ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
June 21 2005	N/A
3. Project No. 200-MW-1	4. Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Package SDG H3130	GRP & Waste Sites/200-MW-1	Bill Thackaberry	Env & Science Assurance (QA)	E6-35 372-0742

17. Comment Submittal Approval	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (optional)	7/5/05 Date; Reviewer/Point of Contact: W R Thackaberry; Requester	7/5/05 Date; Reviewer/Point of Contact: W R Thackaberry; Requester

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
1	Inorganics - Page 10, Copper result was not flagged. This is contrary to statements on pg 3, 8 and 11.		Com K	✓
2	Radiochemistry - pg 3, Minor deficiencies section cites a BHI statement of work.		Com L	✓
	PCBs, Wet Chemistry, Semivolatiles, Volatiles - No Comment			

RECEIVED
JUL 08 2005
EDMC

0067450

REVIEW COMMENT RECORD (RCR)

1. Date 06/27/05	2. Review No.
3. Project No. 200-MW-1	4. Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Validation Package for SDG H3130	Chracterization Soil Sampling	RL Weiss	ERC - S&DM	Sigma 1 372-9631

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. Closed
Organization Manager (Optional)	R. L. Weiss 06/27/2005 Reviewer/Point of Contract Date R. L. Weiss Author/Originator	7-6-05 Date Reviewer/Point of Contact Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Semivolatile, Page 1; The narrative for holding times/sample preservation should note that when not properly preserved and hold time is missed, that non-detects are qualified "R". The current wording does not justify the (correct) "R" flagging applied.		Concur K	OK RLW
2	All others – No Comments			

A-6400-090.1 (11/99)

Date: 20 June 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Inorganics - Data Package No. H3130

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3130 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	Media	Validation	Analysis
B1C7D5	4/13/05	Soil	C	See note 1

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

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. 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.

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

All other 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.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Matrix Spike Duplicate

Matrix spike (MS), matrix spike duplicate (MSD) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All MS/MSD results were acceptable.

Laboratory Control Sample

The LCS is used to monitor the overall performance of all steps in the analysis. Recoveries must fall within the range of 80% to 120% for LCS analysis. Samples with a recovery of less than 50% are rejected and flagged "UR". Samples with a recovery of 50% to 79% and a sample recovery below 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.

All LCS results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike and 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 +/- 35%, 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 an RPD outside QC limits (30.9%), all chromium results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (33.7%), all copper results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

No field duplicate results were submitted for analysis.

- **Analytical Detection Limits**

Reported analytical detection levels are compared against the required target quanitiation limits (RTQLs) to ensure that laboratory detection levels meet the

required criteria. All results met the analyte specific RTQL.

- **Completeness**

Data package No. H3130 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 limits, all mercury results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (30.9%), all chromium results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (33.7%), all copper results were qualified as estimates and flagged "J".

Data flagged "J" is an estimate, but under the FHI validation SOW, 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

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with FHI 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

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: H3130	REVIEWER: TLI	PROJECT: 200-MW-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	J	All	Holding time
Chromium	J	All	RPD
Copper	J	All	RPD

* - 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: FLUOR HANFORD			
Laboratory: LLI			
Case	**SDG: H3130**		
Sample Number		B1C7D5	
Remarks			
Sample Date		4/13/05	
Inorganics		**Result**	**Q**
Silver	**0.5**	0.19	
Cadmium	**0.5**	0.16	
Chromium	**1**	7.4	J
Copper	**2.5**	36.5	J
Mercury	**0.2**	0.02	UJ
Lead	**1**	3.2	

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 06/01/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B1C7D5	Silver, Total	0.19	MG/KG	0.09	1.0
		Cadmium, Total	0.16	MG/KG	0.03	1.0
		Chromium, Total	7.4 J	MG/KG	0.07	1.0
		Copper, Total	36.5 J	MG/KG	0.08	1.0
		Mercury, Total	0.02 u J	MG/KG	0.02	1.0
		Lead, Total	3.2	MG/KG	0.25	1.0

6/20/05

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F04-015
LVL#: 0504L297
SDG/SAF#: H3130/F04-015

W.O.#: 11343-606-001-9999-00
Date Received: 04-25-05

METALS CASE NARRATIVE

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

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

3. The sample was analyzed 5 days past the required holding time for Mercury.

4. Please refer to the Sample Receipt Check List for sample discrepancies in 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. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report. A serial dilution is performed for Mercury.

11. The duplicate analyses for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 15 pages.

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region of less-certain quantification.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

6/2/05
Date

jjw/m04-297

LVLI
LIONVILLE LABORATORY INC.

00000019

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F04-015-167 | PAGE 1 OF 1

COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: CS Cearlock	TELEPHONE NO.: 372-9638	PROJECT COORDINATOR: TRENT, SJ
PRICE CODE: 8N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: 200-E-4; 14-15 ft	PROJECT DESIGNATION: 200-MW-1 Characterization Sampling and Analysis - Soil	SAF NO.: F04-015	
ICE CHEST NO.: GRP-04-015	FIELD LOGBOOK NO.:	COA: 119144ES10	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Lionville Laboratory Incorporated	OFFSITE PROPERTY NO.: Su PTR 15370		BILL OF LADING/AIR BILL NO.: Su PTR 15370

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: ~~B1C7G9~~ B1C7C5 MMB 4/21/05

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
TYPE OF CONTAINER	aGs*	aG	aG	aG	aG
NO. OF CONTAINER(S)	~~2~~ 1 4-4-05	1	1	1	1
VOLUME	40mL	120mL	120mL	250mL	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B1C7D5	SOIL	4-13-05	1055	X	X	X	X	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
TSPG Ae / [illegible]	4-13-05 1400	MO-026 / REF. # /	4-13-05 1400
MO-026 / [illegible]	4/21/05 0720	M.H. Bauchler / M.G. Bauchler	4/21/05 0720
M.H. Bauchler / M.G. Bauchler	4/21/05 0730	[illegible]	
FedEx	4/25/05 0925	J Perry	

SPECIAL INSTRUCTIONS

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {cis-1,2-Dichloroethylene, ~~n-Butylbenzene,~~ trans-1,2-Dichloroethylene} PMG 2/11/05
(2)Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G;
(3)ICP Metals - 6010A (Supertrace) {Cadmium, Chromium, Lead, Silver} ICP Metals - 6010A (Supertrace Add-On) {Copper} Mercury - 7471 - (CV);
(4)IC Anions - 300.0 {~~Fluoride,~~ Nitrate, Nitrite, Phosphate, Sulfate} Total Cyanide - 9010; pH (Soil) - 9045; PMG 2/11/05

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

000015

000000030

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-MW-1	DATA PACKAGE: H3130	
VALIDATOR: JLI	LAB: LCI	DATE: 6/15/05
	SDG: H3130	

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

SAMPLES/MATRIX
BIC7D5
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

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

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: Copper - J all 33.7%
Chromium - J all 30.7%

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: Hg <2X J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Rresults 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 06/01/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0278-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.07 u	MG/KG	0.07	1.0
		Copper, Total	0.08 u	MG/KG	0.08	1.0
		Lead, Total	0.25 u	MG/KG	0.25	1.0
BLANK1	05C0108-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/01/05

CLIENT: TNUHANFORD F04-015 H3130

LVL LOT #: 0504L297

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	B1C7D5	Silver, Total	4.7	0.19	4.7	96.0	1.0
		Cadmium, Total	4.4	0.16	4.7	90.2	1.0
		Chromium, Total	26.3	7.4	18.6	101.6	1.0
		Copper, Total	57.3	36.5	23.3	89.3	1.0
		Mercury, Total	0.21	0.02u	0.16	130.4	1.0
		Lead, Total	46.5	3.2	46.6	92.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/01/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-003REP	B1C7D5	Silver, Total	0.19	0.48	87.7	1.0
		Cadmium, Total	0.16	0.28	54.9	1.0
		Chromium, Total	7.4	10.1	30.9	1.0
		Copper, Total	36.5	51.3	33.7	1.0
		Mercury, Total	0.02u	0.01u	NC	1.0
		Lead, Total	3.2	3.6	11.8	1.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/01/05

CLIENT: TNUHANFORD F04-015 H3130

LVL LOT #: 0504L297

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0278-LC1	Silver, LCS	49.4	50.0	MG/KG	98.8
		Cadmium, LCS	24.9	25.0	MG/KG	99.6
		Chromium, LCS	50.4	50.0	MG/KG	100.8
		Copper, LCS	124	125	MG/KG	99.3
		Lead, LCS	253	250	MG/KG	101.0
LCS1	05C0108-LC1	Mercury, LCS	6.8	6.2	MG/KG	109.3

JUN 2005
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F04-015 H3130

DATE RECEIVED: 04/25/05 LVL LOT # :0504L297

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1C7D5						
SILVER, TOTAL	003	S	05L0278	04/13/05	05/25/05	05/26/05
SILVER, TOTAL	003 REP	S	05L0278	04/13/05	05/25/05	05/26/05
SILVER, TOTAL	003 MS	S	05L0278	04/13/05	05/25/05	05/26/05
CADMIUM, TOTAL	003	S	05L0278	04/13/05	05/25/05	05/26/05
CADMIUM, TOTAL	003 REP	S	05L0278	04/13/05	05/25/05	05/26/05
CADMIUM, TOTAL	003 MS	S	05L0278	04/13/05	05/25/05	05/26/05
CHROMIUM, TOTAL	003	S	05L0278	04/13/05	05/25/05	05/26/05
CHROMIUM, TOTAL	003 REP	S	05L0278	04/13/05	05/25/05	05/26/05
CHROMIUM, TOTAL	003 MS	S	05L0278	04/13/05	05/25/05	05/26/05
COPPER, TOTAL	003	S	05L0278	04/13/05	05/25/05	05/26/05
COPPER, TOTAL	003 REP	S	05L0278	04/13/05	05/25/05	05/26/05
COPPER, TOTAL	003 MS	S	05L0278	04/13/05	05/25/05	05/26/05
MERCURY, TOTAL	003	S	05C0108	04/13/05	05/13/05	05/16/05
MERCURY, TOTAL	003 REP	S	05C0108	04/13/05	05/13/05	05/16/05
MERCURY, TOTAL	003 MS	S	05C0108	04/13/05	05/13/05	05/16/05
LEAD, TOTAL	003	S	05L0278	04/13/05	05/25/05	05/26/05
LEAD, TOTAL	003 REP	S	05L0278	04/13/05	05/25/05	05/26/05
LEAD, TOTAL	003 MS	S	05L0278	04/13/05	05/25/05	05/26/05

