

REVIEW COMMENT RECORD (RCR)

1. Date 01/14/03	2. Review No.
3. Project No. 200-PW-2/4	4. Page 1 of 1

5. Document Number(s)/Title(s) Validation Packages for SDG 2152	6. Program/Project/Building Number 200-PW-2/4 Waste Management	7. Reviewer RL Weiss	8. Organization/Group S&DM	9. Location/Phone Sigma 1 372-9631
--------------------------------------------------------------------	-------------------------------------------------------------------	-------------------------	-------------------------------	------------------------------------------

17. Comment Submittal Approval: _____ Organization Manager (Optional)	10. Agreement with indicated comment disposition(s) <div style="text-align: center;">  Reviewer/Point of Contract </div> <div style="text-align: center;"> <u>1-27-04</u> Date </div> <div style="text-align: center;"> _____ Author/Originator </div>	11. _____ Reviewer/Point of Contact _____ Date _____ 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	Radiochemistry, Pages 3, 4, 10-13, & 23; Tc-99 analysis performed using a tracer, matrix spike not required. Check page 31 of lab data package for info on tracer recoveries.	OK RLW 1-27-04	correct 	
2	Radiochemistry, Pages 3, 4, & 10; I-129 analysis failed to meet RDL for project	OK RLW 1-27-04	correct 	
3	Wet Chemistry, Pages 8, 10, & 11; Oil & Grease results are incorrectly flagged "J". N03/NO2 results should be flagged "J".	OK RLW 1-27-04	correct 	
4				
5				

Date: 12 January 2004
 To: Fluor Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
 Subject: Wet Chemistry - Data Package No. H2152



INTRODUCTION

This memo presents the results of data validation on Data Package No. H2152 prepared by Lionville Laboratory Inc.. 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
B16RW5	4/4/03	Soil	C	See note 1
B16RW7	4/4/03	Soil	C	See note 1
B16RW8	4/4/03	Soil	C	See note 1

1 - Nitrate/nitrite by 353.1, oil & grease by 413.1 and hexavalent chromium by 7196A.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times/Sample Preservation**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for hexavalent chromium, 28 days for oil & grease and nitrate/nitrite.

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

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

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

All 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 and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. 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.

All matrix spike and LCS recovery results were acceptable.

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- **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 target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. All oil & grease results exceeded the TQL. Under the BHI statement of work, no qualification is required. All other results met the TQL.

- **Completeness**

Data package No. H2152 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 holding time being exceeded by less than twice the limit, all nitrate/nitrite 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

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within the standard error associated with the methods.

All oil & grease results exceeded the TQL. 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-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

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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).

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Appendix 2

Summary of Data Qualification

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WET CHEMISTRY DATA QUALIFICATION SUMMARY

SDG: H2152	REVIEWER: TLI	DATE: 1/12/04	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate/nitrite	J	All	Holding time

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: FLUOR-HANFORD								
Laboratory: LLI								
Case		SDG: H2152						
Sample Number		B16RW5		B16RW7		B16RW8		
Remarks								
Location								
Sample Date		4/4/03		4/4/03		4/4/03		
Wet Chemistry		TQL	Result	Q	Result	Q	Result	Q
Hexavalent chromium		0.5	0.42 U		0.42 U		0.43 U	
Nitrate/Nitrite			544 J		433 J		501 J	
Oil & Grease		200	694 U		707 U		712 U	

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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 05/07/03

CLIENT: TNUHANFORD P03-006 H2152
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L165

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	B16RW8	% Solids	93.7	%	0.01	1.0
		Chromium VI	0.43	u MG/KG	0.43	1.0
		Nitrate Nitrite	501	MG/KG	21.8	100
		Oil & Grease Gravimetri	712	u MG/KG	712	1.0
-006	B16RW8 1/15/04	% Solids	96.4	%	0.01	1.0
		Chromium VI	0.42	u MG/KG	0.42	1.0
		Nitrate Nitrite	861	MG/KG	35.6	200
		Oil & Grease Gravimetri	692	u MG/KG	692	1.0
-007	B16RX0 1/15/04	% Solids	94.1	%	0.01	1.0
		Chromium VI	0.42	u MG/KG	0.42	1.0
		Nitrate Nitrite	1120	MG/KG	37.0	200
		Oil & Grease Gravimetri	709	u MG/KG	709	1.0
-008	B16RX1 1/15/04	% Solids	97.5	%	0.01	1.0
		Chromium VI	0.41	u MG/KG	0.41	1.0
		Nitrate Nitrite	3.1	MG/KG	0.18	1.0
		Oil & Grease Gravimetri	684	u MG/KG	684	1.0

R
1/15/04

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/07/03

CLIENT: TNUHANFORD F03-006 H2152
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L165

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	E16RW4 1/15/04	% Solids	97.2	%	0.01	1.0
-002	E16RW5	% Solids	96.0	%	0.01	1.0
		Chromium VI	0.42	u MG/KG	0.42	1.0
		Nitrate Nitrite	544	J MG/KG	20.8	100
		Oil & Grease Gravimetri	694	u MG/KG	694	1.0
-003	E16RW6 1/15/04	% Solids	95.8	%	0.01	1.0
		Chromium VI	0.42	u MG/KG	0.42	1.0
		Nitrate Nitrite	476	MG/KG	21.3	100
		Oil & Grease Gravimetri	696	u MG/KG	696	1.0
-004	E16RW7	% Solids	94.2	%	0.01	1.0
		Chromium VI	0.42	u MG/KG	0.42	1.0
		Nitrate Nitrite	433	J MG/KG	23.2	100
		Oil & Grease Gravimetri	707	u MG/KG	707	1.0

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1/15/04

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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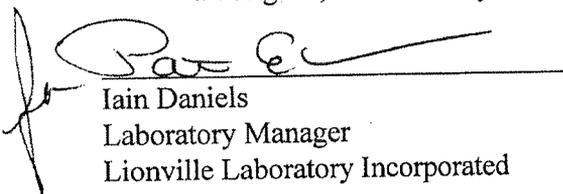
Analytical Report

Client: TNU-HANFORD F03-006 H2152
LVL#: 0304L165

W.O.#: 11343-606-001-9999-00
Date Received: 04-11-03

INORGANIC NARRATIVE

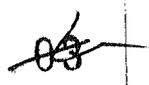
1. This narrative covers the analyses of 8 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS was within Oil and Grease was within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries for Nitrate Nitrite, Oil and Grease and Chromium VI were within the 75-125% control limits.
8. The replicate analyses for Nitrate Nitrite, Oil and Grease, Percent Solids and Chromium VI were within the 20% RPD control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

05-08-03
Date

njp04-165

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 18 pages.



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FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-002	Page 1 of 1	
Collector Johansen/Pope/Pfister		Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ		
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		Sampling Location 216-A-19 (C3245) 14.5 - 17.0 ft		SAF No. F03-006		Price Code 8N Data Turnaround 45 Days		
Ice Chest No. ERC 08 007		Field Logbook No. HNF-N-3361		COA 117504ES10		Method of Shipment Federal Express		
Shipped To TMS 412103 EBERLINE SERVICES (Formerly TMA) Becca		Offsite Property No. A030 208		Bill of Lading/Air Bill No. 7902 5690 5057				
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie to B16 RW6 Special Handling and/or Storage cool 4°C 000015				Preservation	Cool 4C	Cool 4C	None	None
				Type of Container	aG	aG	aG	aG
				No. of Container(s)	1 TMS 3/4/03	1	1	1
				Volume	125mL 120	120mL	60mL	60mL
SAMPLE ANALYSIS				Chromium Hex - 7196	Oil & Grease - 413.1	See item (1) in Special Instructions.	Titanium - H3	
Sample No.	Matrix *	Sample Date	Sample Time					
B16RW5	SOIL	4-4-03	1124	X	X		Tie to B16 RW6	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
M. Johnson		4/4/03 1530		REF IA		4403 1530		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
IA 3728		4-10-03 1000		R. F. ...		4-6-03		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
R. F. ...		4-10-03		Fed Ex				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		
D. ...		4-11-03 110:15		D. ...		4-11-03 110:15		
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		

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-004	Page 1 of 1	
Collector Johansen/Pope/Pfister		Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ		
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		Sampling Location 216-A-19 (C3245) 22.5-25.0 ft		SAF No. F03-006		Price Code 8N Data Turnaround 45 Days		
Ice Chest No. ERC 02-002		Field Logbook No. HNF-N-3361		COA 117504ES10		Air Quality <input type="checkbox"/>		
Shipped To TMD 4-3-03 EBERTLINE SERVICES (Formerly TMA) Recra		Offsite Property No. A030 208		Method of Shipment Federal Express		Bill of Lading/Air Bill No. 7902 5690 5057		
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie To B16R8 Special Handling and/or Storage Cool 14°C 000016				Preservation	Cool 4C	Cool 4C	None	None
				Type of Container	aG	aG	aG	aG
				No. of Container(s)	1 TMD 4/3/03	1	1	1
				Volume	125ml 120ml	120mL	60mL	60mL
SAMPLE ANALYSIS				Chromium Hex - 7196	Oil & Grease - 413.1	See item (1) in Special Instructions	Tritium - H3	
								Tie To:
Sample No.	Matrix *	Sample Date	Sample Time					
B16RW7	SOIL	4-4-03	1348	X	X			
B16RW8	SOIL	4-4-03	1348	X	X			
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS		
Relinquished By/Removed From Johansen/Pope/Pfister 4/4/03 F30		Date/Time		Received By/Stored In REF IA 4403 1530		Date/Time		
Relinquished By/Removed From IA 3728 4-10-03 1000		Date/Time		Received By/Stored In R. Fahley 4-10-03		Date/Time		
Relinquished By/Removed From R. Fahley 4-10-03		Date/Time		Received By/Stored In F. DeLa		Date/Time		
Relinquished By/Removed From J. Smith 4-11-03/10:15		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		

Appendix 5

Data Validation Supporting Documentation

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GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-PW-24		DATA PACKAGE: H2152		
VALIDATOR:	TLF	LAB:	LLI	DATE: 1/8/04	
CASE:			SDG: H2152		
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	Oil/Grease	
				1/8/04	
SAMPLES/MATRIX					
B16RW5					
B16RW7					
B16RW8					
at 1/1/04 NO ₂ /NO ₃ not on COC					

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 DATA VALIDATION CHECKLISTS

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
Spike standards NIST traceable? (Levels D, E) Yes No N/A
Spike standards expired? (Levels D, E)..... Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable?..... Yes No N/A
Standards traceable? (Levels D, E)..... Yes No N/A
Standards expired? (Levels D, E)..... Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable?..... Yes No N/A
Comments: NO PAS

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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: NO2/NO3 - own HT - J all

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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: oil + grease on

Appendix 6

Additional Documentation Requested by Client

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/07/03

CLIENT: TNUHANFORD F03-006 H2152
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L165

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI039-MB1	Chromium VI	0.40	u MG/KG	0.40	1.0
BLANK10	03LN3A24-MB1	Nitrate Nitrite	0.20	u MG/KG	0.20	1.0
BLANK10	03LOG014-MB1	Oil & Grease Gravimetri	667	u MG/KG	667	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/07/03

CLIENT: TNUHANFORD F03-006 H2152
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L165

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	E16RWS	Nitrate Nitrite	1570	544	1040	98.4	200
		Oil & Grease Gravimetr	7620	694 u	7930	96.0	1.0
-008	E16RX1	Soluble Chromium VI	3.9	0.41u	4.1	90.3	1.0
		Insoluble Chromium VI	1230	0.41u	1210	102.0	100
BLANK10	03LVIO39-MB1	Soluble Chromium VI	4.1	0.40u	4.0	101.8	1.0
		Insoluble Chromium VI	1180	0.40u	1170	101.2	100
BLANK10	03LN3A24-MB1	Nitrate Nitrite	5.0	0.20u	5.0	100.6	1.0
BLANK10	03LOG014-MB1	Oil & Grease Gravimetr	7190	667 u	7610	94.4	1.0
		Oil & Grease - Grav M	7730	667 u	7610	101.6	1.0

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Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 05/07/03

CLIENT: TNUHANFORD P03-006 H2152
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L165

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
*****	*****	*****	*****	*****	*****
BLANK10	03LOG014-MB1	Oil & Grease - Grav	94.4	101.6	7.2

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/07/03

CLIENT: TNUHANFORD F03-006 H2152
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L165

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
-002REP	B16RW5	Nitrate Nitrite	544	497	9.0	100
		Oil & Grease Gravimetri	694 u	694 u	NC	1.0
-008REP	B16RX1	% Solids	97.5	97.6	0.15	1.0
		Chromium VI	0.41u	0.41u	NC	1.0

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Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD F03-006 H2152



DATE RECEIVED: 04/11/03

LVL LOT # :0304L165

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16RW4						
% SOLIDS	001	S	03L%S052	04/04/03	04/14/03	04/15/03
B16RW5						
% SOLIDS	002	S	03L%S052	04/04/03	04/14/03	04/15/03
CHROMIUM VI	002	S	03LVI039	04/04/03	04/30/03	04/30/03
NITRATE NITRITE	002	S	03LN3A24	04/04/03	05/05/03	05/05/03
NITRATE NITRITE	002 REP	S	03LN3A24	04/04/03	05/05/03	05/05/03
NITRATE NITRITE	002 MS	S	03LN3A24	04/04/03	05/05/03	05/05/03
OIL & GREASE BY GRAV	002	S	03LOG014	04/04/03	04/22/03	04/24/03
OIL AND GREASE BY GR	002 REP	S	03LOG014	04/04/03	04/22/03	04/24/03
OIL AND GREASE BY GR	002 MS	S	03LOG014	04/04/03	04/22/03	04/24/03
B16RW6						
% SOLIDS	003	S	03L%S052	04/04/03	04/14/03	04/15/03
CHROMIUM VI	003	S	03LVI039	04/04/03	04/30/03	04/30/03
NITRATE NITRITE	003	S	03LN3A24	04/04/03	05/05/03	05/05/03
OIL & GREASE BY GRAV	003	S	03LOG014	04/04/03	04/22/03	04/24/03
B16RW7						
% SOLIDS	004	S	03L%S052	04/04/03	04/14/03	04/15/03
CHROMIUM VI	004	S	03LVI039	04/04/03	04/30/03	04/30/03
NITRATE NITRITE	004	S	03LN3A24	04/04/03	05/05/03	05/05/03
OIL & GREASE BY GRAV	004	S	03LOG014	04/04/03	04/22/03	04/24/03
B16RW8						
% SOLIDS	005	S	03L%S052	04/04/03	04/14/03	04/15/03
CHROMIUM VI	005	S	03LVI039	04/04/03	04/30/03	04/30/03
NITRATE NITRITE	005	S	03LN3A24	04/04/03	05/05/03	05/05/03
OIL & GREASE BY GRAV	005	S	03LOG014	04/04/03	04/22/03	04/24/03
B16RW9						
% SOLIDS	006	S	03L%S052	04/07/03	04/14/03	04/15/03

000027

OK

Date: 12 January 2004
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Radiochemistry - Data Package No. H2152 (SDG No. H2152)



INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2152 which was prepared by Eberline Services Inc. (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B16RW5	4/4/03	Soil	C	See note 1
B16RW7	4/4/03	Soil	C	See note 1
B16RW8	4/4/03	Soil	C	See note 1

1 - Alpha spectroscopy; tritium; carbon-14; nickel-63; total strontium; technetium-99; iodine-129; and neptunium-237.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). 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 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.

000001

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, therefore, no field blank data was available for review.

- **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 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of a matrix spike analysis, all carbon-14 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

000002

- **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 than 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 duplicate results were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. The iodine-129 results in samples B16RW5 and B16RW7 exceeded the TQL. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TQL.

- **Completeness**

Data package SDG No. H2152 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.

000003

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, all carbon-14 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 iodine-129 results in samples B16RW5 and B16RW7 exceeded the TQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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.

000006

Appendix 2

Summary of Data Qualification

000007

RADIOCHEMISTRY CHEMISTRY DATA QUALIFICATION SUMMARY

SDG: H2152	REVIEWER: TLI	DATE: 1/12/04	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon-14	J	All	No MS analysis

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: FLUOR-HANFORD											
Laboratory: EB											
Case		SDG: H2152									
Sample Number		B16RW5		B16RW7		B16RW8					
Remarks											
Location											
Sample Date		4/4/03		4/4/03		4/4/03					
Radiochemistry	TQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	0.127	U	0.056	U	0.141	U				
Carbon-14	50	-1.60	UJ	-1.44	UJ	-2.26	UJ				
Nickel-63	30	17.6		0.298	U	1.59	U				
Total strontium	1	16.1		7.73		7.71					
Technetium-99	15	0.316	U	0.183	U	0.137	U				
Thorium-228		0.470		0.457		0.561					
Thorium-230		0.507		0.379		0.149	U				
Thorium-232	1	0.429		0.341		0.298					
Neptunium-237	1	0	U	0	U	0	U				
Iodine-129	2	-0.546	U	-0.613	U	-0.423	U				

000010

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 H2152

7484-001

B16RW5

DATA SHEET

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	SDG <u>H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R304071-01</u>	Client sample id <u>B16RW5</u>	
Dept sample id <u>7484-001</u>	Location/Matrix <u>216-A-19 (C3245)</u>	<u>SOLID</u>
Received <u>04/11/03</u>	Collected/Weight <u>04/04/03 11:24</u>	<u>192.3 g</u>
% solids <u>96.0</u>	Custody/SAF No <u>F03-006-002</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.127	0.11	0.17	400	U	H
Carbon 14	14762-75-5	<u>-1.60</u>	1.1	1.9	50	U	C
Nickel 63	13981-37-8	17.6	1.6	2.0	30		NI_L
Total Strontium	SR-RAD	16.1	0.71	0.24	1.0		SR
Technetium 99	14133-76-7	0.316	0.31	0.58	15	U	TC
Thorium 228	14274-82-9	0.470	0.32	0.43			TH
Thorium 230	14269-63-7	0.507	0.32	0.30	1.0		TH
Thorium 232	TH-232	0.429	0.24	0.30	1.0		TH
Neptunium 237	13994-20-2	0	0.061	0.092	1.0	U	NP
Iodine 129	15046-84-1	-0.546	1.1	<u>2.4</u>	2.0	U	I

200-PW-2/200-P2-4 OU - Borehole Soil

W
1/15/04

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

000011

EBERLINE SERVICES / RICHMOND
 SAMPLE DELIVERY GROUP H2152

7484-003

B16RW7

DATA SHEET

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	SDG <u>H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304071-03</u>	Client sample id <u>B16RW7</u>	
Dept sample id <u>7484-003</u>	Location/Matrix <u>216-A-19 (C3245)</u>	<u>SOLID</u>
Received <u>04/11/03</u>	Collected/Weight <u>04/04/03 13:48</u>	<u>139.9 g</u>
% solids <u>94.5</u>	Custody/SAF No <u>F03-006-004</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.056	0.10	0.17	400	U	H
Carbon 14	14762-75-5	-1.44	2.0	3.5	50	U	C
Nickel 63	13981-37-8	0.298	1.2	2.1	30	U	NI_L
Total Strontium	SR-RAD	7.73	0.45	0.21	1.0		SR
Technetium 99	14133-76-7	0.183	0.29	0.59	15	U	TC
Thorium 228	14274-82-9	0.457	0.31	0.29			TH
Thorium 230	14269-63-7	0.379	0.23	0.29	1.0		TH
Thorium 232	TH-232	0.341	0.23	0.29	1.0		TH
Neptunium 237	13994-20-2	0	0.061	0.091	1.0	U	NP
Iodine 129	15046-84-1	-0.613	0.91	2.1	2.0	U	I

200-PW-2/200-P2-4 OU - Borehole Soil

K
 1/15/04

000012

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2152

7484-004

B16RW8

DATA SHEET

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	SDG <u>H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304071-04</u>	Client sample id <u>B16RW8</u>	
Dept sample id <u>7484-004</u>	Location/Matrix <u>216-A-19 (C3245)</u>	<u>SOLID</u>
Received <u>04/11/03</u>	Collected/Weight <u>04/04/03 13:48</u>	<u>138.1 g</u>
% solids <u>94.2</u>	Custody/SAF No <u>F03-006-004</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.141	0.094	0.15	400	U	H
Carbon 14	14762-75-5	<u>-2.26</u>	1.9	3.3	50	U	C
Nickel 63	13981-37-8	1.59	1.3	2.1	30	U	NI_L
Total Strontium	SR-RAD	7.71	0.50	0.24	1.0		SR
Technetium 99	14133-76-7	0.137	0.23	0.53	15	U	TC
Thorium 228	14274-82-9	0.561	0.30	0.29			TH
Thorium 230	14269-63-7	0.149	0.15	0.29	1.0	U	TH
Thorium 232	TH-232	0.298	0.22	0.29	1.0		TH
Neptunium 237	13994-20-2	0	0.062	0.092	1.0	U	NP
Iodine 129	15046-84-1	-0.423	0.86	2.0	2.0	U	I

200-PW-2/200-P2-4 OU - Borehole Soil

K
1/15/04

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

000013

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2152 was composed of eight solid (soil) samples designated under SAF No. F03-006 with a Project Designations of: 200-PW-2/200-PW-4 OU – Borehole Soil Sampling.

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 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.8 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa C. Mannion
Melissa C. Mannion
Program Manager

5/29/3
Date

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-002	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ		Price Code 8N	Data Turnaround 45 Days	
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 216-A-19 (C3245) 14.5 - 17.0 ft	H2152 (7484)		SAF No. F03-006	Air Quality <input type="checkbox"/>		
Ice Chest No. ERC 96-039	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Federal Express		Bill of Lading/Air Bill No. 7913 4876 5047		
Shipped To EBERLINE SERVICES (Formerly TMA)	Offsite Property No. A030 194						

POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie To B16RW6 Special Handling and/or Storage None	Preservation	Cool 4C	Cool 4C	None	None						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1 M0413103	1	1	1						
	Volume	125mL 120	120mL	60mL	60mL						
SAMPLE ANALYSIS		Chromium Hex - 7196	Oil & Grease - 413.1	See item (1) in Special Instructions.	Tritium - H3						

Sample No.	Matrix *	Sample Date	Sample Time								
B16RW5	SOIL	4-4-03	1124	/		X	X				Tie To B16RW6

000017

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix * S=Soil SE=Soilment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trace WT=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From <i>M. Hansen</i>	Date/Time 4-4-03 1530	Received By/Stored In <i>REF IA</i>	Date/Time 4-4-03 1530	** The laboratory is to achieve a detection limit of 50.0 pCi/g for Carbon-14. 3/4/03 JAC ** The laboratory is to report both kerosene and diesel range compounds from the WTPH-D analysis.				
Relinquished By/Removed From <i>IA 3728</i>	Date/Time 4-10-02 1000	Received By/Stored In <i>K. Felt</i>	Date/Time 4-10-03	(1) Technetium-99; Strontium-89,90 - Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237				
Relinquished By/Removed From <i>R. Felt</i>	Date/Time 4-10-03	Received By/Stored In <i>Fed Ex</i>	Date/Time	Personnel not available to relinquish samples from the 3728 Ref # <i>IA</i> on 4/10/03				
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

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-004	Page 1 of 1
Collector Johansen/Pope/Pfister		Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ	
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		Sampling Location 216-A-19 (C3245) 22.5-25.0 ft		H2152 (7484)		Price Code 8N Data Turnaround 45 Days	
Ice Chest No. ERC 96.039		Field Logbook No. HNF-N-3361		COA 117504ES10		Method of Shipment Federal Express	
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030 194		Bill of Lading/Air Bill No. 7913 4876 5047			
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie To B16 RX8 Special Handling and/or Storage None				Preservation	Cool 4C	Cool 4C	None
				Type of Container	aG	aG	aG
				No. of Container(s)	1	1	1
				Volume	120 mL	120 mL	60 mL
SAMPLE ANALYSIS				Chromium Hex - 7196	Oil & Grease - 413.1	See item (1) in Special Instructions.	Tritium - H3
				Tie ID:			
Sample No.	Matrix *	Sample Date	Sample Time				
B16RW7	SOIL	4-4-03	1348		X	X	B16RX8
B16RW8	SOIL	4-4-03	1348		X	X	B16RX8
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time	
M. Hulstrom		9/4/03 1530		REF 1A		4403 1530	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time	
IA 3728		4-10-03 1000		R. F. Hulstrom		4-10-03	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time	
R. F. Hulstrom		4-10-03		Fed Ex			
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				Title			
Received By				Date/Time			
FINAL SAMPLE DISPOSITION				Disposal Method			
Disposal Method				Disposed By			
				Date/Time			

000018

Appendix 5

Data Validation Supporting Documentation

000019

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-RW-2+4		DATA PACKAGE: H2152		
VALIDATOR:	TLF	LAB:	EB	DATE: 1/8/03	
CASE:			SDG: H2152		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	UR-237
Total Uranium	Radium-22	Tritium	Ni-63	C-14	F-18
SAMPLES/MATRIX					
B16RW5		B16RW7		B16RW8	
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

Appendix A – Radiochemical Data Validation Checklist

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: _____

Appendix A – Radiochemical Data Validation Checklist

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

Appendix A – Radiochemical Data Validation Checklist

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: NO ETFC 1/15/12

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: NO c-14 MS
FE 9/11/12

Appendix A – Radiochemical Data Validation Checklist

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: _____

12. Holding Times (All levels)

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2152

7484-009

Method Blank

METHOD BLANK

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	SDG <u>H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R304071-09</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7484-009</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-006</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.019	0.15	0.26	400	U	H
Carbon 14	14762-75-5	-1.09	2.1	3.6	50	U	C
Total Strontium	SR-RAD	0.081	0.13	0.25	1.0	U	SR
Technetium 99	14133-76-7	0.194	0.19	0.54	15	U	TC
Thorium 228	14274-82-9	0.042	0.17	0.32		U	TH
Thorium 230	14269-63-7	0.169	0.17	0.32	1.0	U	TH
Thorium 232	TH-232	0	0.085	0.32	1.0	U	TH
Neptunium 237	13994-20-2	0	0.063	0.095	1.0	U	NP
Iodine 129	15046-84-1	0.029	0.36	0.81	2.0	U	I

200-PW-2/200-P2-4 OU - Borehole Soil

QC-BLANK #44438

METHOD BLANKS

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2152

7484-013

Method Blank

METHOD BLANK

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	<u>SDG H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304071-13</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7484-013</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-006</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Nickel 63	13981-37-8	0	1.3	2.1	30	U	NI_L

200-PW-2/200-P2-4 OU - Borehole Soil

QC-BLANK #44519

METHOD BLANKS

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2152

7484-008

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	<u>SDG H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R304071-08</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7484-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-006</u>	

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	13.2	0.40	0.26	400		H	13.0	0.52	102	83-117	80-120
Carbon 14	2470	50	11	50		C	2630	110	94	84-116	80-120
Total Strontium	19.6	0.88	0.30	1.0		SR	21.1	0.84	93	84-116	80-120
Technetium 99	114	3.9	0.56	15		TC	109	4.4	105	82-118	80-120
Thorium 230	39.3	4.4	0.34	1.0		TH	40.8	1.6	96	81-119	80-120
Neptunium 237	17.4	1.5	0.094	1.0		NP	19.9	0.80	87	86-114	80-120
Iodine 129	122	1.0	1.2	2.0		I	116	4.6	105	83-117	80-120

200-PW-2/200-P2-4 OU - Borehole Soil

QC-LCS #44437

LAB CONTROL SAMPLES

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2152

7484-012

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	<u>SDG H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R304071-12</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7484-012</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-006</u>	

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
Nickel 63	267	5.6	2.7	30		NI_L	274	11	97	84-116	80-120

200-PW-2/200-P2-4 OU - Borehole Soil

QC-LCS #44518

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/29/03

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2152

7484-010

B16RW7

DUPLICATE

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	<u>SDG H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R304071-10</u>	Lab sample id <u>R304071-03</u>	Client sample id <u>B16RW7</u>
Dept sample id <u>7484-010</u>	Dept sample id <u>7484-003</u>	Location/Matrix <u>216-A-19 (C3245)</u> <u>SOLID</u>
	Received <u>04/11/03</u>	Collected/Weight <u>04/04/03 13:48</u> <u>139.9 g</u>
% solids <u>94.5</u>	% solids <u>94.5</u>	Custody/SAF No <u>F03-006-004</u> <u>F03-006</u>

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
Tritium	0.108	0.10	0.17	400	U	H	0.056	0.10	0.17	U	-	
Carbon 14	0.051	1.9	3.3	50	U	C	-1.44	2.0	3.5	U	-	
Total Strontium	7.69	0.45	0.19	1.0		SR	7.73	0.45	0.21		1	25
Technetium 99	-0.053	0.26	0.56	15	U	TC	0.183	0.29	0.59	U	-	
Thorium 228	0.338	0.34	0.43		U	TH	0.457	0.31	0.29		30	174
Thorium 230	0.561	0.34	0.43	1.0		TH	0.379	0.23	0.29		39	132
Thorium 232	0.393	0.34	0.43	1.0	U	TH	0.341	0.23	0.29		14	168
Neptunium 237	0	0.073	0.11	1.0	U	NP	0	0.061	0.091	U	-	
Iodine 129	0.404	0.85	1.9	2.0	U	I	-0.613	0.91	<u>2.1</u>	U	-	

200-PW-2/200-P2-4 OU - Borehole Soil

QC-DUP#3 44439

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2152

7484-014

B16RW7

DUPLICATE

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	SDG <u>H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R304071-14</u>	Lab sample id <u>R304071-03</u>	Client sample id <u>B16RW7</u>
Dept sample id <u>7484-014</u>	Dept sample id <u>7484-003</u>	Location/Matrix <u>216-A-19 (C3245)</u> <u>SOLID</u>
	Received <u>04/11/03</u>	Collected/Weight <u>04/04/03 13:48</u> <u>139.9 g</u>
% solids <u>94.5</u>	% solids <u>94.5</u>	Custody/SAF No <u>F03-006-004</u> <u>F03-006</u>

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
Nickel 63	0	1.2	2.1	30	U	NI_L	0.298	1.2	2.1	U	-	

200-PW-2/200-P2-4 OU - Borehole Soil

QC-DUP#3 44520

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>05/29/03</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2152

7484-011

B16RW7

MATRIX SPIKE

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	SDG <u>H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
MATRIX SPIKE	ORIGINAL	
Lab sample id <u>R304071-11</u>	Lab sample id <u>R304071-03</u>	Client sample id <u>B16RW7</u>
Dept sample id <u>7484-011</u>	Dept sample id <u>7484-003</u>	Location/Matrix <u>216-A-19 (C3245)</u> SOLID
	Received <u>04/11/03</u>	Collected/Weight <u>04/04/03 13:48 139.9 g</u>
% solids <u>94.5</u>	% solids <u>94.5</u>	Custody/SAF No <u>F03-006-004 F03-006</u>

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 % (TOTAL)	LMTS LIMITS	PROTOCOL
Tritium	46.3	0.58	0.17	400	X H	50.9	2.0	0.056	0.10	91	85-115	60-140

200-PW-2/200-P2-4 OU - Borehole Soil

QC-MS#3 44440

MATRIX SPIKES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2152

7484-015

B16RW7

MATRIX SPIKE

SDG <u>7484</u>	Client/Case no <u>Hanford</u>	SDG <u>H2152</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
MATRIX SPIKE	ORIGINAL	
Lab sample id <u>R304071-15</u>	Lab sample id <u>R304071-03</u>	Client sample id <u>B16RW7</u>
Dept sample id <u>7484-015</u>	Dept sample id <u>7484-003</u>	Location/Matrix <u>216-A-19 (C3245)</u> <u>SOLID</u>
	Received <u>04/11/03</u>	Collected/Weight <u>04/04/03 13:48</u> <u>139.9 g</u>
% solids <u>94.5</u>	% solids <u>94.5</u>	Custody/SAF No <u>F03-006-004</u> <u>F03-006</u>

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 % (TOTAL)	LMTS LIMITS	PROTOCOL LIMITS
Nickel 63	936	19	5.2	30	NI_L	960	38	0.298	1.2	97	84-116	60-140

200-PW-2/200-P2-4 OU - Borehole Soil

QC-MS#3 44521

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 05/29/03

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