REVIEW COMMENT RECORD (RCR)

1. Date 06/26/06	2. Review No.
3. Project No. 200-UW-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
Validation Package for SDG WSCF20060299	Clay Pipe	RL Weiss	WCH - 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 Reviewer/Point of Contract 06/26/06 Date R. L. Weiss Author/Originator	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	Volatile, Semivolatile, & Wet Chemistry – No Comments			
2	Radiochemistry, Page 8:"J" flagging for U-234, U-235, & Pu-238 should be for no LCS.		[illegible]	
3	Radiochemistry, Pages 3, 4, 10, & 37; I can only find 8 analytes over the RDL. No analytes flagged on page 10. I found missed RDLs for Am-241(GEA), Cs-134, Eu-152, & Eu-154 in samples B1J2V0 & B1J2V1.		[illegible]	
4	Inorganics, Page 13; Typo, Hg not "J" flagged, Th incorrectly flagged "J".		[illegible]	
5	Inorganics, Pages 2, 4, 9, 11-16, & 29; The laboratory reported the blank results as raw liquid values (ug/L). Using nominal 1g -100ml sample preparation for solids, raw liquid values for Hg and Mo are > 10X blanks. No flagging should occur.		[illegible]	

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A-6400-090.1 (11/99)

Date: 19 June 2006
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-UW-1 Operable Unit, Clean Soil from Trench Between 216-U-8 and 216-U-12 Cribs
Subject: Radiochemistry - Data Package No. WSCF20060299 (60299)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 60299 prepared by WSCF Analytical Laboratories (WSCF). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
B1J2T5	4/11/06	Soil	C	See note 1

1 – Technetium-99.

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit, DOE/RL-2005-75, Rev. 0. 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.

All holding times were acceptable.

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- **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.

Due to a post-digestion matrix spike recovery outside QC limits (60%), the technetium-99 result was qualified as an estimate and flagged "J". (The matrix spike is a post-digestion spike but at the direction of FDH, it was assessed in place of a matrix spike).

- **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.

Due to the sampling methodology, no laboratory duplicate was analyzed. At the direction of FHI, a post-digestion spike duplicate was assessed in its place. All post-digestion 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. All analytes met the RTQL.

- **Completeness**

Data package SDG No. 60299 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 a post-digestion matrix spike recovery outside QC limits (60%), the technetium-99 result was qualified as an estimate and flagged "J". (The matrix spike is a post-digestion spike but at the direction of FDH, it was assessed in place of a matrix spike). 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-2005-75, Rev. 0, *Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit*, December 2005.

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

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: 60299	REVIEWER: TLI	Project: 200-UW-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Technetium-99	J	All	Post-digestion spike recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: FLUOR-HANFORD			
Laboratory: WSCF			
Case	**SDG: 60299**		
Sample Number		B1J2T5	
Remarks			
Sample Date		4/11/06	
Radiochemistry	**RTQL**	**Result**	**Q**
Technetium-99	**1**	-0.200	UJ

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.

WSCF
ANALYTICAL RESULTS REPORT

Attention: DL KLAGES **Group #:** 20060299

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Radiochemistry														
W060000734	B1J2T5	K	14133-76-7	Tc-99 by Liquid Scin.	SOLID	LA-508-421	U J	-0.200	pCi/g	1.00	0.30	04/18/06	04/11/06	04/12/06
W060000734	B1J2T5	K	E,T,C	Tc-99 Counting Error	SOLID	LA-508-421		100	%	1.00	0.0	04/18/06	04/11/06	04/12/06

JR 6/17/06

000011

MDL = Minimum Detection Limit U - Analyzed for but not detected above limiting criteria.
RQ = Result Qualifier

DF = Dilution Factor
* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20060299**
Sample Matrix	**SOLID**
Sample Visual	**N/A**
SAF Number	**R06-019**
Data Deliverable	**Summary Report**

Introduction

One (1) soil sample (B1J2T5) from the 200-UW-1 Operable Unit Clean Soil was received at the WSCF Laboratory on April 12, 2006. The sample was received in a cool condition with ice present in the coolers. The sample was analyzed for the analyte indicated on the attached copy of the chain of custody (COC) form in accordance with the *200-UW-1 Operable Unit Letter of Instruction*, referenced in the cover letter.

The sample was taken using the Multi-Increment Sampling Program, which requires the entire sample submitted to be analyzed. This does not allow for laboratory sample duplicates or matrix spikes, so a Replicate of the sample extract and Post Digestion Spike were run instead.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical method. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, method references, and Laboratory QC information. Copies of the chain of custody and sample receipt are included as Attachment 3.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report,* page 10, for a complete listing of approved analytical methods used.

Radiochemistry Comments

There are no holding times associated with WSCF radiochemical methods.

Tecnicium-99 - A Blank, Laboratory Control Sample, Post Digestion Matrix Spike and Post Digestion Sample Replicate were analyzed with this delivery group of less than 20 samples. See page 11 for QC details. Analytical notes:

- Post Digestion Matrix Spike recovery was low at 60%.

All other QC controls are within the established limits.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

John E. Trechter
WSCF Client Services

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		R06-019-002	PAGE 1 OF 1
COLLECTOR HOGAN, JG 04/27/06	COMPANY CONTACT KLAGES, DL	TELEPHONE NO. 373-6312	PROJECT COORDINATOR TRECHTER, JE	PRICE CODE 8C DATA TURNAROUND
SAMPLING LOCATION U-8 Spoils Pile	PROJECT DESIGNATION 200-UW-1 Operable Unit, Clean Soil from Trench between 216-U-8 and 21		SAF NO. R06-019	AIR QUALITY ☐ 15 Days / 15 Days
ICE CHEST NO. TJ-9	FIELD LOGBOOK NO. DTS-SAWS-H100	COA 121595ES20	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A	

MATRIX*
OL = OTHER LIQUID
OS = OTHER SOLID
S = SOIL
W = WATER

SPECIAL HANDLING AND/OR STORAGE: 20060299

POSSIBLE SAMPLE HAZARDS/ REMARKS

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1J2TS	GV060000734	S	04-11-06	1330	1X60mL G/P	Technetium-99 (Tc-99) 21.2 gr	None

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM DURATEK J. G. HOGAN	DATE/TIME 1335 APR 12 2006	RECEIVED BY/STORED IN TA FRAZIER	DATE/TIME 4/12/06 1335	Sample will been taken using the multiple-increment sampling program. This requires the entire sample provided in each bottle to be used in analysis. Reporting format the same as GPP, including QC.
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

000015

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UW-1			DATA PACKAGE: 60299		
VALIDATOR: TZI		LAB: WSCR		DATE: 6/16/06	
			SDG: 60299		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
BJ2T5					
					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: [illegible]

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: Per FHI, use the post-digestion spike in place of a matrix spike - low recovery J all

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: used ~~extract~~ post-digestion replicate per FHI

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

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

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

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

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

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

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

Comments: no FS

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:

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: 20060299
Matrix: SOLID
Test: TC99 by Liquid Scin.

SAF Number: R06-019
Sample Date: 04/11/06
Receive Date:04/12/06

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W060000734									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Tc-99 by Liquid Scin.	14133-76-7	U-0.2	n/a	RPD	04/18/06	0.000	20.000	
MS	Tc-99 by Liquid Scin.	14133-76-7	60	60.000	% Recov	04/18/06	75.000	125.000	
BATCH QC									
BLANK	Tc-99 by Liquid Scin.	14133-76-7	-0.3	-0.300	pCi/g	04/18/06	-10.000	1000.000	
LCS	Tc-99 by Liquid Scin.	14133-76-7	10.8	95.575	% Recov	04/18/06	75.000	125.000	

000024