LAB QC:

SILVER LABORATORY	LC1 BS	S	05L0278	N/A	05/25/05	05/26/05
SILVER, TOTAL	MB1	S	05L0278	N/A	05/25/05	05/26/05
CADMIUM LABORATORY	LC1 BS	S	05L0278	N/A	05/25/05	05/26/05
CADMIUM, TOTAL	MB1	S	05L0278	N/A	05/25/05	05/26/05
CHROMIUM LABORATORY	LC1 BS	S	05L0278	N/A	05/25/05	05/26/05
CHROMIUM, TOTAL	MB1	S	05L0278	N/A	05/25/05	05/26/05
COPPER LABORATORY	LC1 BS	S	05L0278	N/A	05/25/05	05/26/05
COPPER, TOTAL	MB1	S	05L0278	N/A	05/25/05	05/26/05
MERCURY LABORATORY	LC1 BS	S	05C0108	N/A	05/13/05	05/16/05
MERCURY, TOTAL	MB1	S	05C0108	N/A	05/13/05	05/16/05
LEAD LABORATORY	LC1 BS	S	05L0278	N/A	05/25/05	05/26/05
LEAD, TOTAL	MB1	S	05L0278	N/A	05/25/05	05/26/05

Date: 20 June 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: PCB - Data Package No. H3130

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3130 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	Media	Validation	Analysis
B1C7D5	4/13/05	Soil	C	PCBs by 8082

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. 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

JUL 2005
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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 prepared within 14 days and analyzed within 40 days of the date of sample collection.

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".

Due to the samples not being properly preserved (cooler temperature of 13°C), all PCB results were qualified as estimates and flagged "J".

- **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 minimum detectable activity (MDA). 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 MDA, the result is qualified as undetected and elevated to the MDA.

All method blank target compound results were acceptable.

Field Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Blank Spike

Matrix spike and blank spike 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 and is done in duplicate. Matrix spike and blank spike analyses must be within control limits of 50% to 150%. 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.

All matrix spike/blank spike 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 35%. 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.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQL) to ensure that laboratory detection levels meet the required criteria. All results met the analyte specific RTQL.

- **Completeness**

Data Package No. H3130 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 samples not being properly preserved (cooler temperature of 13°C), all PCB results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, 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

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

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

PCB DATA QUALIFICATION SUMMARY*

SDG: H3130	REVIEWER: TLI	PROJECT: 200-MW-1	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	Sample preservation

* - 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

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD			
Laboratory: LLI			
Case:	SDG: H3130		
Sample Number		B1C7D5	
Remarks			
Sample Date		4/13/05	
Analysis Date		4/28/05	
PCB	RDL	Result	Q
Aroclor-1016	16.5	14	UJ
Aroclor-1221	16.5	14	UJ
Aroclor-1232	16.5	14	UJ
Aroclor-1242	16.5	14	UJ
Aroclor-1248	16.5	14	UJ
Aroclor-1254	16.5	14	UJ
Aroclor-1260	16.5	14	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.

Laboratory, Inc.

PCBs by GC

RFW Batch Number: 0504L297 Client: TNU-HANFORD F04-015,#3130 Work Order: 11343606001 Page: 1

Report Date: 04/29/05 09:34

	Cust ID:	B1C7D5	B1C7D5	B1C7D5	PBLKJV	PBLKJV BS
Sample Information	RFW#:	003	003 MS	003 MSD	05LE0321-MB1	05LE0321-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	91 %	92 %	95 %	84 %	93 %
	Decachlorobiphenyl	99 %	98 %	99 %	92 %	95 %
Aroclor-1016		14 U J	84 %	87 %	13 U	84 %
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		14 U	88 %	87 %	13 U	86 %

R 6/20/05

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

000011

000054

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD F04-015
LVL #: 0504L297
SDG/SAF # H3130/F04-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-25-2005

PCB

One (1) soil sample was collected on 04-13-2005.

The sample and its associated QC samples were extracted on 04-26-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 04-28-2005. 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 a sample that met LvLI's sample acceptance policy.

2. The sample was extracted and analyzed within required holding time.

3. The sample and its 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.

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

5/31/05
Date

00000052

som\r:\group\data\pest\tnu hanford\0504-297.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F04-015-167 | PAGE 1 OF 1

COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: CS Cearlock	TELEPHONE NO.: 372-9638	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 200-E-4; 14-15 ft	PROJECT DESIGNATION: 200-MW-1 Characterization Sampling and Analysis - Soil		SAF NO.: F04-015
ICE CHEST NO.: GRP-04-015	FIELD LOGBOOK NO.:	COA: 119144ES10	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Lionville Laboratory Incorporated	OFFSITE PROPERTY NO.: Su PTR 15370		BILL OF LADING/AIR BILL NO.: Su PTR 15370

PRICE CODE: 8N | AIR QUALITY: ☐ | DATA TURNAROUND: 45 Days / 45 Days

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: ~~B1C7G0~~ B1C7C5 MAB 4/21/05

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
TYPE OF CONTAINER	aGs*	aG	aG	aG	aG					
NO. OF CONTAINER(S)	~~1~~ 2 MAB 4-11-05	1	1	1	1					
VOLUME	40mL	120mL	120mL	250mL	250mL					
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS					

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B1C7D5	SOIL	4-13-05	1055	X	X	X	X	X					

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
TSPOPE/ [signature]	4-13-05 1400	MW-026 / REF. #1	4-13-05 1400
MW-026 / [signature]	4/21/05 0720	M.H. Bauchert / M.G. Bauchert	4/21/05 0720
M.H. Bauchert / M.G. Bauchert	4/21/05 0730	FedEx	
FedEx	4/25/05 0925	JPerry	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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)VOA - 8260A (TCL); VOA - 8260A (Add-On) {cis-1,2-Dichloroethylene, ~~n-Butylbenzene,~~ trans-1,2-Dichloroethylene} PMG 2/11/05
(2)Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G;
(3)ICP Metals - 6010A (Supertrace) {Cadmium, Chromium, Lead, Silver} ICP Metals - 6010A (Supertrace Add-On) {Copper} Mercury - 7471 - (CV);
(4)IC Anions - 300.0 {~~Fluoride,~~ Nitrate, Nitrite, Phosphate, Sulfate} Total Cyanide - 9010; pH (Soil) - 9045;
PMG 2/11/05

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

000014

000000058

Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford **Date:** 4/25/05

Purchase Order / Project# /
SAF# / SOW# / Release #:

LvLI Batch #: 0504L297 **Sample Custodian:** [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1.	Samples Hand Delivered or Shipped	Carrier FedEX		Airbill# 7909 8897 4268
2.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals Comments
3.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No	
5.	Samples received cooled or ambient?	Temp 13.0°C all ice melted		Cooler # GRP-04-015
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7.	coc signed and dated?	☑ Yes	☐ No	
8.	Sample containers are intact?	☑ Yes	☐ No	
9.	All samples on coc received? All samples received on coc?	☑ Yes	☐ No	
10.	All sample label information matches coc?	☑ Yes	☐ No	
11.	Samples properly preserved?	☐ Yes	☑ No All #5	
12.	Samples received within hold times? Short holds taken to wet lab?	☑ Yes	☐ No	
13.	VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14.	QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A
15.	Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes OJ 4/25/05	☑ No All #5, 11	
16.	Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) OJ 4/25/05	☑ Yes	☐ No	☐ No Discrepancies

SR-002-B

00000059

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-MW-1			DATA PACKAGE: H3130		
VALIDATOR: TLI		LAB: LLI		DATE: 6/15/05	
			SDG: H3130		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
B1C7D5					
					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 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 MB

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 PA

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:

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: preservation + ~~Hold time/Extraction Date~~

13°C cooler – J all

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:

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:

Date: 20 June 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Semivolatile - Data Package No. H3130

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3130 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	Media	Validation	Analysis
B1C7D5	4/13/05	Soil	C	See note 1

1 -Semivolatiles by 8270, TPH-D (diesel and kerosene) & gasoline range organics by 8015B.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
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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 requirement for semivolatile organics are extraction within 14 days of the date of sample collection and analysis within 40 days from the date of extraction. Method 8015B requires analysis within 14 days.

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". If the holding time is exceeded and the samples not properly preserved, results are rejected and flagged "R/UR".

Due to the holding time being exceeded by less than twice the limit and a cooler temperature of 13°C, all gasoline range organic results were rejected and flagged "R".

Due to the samples not being properly preserved (cooler temperature of 30°C, all tributylphosphate, diesel range organics and kerosene 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".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike sample analyses are used to assess the analytical accuracy of the reported data. Matrix spike/matrix duplicate results are used to assess 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 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 tributylphosphate results were qualified as estimates and flagged "J".

All other matrix spike/matrix spike duplicate and blank spike 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 +/-35%. 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 tributylphosphate results were qualified as estimates and flagged "J".

All other MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQL's) to ensure that laboratory detection levels meet the required criteria. The diesel range organics and kerosene result exceeded the analyte specific RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package No. H3130 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 75%.

MAJOR DEFICIENCIES

Due to the holding time being exceeded by less than twice the limit and a cooler temperature of 13°C, all gasoline range organic results were rejected and flagged "R". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all tributylphosphate results were qualified as estimates and flagged "J". Due to the samples not being properly preserved (cooler temperature of 30°C, all tributylphosphate, diesel range organics and kerosene results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, 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 diesel range organics and kerosene result exceeded the analyte specific RDL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI 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

SEMIVOLATILE/8015B DATA QUALIFICATION SUMMARY*

SDG: H3130	REVIEWER: TLI	PROJECT: 200-MW-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Gasoline range organics	R	All	Holding time and sample preservation
Tributylphosphate Diesel range organics Kerosene	J	All	Sample preservation
Tributylphosphate	J	All	No MS, MSD or LCS analysis

* - 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 /8015B ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD			
Laboratory: LLI			
Case:	**SDG: H3130**		
Sample Number		B1C7D5	
Remarks			
Sample Date		4/13/05	
Extraction Date		4/26/05	
Analysis Date		4/27/05	
Semivolatile/8015B	**RDL**	**Result**	**Q**
Tributylphosphate	**3300**	340	UJ
Diesel Range Organics*	**5000**	12400	UJ
Kerosene*	**5000**	12400	UJ
Gasoline Range Organics	**5000**	29	UR
*** - RDL exceeded**			

000011

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.

Semivolatiles by GC/MS, Special List

Report Date: 04/29/05 08:46

RFW Batch Number: **0504L297** Client: **TNU-HANFORD F04-015**, H3130 Work Order: 11343606001 Page: 1a

	Cust ID:	B1C7D5	B1C7D5	B1C7D5	SBLKIL	SBLKIL BS
Sample Information	RFW#:	003	003 MS	003 MSD	05LE0320-MB1	05LE0320-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	65 %	78 %	68 %	73 %	76 %
	2-Fluorobiphenyl	68 %	78 %	67 %	73 %	76 %
	Terphenyl-d14	81 %	84 %	75 %	83 %	83 %
Tributylphosphate		340 U J	340 U	340 U	330 U	330 U

R 6/20/05

*= Outside of EPA CLP QC limits.

000012

00000079

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 05/23/05 13:15

RFW Batch Number: 0504L297 Client: TNUHANFORD F04-015 H3130 Work Order: 11343606001 Page: 1

	Cust ID:	B1C7D5	B1C7D5	B1C7D5	BLK	BLK BS
Sample Information	RFW#:	003	003 MS	003 MSD	05LE0319-MB1	05LE0319-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	p-Terphenyl	76 %	83 %	78 %	89 %	68 %
Diesel Range Organics		12400 U	66 %	70 %	12000 U	63 %
Kerosene		12400 U	NS	NS	12000 U	NS

6/20/05

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

0000013

0000035

Lionville Laboratory, Inc.

GAS RANGE ORGANICS

Report Date: 05/06/05 13:18

RFW Batch Number: **0504L297** Client: **TNU-HANFORD F04-015**, H3130 Work Order: 11343606001 Page: 1

	Cust ID:	B1C7D5	B1C7D5	B1C7D5	TBLKUN	TBLKUN BS
Sample Information	RFW#:	003	003 MS	003 MSD	05LVJ429-MB1	05LVJ429-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Fluorobenzene		90 %	89 %	122 %	101 %	105 %
Gasoline Range Organics (GRO)		29 U R	99 %	106 %	30 U	98 %

R 6/20/05

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

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD F04-015
LVL #: 0504L297
SDG/SAF # H3130/F04-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-25-2005

SEMIVOLATILE

One (1) soil sample was collected on 04-13-2005.

The sample and its associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 04-26-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for client specified Semivolatile target compound Tributylphosphate on 04-27-2005.

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 a sample that met LvLI's sample acceptance policy.

2. The sample was extracted and analyzed within required holding time.

3. All surrogate recoveries were within acceptance criteria.

4. All matrix spike recoveries were within acceptance criteria.

   All blank spike recoveries were within acceptance criteria.

   The target compound was not included in the spiking solution. The spike recoveries were reported on the form 3s and included in the data package.

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

6. 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").

7. 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.

Judy Stone
Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/31/05
Date

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som\gorup\data\bna\tnu-hanford\0504-397.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 3 pages.

~~00000002~~

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

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD F04-015
LVL #: 0504L297
SDG/SAF # H3130/F04-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-25-2005

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 04-13-2005.

The sample and its associated QC samples were extracted on 04-26-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 04-29-2005. 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 a sample that met LvLI's sample acceptance policy.
2. The sample was extracted and analyzed within required holding time.
3. The method blank was below the reporting limits for the target compounds.
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. 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

5/31/05
Date

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som\r:\group\data\dro\tnu hanford\0504297doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD F04-015
LVL #: 0504L297
SDG/SAF # H3130/F04-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-25-2005

GRO

One (1) soil sample was collected on 04-13-2005.

The sample and its associated QC samples were analyzed according to Lionville Laboratory SOPs based on SW-846 method 8015B for Gasoline Range Organics (GRO) on 04-29-2005. The analysis met the intent of method WTPH-G.

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. The sample was analyzed outside the required holding time. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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. The matrix spike recoveries were within acceptance criteria.

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. 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

5/31/05
Date

som\r\group\data\gro\tnu-hanford\0504-297.doc

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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 0 pages.

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

Initiator: John Lach
Date: 4/27/05
Client: TNU

Batch: 0504L297
Samples: All
Method: SW846/MCAWW/CLP/

Parameter: GRO
Matrix: Soil
Prep Batch: none

1. Reason for SDR

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

b. General Discrepancy

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

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

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

No sample left for analysis

2. Known or Probable Causes(s)

only volume left is 1 large rock which is not amenable to analysis

3. Discussion and Proposed Action

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

Other Description:

use VOA vial A or B for analysis volume

4/28/05

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

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

5. Final Action...signature/date: JL 4/29/05

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

Other Explanation:

VOA vial used, sample run 2 days past hold.

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

QA-105-A-0601

00000043

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F04-015-167 | PAGE 1 OF 1

COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: CS Cearlock	TELEPHONE NO.: 372-9638	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 200-E-4; 14-15 ft	PROJECT DESIGNATION: 200-MW-1 Characterization Sampling and Analysis - Soil		SAF NO.: F04-015
ICE CHEST NO.: GRP-04-015	FIELD LOGBOOK NO.:	COA: 119144E510	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Lionville Laboratory Incorporated	OFFSITE PROPERTY NO.: 5a PTR 15370		BILL OF LADING/AIR BILL NO.: 5a PTR 15370

PRICE CODE: 8N | AIR QUALITY: ☐ | DATA TURNAROUND: 45 Days / 45 Days

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: ~~B1C7G0~~ B1C7C8 MMB 4/21/05

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
TYPE OF CONTAINER	aGs*	aG	aG	aG	aG
NO. OF CONTAINER(S)	2 2 4-13-05	1	1	1	1
VOLUME	40mL	120mL	120mL	250mL	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B1C7D5	SOIL	4-13-05	1055	X	X	X	X	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
TSPCR2 / [illegible]	4-13-05 1400	MO-026 / REF. #1	4-13-05 1400
MO-026 / [illegible]	4/21/05 0720	M.H. Bauchler / M.G. Bauchler	4/21/05 0720
M.H. Bauchler / M.G. Bauchler	4/21/05 0720	FedEx	
FedEx	4/25/05 0925	J Perry	

SPECIAL INSTRUCTIONS

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {cis-1,2-Dichloroethylene, ~~n-Butylbenzene,~~ trans-1,2-Dichloroethylene} PMG 2/11/05
(2)Seml-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G;
(3)ICP Metals - 6010A (Supertrace) {Cadmium, Chromium, Lead, Silver} ICP Metals - 6010A (Supertrace Add-On) {Copper} Mercury - 7471 - (CV);
(4)IC Anions - 300.0 {~~Fluoride,~~ Nitrate, Nitrite, Phosphate, Sulfate} Total Cyanide - 9010; pH (Soil) - 9045; PMG 2/11/05

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

000020

00000085

Lionville Laboratory, Inc.
GRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD F04-015, H3130

GRO

DATE RECEIVED: 04/25/05 LVL LOT # :0504L297

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1C7D5	003	S	05LVJ429	04/13/05	N/A	04/29/05
B1C7D5	003 MS	S	05LVJ429	04/13/05	N/A	04/29/05
B1C7D5	003 MSD	S	05LVJ429	04/13/05	N/A	04/29/05
LAB QC:						
TBLKUN	MB1	S	05LVJ429	N/A	N/A	04/29/05
TBLKUN	MB1 BS	S	05LVJ429	N/A	N/A	04/29/05

JUN 2005
RECEIVED

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F04-015 H3130

DRO

DATE RECEIVED: 04/25/05 LVL LOT # :0504L297

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1C7D5	003	S	05LE0319	04/13/05	04/26/05	04/29/05
B1C7D5	003 MS	S	05LE0319	04/13/05	04/26/05	04/29/05
B1C7D5	003 MSD	S	05LE0319	04/13/05	04/26/05	04/29/05
LAB QC:						
BLK	MB1	S	05LE0319	N/A	04/26/05	04/29/05
BLK	MB1 BS	S	05LE0319	N/A	04/26/05	04/29/05

JUN 2005
RECEIVED

00000032

~~00000001~~

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD F04-015, #3130

DATE RECEIVED: 04/25/05

LVL LOT # :0504L297

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1C7D5	003	S	05LE0320	04/13/05	04/26/05	04/27/05
B1C7D5	003 MS	S	05LE0320	04/13/05	04/26/05	04/27/05
B1C7D5	003 MSD	S	05LE0320	04/13/05	04/26/05	04/27/05
LAB QC:						
SBLKIL	MB1	S	05LE0320	N/A	04/26/05	04/27/05
SBLKIL	MB1 BS	S	05LE0320	N/A	04/26/05	04/27/05

JUN 2005
RECEIVED

Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

5

CLIENT: TNU Hanford **Date:** 4/25/05

Purchase Order / Project# /
SAF# / SOW# / Release #:

LvLI Batch #: 0504L297 **Sample Custodian:** JHenry

NOTE: EXPLAIN ALL DISCREPANCIES

1.	Samples Hand Delivered or Shipped	Carrier FedEX		Airbill# 7909 8897 4268	
2.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	Comments
3.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No		
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No		
5.	Samples received cooled or ambient?	Temp 13.0°C all ice melted		Cooler # GRP-04-015	
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	
7.	coc signed and dated?	☑ Yes	☐ No		
8.	Sample containers are intact?	☑ Yes	☐ No		
9.	All samples on coc received? All samples received on coc?	☑ Yes	☐ No		
10.	All sample label information matches coc?	☑ Yes	☐ No		
11.	Samples properly preserved?	☐ Yes	☑ No All #5		
12.	Samples received within hold times? Short holds taken to wet lab?	☑ Yes	☐ No		
13.	VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A	
14.	QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A	
15.	Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes JH 4/25/05	☑ No All #5, 11		
16.	Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)	☑ Yes OJ 4/25/05	☐ No	☐ No Discrepancies	

SR-002-B

00000086

[redacted]

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

HNF-20433 REV 0

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-MW-1			DATA PACKAGE: ~~H3054~~ H3130		
VALIDATOR: TLI		LAB: LLI		DATE: 6/15/03	
			SDG: H3130		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270	8015B	SW-846 8270 (TCLP)

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: No TBP MS/MSD — 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/kerosen — <2x ~~Kth~~ cooler temp 13°C

GRO — <2x " " 13°C

R ~~all~~ GRO

J — DRO + kerosen

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: DRO + kerosene over [illegible]

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:

Christian, Bruce

From: Trent, Stephen J [Stephen_J_Trent@RL.gov] **Sent:** Mon 6/27/2005 2:02 PM
To: Christian, Bruce
Cc: Ayres, Doris E; Lynch, Sherry A
Subject: Additional comment on H3130 validation
Attachments:

Bruce,

I got some clarification from Lionville on the holding time exceedance for on the TPH analyses in SDG H3130. According to the lab, the only analysis performed outside holding time was the GRO analysis; it was analysed on 4/29/05. The DRO+kerosene was analysed on 4/26/05, which was within the holding time. Therefore, it looks like you need adjust your qualification of hte DRO+kerosene from "R" to "J".

Steve

Date: 20 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Wet Chemistry - Data Package No. H3130

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3130 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	Media	Validation	Analysis
B1C7D2	4/13/05	Soil	C	See note 1
B1C7D4	4/13/05	Soil	C	See note 1
B1C7D5	4/13/05	Soil	C	See note 2

1 - Oil & grease by 9071A.
2 - Anions by 300.0, pH by 9045C, cyanide by 9010B.
* - Nitrate, nitrite and phosphate not validated or reported per FHI.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. 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

JUL 2005
RECEIVED

DATA QUALITY PARAMETERS

- **Holding Times/Sample Preservation**

Analytical holding times 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 28 days for oil & grease and sulfate; 14 days for cyanide; and immediate (24 hours) for pH.

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 samples not being properly preserved (cooler temperature of 13°C), all cyanide, oil & grease and sulfate results were qualified as estimates and flagged "J".

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

All other holding times were acceptable.

- **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 equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike

Matrix spike (MS) 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. Matrix spike and LCS recoveries must fall within the range of 75% to 125%. 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 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (135.6%), all sulfate results were qualified as estimates and flagged "J".

All other matrix spike recovery results were acceptable.

Laboratory Control Sample

The LCS is used to monitor the overall performance of all steps in the analysis. Recoveries must fall within the range of 80% to 120% for LCS analysis. Samples with a recovery of less than 50% are rejected and flagged "UR". Samples with a recovery of 50% to 79% and a sample recovery below 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.

All LCS 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 35%, 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

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All undetected oil & grease results were reported above the RTQL. Under the FHI statement of work, no qualification is required. All other

results met the RTQL.

- **Completeness**

Data package No. H3130 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 samples not being properly preserved (cooler temperature of 13°C), all cyanide, oil & grease and sulfate results were qualified as estimates and flagged "J". Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J". Due to a matrix spike recovery outside QC limits (135.6%), all sulfate results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected oil & grease results were reported above the RTQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with FHI 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: H3130	REVIEWER: TLI	PROJECT: 200-MW-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Cyanide Oil & Grease Sulfate	J	All	Sample preservation
pH	J	All	Holding time
Sulfate	J	All	MS 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

WET CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: FLUOR-HANFORD							
Laboratory: LLI							
Case	SDG: H3130						
Sample Number		B1C7D2		B1C7D4		B1C7D5	
Remarks							
Sample Date		4/13/05		4/13/05		4/13/05	
Wet Chemistry	RTQL	Result	Q	Result	Q	Result	Q
Cyanide	0.5	NA		NA		0.49	UJ
Sulfate	5	NA		NA		18.1	J
pH**		NA		NA		8.6	J
Oil & Grease	200	702	UJ	691	UJ	NA	
** - Units are pH units							
NA - Not analyzed							

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/24/05

CLIENT: TNUHANFORD F04-015 H3130
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0504L297

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B1C7D2	% Solids	95.0		%	0.01	1.0
		Oil & Grease Gravimetri	702	u J	MG/KG	702	1.0
-002	B1C7D4	% Solids	96.5		%	0.01	1.0
		Oil & Grease Gravimetri	691	u J	MG/KG	691	1.0
-003	B1C7D5	% Solids	96.8		%	0.01	1.0
		~~Nitrite by IC~~	~~1.03~~	~~u~~	~~MG/KG~~	1.03	1.0
		~~Nitrate by IC~~	~~2.95~~		~~MG/KG~~	1.03	1.0
		Cyanide, Total	0.49	u J	MG/KG	0.49	1.0
		~~Phosphate by IC~~	~~1.0~~	~~u~~	~~MG/KG~~	1.0	1.0
		Sulfate by IC	18.1	J	MG/KG	1.0	1.0
		pH	8.6	J	PH UNIT	0.01	1.0

6/18/4

6/6/4

6/20/05

06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F04-015 H3130
LVL#: 0504L297

W.O.#: 11343-606-001-9999-00
Date Received: 04-25-05

INORGANIC NARRATIVE

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

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

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

4. The results presented in this report are derived from samples that did not meet LvLI's sample acceptance policy as noted on the Sample Receipt Checklist.

5. The method blanks were within the method criteria.

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

7. The matrix spike (MS) recoveries for Oil and Grease, Nitrite, Nitrate, Total Cyanide and Phosphate were within the 75-125% control limits however MS recovery for Sulfate was above the control limits at 135.6% that may be attributed to sample inhomogeneity.

8. The replicate analyses for Percent Solids, Oil and Grease, Nitrite, Total Cyanide, Phosphate, Sulfate and pH were within the 20% RPD control limit however replicate analysis for Nitrate was outside the control limit that may be attributed to sample inhomogeneity.

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

5/25/05
Date

njp\i04-297

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 16 pages.

03

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

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-015-161	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
Pope/Pfister/Tyra/Wiberg	CS Cearlock	372-9638	TRENT, SJ	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
200-E-4; 9-10 ft	200-MW-1 Characterization Sampling and Analysis - Soil		F04-015		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**COA**	**METHOD OF SHIPMENT**		
GRP-04-015		119144ES10	Federal Express		
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Lionville Laboratory Incorporated	See PTR 15370		See PTR 15370		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
N/A

SPECIAL HANDLING AND/OR STORAGE
Radioactive Tie To: B1C7C8

PRESERVATION	Cool 4C
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	120mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B1C7D2	SOIL	4-13-05	1005	X

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
JSPope/ [illegible]	4-13-05 1400	MO-026 / REF #1	4-13-05 1400
MO-026 / [illegible]	4/21/05 0710	M.H. Bauchler / M.H. Bauchler	4/21/05 0710
M.H. Bauchler / M.H. Bauchler	4/21/05 0710	FedEx	
FedEx	4/25/05 0935	JRuiz	

SPECIAL INSTRUCTIONS
(1) ~~NO2/NO3 - 353.2; Chromium Hex - 7196;~~ Oil & Grease - 413.1;
PMG 2/14/05

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

13

000014

Pacific Northwest NNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F04-015-166 | PAGE 1 OF 1

COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: CS Cearlock	TELEPHONE NO.: 372-9638	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 200-E-4; 14-15 ft	PROJECT DESIGNATION: 200-MW-1 Characterization Sampling and Analysis - Soil		SAF NO.: F04-015
ICE CHEST NO.: GRP-04-015	FIELD LOGBOOK NO.:	COA: 119144ES10	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Lionville Laboratory Incorporated	OFFSITE PROPERTY NO.: See PTC 15370		BILL OF LADING/AIR BILL NO.: See PTC 15370

PRICE CODE: 8N
AIR QUALITY: ☐
DATA TURNAROUND: 45 Days / 45 Days

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: ~~B1C7G0~~ B1C7C8 MAD 4/21/05

PRESERVATION	Cool 4C													
TYPE OF CONTAINER	aG													
NO. OF CONTAINER(S)	1													
VOLUME	120mL													
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS													

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME											
B1C7D4	SOIL	4-13-05	1055	X										

000015

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
JSPope/ASPfister 4-13-05	1400	MU-026 Rec'd 4-13-05	1400
MU-026 RJT 4/21/05	0720	M.H. Bauchler M.H. Bauchler 4/21/05	0720
M.H. Bauchler M.H. Bauchler 4/21/05	0720	FedEx	
FedEx 4/25/05	0925	JPerry	

SPECIAL INSTRUCTIONS: (1)~~NO2/NO3 - 353.2; Chromium Hex - 7196;~~ Oil & Grease - 413.1;
PMG 2/14/05

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-015-167	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
Pope/Pfister/Tyra/Wiberg	CS Cearlock	372-9638	TRENT, SJ	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
200-E-4; 14-15 ft	200-MW-1 Characterization Sampling and Analysis - Soil		F04-015		
ICE CHEST NO. GRP-04-015	**FIELD LOGBOOK NO.**	**COA** 119144E510	**METHOD OF SHIPMENT** Federal Express		
SHIPPED TO Lionville Laboratory Incorporated	**OFFSITE PROPERTY NO.** Su PTR 15370		**BILL OF LADING/AIR BILL NO.** Su PTR 15370		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: ~~B1C7G9~~ B1C7C5 MMB 4/21/05

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
TYPE OF CONTAINER	aGs*	aG	aG	aG	aG					
NO. OF CONTAINER(S)	~~2~~ 1 4-13-05	1	1	1	1					
VOLUME	40mL	120mL	120mL	250mL	250mL					
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS					

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B1C7D5	SOIL	4-13-05	1055	X	X	X	X	X					

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
TSPOPE/ [signature]	4-13-05 1400	MO-026 / REF. #	4-13-05 1400
MO-026 REF.	4/21/05 0720	M.H. Bauchum M.G. Bauchum	4/21/05 0720
M.H. Bauchum M.G. Bauchum	4/21/05 0720	[signature]	
FedEx	4/25/05 0925	JPerry	

SPECIAL INSTRUCTIONS

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {cis-1,2-Dichloroethylene, ~~n-Butylbenzene, trans-1,2-Dichloroethylene~~} PMG 2/11/05
(2)Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G;
(3)ICP Metals - 6010A (Supertrace) {Cadmium, Chromium, Lead, Silver} ICP Metals - 6010A (Supertrace Add-On) {Copper} Mercury - 7471 - (CV);
(4)IC Anions - 300.0 {~~Fluoride~~, Nitrate, Nitrite, Phosphate, Sulfate} Total Cyanide - 9010; pH (Soil) - 9045; PMG 2/11/05

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

000016

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-MW-1			DATA PACKAGE: H3130		
VALIDATOR: TLI		LAB: LLI		DATE: 6/15/05	
			SDG: H3130		

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate	Cyanide	

SAMPLES/MATRIX
B1C7D2 B1C7D4 B1C7D5
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

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: Sulfate MS 13570 J all

no PAS

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:

6. HOLDING TIMES (all levels)

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

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

Comments:

preservation — oil + grease + cyanide + sulfate
cooler temp 13°C — J all

pH — ~~>2 ~~ >2x 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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/24/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LOG019-MB1	Oil & Grease Gravimetri	667	u	MG/KG	667	1.0
BLANK10	05LICA29-MB1	Nitrite by IC	12.5	u	MG/KG	12.5	1.0
		Nitrate by IC	12.5	u	MG/KG	12.5	1.0
		Phosphate by IC	12.5	u	MG/KG	12.5	1.0
BLANK1	05LC026-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	05LICC31-MB1	Sulfate by IC	12.5	u	MG/KG	12.5	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/24/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B1C7D2	Oil & Grease Gravimetr	12600	702 u	12800	98.7	1.0
-003	B1C7D5	Nitrite by IC	40.6	1.03u	41.3	98.3	2.0
		Nitrate by IC	45.5	2.95	41.3	103.0	2.0
		Cyanide, Total	5.16	0.49u	5.29	97.5	1.0
		Phosphate by IC	43.9	1.0 u	41.3	106.3	2.0
		Sulfate by IC	72.3	18.1	40.0	135.6	2.0
BLANK10	05LOG019-MB1	Oil & Grease Gravimetr	12200	667 u	12200	100.2	1.0
		Oil & Grease - Grav M	12400	667 u	12200	102.3	1.0
BLANK10	05LICA29-MB1	Nitrite by IC	246	12.5 u	250	98.2	1.0
		Nitrate by IC	240	12.5 u	250	96.2	1.0
		Phosphate by IC	245	12.5 u	250	98.2	1.0
BLANK10	05LICC31-MB1	Sulfate by IC	244	12.5 u	250	97.5	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 05/24/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	05LOG019-MB1	Oil & Grease - Grav	100.2	102.3	2.1

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/24/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	B1C7D2	% Solids	95.0	95.2	0.23	1.0
		Oil & Grease Gravimetri	702 u	702 u	NC	1.0
-003REP	B1C7D5	Nitrite by IC	1.03u	1.03u	NC	1.0
		Nitrate by IC	2.95	1.74	51.4	1.0
		Cyanide, Total	0.49u	0.51u	NC	1.0
		Phosphate by IC	1.0 u	1.0 u	NC	1.0
		Sulfate by IC	18.1	17.9	0.71	1.0
		pH	8.6	8.6	0.3	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/24/05

CLIENT: TNUHANFORD F04-015 H3130 LVL LOT #: 0504L297
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	05LC026-LCS1	Cyanide, Total LCS	1.97	2.0	MG/KG	98.4
LCSS2	05LC026-LCS2	Cyanide, Total LCS	10.3	10.0	MG/KG	103.4

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Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F04-015 H3130

DATE RECEIVED: 04/25/05 LVL LOT # :0504L297

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1C7D2						
% SOLIDS	001	S	05L%S057	04/13/05	04/26/05	04/26/05
% SOLIDS	001 REP	S	05L%S057	04/13/05	04/26/05	04/26/05
OIL & GREASE BY GRAV	001	S	05LOG019	04/13/05	04/26/05	04/26/05
OIL AND GREASE BY GR	001 REP	S	05LOG019	04/13/05	04/26/05	04/26/05
OIL AND GREASE BY GR	001 MS	S	05LOG019	04/13/05	04/26/05	04/26/05
B1C7D4						
% SOLIDS	002	S	05L%S057	04/13/05	04/26/05	04/26/05
OIL & GREASE BY GRAV	002	S	05LOG019	04/13/05	04/26/05	04/26/05
B1C7D5						
% SOLIDS	003	S	05L%S057	04/13/05	04/26/05	04/26/05
NITRITE BY IC	003	S	05LICA29	04/13/05	05/02/05	05/02/05
NITRITE BY IC	003 REP	S	05LICA29	04/13/05	05/02/05	05/02/05
NITRITE BY IC	003 MS	S	05LICA29	04/13/05	05/02/05	05/02/05
NITRATE BY IC	003	S	05LICA29	04/13/05	05/02/05	05/02/05
NITRATE BY IC	003 REP	S	05LICA29	04/13/05	05/02/05	05/02/05
NITRATE BY IC	003 MS	S	05LICA29	04/13/05	05/02/05	05/02/05
TOTAL CYANIDE	003	S	05LC026	04/13/05	04/26/05	04/26/05
TOTAL CYANIDE	003 REP	S	05LC026	04/13/05	04/26/05	04/26/05
TOTAL CYANIDE	003 MS	S	05LC026	04/13/05	04/26/05	04/26/05
PHOSPHATE BY IC	003	S	05LICA29	04/13/05	05/02/05	05/02/05
PHOSPHATE BY IC	003 REP	S	05LICA29	04/13/05	05/02/05	05/02/05
PHOSPHATE BY IC	003 MS	S	05LICA29	04/13/05	05/02/05	05/02/05
SULFATE BY IC	003	S	05LICC31	04/13/05	05/06/05	05/06/05
SULFATE BY IC	003 REP	S	05LICC31	04/13/05	05/06/05	05/06/05
SULFATE BY IC	003 MS	S	05LICC31	04/13/05	05/06/05	05/06/05
PH	003	S	05LPH027	04/13/05	04/26/05	04/26/05
PH	003 REP	S	05LPH027	04/13/05	04/26/05	04/26/05

LAB QC:

OIL & GREASE BY GRAV	MB1	S	05LOG019	N/A	04/26/05	04/26/05

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F04-015 H3130

DATE RECEIVED: 04/25/05 LVL LOT # :0504L297

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
OIL AND GREASE BY GR	MB1 BS	S	05LOG019	N/A	04/26/05	04/26/05
OIL AND GREASE BY GR	MB1 BSD	S	05LOG019	N/A	04/26/05	04/26/05
NITRITE BY IC	MB1	S	05LICA29	N/A	05/02/05	05/02/05
NITRITE BY IC	MB1 BS	S	05LICA29	N/A	05/02/05	05/02/05
NITRATE BY IC	MB1	S	05LICA29	N/A	05/02/05	05/02/05
NITRATE BY IC	MB1 BS	S	05LICA29	N/A	05/02/05	05/02/05
TOTAL CYANIDE	LCS L	S	05LC026	N/A	04/26/05	04/26/05
TOTAL CYANIDE	LCS L	S	05LC026	N/A	04/26/05	04/26/05
TOTAL CYANIDE	MB1	S	05LC026	N/A	04/26/05	04/26/05
PHOSPHATE BY IC	MB1	S	05LICA29	N/A	05/02/05	05/02/05
PHOSPHATE BY IC	MB1 BS	S	05LICA29	N/A	05/02/05	05/02/05
SULFATE BY IC	MB1	S	05LICC31	N/A	05/06/05	05/06/05
SULFATE BY IC	MB1 BS	S	05LICC31	N/A	05/06/05	05/06/05

Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford **Date:** 4/25/05

Purchase Order / Project# /
SAF# / SOW# / Release #:

LvLI Batch #: 0504L297 **Sample Custodian:** JHerring

NOTE: EXPLAIN ALL DISCREPANCIES

1.	Samples Hand Delivered or Shipped	Carrier FedEx		Airbill# 7909 8897 4268	
2.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	Comments
3.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No		
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No		
5.	Samples received cooled or ambient?	Temp 13.0°C all ice melted		Cooler # GRP-04-015	
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	
7.	coc signed and dated?	☑ Yes	☐ No		
8.	Sample containers are intact?	☑ Yes	☐ No		
9.	All samples on coc received? All samples received on coc?	☑ Yes	☐ No		
10.	All sample label information matches coc?	☑ Yes	☐ No		
11.	Samples properly preserved?	☐ Yes	☑ No All #5		
12.	Samples received within hold times? Short holds taken to wet lab?	☑ Yes	☐ No		
13.	VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A	
14.	QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A	
15.	Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes JP 4/25/05	☑ No All #5, 11		
16.	Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) OJ 4/25/05	☑ Yes	☐ No	☐ No Discrepancies	

SR-002-B

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Date: 20 June 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Radiochemistry - Data Package No. H3130

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3130 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	Media	Validation	Analysis
B1C7D2	4/13/05	Soil	C	See note 1
B1C7D4	4/13/05	Soil	C	See note 1
B1C7D5	4/13/05	Soil	C	See note 2

1 - Technetium-99 & tritium.
2 - Strontium-90, total uranium, gamma spectroscopy and alpha spectroscopy.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. 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

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DATA QUALITY OBJECTIVES

- **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.

- **Laboratory (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 required detection limit (RDL), 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 minimum detectable activity (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 laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is either 65-135% or 70-130%, depending on the analyte. 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, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than +/- 35 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the

CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. 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 Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the required target quanitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. Four analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific RTQL.

- **Completeness**

Data package SDG No. H3130 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

Four analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI 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

RADIOCHEMIISTRY DATA QUALIFICATION SUMMARY*

SDG: H3130	REVIEWER: TLI	PROJECT: 200-MW-1	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - 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: FLUOR-HANFORD							
Laboratory: EB							
Case	SDG: H3130						
Sample Number		B1C7D2		B1C7D4		B1C7D5	
Remarks							
Sample Date		4/13/05		4/13/05		4/13/05	
Radiochemistry	RDL	Result	Q	Result	Q	Result	Q
Tritium	400	0.087	U	0.110	U	NA	
Technetium-99	15	0.111	U	0.082	U	NA	
Iodine-129	2	NA		NA		0.040	U
Total Uranium (ug/g)		NA		NA		1.21	
Uranium-233/234(aspec)	1	NA		NA		0.697	
Uranium-235(aspec)	1	NA		NA		0.037	U
Uranium-238(aspec)	1	NA		NA		0.455	
Plutonium-238	1	NA		NA		0.025	U
Plutonium-239/240	1	NA		NA		0	U
Americium-241	1	NA		NA		0.119	U
Potassium-40		NA		NA		14.9	
Cobalt-60	0.05	NA		NA		U	U*
Cesium 137	0.1	NA		NA		U	U
Radium-226		NA		NA		0.407	
Radium-228		NA		NA		0.742	
Europium-152	0.1	NA		NA		U	U*
Europium-154	0.1	NA		NA		U	U*
Europium-155	0.1	NA		NA		U	U*
Thorium-228		NA		NA		0.644	
Thorium-232		NA		NA		0.742	
Uranium-235(gea)		NA		NA		U	U
Uranium-238(gea)		NA		NA		U	U
Americium-241(gea)		NA		NA		U	U
NA = Not analyzed							

000010

* - RTQL 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 H3130

7264-001 B1C7D2

DATA SHEET

SDG	7264	Client/Case no	Hanford	SDG H3130
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R504140-01	Client sample id	B1C7D2	
Dept sample id	7264-001	Location/Matrix	200-E-4; 9-10 ft	SOLID
Received	04/22/05	Collected/Weight	04/13/05 10:05	51.81 g
% solids	96.4	Custody/SAF No	F04-015-159	F04-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.087	0.20	0.33	400	U	H
Technetium 99	14133-76-7	0.111	0.25	0.48	15	U	TC

200-MW-1 Characterization - Soil

6/20/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/09/05

00000016

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3130

7264-002 B1C7D4

DATA SHEET

SDG	7264	Client/Case no	Hanford	SDG H3130
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R504140-02	Client sample id	B1C7D4	
Dept sample id	7264-002	Location/Matrix	200-E-4; 14-15 ft	SOLID
Received	04/22/05	Collected/Amount	04/13/05 10:55	55.49
% solids	96.6	Custody/SAF No	F04-015-164	F04-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.110	0.15	0.25	400	U	H
Technetium 99	14133-76-7	0.082	0.27	0.41	15	U	TC

200-MW-1 Characterization - Soil

W 6/20/05

DATA SHEETS
Page 2
SUMMARY DATA SECTION
Page 14

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/09/05

00000017

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3130

7264-003 B1C7D5

DATA SHEET

SDG	7264	Client/Case no	Hanford	SDG H3130	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R504140-03	Client sample id	B1C7D5		
Dept sample id	7264-003	Location/Matrix	200-E-4; 15-15 ft	SOLID	
Received	04/22/05	Collected/Weight	04/13/05 10:55	281.8 g	
% solids	96.3	Custody/SAF No	F04-015-165	F04-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.040	0.17	0.33	1.0	U	SR
Total Uranium (ug/g)	7440-61-1	1.21	0.15	0.010	1.0		U_T
Uranium 233/234	U-233/234	0.697	0.31	0.23	1.0		U
Uranium 235	15117-96-1	0.037	0.073	0.28	1.0	U	U
Uranium 238	U-238	0.455	0.25	0.23	1.0		U
Plutonium 238	13981-16-3	0.025	0.050	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.050	0.19	1.0	U	PU
Americium 241	14596-10-2	0.119	0.12	0.23	1.0	U	AM
Potassium 40	13966-00-2	14.9	1.6	0.73			GAM
Cobalt 60	10198-40-0	U		0.088	0.050	U	GAM
Cesium 137	10045-97-3	U		0.082	0.10	U	GAM
Radium 226	13982-63-3	0.407	0.14	0.15	0.10		GAM
Radium 228	15262-20-1	0.742	0.31	0.33	0.20		GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.644	0.088	0.093			GAM
Thorium 232	TH-232	0.742	0.31	0.33			GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM

200-MW-1 Characterization - Soil

6/20/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/09/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H3130 was composed of three solid (soil) samples designated under SAF No. F04-015 with a Project Designation of: 200-MW-1 Characterization Sampling and Analysis – Soil.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.5 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.7 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.8 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."

Mel Mann
Melissa C. Mannion
Senior Program Manager

4/8/5
Date

00000002

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-015-159	PAGE 1 OF 1

COLLECTOR Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT CS Cearlock	TELEPHONE NO. 372-9638	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 200-E-4; 9-10 ft	PROJECT DESIGNATION 200-MW-1 Characterization Sampling and Analysis - Soil		SAF NO. F04-015		
ICE CHEST NO. SAWS-100	FIELD LOGBOOK NO.	COA 119144ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. See PTR 15368		BILL OF LADING/AIR BILL NO. See PTR 15368		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
N/A

SPECIAL HANDLING AND/OR STORAGE
Radioactive Tie To: B1C7C8

PRESERVATION	None			
TYPE OF CONTAINER	aG			
NO. OF CONTAINER(S)	1			
VOLUME	60mL			
SAMPLE ANALYSIS	~~Iodine-129;~~ Technetium-99; Tritium - H3;	PMG 2/11/05		

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME											
B1C7D2	SOIL	4-13-05	1005	X										

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: JS Pope / [illegible] DATE/TIME: 4-13-05 1400	RECEIVED BY/STORED IN: MW-026 / REF. #1 DATE/TIME: 4-13-05 1400	
RELINQUISHED BY/REMOVED FROM: MW-026 / [illegible] DATE/TIME: 4/21/05 0655	RECEIVED BY/STORED IN: M.H. Bauchler / M.G. Bauchler DATE/TIME: 4/21/05 0655	
RELINQUISHED BY/REMOVED FROM: M.H. Bauchler / M.G. Bauchler DATE/TIME: 4/21/05 0655	RECEIVED BY/STORED IN: Fed Ex DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: FED EX 4/22/05 DATE/TIME:	RECEIVED BY/STORED IN: AK 4/22/05 DATE/TIME: 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:	
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

A-6003-618(03/03)

000016

000002

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-015-164	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
Pope/Pfister/Tyra/Wiberg	CS Cearlock	372-9638	TRENT, SJ	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
200-E-4; 14-15 ft	200-MW-1 Characterization Sampling and Analysis - Soil		F04-015		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**COA**	**METHOD OF SHIPMENT**		
SAWS-100		119144ES10	Federal Express		
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	See PTR 15368		See PTR 15368		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
N/A

SPECIAL HANDLING AND/OR STORAGE
Radioactive Tie To: ~~B1C7C9~~ B1C7C8 NAB 4/21/05

PRESERVATION	None												
TYPE OF CONTAINER	aG												
NO. OF CONTAINER(S)	1												
VOLUME	60mL												
SAMPLE ANALYSIS	~~Iodine-129;~~ Technetium-99; Tritium - H3;	PMG 2/11/05											

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME											
B1C7D4	SOIL	4-13-05	1055	X										

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
JS Pfister / JS Pfister	4-13-05 1400	MG-026 / CEC #6	4-13-05 1400
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MG-026 RST	4/21/05 0655	M.H. Bauchler / M.G. Bauchler	4/21/05 0655
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
M.H. Bauchler / M.G. Bauchler	4/21/05 0655	Fed Ex	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
FED EX	4-22-05	AK	4/22/05 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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

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Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-015-165	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
Pope/Pfister/Tyra/Wiberg	CS Cearlock	372-9638	TRENT, SJ	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
200-E-4; 14-15 ft	200-MW-1 Characterization Sampling and Analysis - Soil		F04-015		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**COA**	**METHOD OF SHIPMENT**		
5HWS-100		119144ES10	Federal Express		
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	See PTC 15368		See PTC 15368		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
N/A

SPECIAL HANDLING AND/OR STORAGE
Radioactive Tie To: ~~B1C7C9~~ B1C7C8 MAB 4/21/05

PRESERVATION	None											
TYPE OF CONTAINER	P											
NO. OF CONTAINER(S)	1											
VOLUME	500mL											
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS											

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME											
B1C7D5	SOIL	4-13-05	1655	X										

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J.S. Pole/ [illegible]	4-13-05 1400	MO-026/ REF. #1	4-13-05 1400
MO-026 RCT	4/21/05 0655	M.H. Bauchler/M.G. Bauchler	4/21/05 0655
M.H. Bauchler/M.G. Bauchler	4/21/05 0655	LD EX	
FED EX	4-22-05	AK	4/22/05 10:00

SPECIAL INSTRUCTIONS
(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 – Total Sr; Total Uranium;

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

000018

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Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-MW-1			DATA PACKAGE: #3130		
VALIDATOR: TLT		LAB: LLI		DATE: 6/15/05	
			SDG: #3130		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	+		
SAMPLES/MATRIX					
~~BIC8T~~ EB1K	BIC7D2	BIC7D4	BIC7D5		
					Soil

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:

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 Field QC

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: 4 error

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3130

7264-005 Method Blank

METHOD BLANK

SDG	7264	Client/Case no	Hanford		SDG H3130
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R504140-05	Client sample id	Method Blank		
Dept sample id	7264-005	Material/Matrix			SOLID
		SAF No	F04-015		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.143	0.14	0.25	400	U	H
Total Strontium	SR-RAD	-0.042	0.17	0.36	1.0	U	SR
Technetium 99	14133-76-7	0.112	0.21	0.52	15	U	TC
Total Uranium (ug/g)	7440-61-1	0	0.004	0.010	1.0	U	U_T
Uranium 233/234	U-233/234	0	0.066	0.25	1.0	U	U
Uranium 235	15117-96-1	0	0.080	0.31	1.0	U	U
Uranium 238	U-238	0	0.066	0.25	1.0	U	U
Plutonium 238	13981-16-3	0.030	0.061	0.23	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.061	0.23	1.0	U	PU
Americium 241	14596-10-2	0	0.10	0.39	1.0	U	AM
Potassium 40	13966-00-2	U		0.78		U	GAM
Cobalt 60	10198-40-0	U		0.083	0.050	U	GAM
Cesium 137	10045-97-3	U		0.069	0.10	U	GAM
Radium 226	13982-63-3	U		0.13	0.10	U	GAM
Radium 228	15262-20-1	U		0.27	0.20	U	GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.23	0.10	U	GAM
Europium 155	14391-16-3	U		0.097	0.10	U	GAM
Thorium 228	14274-82-9	U		0.079		U	GAM
Thorium 232	TH-232	U		0.27		U	GAM
Uranium 235	15117-96-1	U		0.18		U	GAM
Uranium 238	U-238	U		8.4		U	GAM
Americium 241	14596-10-2	U		0.058		U	GAM

200-MW-1 Characterization - Soil

QC-BLANK 52821

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/09/05

00000011

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3130

7264-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7264
Contact Melissa C. Mannion

Client/Case no Hanford SDG H3130
Contract No. 630

Lab sample id R504140-04
Dept sample id 7264-004

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No F04-015

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
Tritium	12.7	0.37	0.25	400	X	H	12.8	0.51	99	83-117	80-120
Total Strontium	11.9	0.62	0.27	1.0		SR	11.0	0.44	108	81-119	80-120
Technetium 99	64.7	1.5	0.36	15		TC	65.4	2.6	99	84-116	80-120
Total Uranium (ug/g)	35.4	4.5	0.095	1.0		U_T	36.2	1.4	98	76-124	80-120
Uranium 233/234	9.72	1.3	0.75	1.0		U	9.66	0.39	101	78-122	80-120
Uranium 235	8.07	1.2	0.26	1.0		U	7.84	0.31	103	75-125	80-120
Uranium 238	9.37	1.3	0.71	1.0		U	10.5	0.42	89	79-121	80-120
Plutonium 238	11.5	1.4	0.19	1.0		PU	12.0	0.48	96	80-120	80-120
Plutonium 239/240	11.6	1.4	0.19	1.0		PU	13.2	0.53	88	82-118	80-120
Americium 241	12.0	1.6	0.27	1.0		AM	12.3	0.49	98	78-122	80-120
Cobalt 60	3.61	0.13	0.077	0.050		GAM	3.59	0.14	101	76-124	80-120
Cesium 137	3.96	0.12	0.097	0.10		GAM	3.72	0.15	106	75-125	80-120

200-MW-1 Characterization - Soil

QC-LCS 52820

LAB CONTROL SAMPLES
Page 1
SUMMARY DATA SECTION
Page 9

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 06/09/05

00000012

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3130

7264-006 B1C7D2

DUPLICATE

SDG	7264			Client/Case no	Hanford SDG H3130
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R504140-06	Lab sample id	R504140-01	Client sample id	B1C7D2
Dept sample id	7264-006	Dept sample id	7264-001	Location/Matrix	200-E-4; 9-10 ft SOLID
		Received	04/22/05	Collected/Weight	04/13/05 10:05 51.81 g
% solids	96.4	% solids	96.4	Custody/SAF No	F04-015-159 F04-015

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	PROT LIMIT
Tritium	0.025	0.18	0.30	400	U	H	0.087	0.20	0.33	U	-		
Technetium 99	0.104	0.30	0.57	15	U	TC	0.111	0.25	0.48	U	-		

200-MW-1 Characterization - Soil

QC-DUP#1 52822

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	06/09/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3130

7264-007 B1C7D5

DUPLICATE

SDG	7264			Client/Case no	Hanford SDG H3130
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R504140-07	Lab sample id	R504140-03	Client sample id	B1C7D5
Dept sample id	7264-007	Dept sample id	7264-003	Location/Matrix	200-E-4; 15-15 ft SOLID
		Received	04/22/05	Collected/Weight	04/13/05 10:55 281.8 g
% solids	96.3	% solids	96.3	Custody/SAF No	F04-015-165 F04-015

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 PROT TOT LIMIT
Total Strontium	0.011	0.15	0.32	1.0	U	SR	0.040	0.17	0.33	U	-	
Total Uranium (ug/g)	1.18	0.14	0.010	1.0		U_T	1.21	0.15	0.010		3	32
Uranium 233/234	0.630	0.27	0.25	1.0		U	0.697	0.31	0.23		10	94
Uranium 235	0.040	0.080	0.31	1.0	U	U	0.037	0.073	0.28	U	-	
Uranium 238	0.332	0.20	0.25	1.0		U	0.455	0.25	0.23		31	122
Plutonium 238	0	0.051	0.20	1.0	U	PU	0.025	0.050	0.19	U	-	
Plutonium 239/240	0	0.051	0.19	1.0	U	PU	0	0.050	0.19	U	-	
Americium 241	0.038	0.075	0.29	1.0	U	AM	0.119	0.12	0.23	U	-	
Potassium 40	17.4	1.3	0.69			GAM	14.9	1.6	0.73		15	37
Cobalt 60	U		0.070	0.050	U	GAM	U		0.088	U	-	
Cesium 137	U		0.061	0.10	U	GAM	U		0.082	U	-	
Radium 226	0.455	0.13	0.12	0.10		GAM	0.407	0.14	0.15		11	74
Radium 228	0.777	0.27	0.26	0.20		GAM	0.742	0.31	0.33		5	87
Europium 152	U		0.14	0.10	U	GAM	U		0.20	U	-	
Europium 154	U		0.21	0.10	U	GAM	U		0.27	U	-	
Europium 155	U		0.14	0.10	U	GAM	U		0.18	U	-	
Thorium 228	0.725	0.071	0.074			GAM	0.644	0.088	0.093		12	40
Thorium 232	0.777	0.27	0.26			GAM	0.742	0.31	0.33		5	87
Uranium 235	U		0.21		U	GAM	U		0.27	U	-	
Uranium 238	U		7.7		U	GAM	U		10	U	-	
Americium 241	U		0.16		U	GAM	U		0.21	U	-	

200-MW-1 Characterization - Soil

QC-DUP#3 52823

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	06/09/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3130

7264-008

B1C7D4

MATRIX SPIKE

SDG	7264			Client/Case no	Hanford SDG H3130
Contact	Melissa C. Mannion			Contract	No. 630
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R504140-08	Lab sample id	R504140-02	Client sample id	B1C7D4
Dept sample id	7264-008	Dept sample id	7264-002	Location/Matrix	200-E-4; 14-15 ft SOLID
		Received	04/22/05	Collected/Amount	04/13/05 10:55 55.49
% solids	96.6	% solids	96.6	Custody/SAF No	F04-015-164 F04-015

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	58.2	1.2	0.41	400	X	H	65.8	2.6	0.110	0.15	88	85-115	60-140

200-MW-1 Characterization - Soil

QC-MS#2 52824

MATRIX SPIKES
Page 1
SUMMARY DATA SECTION
Page 12

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	06/09/05

00000015

Date: 20 June 2005
To: Fluor Hanford Inc. (technical representative)
From: TèchLaw, Inc.
Project: 200-MW-1 Characterization Sampling and Analysis - Soil
Subject: Volatiles - Data Package No. H3130

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3130 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	Media	Validation	Analysis
B1C7D5	4/13/05	Soil	C	Volatile by 8260A

Data validation was conducted in accordance with the FHI validation statement of work and the 200-MW-1 Miscellaneous Waste Group OU RI/FS Workplan, DOE/RL-2001-65 (Rev. 0), April 2002. 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

JUL 2005
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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: Soil samples must be analyzed within 14 days of the date of sample collection.

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 samples not being properly preserved (cooler temperature 13°C), all volatile organic results were qualified as estimates and flagged "J".

All holding times were acceptable.

- **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 of a given matrix. 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 project quantitation limit (MDL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the MDL, qualified as undetected and flagged "U".

Due to method blank contamination, the methylene chloride results was qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within 50-150%. 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 outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy and blank spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All surrogate recovery 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 by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Sample results must be within RPD limits of +/- 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the

required criteria. Ten analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package No. H3130 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 method blank contamination, the methylene chloride results was qualified as undetected and flagged "U". Due to the samples not being properly preserved (cooler temperature 13°C), all volatile organic results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Ten analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-65, Rev. 0, *200-MW-1 Miscellaneous Waste Group OUs RI/FS Work Plan*, April 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the BHI 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 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

VOLATILE DATA QUALIFICATION SUMMARY*

SDG: H3130	REVIEWER: TLI	PROJECT: 200-MW-1	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	Sample preservation
Methylene Chloride	U	All	Method blank contamination

* - 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

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (UG/KG)

Project: FLUOR-HANFORD			
Laboratory: LLI			
Case:	SDG: H3130		
Sample Number		B1C7D5	
Sample Date		4/13/05	
VOA	RDL	Result	Q
Chloromethane		11	UJ
Bromomethane		11	UJ
Vinyl Chloride		11	UJ
Chloroethane		11	UJ
Methylene Chloride	5	5	UJ
Acetone		4	J
Carbon Disulfide		6	UJ
1,1-Dichloroethene	5	6	UJ*
1,1-Dichloroethane	10	6	UJ
1,2-Dichloroethene (total)		6	UJ
Chloroform	5	6	UJ*
1,2-Dichloroethane		6	UJ
2-Butanone	10	11	UJ*
1,1,1-Trichloroethane	5	6	UJ*
Carbon Tetrachloride	5	6	UJ*
Bromodichloromethane		6	UJ
1,2-Dichloropropane		6	UJ
cis-1,3-Dichloropropene		6	UJ
Trichloroethene		6	UJ
Dibromochloromethane		6	UJ
1,1,2-Trichloroethane		6	UJ
Benzene	5	6	UJ*
trans-1,3-Dichloropropene		6	UJ
Bromoform		6	UJ
4-Methyl-2-pentanone		11	UJ
2-Hexanone		11	UJ
Tetrachloroethene		6	UJ
1,1,2,2-Tetrachloroethane		6	UJ
Toluene	5	6	UJ*
Chlorobenzene	5	6	UJ*
Ethylbenzene	5	6	UJ*
Styrene		6	UJ
Xylenes (total)	5	6	UJ*
n-Butylbenzene		6	UJ
trans-1,2-Dichloroethene		6	UJ
cis-1,2-Dichloroethene		6	UJ

000010

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

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

RFW Batch Number: 0504L297 Client: TNUHANFORD F04-015 H3130 Work Order: 11343606001 Page: 1a

Report Date: 05/23/05 09:51

	Cust ID:	B1C7D5	B1C7D5	B1C7D5	VBLKPU	VBLKPU BS
Sample Information	RFW#:	003	003 MS	003 MSD	05LVG108-MB1	05LVG108-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.06	1.02	0.980	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	93 %	97 %	95 %	92 %	99 %
	Bromofluorobenzene	87 %	96 %	91 %	88 %	94 %
	1,2-Dichloroethane-d4	87 %	91 %	92 %	86 %	86 %
Chloromethane		11 U	11 U	10 U	10 U	10 U
Bromomethane		11 U	11 U	10 U	10 U	10 U
Vinyl Chloride		11 U	11 U	10 U	10 U	10 U
Chloroethane		11 U	11 U	10 U	10 U	10 U
Methylene Chloride		5 ~~JB~~ UJ	5 JB	5 B	2 J	3 JB
Acetone		4 J	5 J	5 J	10 U	10 U
Carbon Disulfide		6 U	6 U	5 U	5 U	5 U
1,1-Dichloroethene		6 U	96 %	92 %	5 U	96 %
1,1-Dichloroethane		6 U	6 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		6 U	6 U	5 U	5 U	5 U
Chloroform		6 U	6 U	5 U	5 U	5 U
1,2-Dichloroethane		6 U	6 U	5 U	5 U	5 U
2-Butanone		11 U	11 U	10 U	10 U	10 U
1,1,1-Trichloroethane		6 U	6 U	5 U	5 U	5 U
Carbon Tetrachloride		6 U	6 U	5 U	5 U	5 U
Bromodichloromethane		6 U	6 U	5 U	5 U	5 U
1,2-Dichloropropane		6 U	6 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	6 U	5 U	5 U	5 U
Trichloroethene		6 U	114 %	104 %	5 U	112 %
Dibromochloromethane		6 U	6 U	5 U	5 U	5 U
1,1,2-Trichloroethane		6 U	6 U	5 U	5 U	5 U
Benzene		6 U	101 %	95 %	5 U	100 %
Trans-1,3-Dichloropropene		6 U	6 U	5 U	5 U	5 U
Bromoform		6 U	6 U	5 U	5 U	5 U
4-Methyl-2-pentanone		11 U	11 U	10 U	10 U	10 U
2-Hexanone		11 U	11 U	10 U	10 U	10 U
Tetrachloroethene		6 U	6 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	6 U	5 U	5 U	5 U
Toluene		6 U	108 %	103 %	5 U	107 %

*= Outside of EPA CLP QC limits.

6/20/05

000011

000065

RFW Batch Number: 0504L297 Client: TNUHANFORD F04-015 H3130 Work Order: 11343606001 Page: 1b

Cust ID:	B1C7D5	B1C7D5	B1C7D5	VBLKPU	VBLKPU BS
RFW#:	003	003 MS	003 MSD	05LVG108-MB1	05LVG108-MB1
Chlorobenzene	6 U J	109 %	104 %	5 U	110 %
Ethylbenzene	6 U	6 U	5 U	5 U	5 U
Styrene	6 U	6 U	5 U	5 U	5 U
Xylene (total)	6 U	6 U	5 U	5 U	5 U
cis-1,2-dichloroethene	6 U	6 U	5 U	5 U	5 U
trans-1,2-dichloroethene	6 U	6 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

6/20/06

000012

000000066

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU HANFORD F04-015
LVL#: 0504L297
SDG/SAF#: H3130/F04-015

W.O.#: 11343-606-001-9999-00
Date Received: 04-25-2005

GC/MS VOLATILE

One (1) soil sample was collected on 04-13-2005.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 04-26-2005.

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. The sample was extracted and analyzed within required holding time.
3. A non-target compound was detected in the sample.
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 Methylene Chloride 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").
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

5/31/05
Date

00000061

som\group\data\voa\tnu-hanford\0504-297.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 3 pages.

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

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F04-015-167 | PAGE 1 OF 1

COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: CS Cearlock	TELEPHONE NO.: 372-9638	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 200-E-4; 14-15 ft	PROJECT DESIGNATION: 200-MW-1 Characterization Sampling and Analysis - Soil		SAF NO.: F04-015
ICE CHEST NO.: GRP-04-015	FIELD LOGBOOK NO.:	COA: 119144ES10	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Lionville Laboratory Incorporated	OFFSITE PROPERTY NO.: 5a PTR 15370		BILL OF LADING/AIR BILL NO.: 5a PTR 15370

PRICE CODE: 8N | AIR QUALITY: ☐ | DATA TURNAROUND: 45 Days / 45 Days

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie To: ~~B16760~~ B1C7CF MMB 4/21/05

PRESERVATION	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
TYPE OF CONTAINER	aGs*	aG	aG	aG	aG
NO. OF CONTAINER(S)	~~2~~ 2 MB 4-19-05	1	1	1	1
VOLUME	40mL	120mL	120mL	250mL	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B1C7D5	SOIL	4-13-05	1055	X	X	X	X	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
TSPoPE/ASP	4-13-05 1400	MO-026 / REF. #	4-13-05 1400
MO-026 KUT	4/21/05 0720	M.H. Bauchler M.G. Bauchler	4/21/05 0720
M.H. Bauchler M.G. Bauchler	4/21/05 0730	FedEx	
FedEx	4/25/05 0925	JPerry	

SPECIAL INSTRUCTIONS

(1)VOA - 8260A (TCL); VOA - 8260A (Add-On) {cis-1,2-Dichloroethylene, ~~n-Butylbenzene,~~ trans-1,2-Dichloroethylene} PMG 2/11/05
(2)Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G;
(3)ICP Metals - 6010A (Supertrace) {Cadmium, Chromium, Lead, Silver} ICP Metals - 6010A (Supertrace Add-On) {Copper} Mercury - 7471 - (CV);
(4)IC Anions - 300.0 {~~Fluoride,~~ Nitrate, Nitrite, Phosphate, Sulfate} Total Cyanide - 9010; pH (Soil) - 9045; PMG 2/11/05

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(03/03)

000015

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Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford **Date:** 4/25/05

Purchase Order / Project# /
SAF# / SOW# / Release #:

LvLI Batch #: 0504L297 **Sample Custodian:** JHenry

NOTE: EXPLAIN ALL DISCREPANCIES

1.	Samples Hand Delivered or Shipped	Carrier FedEX		Airbill# 7909 8897 4268	
2.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	Comments
3.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No		
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No		
5.	Samples received cooled or ambient?	Temp 13.0°C all ice melted		Cooler # GRP-04-015	
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	
7.	coc signed and dated?	☑ Yes	☐ No		
8.	Sample containers are intact?	☑ Yes	☐ No		
9.	All samples on coc received? All samples received on coc?	☑ Yes	☐ No		
10.	All sample label information matches coc?	☑ Yes	☐ No		
11.	Samples properly preserved?	☐ Yes	☑ No All #5		
12.	Samples received within hold times? Short holds taken to wet lab?	☑ Yes	☐ No		
13.	VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A	
14.	QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A	
15.	Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes JH 4/25/05	☑ No All #5, 11		
16.	Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)	☑ Yes OJ 4/25/05	☐ No	☐ No Discrepancies	

SR-002-B

00000073

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-MW-1			DATA PACKAGE: H3130		
VALIDATOR: TLI		LAB: LLI		DATE: 6/15/05	
			SDG: H3130		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
BICTDS					
					Soil

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: Methylene Chloride - in MB - U

NO FB

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

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:

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: cooler temp 13°C – 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: 10 error

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: