; Date/Time: 2/23/06 10:00
Relinquished By/Removed From: ; Date/Time:	Received By/Stored In: ; Date/Time:
Relinquished By/Removed From: ; Date/Time:	Received By/Stored In: ; Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}

(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-20	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9N; Data Turnaround: 45 Days; Air Quality:
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 3, SEDIMENT K0235 (7393)	SAF No.: RC-047	
Ice Chest No.: ERC-99-027	Field Logbook No.: EL-159~~6~~7 AD 13106; COA: BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060306	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

~~COOL 4C~~ RZS 2-22-06
None

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

000022

Sample No.	Matrix *	Sample Date	Sample Time										
J112B0	OTHER SOLID	2-21-06	1300	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0830 2-22-06	Received By/Stored In: RZ Steffler R.J. Steffler Date/Time: 0830 2-22-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler Date/Time: 1600 2-22-06	Received By/Stored In: Fed Ex Date/Time:
Relinquished By/Removed From: FED EX Date/Time:	Received By/Stored In: Flex Kessner Date/Time: 2/23/06 10:00
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 – Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-21	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 4, SEDIMENT K0235 (7393)		SAF No. RC-047
Ice Chest No. ERC-99-027	Field Logbook No. EL-159~~6~~ 7 4/P 13/06	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060306		Bill of Lading/Air Bill No. SEE OSPC

Price Code 9N

Air Quality

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

~~COOL 4C~~ None RZS 2-22-06

000023

Preservation				None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container				G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)				1	1	1	1	1	1	1	1	1	
Volume				750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	
Sample No.	Matrix *	Sample Date	Sample Time										
J112B1	OTHER SOLID	2-21-06	1400	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From JAMES BERNHARD Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler Date/Time 1600 WCH 2-22-06	Received By/Stored In Fed Ex Date/Time
Relinquished By/Removed From FED EX Date/Time	Received By/Stored In Alex Delaney Date/Time 2/23/06 10:00
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-35	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr7 SEDIMENT K0235 (7393)		SAF No.: RC-047
Ice Chest No.: ERC-99-027	Field Logbook No.: EL-1597	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060306		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 9N

Air Quality: ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

~~COOL 4C~~ RZS 2-22-06
None

000024

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On; TPH-Gasoline Range - WTPH-G		

Sample No.	Matrix *	Sample Date	Sample Time										
J116L6	OTHER SOLID	2-21-06	1445	X	X								

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06	
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0830 2-22-06	Received By/Stored In: RZ Steffler RJ Steffler Date/Time: 0830 2-22-06	
Relinquished By/Removed From: RZ Steffler RJ Steffler Date/Time: 1600 2-22-06	Received By/Stored In: Fed Ex Date/Time:	
Relinquished By/Removed From: FED EX Date/Time:	Received By/Stored In: Alex Kelleel Date/Time: 2/23/06 10:00	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-36	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 8 SEDIMENT K0235 (7393)		SAF No.: RC-047
Ice Chest No.: ERC-99-027	Field Logbook No.: EL-1597	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060306		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 9N

Air Quality: ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

~~COOL 4C~~ RZS 2-22-06
None

000025

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On; TPH-Gasoline Range - WTPH-G		

Sample No.	Matrix *	Sample Date	Sample Time										
J116L7	OTHER SOLID	2-21-06	1530	X	X								

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06	
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0830 2-22-06	Received By/Stored In: RZ Stettler Date/Time: 0830 2-22-06	
Relinquished By/Removed From: RZ Stettler Date/Time: 1600 2-22-06	Received By/Stored In: Fed Ex Date/Time:	
Relinquished By/Removed From: FED EX Date/Time:	Received By/Stored In: Alex Kellner Date/Time: 2/23/06 10:00	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-99	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688 K0235	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location ~~REF~~, SEDIMENT SEE 2-21-06 Cr #8 (7393)		SAF No. RC-047
Ice Chest No. ERC-99-027	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060306		Bill of Lading/Air Bill No. SEE OSPC

Price Code 9N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

~~COOL 4C~~ None RZS 2-22-06

000026

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On; TPH-Gasoline Range - WTPH-G		
Sample No. / Matrix * / Sample Date / Sample Time										
J11733 / OTHER SOLID / 2-21-06 / 1630	X	X								

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By/Removed From [signature] Date/Time 1900 JAMES BERNHARD 2-21-06	Received By/Stored In [signature] Date/Time 1900 EAS LOCKED STORAGE 2-21-06		S=Soil SE=Sediment SO=Solid SI=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From [signature] Date/Time 0830 EAS LOCKED STORAGE 2-22-06	Received By/Stored In [signature] Date/Time 0830 RZ Steffler [signature] 2-22-06		
Relinquished By/Removed From RZ Steffler [signature] Date/Time 1600 2-22-06	Received By/Stored In Fed EX Date/Time		
Relinquished By/Removed From FED EX Date/Time	Received By/Stored In [signature] Date/Time 2/23/06 10:00		
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time		
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time		

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	RCRA T+S		DATA PACKAGE:	K0235	
VALIDATOR:	TLI	LAB: EB		DATE: 6/3/06	
			SDG: K0235		

ANALYSES ~~PERFORMED~~				
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy
Total Uranium	Radium-22	Tritium	C-14	

SAMPLES/MATRIX				
J11298	J11299	J11280	J11281	J11LLL
J11LL7	J11733			
				solid

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

Method blank results acceptable? ..... Yes No N/A

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

Field blank results acceptable? ..... Yes No N/A

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A

LCS/BSS recoveries acceptable? ..... Yes No N/A

LCS/BSS traceable? (Levels D,E) ..... Yes No N/A

LCS/BSS expired? (Levels D,E) ..... Yes No N/A

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no thorium 228 or 232 LCS - J all

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☒ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) ..... ☒ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split sample(s) analyzed? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no FS or PAs

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: _____

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data?(Levels D, E) Yes No N/A

Results Acceptable? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: 2 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-09 **Method Blank**

METHOD BLANK

SDG	7393	Client/Case no	Hanford SDG_K0235
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R602162-09	Client sample id	Method Blank
Dept sample id	7393-009	Material/Matrix	SOLID
		SAF No	RC-047

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	1.16	2.0	3.3	50	U	C
Total Strontium	SR-RAD	-0.009	0.14	0.29	1.0	U	SR
Thorium 228	14274-82-9	0	0.10	0.38	1.0	U	TH
Thorium 230	14269-63-7	0.248	0.30	0.38	1.0	U	TH
Thorium 232	TH-232	0.050	0.10	0.38	1.0	U	TH
Uranium 233/234	U-233/234	0	0.048	0.18	1.0	U	U
Uranium 235	15117-96-1	0.029	0.059	0.22	1.0	U	U
Uranium 238	U-238	0	0.048	0.18	1.0	U	U
Potassium 40	13966-00-2	U		0.23		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.010	0.10	U	GAM
Radium 226	13982-63-3	U		0.019	0.10	U	GAM
Radium 228	15262-20-1	U		0.041	0.20	U	GAM
Europium 152	14683-23-9	U		0.022	0.10	U	GAM
Europium 154	15585-10-1	U		0.023	0.10	U	GAM
Europium 155	14391-16-3	U		0.025	0.10	U	GAM
Thorium 228	14274-82-9	U		0.012		U	GAM
Thorium 232	TH-232	U		0.041		U	GAM
Uranium 235	15117-96-1	U		0.031		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Americium 241	14596-10-2	U		0.041		U	GAM
Beryllium 7	13966-02-4	U		0.059		U	GAM
Ruthenium 106	13967-48-1	U		0.066		U	GAM
Antimony 125	14234-35-6	U		0.021		U	GAM
Cesium 134	13967-70-9	U		0.015		U	GAM

100&300Area Compnt RCBRA Sediment&Ti

QC-BLANK #56303

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-08

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7393

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0235

Contract No. 630

Lab sample id R602162-08

Dept sample id 7393-008

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-047

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	2160	14	3.5	50		C	2130	85	101	84-116	80-120
Total Strontium	11.3	0.57	0.22	1.0		SR	10.8	0.43	105	81-119	80-120
Thorium 230	40.0	5.1	0.44	1.0		TH	44.4	1.8	90	81-119	80-120
Uranium 233/234	19.7	1.9	0.86	1.0		U	19.3	0.77	102	82-118	80-120
Uranium 235	15.1	1.6	0.20	1.0		U	15.7	0.63	96	82-118	80-120
Uranium 238	20.3	2.0	0.82	1.0		U	21.0	0.84	97	83-117	80-120
Cobalt 60	0.588	0.049	0.028	0.050		GAM	0.591	0.024	99	74-126	80-120
Cesium 137	0.664	0.044	0.034	0.10		GAM	0.606	0.024	110	72-128	80-120

100&300Area Compnt RCBRA Sediment&Ti

QC-LCS #56302

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0235

R602162-10

J112B1

DUPLICATE

SDG	7393	Client/Case no	Hanford SDG K0235
Contact	Melissa C. Mannion	Contract	No. 630
DUPLICATE		ORIGINAL	
Lab sample id	R602162-10	Lab sample id	R602162-04
Dept sample id	7393-010	Dept sample id	7393-004
		Received	02/23/06
% solids	100.0	% solids	100.0
Client sample id	J112B1		
Location/Matrix	Cr 4, SEDIMENT SOLID		
Collected/Weight	02/21/06 14:00 1080 g		
Custody/SAF No	RC-047-21 RC-047		

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Carbon 14	234	4.4	2.7	50		C	230	4.4	2.7		2	22	0.2
Total Strontium	-0.098	0.17	0.37	1.0	U	SR	0.024	0.12	0.23	U	-		1.2
Thorium 228	0.572	0.32	0.24	1.0		TH	0.346	0.35	0.55	U	49	155	1.0
Thorium 230	0.443	0.26	0.24	1.0		TH	0.172	0.35	0.44	U	88	213	1.2
Thorium 232	0.253	0.19	0.24	1.0		TH	1.09	0.47	0.44		125	114	3.3
Uranium 233/234	0.417	0.21	0.16	1.0		U	0.513	0.22	0.21		21	99	0.6
Uranium 235	0.025	0.050	0.19	1.0	U	U	0.098	0.13	0.25	U	-		1.0
Uranium 238	0.375	0.17	0.16	1.0		U	0.324	0.16	0.21		15	101	0.4
Potassium 40	9.50	0.35	0.16			GAM	9.47	0.24	0.12		0	33	0
Cobalt 60	U		0.017	0.050	U	GAM	U		0.011	U	-		0.6
Cesium 137	U		0.017	0.10	U	GAM	U		0.011	U	-		0.6
Radium 226	0.402	0.035	0.034	0.10		GAM	0.382	0.021	0.020		5	35	0.4
Radium 228	0.578	0.072	0.071	0.20		GAM	0.559	0.050	0.049		3	39	0.3
Europium 152	U		0.037	0.10	U	GAM	U		0.025	U	-		0.5
Europium 154	U		0.055	0.10	U	GAM	U		0.036	U	-		0.6
Europium 155	U		0.070	0.10	U	GAM	U		0.045	U	-		0.6
Thorium 228	0.518	0.022	0.021			GAM	0.510	0.014	0.014		2	33	0.1
Thorium 232	0.578	0.072	0.071			GAM	0.559	0.050	0.049		3	39	0.3
Uranium 235	U		0.072		U	GAM	U		0.052	U	-		0.4
Uranium 238	U		2.0		U	GAM	U		1.5	U	-		0.4
Americium 241	U		0.13		U	GAM	U		0.087	U	-		0.5
Beryllium 7	U		0.17		U	GAM	U		0.11	U	-		0.6
Ruthenium 106	U		0.13		U	GAM	U		0.084	U	-		0.6
Antimony 125	U		0.035		U	GAM	U		0.022	U	-		0.6
Cesium 134	U		0.021		U	GAM	U		0.014	U	-		0.5

100&300Area Compnt RCBRA Sediment&Ti

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/11/06

Date: 7 June 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Sediment & Tissue
Subject: Semivolatile/Petroleum Hydrocarbon - Data Package No. K0235-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0235 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11298	2/21/06	Solid	C	See note 1
J11299	2/21/06	Solid	C	See note 1
J112B0	2/21/06	Solid	C	See note 1
J112B1	2/21/06	Solid	C	See note 1
J116L6	2/21/06	Solid	C	See note 1
J116L7	2/21/06	Solid	C	See note 1
J11733	2/21/06	Solid	C	See note 1

1 – Semivolatiles by 8270C, gasoline range organic and diesel range organics by 8310B.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Sampling and Analysis Plan (DOE/RL-2005-42, Rev. 0, October 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction for semivolatile analytes and analyzed within 14 days for DRO and GRO.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less that twice the limit, all DRO results were qualified as estimates and flagged "J".

All other holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in all samples were qualified as undetected, raised to the RQL and flagged "U".

Due to method blank contamination, all DRO results in samples J11298, J112B0, J112B1, J116L7 and J11733 were qualified as estimates and flagged "UJ".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike or matrix spike duplicate analysis, all GRO results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the

recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to RPDs outside QC limits, all 1,3-dichlorobenzene (34%), 1,4-dichlorobenzene (32%) and hexachloroethane (32%) results were qualified as estimates and flagged "J".

Due to the lack of a matrix spike or matrix spike duplicate analysis, all GRO results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J116L7/J11733) were submitted for analysis. Field duplicate samples are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All GRO results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K0235 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less that twice the limit, all DRO results were qualified as estimates and flagged "J".
- Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in all samples were qualified as undetected, raised to the RQL and flagged "U".
- Due to method blank contamination, all DRO results in samples J11298, J112B0, J112B1, J116L7 and J11733 were qualified as estimates and flagged "UJ".
- Due to the lack of a matrix spike or matrix spike duplicate analysis, all GRO results were qualified as estimates and flagged "J".
- Due to RPDs outside QC limits, all 1,3-dichlorobenzene (34%), 1,4-dichlorobenzene (32%) and hexachloroethane (32%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005-42, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Sampling and Analysis Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMVOLATILE/PETROLEUM HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: K0235	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Diesel range organics	UJ	J11298, J112B0 J112B1, J116L7 J11733	Blank contamination
Bis(2-ethylhexyl)phthalate	U at RQL	All	Blank contamination
Gasoline range organics	J	All	No MS or MSD
1,3-Dichlorobenzene 1,4-Dichlorobenzene Hexachloroethane	J	All	RPD
Diesel range organics	J	All	Holding time

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE/8310 ANALYSIS, SOLID MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD															
Laboratory: LLI	SDG: K0235														
Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
Extraction Date		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06	
Analysis Date		3/3/06		3/3/06		3/3/06		3/3/06		3/6/06		3/5/06		3/6/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
bis(2-Chloroethyl)ether		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2-Chlorophenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
1,3-Dichlorobenzene		370	UJ	370	UJ	350	UJ	350	UJ	350	UJ	350	UJ	350	UJ
1,4-Dichlorobenzene		370	UJ	370	UJ	350	UJ	350	UJ	350	UJ	350	UJ	350	UJ
1,2-Dichlorobenzene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2-Methylphenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,2'-oxybis(1-chloropropane)		370	U	370	U	350	U	350	U	350	U	350	U	350	U
3 and/or 4-Methylphenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
N-Nitroso-di-n-propylamine		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Hexachloroethane		370	UJ	370	UJ	350	UJ	350	UJ	350	UJ	350	UJ	350	UJ
Nitrobenzene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Isophorone		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2-Nitrophenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,4-Dimethylphenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
bis(2-Chloroethoxy)methane		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,4-Dichlorophenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
1,2,4-Trichlorobenzene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Naphthalene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
4-Chloroaniline		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Hexachlorobutadiene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
4-Chloro-3-methylphenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2-Methylnaphthalene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Hexachlorocyclopentadiene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,4,6-Trichlorophenol		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,4,5-Trichlorophenol		920	U	910	U	870	U	870	U	870	U	880	U	870	U
2-Chloronaphthalene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2-Nitroaniline		920	U	910	U	870	U	870	U	870	U	880	U	870	U
Dimethylphthalate		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Acenaphthylene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,6-Dinitrotoluene		370	U	370	U	350	U	350	U	350	U	350	U	350	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

SEMIVOLATILE/8310 ANALYSIS, SOLID MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD															
Laboratory: LLI	SDG: K0235														
Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
Extraction Date		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06	
Analysis Date		3/3/06		3/3/06		3/3/06		3/3/06		3/6/06		3/5/06		3/6/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline		920	U	910	U	870	U	870	U	870	U	880	U	870	U
Acenaphthene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,4-Dinitrophenol		920	U	910	U	870	U	870	U	870	U	880	U	870	U
4-Nitrophenol		920	U	910	U	870	U	870	U	870	U	880	U	870	U
Dibenzofuran		370	U	370	U	350	U	350	U	350	U	350	U	350	U
2,4-Dinitrotoluene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Diethylphthalate		370	U	370	U	350	U	350	U	350	U	350	U	350	U
4-Chlorophenyl-phenyl ether		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Fluorene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
4-Nitroaniline		920	U	910	U	870	U	870	U	870	U	880	U	870	U
4,6-Dinitro-2-methylphenol		920	U	910	U	870	U	870	U	870	U	880	U	870	U
N-Nitrosodiphenylamine		370	U	370	U	350	U	350	U	350	U	350	U	350	U
4-Bromophenyl-phenyl ether		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Hexachlorobenzene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Pentachlorophenol		920	U	910	U	870	U	870	U	870	U	880	U	870	U
Phenanthrene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Anthracene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Carbazole		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Di-n-butylphthalate		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Fluoranthene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Pyrene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Butylbenzylphthalate		370	U	370	U	350	U	350	U	350	U	350	U	350	U
3,3'-Dichlorobenzidine		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Benzo(a)anthracene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Chrysene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
bis(2-Ethylhexyl)phthalate		330	U	330	U	330	U	330	U	330	U	330	U	330	U
Di-n-octylphthalate		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Benzo(b)fluoranthene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Benzo(k)fluoranthene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Benzo(a)pyrene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Indeno(1,2,3-cd)pyrene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Dibenz(a,h)anthracene		370	U	370	U	350	U	350	U	350	U	350	U	350	U
Benzo(g,h,i)perylene		370	U	370	U	350	U	350	U	350	U	350	U	350	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

SEMIVOLATILE/8310 ANALYSIS, SOLID MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD															
Laboratory: LLI	SDG: K0235														
Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
Extraction Date		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06	
Analysis Date		3/3/06		3/3/06		3/3/06		3/3/06		3/6/06		3/5/06		3/6/06	
Total Petroleum Hydrocarbons	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gasoline Range Organics	5	33	UJ	30	UJ	30	UJ	30	UJ	30	UJ	33	UJ	30	UJ
Diesel Range Organics	5	5400	UJ	6600	J	2900	UJ	4300	UJ	18000	J	4600	UJ	4100	UJ

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000013

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0602L325 Client: TNU-HANFORD RC-047 Work Order: 11343606001 Report Date: 03/09/06 11:45 Page: 1a

	Cust ID:	J11298		J11299		J112B0		J112B1		J112B1		J112B1	
Sample Information	RFW#:	001		002		003		004		004 MS		004 MSD	
	Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	69	%	59	%	81	%	58	%	65	%	76	%
	2-Fluorobiphenyl	74	%	62	%	86	%	67	%	76	%	84	%
	Terphenyl-d14	84	%	73	%	114	%	104	%	89	%	99	%
	Phenol-d5	72	%	60	%	89	%	71	%	75	%	84	%
	2-Fluorophenol	55	%	47	%	86	%	61	%	64	%	83	%
	2,4,6-Tribromophenol	79	%	68	%	80	%	79	%	80	%	84	%
		fl		fl		fl		fl		fl		fl	
Phenol		370	U	370	U	350	U	350	U	84	%	96	%
bis(2-Chloroethyl)ether		370	U	370	U	350	U	350	U	81	%	96	%
2-Chlorophenol		370	U	370	U	350	U	350	U	79	%	96	%
1,3-Dichlorobenzene		370	U J	370	U J	350	U J	350	U J	60	%	85	%
1,4-Dichlorobenzene		370	U J	370	U J	350	U J	350	U J	61	%	84	%
1,2-Dichlorobenzene		370	U	370	U	350	U	350	U	67	%	89	%
2-Methylphenol		370	U	370	U	350	U	350	U	85	%	94	%
2,2'-oxybis(1-Chloropropane)		370	U	370	U	350	U	350	U	79	%	93	%
4-Methylphenol		370	U	370	U	350	U	350	U	88	%	96	%
N-Nitroso-di-n-propylamine		370	U	370	U	350	U	350	U	96	%	100	%
Hexachloroethane		370	U J	370	U J	350	U J	350	U J	58	%	80	%
Nitrobenzene		370	U	370	U	350	U	350	U	73	%	85	%
Isophorone		370	U	370	U	350	U	350	U	86	%	97	%
2-Nitrophenol		370	U	370	U	350	U	350	U	77	%	88	%
2,4-Dimethylphenol		370	U	370	U	350	U	350	U	78	%	85	%
bis(2-Chloroethoxy)methane		370	U	370	U	350	U	350	U	81	%	92	%
2,4-Dichlorophenol		370	U	370	U	350	U	350	U	79	%	91	%
1,2,4-Trichlorobenzene		370	U	370	U	350	U	350	U	69	%	84	%
Naphthalene		370	U	370	U	350	U	350	U	69	%	82	%
4-Chloroaniline		370	U	370	U	350	U	350	U	77	%	92	%
Hexachlorobutadiene		370	U	370	U	350	U	350	U	74	%	90	%
4-Chloro-3-methylphenol		370	U	370	U	350	U	350	U	79	%	91	%
2-Methylnaphthalene		370	U	370	U	350	U	350	U	78	%	90	%
Hexachlorocyclopentadiene		370	U	370	U	350	U	350	U	62	%	74	%
2,4,6-Trichlorophenol		370	U	370	U	350	U	350	U	89	%	97	%
2,4,5-Trichlorophenol		920	U	910	U	870	U	870	U	88	%	96	%

*= Outside of EPA CLP QC limits.

JC 6/4/06

000014

000000007

Cust ID:	J11298		J11299		J112B0		J112B1		J112B1		J112B1	
RFW#:	001		002		003		004		004 MS		004 MSD	
2-Chloronaphthalene	370	U	370	U	350	U	350	U	85	%	95	%
2-Nitroaniline	920	U	910	U	870	U	870	U	90	%	101	%
Dimethylphthalate	370	U	370	U	350	U	350	U	88	%	91	%
Acenaphthylene	370	U	370	U	350	U	350	U	85	%	92	%
2,6-Dinitrotoluene	370	U	370	U	350	U	350	U	90	%	96	%
3-Nitroaniline	920	U	910	U	870	U	870	U	96	%	107	%
Acenaphthene	370	U	370	U	350	U	350	U	83	%	93	%
2,4-Dinitrophenol	920	U	910	U	870	U	870	U	96	%	93	%
4-Nitrophenol	920	U	910	U	870	U	870	U	93	%	99	%
Dibenzofuran	370	U	370	U	350	U	350	U	88	%	96	%
2,4-Dinitrotoluene	370	U	370	U	350	U	350	U	94	%	104	%
Diethylphthalate	370	U	370	U	350	U	350	U	91	%	96	%
4-Chlorophenyl-phenylether	370	U	370	U	350	U	350	U	86	%	96	%
Fluorene	370	U	370	U	350	U	350	U	85	%	94	%
4-Nitroaniline	920	U	910	U	870	U	870	U	79	%	87	%
4,6-Dinitro-2-methylphenol	920	U	910	U	870	U	870	U	93	%	99	%
N-Nitrosodiphenylamine (1)	370	U	370	U	350	U	350	U	74	%	81	%
4-Bromophenyl-phenylether	370	U	370	U	350	U	350	U	79	%	85	%
Hexachlorobenzene	370	U	370	U	350	U	350	U	83	%	93	%
Pentachlorophenol	920	U	910	U	870	U	870	U	109	%	114	%
Phenanthrene	370	U	370	U	350	U	350	U	88	%	98	%
Anthracene	370	U	370	U	350	U	350	U	88	%	94	%
Carbazole	370	U	370	U	350	U	350	U	88	%	95	%
Di-n-butylphthalate	370	U	370	U	350	U	350	U	91	%	100	%
Fluoranthene	370	U	370	U	350	U	350	U	83	%	91	%
Pyrene	370	U	370	U	350	U	350	U	96	%	108	%
Butylbenzylphthalate	370	U	370	U	350	U	350	U	107	%	122	%
3,3'-Dichlorobenzidine	370	U	370	U	350	U	350	U	76	%	87	%
Benzo(a)anthracene	370	U	370	U	350	U	350	U	90	%	97	%
Chrysene	370	U	370	U	350	U	350	U	89	%	94	%
bis(2-Ethylhexyl)phthalate	330 ~~39~~ 6/4/02 JBU		330 ~~54~~ 6/4/02 JBU		330 ~~58~~ 6/4/02 JBU		330 ~~59~~ 6/4/02 JBU		106	%	120	%
Di-n-octyl phthalate	370	U	370	U	350	U	350	U	89	%	99	%
Benzo(b)fluoranthene	370	U	370	U	350	U	350	U	80	%	81	%
Benzo(k)fluoranthene	370	U	370	U	350	U	350	U	77	%	82	%
Benzo(a)pyrene	370	U	370	U	350	U	350	U	85	%	91	%
Indeno(1,2,3-cd)pyrene	370	U	370	U	350	U	350	U	106	%	115	%
Dibenz(a,h)anthracene	370	U	370	U	350	U	350	U	104	%	114	%
Benzo(g,h,i)perylene	370	U	370	U	350	U	350	U	106	%	115	%

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

6/4/02

000000015

00000008

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0602L325 Client: TNU-HANFORD RC-047 Work Order: 11343606001 Report Date: 03/09/06 11:45 Page: 2a

	Cust ID:	J116L6		J116L7		J11733		SBLKUH		SBLKUH BS	
Sample Information	RFW#:	005		006		007		06LE0152-MB1		06LE0152-MB1	
	Matrix:	SOLID		SOLID		SOLID		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 Recovery	Nitrobenzene-d5	65	%	54	%	70	%	72	%	79	%
	2-Fluorobiphenyl	65	%	57	%	77	%	71	%	83	%
	Terphenyl-d14	87	%	87	%	106	%	81	%	96	%
	Phenol-d5	68	%	60	%	71	%	69	%	79	%
	2-Fluorophenol	61	%	56	%	72	%	59	%	64	%
	2,4,6-Tribromophenol	72	%	70	%	81	%	69	%	89	%
Phenol		350	U	350	U	350	U	330	U	78	%
bis(2-Chloroethyl)ether		350	U	350	U	350	U	330	U	90	%
2-Chlorophenol		350	U	350	U	350	U	330	U	86	%
1,3-Dichlorobenzene		350	U J	350	U J	350	U J	330	U J	84	%
1,4-Dichlorobenzene		350	U J	350	U J	350	U J	330	U J	85	%
1,2-Dichlorobenzene		350	U	350	U	350	U	330	U	92	%
2-Methylphenol		350	U	350	U	350	U	330	U	76	%
2,2'-oxybis(1-Chloropropane)		350	U	350	U	350	U	330	U	84	%
4-Methylphenol		350	U	350	U	350	U	330	U	85	%
N-Nitroso-di-n-propylamine		350	U	350	U	350	U	330	U	91	%
Hexachloroethane		350	U J	350	U J	350	U J	330	U J	80	%
Nitrobenzene		350	U	350	U	350	U	330	U	83	%
Isophorone		350	U	350	U	350	U	330	U	95	%
2-Nitrophenol		350	U	350	U	350	U	330	U	86	%
2,4-Dimethylphenol		350	U	350	U	350	U	330	U	65	%
bis(2-Chloroethoxy)methane		350	U	350	U	350	U	330	U	88	%
2,4-Dichlorophenol		350	U	350	U	350	U	330	U	79	%
1,2,4-Trichlorobenzene		350	U	350	U	350	U	330	U	82	%
Naphthalene		350	U	350	U	350	U	330	U	86	%
4-Chloroaniline		350	U	350	U	350	U	330	U	104	%
Hexachlorobutadiene		350	U	350	U	350	U	330	U	85	%
4-Chloro-3-methylphenol		350	U	350	U	350	U	330	U	83	%
2-Methylnaphthalene		350	U	350	U	350	U	330	U	95	%
Hexachlorocyclopentadiene		350	U	350	U	350	U	330	U	82	%
2,4,6-Trichlorophenol		350	U	350	U	350	U	330	U	97	%
2,4,5-Trichlorophenol		870	U	880	U	870	U	830	U	72	%

*= Outside of EPA CLP QC limits.

VR 6/4/06

000016

000000009

Cust ID:	J116L6	J116L7	J11733	SBLKUH	SBLKUH BS
RFW#:	005	006	007	06LE0152-MB1	06LE0152-MB1
2-Chloronaphthalene	350 U	350 U	350 U	330 U	90 %
2-Nitroaniline	870 U	880 U	870 U	830 U	92 %
Dimethylphthalate	350 U	350 U	350 U	330 U	93 %
Acenaphthylene	350 U	350 U	350 U	330 U	91 %
2,6-Dinitrotoluene	350 U	350 U	350 U	330 U	90 %
3-Nitroaniline	870 U	880 U	870 U	830 U	117 %
Acenaphthene	350 U	350 U	350 U	330 U	94 %
2,4-Dinitrophenol	870 U	880 U	870 U	830 U	55 %
4-Nitrophenol	870 U	880 U	870 U	830 U	113 %
Dibenzofuran	350 U	350 U	350 U	330 U	93 %
2,4-Dinitrotoluene	350 U	350 U	350 U	330 U	102 %
Diethylphthalate	350 U	350 U	350 U	330 U	94 %
4-Chlorophenyl-phenylether	350 U	350 U	350 U	330 U	91 %
Fluorene	350 U	350 U	350 U	330 U	99 %
4-Nitroaniline	870 U	880 U	870 U	830 U	119 %
4,6-Dinitro-2-methylphenol	870 U	880 U	870 U	830 U	100 %
N-Nitrosodiphenylamine (1)	350 U	350 U	350 U	330 U	83 %
4-Bromophenyl-phenylether	350 U	350 U	350 U	330 U	86 %
Hexachlorobenzene	350 U	350 U	350 U	330 U	102 %
Pentachlorophenol	870 U	880 U	870 U	830 U	108 %
Phenanthrene	350 U	350 U	350 U	330 U	99 %
Anthracene	350 U	350 U	350 U	330 U	101 %
Carbazole	350 U	350 U	350 U	330 U	101 %
Di-n-butylphthalate	350 U	350 U	350 U	330 U	98 %
Fluoranthene	350 U	350 U	350 U	330 U	102 %
~~Pyrene~~	~~350 U~~	~~350 U~~	~~350 U~~	~~330 U~~	
Pyrene	350 U	350 U	350 U	330 U	98 %
Butylbenzylphthalate	350 U	350 U	350 U	330 U	99 %
3,3'-Dichlorobenzidine	350 U	350 U	350 U	330 U	117 %
Benzo(a)anthracene	350 U	350 U	350 U	330 U	98 %
Chrysene	350 U	350 U	350 U	330 U	98 %
bis(2-Ethylhexyl)phthalate	330 ~~58 JB~~ U 6/4/06	330 ~~42 JB~~ U 6/4/06	330 ~~29 JB~~ U 6/4/06	34 J	96 %
Di-n-octyl phthalate	350 U	350 U	350 U	330 U	100 %
Benzo(b)fluoranthene	350 U	350 U	350 U	330 U	111 %
Benzo(k)fluoranthene	350 U	350 U	350 U	330 U	93 %
Benzo(a)pyrene	350 U	350 U	350 U	330 U	101 %
Indeno(1,2,3-cd)pyrene	350 U	350 U	350 U	330 U	108 %
Dibenz(a,h)anthracene	350 U	350 U	350 U	330 U	109 %
Benzo(g,h,i)perylene	350 U	350 U	350 U	330 U	105 %

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

6/4/06

6/4/06

000017

000000010

Lithville Laboratory, Inc.

GAS RANGE ORGANICS

Report Date: 04/08/06 11:26

RFW Batch Number: 0602L325 Client: TNUHANFORD RC-047 K0235 Work Order: 11343606001 Page: 1

	Cust ID:	J11298	J11299	J112B0	J112B1	J116L6	J116L7
Sample Information	RFW#:	001	002	003	004	005	006
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
	Fluorobenzene	75 %	57 %	80 %	75 %	59 %	83 %
		fl	fl	fl	fl	fl	fl
Gasoline Range Organics (GRO)		33 U J	30 U J	30 U J	30 U J	30 U J	33 U J

	Cust ID:	J11733	TBLKYU	TBLKYU BS	TBLKYU BSD	TBLKYW	TBLKYW BS
Sample Information	RFW#:	007	06LVJ303-MB1	06LVJ303-MB1	06LVJ303-MB1	06LVJ306-MB1	06LVJ306-MB1
	Matrix:	SOLID	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
	Fluorobenzene	83 %	93 %	96 %	92 %	92 %	96 %
		fl	fl	fl	fl	fl	fl
Gasoline Range Organics (GRO)		30 U J	30 U	110 %	100 %	30 U	112 %

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

000018

L/4/06

4/10/06

GAS RANGE ORGANICS

Report Date: 04/08/06 11:26

RFW Batch Number: 0602L325 Client: TNUHANFORD RC-047 K0235 Work Order: 11343606001 Page: 2

Cust ID: TBLKYW BSD

Sample Information

RFW#: 06LVJ306-MB1
Matrix: SOIL
D.F.: 1.00
Units: UG/KG

Fluorobenzene	96	%
Gasoline Range Organics (GRO)	109	%

6/4/06

000019

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

4/10/06

DIESEL RANGE ORGANICS BY GC

Report Date: 03/16/06 10:05

RFW Batch Number: 0602L325 Client: TNU-HANFORD RC-047,K0235 Work Order: 11343606001 Page: 1

	Cust ID:	J11298	J11299	J112B0	J112B0	J112B0	J112B1
Sample Information	RFW#:	001	002	003	003 MS	003 MSD	004
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	p-Terphenyl	62 %	91 %	88 %	79 %	81 %	84 %
		fl	fl	fl	fl	fl	fl
Diesel Range Organics		5400 ~~B~~ UJ	6600 ~~B~~ UJ	2900 ~~B~~ UJ	62 %	72 %	4300 ~~B~~ UJ

	Cust ID:	J116L6	J116L7	J11733	BLK	BLK BS
Sample Information	RFW#:	005	006	007	06LE0156-MB1	06LE0156-MB1
	Matrix:	SOLID	SOLID	SOLID	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
	p-Terphenyl	91 %	86 %	51 %	74 %	73 %
		fl	fl	fl	fl	fl
Diesel Range Organics		18000 ~~B~~ UJ	4600 ~~B~~ UJ	4100 ~~B~~ UJ	1300 J	70 %

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

6/9/06

000020

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-047
LVL #: 0602L325
SDG/SAF # K0235 /RC-047

W.O. #: 11343-606-001-9999-00
Date Received: 02-23-2006

SEMIVOLATILE

Seven (7) solid samples were collected on 02-21-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 02-28-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 03-03-2006.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. Samples were extracted and analyzed within required holding time.

3. Non-target compounds were detected in the samples.

4. All surrogate recoveries were within acceptance criteria.

5. All matrix spike recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.

8. Internal standard area and retention time criteria were met.

9. Manual integrations are performed according to SOP 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 the Glossary ("Technical Flags For Manual Integration").

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 2 7 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

11. 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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

3/14/06
Date

som\gorup\data\bna\mu-hanford\0602-325.doc

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LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RCS-047
LVL #: 0602L325
SDG/SAF # K0235/RCS-047

W.O. #: 11343-606-001-9999-00
Date Received: 02-23-2006

GRO

Seven (7) solid samples were collected on 02-21-2006.

The samples and their associated QC samples were analyzed according to Lionville Laboratory SOPs based on SW-846 method 8015B for Gasoline Range Organics (GRO) on 03-03,06-2006.

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

1. All results presented in this report are derived from a sample that met LVLI's sample acceptance policy.
2. All required holding times have been met.
3. The method blank was below the reporting limits for the target compound.
4. All surrogate recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. Matrix spike QC was not performed on any samples in this data set. However, blank spike QC was performed with these samples to demonstrate that systems were in control.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. The continuing calibration standards analyzed prior to sample extracts were outside the acceptance criteria.
9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/12/06
Date

kim\r\group\data\gro\tnu-hanford\0602-239.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 1 4 pages.

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LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-047
LVL #: 0602L325
SDG/SAF # K0235/RC-047

W.O. #: 11343-606-001-9999-00
Date Received: 02-23-2006

DIESEL RANGE ORGANICS

Seven (7) solid samples were collected on 02-21-2006.

The samples and their associated QC samples were extracted on 03-02-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 03-08-2006. The analysis was based on method 8015B. The analysis met the intent of method WTPH-D.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. Samples were extracted and analyzed within required holding time.

3. The method blank was below the reporting limit for the target compound.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recovery was within acceptance criteria.

6. The matrix spike recoveries were within acceptance criteria.

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

8. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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 1 4 pages.

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LIONVILLE LABORATORY INC.

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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

3/23/04
Date

som\r:\group\data\dro\tnu hanford\0602-325s.doc

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-18	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: Cr 1, SEDIMENT		SAF No.: RC-047
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1596 7 SID13100	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060292		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 9N

Air Quality: [ ]

Data Turnaround: 45 Days

0000000020

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

000027

Sample No.	Matrix *	Sample Date	Sample Time										
J11298	OTHER SOLID	2-21-06	1100				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0730 2-22-06	Received By/Stored In: RZ Steffler R.J. Steffler Date/Time: 0830 2-22-06
Relinquished By/Removed From: RZ Steffler R.J. Steffler Date/Time: 1600 2-22-06	Received By/Stored In: Fed Ex Date/Time:
Relinquished By/Removed From: Fed Ex Date/Time: 2-23-06 0915	Received By/Stored In: [signature] Date/Time: 2-23-06 0915
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}

(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-19	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 2, SEDIMENT		SAF No. RC-047
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7 HP 13106	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC

Price Code 9N

Air Quality ☐

Data Turnaround 45 Days

000000021

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

000028

Sample No.	Matrix *	Sample Date	Sample Time										
J11299	OTHER SOLID	2-21-06	1200				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From JAMES BERNHARD	Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler R.J. Steffler	Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler R.J. Steffler	Date/Time 1600 WCH 2-22-06	Received By/Stored In Fed EX	Date/Time
Relinquished By/Removed From Fed EX	Date/Time 2-23-06 0915	Received By/Stored In D. Smith	Date/Time 2-23-06 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}

(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-20	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N / Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 3, SEDIMENT	SAF No. RC-047	Air Quality ☐
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596-7 / COA BESRAS6520	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES RICHLAND	Offsite Property No. A060292	Bill of Lading/Air Bill No. SEE OSPC	

000000022

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

000029

Sample No.	Matrix *	Sample Date	Sample Time										
J112B0	OTHER SOLID	2-21-06	1300				X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JAMES BERNHARD	2-21-06 1900	EAS LOCKED STORAGE	2-21-06 1900
EAS LOCKED STORAGE	2-22-06 0830	RZ Stoffler R.J. Stoffler	2-22-06 0830
RZ Stoffler R.J. Stoffler	2-22-06 1600	FedEx	
[illegible]	2.23.06 0915	[illegible]	2.23.06 0915

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-21	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 4, SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000030

SAMPLE ANALYSIS													
Preservation				None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container				G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)				1	1	1	1	1	1	1	1	1	
Volume				750g	5g	5g	15g	50g	50g	50g	50g	50g	
Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	
J112B1	OTHER SOLID	2-21-06	1400				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From JAMES BERNHARD	Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler	Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler	Date/Time 1600 2-22-06	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 2-23-06 0915	Received By/Stored In	Date/Time 2-23-06 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 2-23-06
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-35	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 9N	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr SEDIMENT	SAF No. RC-047	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES, LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC

0000024

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

0000031

SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		

Sample No.	Matrix *	Sample Date	Sample Time										
J116L6	OTHER SOLID	2-21-06	1445			X	X	X	X	X	X		

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JAMES BERNHARD	2-21-06 1900	EAS LOCKED STORAGE	2-21-06 1900
EAS LOCKED STORAGE	2-22-06 0830	RZ Stiffler R.J. Stiffler	2-22-06 0830
RZ Stiffler R.J. Stiffler	2-22-06 1600	Fed Ex	
Fed Ex	2.23.06 0915	[illegible]	2.23.06 0915

SPECIAL INSTRUCTIONS

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solid
DL=Drum Liqui
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-36	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 9N	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr & SEDIMENT		SAF No. RC-047
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
Sample No. / Matrix * / Sample Date / Sample Time										
J116L7 / OTHER SOLID / 2-21-06 / 1530			X	X	X	X	X	X		

000032

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From JAMES BERNHARD Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler Date/Time 1600 2-22-06	Received By/Stored In Fed Ex Date/Time
Relinquished By/Removed From Fed Ex Date/Time 2-23-06 0915	Received By/Stored In Date/Time 2-23-06 0915
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time

SPECIAL INSTRUCTIONS

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-99	Page 1 of 1

Collector: TILLER JAMES BERNHARD	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location: ~~REP~~, SEDIMENT JEB 2-21-06 C-#8		SAF No.: RC-047
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1597	COA: BESRAS6520	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060292		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 9N

Air Quality ☐

Data Turnaround: 45 Days

0000000026

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000033

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On; TPH-Gasoline Range - WTPH-G		

Sample No.	Matrix *	Sample Date	Sample Time										
J11733	OTHER SOLID	2-21-06	1630			X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From: JAMES BERNHARD Date/Time: 1900 2-21-06	Received By/Stored In: EAS LOCKED STORAGE Date/Time: 1900 2-21-06	
Relinquished By/Removed From: EAS LOCKED STORAGE Date/Time: 0830 2-22-06	Received By/Stored In: RZ Steffler R.J. Steffler Date/Time: 0830 2-22-06	
Relinquished By/Removed From: RZ Steffler R.J. Steffler Date/Time: 1600 WCH 2-22-06	Received By/Stored In: Fed Ex Date/Time:	
Relinquished By/Removed From: Fed Ex Date/Time: 2.23.06 0915	Received By/Stored In: [signature] Date/Time: 2.23.06 0915	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCRA S+T			DATA PACKAGE: K0235		
VALIDATOR: TLI		LAB: LLI		DATE: 6/3/01	
			SDG: K0235		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270	8015B	SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J11298 J11295 J11280 J11281 J11611					
J11617 J11733					
					solid

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: DRO - MB UJ 98, B0, B1, L7 + 33 no FB

bis(2ethylhexyl)phthalate - in MB - U at RQL

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

GRO - NO MS/MSD J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD RPD values acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

GRO - no MS/MSD J all

SU - 1,3 dichlorobenzene - 33% - J all

hexachloro ~~benzene~~ butadiene - 32% - J all

1,4-dichloro ~~benzen~~ ethene - 32% - J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

DRO - HT exceeded - <2X limit J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: all ~~TPH~~ GRO - over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 7 June 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Sediment & Tissue
Subject: PCB/Pesticide - Data Package No. K0235-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0235 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11298	2/21/06	Solid	C	See note 1
J11299	2/21/06	Solid	C	See note 1
J112B0	2/21/06	Solid	C	See note 1
J112B1	2/21/06	Solid	C	See note 1
J116L6	2/21/06	Solid	C	See note 1
J116L7	2/21/06	Solid	C	See note 1
J11733	2/21/06	Solid	C	See note 1

1 – Pesticides by 8081A and PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Sampling & Analysis Plan (DOE/RL-2005-42, Rev. 0, October 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times & Sample Preservation

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-

detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J116L7/J11733) were submitted for analysis. Field duplicate samples are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the project specific RQLs to ensure that laboratory detection levels meet the required criteria. The toxaphene result in all samples exceeded the RQL. Under the WCH validation statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data Package No. K0235 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The toxaphene result in all samples exceeded the RQL. Under the WCH validation statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005-42, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Sampling & Analysis Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: K0235	REVIEWER: [illegible]	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS, MSD or LCS

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, SOLID MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD															
Laboratory: LLI	SDG: K0235														
Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
Extraction Date		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06	
Analysis Date		3/10/06		3/10/06		3/10/06		3/10/06		3/10/06		3/10/06		3/10/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016		15	U	15	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1221		15	U	15	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1232	16.5	15	U	15	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1242	16.5	15	U	15	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1248		15	U	15	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1254	16.5	15	U	15	U	8.5		24		14	U	14	U	14	U
Aroclor-1260	16.5	15	U	15	U	14	U	14	U	14	U	14	U	14	U
Sample Number		J11298		J11299		J112B0		J112B1		J116L6		J116L7		J11733	
Remarks														Duplicate	
Sample Date		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
Extraction Date		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06		2/28/06	
Analysis Date		3/10/06		3/10/06		3/10/06		3/10/06		3/10/06		3/10/06		3/10/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Gamma-BHC (Lindane)	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Beta-BHC	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Heptachlor	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Delta-BHC	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Aldrin	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Heptachlor Epoxide	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Endosulfan I	5	0.66		1.1		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Dieldrin	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
4,4'-DDE	5	0.81		0.58		0.38		0.84		1.4	U	3.5		3.7	
Endrin	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Endosulfan II	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
4,4'-DDD	5	1.7		1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Endosulfan Sulfate	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
4,4'-DDT	5	110		0.51		1.4	U	1.4	U	1.4	U	1.3		1.4	
Methoxychlor	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Endrin Ketone	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Endrin Aldehyde	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
alpha-Chlordane	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
gamma-Chlordane	5	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
Toxaphene	5	15	UJ	15	UJ	14	UJ	14	UJ	14	UJ	14	UJ	14	UJ

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

000010

PCBs by GC

Report Date: 04/17/06 12:42

RFW Batch Number: 0602L325 Client: TNUHANFORD RC-047 K0235 Work Order: 11343606001 Page: 1

	Cust ID:	J11298		J11299		J112B0		J112B1		J116L6		J116L6	
Sample Information	RFW#:	001		002		003		004		005		005 MS	
	Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	90	%	96	%	93	%	93	%	98	%	87	%
	Decachlorobiphenyl	92	%	99	%	96	%	94	%	102	%	98	%
Aroclor-1016		15	U	15	U	14	U	14	U	14	U	99	%
Aroclor-1221		15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1232		15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1242		15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1248		15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1254		15	U	15	U	8.5	J	24		14	U	14	U
Aroclor-1260		15	U	15	U	14	U	14	U	14	U	110	%

	Cust ID:	J116L6		J116L7		J11733		PBLKCL		PBLKCL BS	
Sample Information	RFW#:	005 MSD		006		007		06LE0149-MB1		06LE0149-MB1	
	Matrix:	SOLID		SOLID		SOLID		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:	Tetrachloro-m-xylene	102	%	80	%	98	%	86	%	94	%
	Decachlorobiphenyl	113	%	96	%	98	%	94	%	91	%
Aroclor-1016		114	%	14	U	14	U	13	U	100	%
Aroclor-1221		14	U	14	U	14	U	13	U	13	U
Aroclor-1232		14	U	14	U	14	U	13	U	13	U
Aroclor-1242		14	U	14	U	14	U	13	U	13	U
Aroclor-1248		14	U	14	U	14	U	13	U	13	U
Aroclor-1254		14	U	14	U	14	U	13	U	13	U
Aroclor-1260		124	%	14	U	14	U	13	U	102	%

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

6/4/06

4/17/06

000014

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 04/05/06 12:47

RFW Batch Number: 0602L325 Client: TNUHANFORD RC-047 K0235 Work Order: 11343606001 Page: 1

	Cust ID:	J11298	J11299	J112B0	J112B1	J112B1	J112B1
Sample Information	RFW#:	001	002	003	004	004 MS	004 MSD
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	4.00	4.00	4.00	4.00	4.00	4.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	85 %	90 %	83 %	79 %	100 %	82 %
	Decachlorobiphenyl	100 %	103 %	94 %	87 %	110 %	96 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.5 U	1.5 U	1.4 U	1.4 U	91 %	77 %
gamma-BHC (Lindane)		1.5 U	1.5 U	1.4 U	1.4 U	96 %	82 %
Beta-BHC		1.5 U	1.5 U	1.4 U	1.4 U	97 %	85 %
Heptachlor		1.5 U	1.5 U	1.4 U	1.4 U	92 %	80 %
Delta-BHC		1.5 U	1.5 U	1.4 U	1.4 U	86 %	74 %
Aldrin		1.5 U	1.5 U	1.4 U	1.4 U	89 %	77 %
Heptachlor epoxide		1.5 U	1.5 U	1.4 U	1.4 U	95 %	83 %
gamma-Chlordane		1.5 U	1.5 U	1.4 U	1.4 U	92 %	80 %
Endosulfan I		0.66 J	1.1 J	1.4 U	1.4 U	92 %	81 %
alpha-Chlordane		1.5 U	1.5 U	1.4 U	1.4 U	94 %	83 %
4,4'-DDE		0.81 J	0.58 J	0.38 J	0.84 J	93 %	81 %
Dieldrin		1.5 U	1.5 U	1.4 U	1.4 U	91 %	79 %
Endrin		1.5 U	1.5 U	1.4 U	1.4 U	92 %	82 %
4,4'-DDD		1.7	1.5 U	1.4 U	1.4 U	97 %	85 %
Endosulfan II		1.5 U	1.5 U	1.4 U	1.4 U	93 %	82 %
4,4'-DDT		110	0.51 J	1.4 U	1.4 U	97 %	85 %
Endrin aldehyde		1.5 U	1.5 U	1.4 U	1.4 U	93 %	79 %
Endosulfan sulfate		1.5 U	1.5 U	1.4 U	1.4 U	91 %	81 %
Methoxychlor		1.5 U	1.5 U	1.4 U	1.4 U	113 %	97 %
Endrin ketone		1.5 U	1.5 U	1.4 U	1.4 U	100 %	88 %
Toxaphene		15 U J	15 U J	14 U J	14 U J	14 U	14 U

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

6/14/06

000012

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 04/05/06 12:47

RFW Batch Number: 0602L325 Client: TNUHANFORD RC-047 K0235 Work Order: 11343606001 Page: 2

	Cust ID:	J116L6		J116L7		J11733		PBLKCL		PBLKCL BS	
Sample Information	RFW#:	005		006		007		06LE0149-MB1		06LE0149-MB1	
	Matrix:	SOLID		SOLID		SOLID		SOIL		SOIL	
	D.F.:	4.00		4.00		4.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	86	%	82	%	90	%	87	%	93	%
	Decachlorobiphenyl	99	%	98	%	104	%	88	%	94	%
Alpha-BHC		1.4	U	1.4	U	1.4	U	0.33	U	113	%
gamma-BHC (Lindane)		1.4	U	1.4	U	1.4	U	0.33	U	111	%
Beta-BHC		1.4	U	1.4	U	1.4	U	0.33	U	101	%
Heptachlor		1.4	U	1.4	U	1.4	U	0.33	U	103	%
Delta-BHC		1.4	U	1.4	U	1.4	U	0.33	U	100	%
Aldrin		1.4	U	1.4	U	1.4	U	0.33	U	107	%
Heptachlor epoxide		1.4	U	1.4	U	1.4	U	0.33	U	106	%
gamma-Chlordane		1.4	U	1.4	U	1.4	U	0.33	U	104	%
Endosulfan I		1.4	U	1.4	U	1.4	U	0.33	U	108	%
alpha-Chlordane		1.4	U	1.4	U	1.4	U	0.33	U	104	%
4,4'-DDE		1.4	U	3.5		3.7		0.33	U	114	%
Dieldrin		1.4	U	1.4	U	1.4	U	0.33	U	112	%
Endrin		1.4	U	1.4	U	1.4	U	0.33	U	109	%
4,4'-DDD		1.4	U	1.4	U	1.4	U	0.33	U	119	%
Endosulfan II		1.4	U	1.4	U	1.4	U	0.33	U	109	%
4,4'-DDT		1.4	U	1.3	J	1.4	J	0.33	U	107	%
Endrin aldehyde		1.4	U	1.4	U	1.4	U	0.33	U	100	%
Endosulfan sulfate		1.4	U	1.4	U	1.4	U	0.33	U	109	%
Methoxychlor		1.4	U	1.4	U	1.4	U	0.33	U	108	%
Endrin ketone		1.4	U	1.4	U	1.4	U	0.33	U	112	%
Toxaphene		14	U J	14	U J	14	U J	3.3	U	3.3	U

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

000013

6/4/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-047
LVL #: 0602L325
SDG/SAF # K0232/RC-047

W.O. #: 11343-606-001-9999-00
Date Received: 02-23-2006

PCB

Seven (7) solid samples were collected on 02-21-2006.

The samples and their associated QC samples were extracted on 02-28-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 03-09,10,11-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. Samples were extracted and analyzed within required holding time.

3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.

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

5. All surrogate recoveries were within acceptance criteria.

6. The blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

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

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 4 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

11. 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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/18/06
Date

kim\a:\group\data\pest\tmu hanford\0602-325.pcbs

LVLI
LIONVILLE LABORATORY INC.

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-047
LVL #: 0602L325
SDG/SAF # K0235/RC-047

W.O. #: 11343-606-001-9999-00
Date Received: 02-23-2006

CHLORINATED PESTICIDES

Seven (7) solid samples were collected on 02-21-2006.

The samples and their associated QC samples were extracted on 02-28-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 03-09,10-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance.

2. Samples were extracted and analyzed within required holding time.

3. The samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.

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

5. All surrogate recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. All samples required a 4-fold instrument dilution due to the nature of the sample matrix. The reporting limits were adjusted to reflect the necessary dilution.

9. The initial calibrations associated with this data set were within acceptance criteria.

10. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 5 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

11. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

12. 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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/6/06
Date

som\r:\group\data\pest\tmu hanford\0602-325s.pst

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-18	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 1, SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

Sample No.	Matrix *	Sample Date	Sample Time										
J11298	OTHER SOLID	2-21-06	1100				X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JAMES BERNHARD	1900 2-21-06	EAS LOCKED STORAGE	1900 2-21-06
EAS LOCKED STORAGE	0830 2-22-06	RZ Steffler RJ Steffler	0830 2-22-06
RZ Steffler RJ Steffler	1600 2-22-06	Fed Ex	
Fed Ex	2-23-06 0915	W Smith	2-23-06 0915

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

000019

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-19	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 2, SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7 HP 13106	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

020000

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

Sample No.	Matrix *	Sample Date	Sample Time										
J11299	OTHER SOLID	2-21-06	1200				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From JAMES BERNHARD	Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler	Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler	Date/Time 1600 2-22-06	Received By/Stored In Fed EX	Date/Time
Relinquished By/Removed From Fed EX	Date/Time 2-23-06 0915	Received By/Stored In	Date/Time 2-23-06 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)
(3) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-047-20	Page 1 of 1
Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 3, SEDIMENT		SAF No. RC-047	Air Quality ☐
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7 4/1310 C	COA BESRAS6520	Method of Shipment FED EX	Data Turnaround 45 Days
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000021

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G			
No. of Container(s)	1	1	1	1	1	1	1	1	1			
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G			
Sample No.	Matrix *	Sample Date	Sample Time									
J112B0	OTHER SOLID	2-21-06	1300				X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From JAMES BERNHARD Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler Date/Time 1600 2-22-06	Received By/Stored In Fed Ex Date/Time
Relinquished By/Removed From Fed Ex Date/Time 2-23-06 0915	Received By/Stored In Date/Time 2-23-06 0915
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-21	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr 4, SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1596 7/A 13106	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000022

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	750g	5g	5g	15g	50g	50g	50g	50g	50g	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	

Sample No.	Matrix *	Sample Date	Sample Time										
J112B1	OTHER SOLID	2-21-06	1400				X	X	X	X	X	X	

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From JAMES BERNHARD	Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE — Date/Time 1900 2-21-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0830 2-22-06	Received By/Stored In RZ Steffler RJ Steffler — Date/Time 0830 2-22-06
Relinquished By/Removed From RZ Steffler RJ Steffler	Date/Time 1600 WCH 2-22-06	Received By/Stored In Fed Ex — Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 2-23-06 0915	Received By/Stored In D. J. Miller — Date/Time 2-23-06 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In 2-23-06 — Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In — Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Radium-226, Radium-228, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) Strontium-89,90 – Total Sr; Isotopic Thorium {Thorium-232}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}
(3) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV)

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-35	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES, LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On; TPH-Gasoline Range - WTPH-G		

000023

Sample No.	Matrix *	Sample Date	Sample Time										
J116L6	OTHER SOLID	2-21-06	1445			X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From JAMES BERNHARD Date/Time 1900 2-21-06	Received By/Stored In EAS LOCKED STORAGE Date/Time 1900 2-21-06	
Relinquished By/Removed From EAS LOCKED STORAGE Date/Time 0830 2-22-06	Received By/Stored In RZ Stiffler Date/Time 0830 2-22-06	
Relinquished By/Removed From RZ Stiffler Date/Time 1600 2-22-06	Received By/Stored In Fed Ex Date/Time	
Relinquished By/Removed From Fed Ex Date/Time 2-23-06 0915	Received By/Stored In Date/Time 2-23-06 1091 5	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time 2-23-06	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-36	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location Cr & SEDIMENT		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 – Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On; TPH-Gasoline Range - WTPH-G		
Sample No. / Matrix * / Sample Date / Sample Time										
J116L7 / OTHER SOLID / 2-21-06 / 1530			X	X	X	X	X	X		

020024

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JAMES BERNHARD	2-21-06 1900	EAS LOCKED STORAGE	2-21-06 1900
EAS LOCKED STORAGE	2-22-06 0830	RZ Steffler R.J. Steffler	2-22-06 0830
RZ Steffler R.J. Steffler	2-22-06 1600	Fed Ex	
Fed Ex	2.23.06 0915	W. Mitch	2.23.06 0915

SPECIAL INSTRUCTIONS

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-047-99	Page 1 of 1

Collector TILLER JAMES BERNHARD	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9N	Data Turnaround 45 Days
Project Designation 100 & 300 Area Component of the RCBRA Sediment and Ti	Sampling Location SEE 2-21-06 ~~REF~~, SEDIMENT Cr #8		SAF No. RC-047	Air Quality ☐	
Ice Chest No. AFS-04-120	Field Logbook No. EL-1597	COA BESRAS6520	Method of Shipment FED EX		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060292		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE <DOT LIMITS

Special Handling and/or Storage

COOL 4C

000025

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	750g	5g	15g	50g	50g	50g	50g	50g		
SAMPLE ANALYSIS	Gamma Spec - (Full List)	Strontium-89,90 -- Total Sr; Isotopic Thorium; Isotopic Uranium	ICP Metals - 6010 (Full List); Mercury - 7471 - (CV)	Pesticides - 8081	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	TPH-Diesel Range - WTPH-D - Add On: TPH-Gasoline Range - WTPH-G		
Sample No.	Matrix *	Sample Date	Sample Time								
J11733	OTHER SOLID	2-21-06	1630			X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By/Removed From [signature] Date/Time 1900 JAMES BERNHARD 2-21-06	Received By/Stored In [signature] Date/Time 1900 EAS LOCKED STORAGE 2-21-06		S=Soil SE=Sediment SO=Solid SI=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From [signature] Date/Time 0830 EAS LOCKED STORAGE 2-22-06	Received By/Stored In [signature] Date/Time 0830 RR Steffler R.J. Steffler 2-22-06		
Relinquished By/Removed From RR Steffler R.J. Steffler Date/Time 1600 WCH 2-22-06	Received By/Stored In Fed Ex Date/Time		
Relinquished By/Removed From Fed Ex 2.23.06 0915	Received By/Stored In [signature] 2.23.06 0915		
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time		
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time		

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA T&S			DATA PACKAGE: K0233		
VALIDATOR: TLI		LAB: LLI		DATE: 6/3/06	
			SDG: K0233		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J11298 J11299 J112B0 J112B1 J11GL6					
J11GL7 J11733					
				solid	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... Yes No N/A
Surrogate recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments: no PAS

no toxaphene MS/MSD/LCS J all

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no toxaphene MS/MSD – J all

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

all toxaphene over

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries acceptable? ..... Yes No N/A

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments: