

REVIEW COMMENT RECORD (RCR)

1. Date 8/22/2007		2. Review No.	
3. Project No.		Page 1 of 4	
5. Document Number(s)/Title(s) VSR07-017 Project CPP 200 Area Chemical and Radiochemical Validation – Level C	6. Program/Project/Building Number S&GRP	7. Reviewer HL Anastos	8. Organization/Group Geosciences
17. Comment Submittal Approval		9. Location/Phone 1200 Jadwin/Rm374/ 376-2444	
10. Agreement With Indicated Comment Disposition(s)		11. CLOSED	
Date _____ Organization Manager (optional) (print and sign) _____ Reviewer/Point of Contact (print and sign) <u>HL Anastos</u> Date <u>9-5-07</u>		Reviewer/Point of Contact (print and sign) _____ Date _____ Author/Organizer (print and sign) _____	
12. Item	13a. Comments	13b. Basis	13c. Recommendation
1	(p.1) Designation of "22UJ" as a flag is confusing. "UJ" is the data flag, "22" is the modified result.	Professional opinion	Clarify the second to the last sentence on the page as follows: "The sample result for acetone was detected and would be flagged as "J," but was further qualified as a non-detect estimate at the RDL due to blank contamination. The result was changed to 22, the RDL, and flagged "UJ"."
			14. Reviewer Concurrence Required (Y or N) N
			15. Disposition (provide justification if NOT accepted) (p. 1) Recommendation accepted.
2	(p.2) Clarify "Laboratory Blanks" section for same reason as in 1.	Professional opinion	Clarify "Laboratory Blanks" as follows: "All laboratory blank results were acceptable with the following exception. The acetone laboratory blank result was > the method detection limit (MDL). The sample result for acetone was a detect at <
			16. Status (p. 2) Recommendation accepted.

REVIEW COMMENT RECORD (RCR)		1. Date	8/22/2007	2. Review No.	
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12. Item	13a. Comments	13b. Basis	13c. Recommendation	14. Reviewer Concurrency Required (Y or N)	15. Disposition (provide justification if NOT accepted)	16. Status
3	(p. 2) Clear criteria are not specified in HNF-20433 regarding the MS/MSD solution containing 1-butanol. Recommend the validator's professional opinion for data qualification is accepted, and modification of HNF-20433 is suggested.	Interpretation of HNF-20433.	the required detection limit (RDL) and <10X the blank result and would be qualified as non-detect at the RDL (22) and flagged "U," but was further qualified as a non-detect estimate and flagged "U" due to a holding time infraction. The result is changed from the detected 11 to 22 (the RDL) and flagged as "U".	N	N/A	
4	(p. 35) Clear criteria are not specified in HNF-20433 regarding the MS/MSD and LCS solutions containing tributyl phosphate. Recommend the validator's professional opinion for data qualification is accepted, and modification of HNF-20433 is suggested.	Interpretation of HNF-20433.	HL Anastos to review criteria for MS/MSD in HNF-20433. No change is needed for VSR07-017.	N	N/A	

REVIEW COMMENT RECORD (RCR)

1. Date		2. Review No.				
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3. Project No.		Page 3 of 4				
12. Item	13a. Comments	13b. Basis	13c. Recommendation	14. Reviewer Concurrency Required (Y or N)	15. Disposition (provide justification if NOT accepted)	16. Status
5	(p.123-4) 48 hour holding time for nitrate, nitrite, and phosphate should be applied following extraction, not from sample collection. The qualifications for these analytes need reassessed to the criteria listed above.	Validation Services Request Form (A-6003-620) VSR# VSR07-017 Dated 7/13/07 See Comments Section.	Nitrate, nitrite, and phosphate were analyzed within the 48 hour holding time following extraction. No qualification is necessary. Document must be updated to reflect these changes.	Y	(p. 123-124) Recommendation accepted. AQA was not notified that the HT assessment had changed for nitrate, nitrite and phosphate.	
6	(p.124) The 28 day holding time for fluoride and sulfate was exceeded, which requires qualification as an estimate with a "J" flag per HNF-20433.	HNF-20433, section 9.6.	Fluoride and sulfate were analyzed one day beyond the holding time and the associated samples are required to be qualified per HNF-20433. Fluoride was not detected and should be qualified as an estimate and flagged "UJ." Sulfate was detected and should be qualified as an estimate and flagged "J." Document must be updated to reflect these changes.	Y	(p. 124) Recommendation accepted - originally not qualified based on professional judgment.	
7	(p.152) Pu-238 RPD was >35 which requires qualification as an estimate with a "J" flag per HNF-20434.	Interpretation of HNF-20434.	"J" flag must be applied to the Pu-238 data. Document must be updated to reflect this change.	Y	(p. 152) Recommendation accepted - originally not qualified based on professional judgment.	

REVIEW COMMENT RECORD (RCR)

1. Date		2. Review No.				
8/22/2007						
3. Project No.		Page 4 of 4				
12. Item	13a. Comments	13b. Basis	13c. Recommendation	14. Reviewer Concurrence Required (Y or N)	15. Disposition (provide justification if NOT accepted)	16. Status
8	<p>The validator's comment regarding 7. above (replicate error ratio (RER) <1.0) is valid. Suggest that the criteria for RPD be reviewed during the next revision of HNF-20434 to consider including evaluation of the RER or DER. Until such time as HNF-20434 is modified, the 'J' flag will be applied.</p>	<p>Professional opinion</p>	<p>HL Anastos to review criteria for RPD to allow RER evaluation in HNF-20434.</p> <p>No change is needed for VSR07-017.</p>	N	N/A	

**Project Hanford Management System
COMMENT RESOLUTION SHEET**

Document Number: VSR07-017

Revision Number

Date: Aug 31, 2007

Document Title:

Data Validation Report for FH VSR07-017 Project CFP 200 Area SDGs W04150, H2671

Reviewer:

Bill Thackaberry

Reviewers, if other than original:

Project/Organization:

FH/GRP/QA

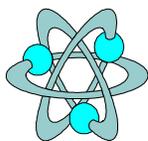
Responsible Manager:

Mike Horhota

*Comments Resolved
W. Thackaberry 9/4/07*

COMMENT(S)

Initials (if other than listed reviewer)	Section/ Step	Comments/Discrepancies	Basis	Recommendation	Resolution
	VOAs	no comment			
	SEMI VOAs	No Comment			
	Gen Chem	Pg 124, Hold times. Fluoride and Sulfate data for B195W2 should be flagged.	HNF-20433 section 9.6		(pg 124) Now flagged - originally not flagged based on professional judgement.
	Rad Chem	Pg 152, Lab Dup Samples, PU 238 for sample B197F0 should be flagged	HNF-20434 section 7.5.1		(pg 152) Now flagged - originally not flagged based on professional judgement.



Data Validation Report for Fluor Hanford

VSR07-017
Project CPP 200 Area

Chemical & Radiochemical Validation - Level C

Validation Performed By: Carl Schloesser Date: 09/05/2007

Validation Reviewed By: Cheryl A. Schloesser Date: 09/05/2007

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Date: 22 August 2007
To: Fluor Hanford Inc. (technical representative)
From: Analytical Quality Associates, Inc.
Project: CPP 200 Area
Subject: Volatile Organics - Sample Data Group (SDG) W04150

INTRODUCTION

This memorandum presents the results of data validation for SDG W04150 prepared by STL St. Louis. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B195W2	07/21/04	Soil	C	8260B

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench, DOE/RL-2006-47, Rev. 0 (SAP). 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. 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 and Sample Preservation

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements for volatile organics are analysis within 14 days of sample collection. Sample preservation requires chilling to 4 degrees Celsius.

Sample B195W2 was properly preserved but analyzed beyond the holding time and within 2X the holding time. Sample results for methylene chloride and styrene were detects and should be qualified as estimates and flagged "J." The sample result for acetone was detected and would be flagged as "J," but was further qualified as a non-detect estimate at the RDL due to blank contamination. The result was changed to 22, the RDL, and flagged "UJ". The remaining sample results were non-detects and should be qualified as estimates and flagged "UJ."

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable with the following exception. The acetone laboratory blank result was > the method detection limit (MDL). The sample result for acetone was a detect at < the required detection limit (RDL) and <10X the blank result and would be qualified as non-detect at the RDL (22) and flagged “U,” but was further qualified as a non-detect estimate and flagged “UJ” due to a holding time infraction. The result is changed from the detected 11 to 22 (the RDL) and flagged as “UJ.”

Field Blanks

No field blanks were submitted for analysis.

Equipment Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by reviewing surrogate results, matrix spike sample results, and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Surrogates

All surrogate recoveries were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable with the following exceptions. The MSD recovery for 1,2-dichloropropane was below the lower acceptance limit. The associated sample result was a non-detect and should be qualified as an estimate and flagged “UJ.” The MS recovery for 1,2-dichloroethene (total) was above the upper acceptance limit. The associated sample result was a non-detect and should not be qualified for the MS infraction. 1-Butanol was not represented in the MS/MSD spiking solution. The associated sample result was a non-detect and should be qualified as an estimate and flagged “UJ.”

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exception. 1-Butanol was not represented in the LCS spiking solution. The associated sample result was a non-detect and should be qualified as an estimate and flagged “UJ.”

- **Precision**

Precision is evaluated by reviewing MS/MSD results and field duplicate sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference limits are $\pm 30\%$. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

MS/MSD Samples

All MS/MSD relative percent difference values were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDG W04150 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

Minor deficiencies leading to qualification of sample results as estimates were due to a holding time infraction, laboratory blank contamination, a MSD recovery infraction, and lack of LCS and MS/MSD data. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

FHI, Contract #29774, *Validation of Radiological and Chemical Analytical Data*, Fluor Hanford Incorporated, August 24, 2006.

DOE/RL-2006-47, Rev. 0, *Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench*, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.
- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDL. The data should be considered usable for decision-making purposes.
- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.
- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.
- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2
Summary of Data Qualification

Volatile Organics Data Qualification Summary			
SDG: W04150	Reviewer: AQA	Project: CPP 200 Area	Page 1 of 1
Analyte(s)	Qualifier	Samples Affected	Reason
Acetone	22UJ	B195W2	Analyzed beyond the holding time but within 2X the holding time, laboratory blank contamination
1,2-Dichloropropane	UJ	B195W2	Analyzed beyond the holding time but within 2X the holding time, low MSD recovery
1-Butanol	UJ	B195W2	Analyzed beyond the holding time but within 2X the holding time, lack of MS/MSD & LCS data
Methylene chloride & Styrene	J	B195W2	Analyzed beyond the holding time but within 2X the holding time
All remaining VOCs	UJ	B195W2	Analyzed beyond the holding time but within 2X the holding time

Comments: None

Appendix 3

Annotated Laboratory Reports

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Client Sample ID: B195W2

GC/MS Volatiles

Lot-Sample #...: F4H120314-001 Work Order #...: GM17P1A7 Matrix.....: SOLID
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 08/18/04 Analysis Date...: 08/18/04
 Prep Batch #...: 4232079
 Dilution Factor: 1
 * Moisture.....: 7.3 Method.....: SW846 8260B

PARAMETER	RESULT		REPORTING		
			LIMIT	UNITS	MDL
n-Butylbenzene	ND	UJ	5.4	ug/kg	0.81
1-Butanol	ND	UJ	54	ug/kg	36
cis-1,2-Dichloroethene	ND	UJ	5.4	ug/kg	0.22
trans-1,2-Dichloroethene	ND	UJ	5.4	ug/kg	0.33
Chloromethane	ND	UJ	11	ug/kg	0.25
Vinyl chloride	ND	UJ	5.4	ug/kg	0.69
Bromomethane	ND	UJ	11	ug/kg	0.96
Chloroethane	ND	UJ	11	ug/kg	0.60
Acetone	11	J, B 22UJ	22	ug/kg	1.4
1,1-Dichloroethene	ND	UJ	5.4	ug/kg	0.73
Methylene chloride	11	J	5.4	ug/kg	2.8
Carbon disulfide	ND	UJ	5.4	ug/kg	0.29
1,1-Dichloroethane	ND	UJ	5.4	ug/kg	0.23
2-Butanone	ND	UJ	22	ug/kg	1.2
1,2-Dichloroethene (total)	ND	UJ	11	ug/kg	0.66
Chloroform	ND	UJ	5.4	ug/kg	0.13
1,1,1-Trichloroethane	ND	UJ	5.4	ug/kg	0.12
Carbon tetrachloride	ND	UJ	5.4	ug/kg	0.15
1,2-Dichloroethane	ND	UJ	5.4	ug/kg	0.15
Benzene	ND	UJ	5.4	ug/kg	0.12
Trichloroethene	ND	UJ	5.4	ug/kg	0.065
1,2-Dichloropropane	ND	UJ	5.4	ug/kg	0.11
Bromodichloromethane	ND	UJ	5.4	ug/kg	0.076
4-Methyl-2-pentanone	ND	UJ	22	ug/kg	0.97
cis-1,3-Dichloropropene	ND	UJ	5.4	ug/kg	0.16
Toluene	ND	UJ	5.4	ug/kg	0.64
trans-1,3-Dichloropropene	ND	UJ	5.4	ug/kg	0.57
1,1,2-Trichloroethane	ND	UJ	5.4	ug/kg	0.83
2-Hexanone	ND	UJ	22	ug/kg	1.4
Tetrachloroethene	ND	UJ	5.4	ug/kg	0.22
Dibromochloromethane	ND	UJ	5.4	ug/kg	0.64
Chlorobenzene	ND	UJ	5.4	ug/kg	0.13
Ethylbenzene	ND	UJ	5.4	ug/kg	0.41
Xylenes (total)	ND	UJ	5.4	ug/kg	0.88
Styrene	0.41	J	5.4	ug/kg	0.22
Bromoform	ND	UJ	5.4	ug/kg	0.67
1,1,2,2-Tetrachloroethane	ND	UJ	5.4	ug/kg	0.79

(Continued on next page)

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Client Sample ID: B195W2

GC/MS Volatiles

Lot-Sample #...: F4H120314-001 Work Order #...: GM17P1A7 Matrix.....: SOLID

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Toluene-d8	100	(80 - 130)
Dibromofluoromethane	97	(78 - 130)
1,2-Dichloroethane-d4	99	(72 - 134)
4-Bromofluorobenzene	104	(68 - 150)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

FLUOR HANFORD IC

B195W2

GC/MS Volatiles

Lot-Sample #: F4H120314-001

Work Order #: GM17P1A7

Matrix: SOLID

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

<u>PARAMETER</u>	<u>CAS #</u>	<u>ESTIMATED RESULT</u>	<u>RETENTION TIME</u>	<u>UNITS</u>
None				ug/kg

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F4H120314
W04150

This report contains the analytical results for the sample received under chain of custody by STL St. Louis on August 12, 2004. This sample is associated with your F04-015 project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

The samples were analyzed outside the 14-day holding time for soils for all parameters except metals. The lab did not receive the samples until after the holding time had expired.

Observations/Nonconformances

Metals

The MS/MSD recovery for Mercury is outside the established QC limits. The Mercury concentration in the original sample is greater than 4 times the amount spiked, making percent recovery information ineffective. Method performance is demonstrated by acceptable LCS recovery.

The MS recovery for Silver is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH - Diesel & Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples associated with this method blank demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Case Narrative
LOT NUMBER: F4H120314
W04150

Semi-Volatiles

The LCS recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable MS/MSD recoveries.

Volatiles

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis.

The surrogate recovery of DBFM is out high in MS, which caused four front end compounds to be out high and the Bromomethane RPD to be out. Sample purge efficiency and compliance is demonstrated by the remaining acceptable MS/MSD and LCS recoveries.

Oil & Grease

The MS/MSD associated with this sample was run on sample B193K0 from SD6 W04366. both samples were included in the same analytical batch.

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: CPP 200 Area			DATA PACKAGE: VSR07-017		
VALIDATOR: Carl Schloesslin		LAB: STL St. Louis		DATE: 07-31-2007	
			SDG: W04150		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
X					
SAMPLES/MATRIX Soil sample B195W2					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: None

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: MB detection: Acetone 6.7 ug/kg

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: 1,2-dichloroethene (total) (non-SAP analyte) MS %R = 129%

1,2-dichloropropane (non-SAP analyte) MSD %R = 74%

1-Butanol not spiked in MS/MSD or LCS

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: None

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No N/A
Internal 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: Sample analyzed 28 days after collection.

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: None

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: _____

Appendix 6

Additional Documentation Requested By Client

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F4H120314 Work Order #...: GM17P1C5-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H120314-001 GM17P1C6-MSD
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 08/18/04 Analysis Date...: 08/18/04
 Prep Batch #...: 4232079
 Dilution Factor: 1 % Moisture.....: 7.3

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
n-Butylbenzene	ND	53.7	52.8	ug/kg	98		SW846 8260B
	ND	53.6	55.7	ug/kg	104	5.2	SW846 8260B
cis-1,2-Dichloroethene	ND	53.7	68.5	ug/kg	128		SW846 8260B
	ND	53.6	53.9	ug/kg	101	24	SW846 8260B
trans-1,2-Dichloroethene	ND	53.7	69.7	ug/kg	130 a		SW846 8260B
	ND	53.6	52.8	ug/kg	99	28	SW846 8260B
Chloromethane	ND	53.7	51.0	ug/kg	95		SW846 8260B
	ND	53.6	39.3	ug/kg	73	26	SW846 8260B
Vinyl chloride	ND	53.7	60.2	ug/kg	112		SW846 8260B
	ND	53.6	44.3	ug/kg	83	30	SW846 8260B
Bromomethane	ND	53.7	51.8	ug/kg	96		SW846 8260B
	ND	53.6	37.4	ug/kg	70 p	32	SW846 8260B
Chloroethane	ND	53.7	68.0	ug/kg	127		SW846 8260B
	ND	53.6	52.6	ug/kg	98	26	SW846 8260B
Acetone	11	53.7	66.1	ug/kg	102		SW846 8260B
	11	53.6	53.7	ug/kg	79	21	SW846 8260B
1,1-Dichloroethene	ND	53.7	67.0	ug/kg	125		SW846 8260B
	ND	53.6	51.9	ug/kg	97	25	SW846 8260B
Methylene chloride	11	53.7	72.2	ug/kg	113		SW846 8260B
	11	53.6	54.0	ug/kg	79	29	SW846 8260B
Carbon disulfide	ND	53.7	72.8	ug/kg	135		SW846 8260B
	ND	53.6	57.4	ug/kg	107	24	SW846 8260B
1,1-Dichloroethane	ND	53.7	66.9	ug/kg	125		SW846 8260B
	ND	53.6	53.3	ug/kg	99	23	SW846 8260B
2-Butanone	ND	53.7	65.5	ug/kg	122		SW846 8260B
	ND	53.6	53.4	ug/kg	100	20	SW846 8260B
1,2-Dichloroethene (total)	ND	107	138	ug/kg	129 a		SW846 8260B
	ND	107	107	ug/kg	100	26	SW846 8260B
Chloroform	ND	53.7	67.6	ug/kg	126		SW846 8260B
	ND	53.6	53.3	ug/kg	99	24	SW846 8260B
1,1,1-Trichloroethane	ND	53.7	63.4	ug/kg	118		SW846 8260B
	ND	53.6	55.6	ug/kg	104	13	SW846 8260B
Carbon tetrachloride	ND	53.7	53.2	ug/kg	99		SW846 8260B
	ND	53.6	54.9	ug/kg	102	3.2	SW846 8260B
1,2-Dichloroethane	ND	53.7	51.1	ug/kg	95		SW846 8260B
	ND	53.6	55.9	ug/kg	104	9.0	SW846 8260B
Benzene	ND	53.7	50.0	ug/kg	93		SW846 8260B
	ND	53.6	51.8	ug/kg	97	3.4	SW846 8260B

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MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F4H120314 Work Order #...: GM17P1C5-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H120314-001 GM17P1C6-MSD

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Trichloroethene	ND	53.7	50.5	ug/kg	94		SW846 8260B
	ND	53.6	38.2	ug/kg	71	28	SW846 8260B
1,2-Dichloropropane	ND	53.7	47.6	ug/kg	89		SW846 8260B
	ND	53.6	39.5	ug/kg	74 a	19	SW846 8260B
Bromodichloromethane	ND	53.7	51.3	ug/kg	96		SW846 8260B
	ND	53.6	41.3	ug/kg	77	22	SW846 8260B
4-Methyl-2-pentanone	ND	53.7	45.6	ug/kg	85		SW846 8260B
	ND	53.6	39.8	ug/kg	74	14	SW846 8260B
cis-1,3-Dichloropropene	ND	53.7	52.2	ug/kg	97		SW846 8260B
	ND	53.6	42.7	ug/kg	80	20	SW846 8260B
Toluene	ND	53.7	54.3	ug/kg	101		SW846 8260B
	ND	53.6	58.5	ug/kg	109	7.5	SW846 8260B
trans-1,3-Dichloropropene	ND	53.7	59.3	ug/kg	110		SW846 8260B
	ND	53.6	66.4	ug/kg	124	11	SW846 8260B
1,1,2-Trichloroethane	ND	53.7	51.9	ug/kg	97		SW846 8260B
	ND	53.6	57.5	ug/kg	107	10	SW846 8260B
2-Hexanone	ND	53.7	54.5	ug/kg	102		SW846 8260B
	ND	53.6	64.1	ug/kg	119	16	SW846 8260B
Tetrachloroethene	ND	53.7	42.3	ug/kg	79		SW846 8260B
	ND	53.6	44.7	ug/kg	83	5.7	SW846 8260B
Dibromochloromethane	ND	53.7	52.7	ug/kg	98		SW846 8260B
	ND	53.6	54.5	ug/kg	102	3.4	SW846 8260B
Chlorobenzene	ND	53.7	52.0	ug/kg	97		SW846 8260B
	ND	53.6	56.4	ug/kg	105	8.2	SW846 8260B
Ethylbenzene	ND	53.7	52.9	ug/kg	98		SW846 8260B
	ND	53.6	57.0	ug/kg	106	7.5	SW846 8260B
Styrene	0.41	53.7	52.6	ug/kg	97		SW846 8260B
	0.41	53.6	56.5	ug/kg	105	7.2	SW846 8260B
Bromoform	ND	53.7	48.8	ug/kg	91		SW846 8260B
	ND	53.6	53.9	ug/kg	101	9.9	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	53.7	49.3	ug/kg	92		SW846 8260B
	ND	53.6	54.7	ug/kg	102	10	SW846 8260B
m-Xylene & p-Xylene	ND	107	104	ug/kg	97		SW846 8260B
	ND	107	114	ug/kg	106	8.9	SW846 8260B
o-Xylene	ND	53.7	53.3	ug/kg	99		SW846 8260B
	ND	53.6	56.5	ug/kg	105	5.9	SW846 8260B
1,3-Dichlorobenzene	ND	53.7	51.5	ug/kg	96		SW846 8260B
	ND	53.6	54.4	ug/kg	102	5.6	SW846 8260B
1,4-Dichlorobenzene	ND	53.7	49.1	ug/kg	91		SW846 8260B
	ND	53.6	54.9	ug/kg	102	11	SW846 8260B
1,2-Dichlorobenzene	ND	53.7	51.5	ug/kg	96		SW846 8260B
	ND	53.6	56.1	ug/kg	105	8.5	SW846 8260B

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: F4H120314 Work Order #....: GM17P1C5-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H120314-001 GM17P1C6-MSD

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Bromobenzene	ND	53.7	53.3	ug/kg	99		SW846 8260B
	ND	53.6	53.3	ug/kg	99	0.08	SW846 8260B
Bromochloromethane	ND	53.7	63.5	ug/kg	118		SW846 8260B
	ND	53.6	51.8	ug/kg	97	20	SW846 8260B
sec-Butylbenzene	ND	53.7	50.3	ug/kg	94		SW846 8260B
	ND	53.6	54.1	ug/kg	101	7.2	SW846 8260B
tert-Butylbenzene	ND	53.7	46.9	ug/kg	87		SW846 8260B
	ND	53.6	49.4	ug/kg	92	5.3	SW846 8260B
Allyl chloride	ND	53.7	76.1	ug/kg	142 a		SW846 8260B
	ND	53.6	60.5	ug/kg	113	23	SW846 8260B
2-Chlorotoluene	ND	53.7	54.5	ug/kg	101		SW846 8260B
	ND	53.6	58.2	ug/kg	109	6.6	SW846 8260B
4-Chlorotoluene	ND	53.7	50.3	ug/kg	94		SW846 8260B
	ND	53.6	53.7	ug/kg	100	6.6	SW846 8260B
Cyclohexanone	ND	537	662	ug/kg	123		SW846 8260B
	ND	536	740	ug/kg	138	11	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	ND	53.7	51.9	ug/kg	97		SW846 8260B
	ND	53.6	59.5	ug/kg	111	14	SW846 8260B
1,2-Dibromoethane (EDB)	ND	53.7	51.0	ug/kg	95		SW846 8260B
	ND	53.6	54.5	ug/kg	102	6.7	SW846 8260B
trans-1,4-Dichloro-2-butene	ND	53.7	54.3	ug/kg	101		SW846 8260B
	ND	53.6	58.1	ug/kg	108	6.7	SW846 8260B
Dichlorodifluoromethane (Freon 12)	ND	53.7	43.1	ug/kg	80		SW846 8260B
	ND	53.6	32.2	ug/kg	60	29	SW846 8260B
1,3-Dichloropropane	ND	53.7	51.6	ug/kg	96		SW846 8260B
	ND	53.6	58.6	ug/kg	109	13	SW846 8260B
2,2-Dichloropropane	ND	53.7	68.4	ug/kg	127 a		SW846 8260B
	ND	53.6	55.2	ug/kg	103	21	SW846 8260B
1,1-Dichloropropene	ND	53.7	53.8	ug/kg	100		SW846 8260B
	ND	53.6	57.5	ug/kg	107	6.7	SW846 8260B
Ethyl ether	ND	53.7	58.1	ug/kg	108		SW846 8260B
	ND	53.6	46.2	ug/kg	86	23	SW846 8260B
Ethyl methacrylate	ND	53.7	53.2	ug/kg	99		SW846 8260B
	ND	53.6	59.5	ug/kg	111	11	SW846 8260B
Freon 113	ND	53.7	69.2	ug/kg	129		SW846 8260B
	ND	53.6	53.8	ug/kg	100	25	SW846 8260B

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MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: F4H120314 Work Order #....: GM17P1C5-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H120314-001 GM17P1C6-MSD

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Hexachlorobutadiene	ND	53.7	45.8	ug/kg	85		SW846 8260B
	ND	53.6	45.5	ug/kg	85	0.78	SW846 8260B
n-Hexane	ND	53.7	59.1	ug/kg	110		SW846 8260B
	ND	53.6	47.0	ug/kg	88	23	SW846 8260B
Isopropylbenzene	ND	53.7	59.0	ug/kg	110		SW846 8260B
	ND	53.6	62.6	ug/kg	117	6.0	SW846 8260B
4-Isopropyltoluene	ND	53.7	55.4	ug/kg	103		SW846 8260B
	ND	53.6	59.3	ug/kg	111	6.8	SW846 8260B
Methyl methacrylate	ND	53.7	53.7	ug/kg	100		SW846 8260B
	ND	53.6	42.6	ug/kg	79	23	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	53.7	67.7	ug/kg	126		SW846 8260B
	ND	53.6	54.8	ug/kg	102	21	SW846 8260B
Naphthalene	ND	53.7	44.1	ug/kg	82		SW846 8260B
	ND	53.6	49.4	ug/kg	92	11	SW846 8260B
n-Propylbenzene	ND	53.7	55.3	ug/kg	103		SW846 8260B
	ND	53.6	60.5	ug/kg	113	8.9	SW846 8260B
1,1,1,2-Tetrachloroethane	ND	53.7	52.9	ug/kg	98		SW846 8260B
	ND	53.6	54.9	ug/kg	102	3.7	SW846 8260B
Tetrahydrofuran	ND	53.7	57.9	ug/kg	108		SW846 8260B
	ND	53.6	52.9	ug/kg	99	9.1	SW846 8260B
1,2,3-Trichlorobenzene	ND	53.7	46.5	ug/kg	87		SW846 8260B
	ND	53.6	46.8	ug/kg	87	0.62	SW846 8260B
1,2,4-Trichloro- benzene	ND	53.7	48.5	ug/kg	90		SW846 8260B
	ND	53.6	50.3	ug/kg	94	3.6	SW846 8260B
Trichlorofluoromethane	ND	53.7	66.9	ug/kg	125		SW846 8260B
	ND	53.6	51.6	ug/kg	96	26	SW846 8260B
1,3,5-Trimethylbenzene	ND	53.7	53.7	ug/kg	100		SW846 8260B
	ND	53.6	58.1	ug/kg	108	8.0	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Toluene-d8	108	(80 - 130)
	109	(80 - 130)
Dibromofluoromethane	134 *	(78 - 130)
	99	(78 - 130)
1,2-Dichloroethane-d4	103	(72 - 134)
	99	(72 - 134)

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MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F4H120314 Work Order #...: GM17P1C5-MS Matrix.....: SOLID
MS Lot-Sample #: F4H120314-001 GM17P1C6-MSD

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
4-Bromofluorobenzene	105	(68 - 150)
	116	(68 - 150)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

p Relative percent difference (RPD) is outside stated control limits.

a Spiked analyte recovery is outside stated control limits.

* Surrogate recovery is outside stated control limits.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F4H120314
 MB Lot-Sample #: F4H190000-079

Work Order #...: GNF9N1AA

Matrix.....: SOLID

Analysis Date...: 08/18/04
 Dilution Factor: 1

Prep Date.....: 08/18/04

Prep Batch #...: 4232079

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
cis-1,2-Dichloroethene	ND	5.0	ug/kg	SW846 8260B
trans-1,2-Dichloroethene	ND	5.0	ug/kg	SW846 8260B
1-Butanol	ND	50	ug/kg	SW846 8260B
n-Butylbenzene	ND	5.0	ug/kg	SW846 8260B
Chloromethane	ND	10	ug/kg	SW846 8260B
Vinyl chloride	ND	5.0	ug/kg	SW846 8260B
Bromomethane	ND	10	ug/kg	SW846 8260B
Chloroethane	ND	10	ug/kg	SW846 8260B
Acetone	6.7 J	20	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/kg	SW846 8260B
Methylene chloride	ND	5.0	ug/kg	SW846 8260B
Carbon disulfide	ND	5.0	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Butanone	ND	20	ug/kg	SW846 8260B
1,2-Dichloroethene (total)	ND	10	ug/kg	SW846 8260B
Chloroform	ND	5.0	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
Benzene	ND	5.0	ug/kg	SW846 8260B
Trichloroethene	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloropropane	ND	5.0	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.0	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
Toluene	ND	5.0	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Hexanone	ND	20	ug/kg	SW846 8260B
Tetrachloroethene	ND	5.0	ug/kg	SW846 8260B
Dibromochloromethane	ND	5.0	ug/kg	SW846 8260B
Chlorobenzene	ND	5.0	ug/kg	SW846 8260B
Ethylbenzene	ND	5.0	ug/kg	SW846 8260B
Xylenes (total)	ND	5.0	ug/kg	SW846 8260B
Styrene	ND	5.0	ug/kg	SW846 8260B
Bromoform	ND	5.0	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	SW846 8260B

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METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F4H120314

Work Order #...: GNF9N1AA

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Toluene-d8	101	(80 - 130)		
Dibromofluoromethane	96	(78 - 130)		
1,2-Dichloroethane-d4	105	(72 - 134)		
4-Bromofluorobenzene	100	(68 - 150)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

_____ *PS*

FLUOR HANFORD IC
Method Blank Report
GC/MS Volatiles

Lot-Sample #: F4H190000-079 B Work Order #: GNF9N1AA Matrix: SOLID

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

<u>PARAMETER</u>	<u>CAS #</u>	<u>ESTIMATED RESULT</u>	<u>RETENTION TIME</u>	<u>UNITS</u>
None				ug/kg



LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F4H120314 Work Order #...: GNF9N1AC Matrix.....: SOLID
 LCS Lot-Sample#: F4H190000-079
 Prep Date.....: 08/18/04 Analysis Date...: 08/18/04
 Prep Batch #...: 4232079
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
n-Butylbenzene	50.0	54.9	ug/kg	110	SW846 8260B
cis-1,2-Dichloroethene	50.0	52.2	ug/kg	104	SW846 8260B
trans-1,2-Dichloroethene	50.0	51.7	ug/kg	103	SW846 8260B
Chloromethane	50.0	38.3	ug/kg	77	SW846 8260B
Vinyl chloride	50.0	45.7	ug/kg	91	SW846 8260B
Bromomethane	50.0	37.0	ug/kg	74	SW846 8260B
Chloroethane	50.0	51.2	ug/kg	102	SW846 8260B
Acetone	50.0	48.4	ug/kg	97	SW846 8260B
1,1-Dichloroethene	50.0	49.9	ug/kg	100	SW846 8260B
Methylene chloride	50.0	50.6	ug/kg	101	SW846 8260B
Carbon disulfide	50.0	55.7	ug/kg	111	SW846 8260B
1,1-Dichloroethane	50.0	51.1	ug/kg	102	SW846 8260B
2-Butanone	50.0	54.0	ug/kg	108	SW846 8260B
1,2-Dichloroethene (total)	100	104	ug/kg	104	SW846 8260B
Chloroform	50.0	52.2	ug/kg	104	SW846 8260B
1,1,1-Trichloroethane	50.0	52.9	ug/kg	106	SW846 8260B
Carbon tetrachloride	50.0	53.7	ug/kg	107	SW846 8260B
1,2-Dichloroethane	50.0	54.5	ug/kg	109	SW846 8260B
Benzene	50.0	48.2	ug/kg	96	SW846 8260B
Trichloroethene	50.0	45.2	ug/kg	90	SW846 8260B
1,2-Dichloropropane	50.0	49.2	ug/kg	98	SW846 8260B
Bromodichloromethane	50.0	52.4	ug/kg	105	SW846 8260B
4-Methyl-2-pentanone	50.0	53.2	ug/kg	106	SW846 8260B
cis-1,3-Dichloropropene	50.0	54.2	ug/kg	108	SW846 8260B
Toluene	50.0	53.4	ug/kg	107	SW846 8260B
trans-1,3-Dichloropropene	50.0	63.0	ug/kg	126	SW846 8260B
1,1,2-Trichloroethane	50.0	55.2	ug/kg	110	SW846 8260B
2-Hexanone	50.0	65.3	ug/kg	131	SW846 8260B
Tetrachloroethene	50.0	42.8	ug/kg	86	SW846 8260B
Dibromochloromethane	50.0	53.3	ug/kg	107	SW846 8260B
Chlorobenzene	50.0	53.7	ug/kg	107	SW846 8260B
Ethylbenzene	50.0	53.8	ug/kg	108	SW846 8260B
Styrene	50.0	53.2	ug/kg	106	SW846 8260B

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F4H120314
LCS Lot-Sample#: F4H190000-079

Work Order #...: GNF9N1AC

Matrix.....: SOLID

<u>PARAMETER</u>	<u>SPIKE AMOUNT</u>	<u>MEASURED AMOUNT</u>	<u>UNITS</u>	<u>PERCENT RECOVERY</u>	<u>METHOD</u>
Bromoform	50.0	51.6	ug/kg	103	SW846 8260B
1,1,2,2-Tetrachloroethane	50.0	54.3	ug/kg	109	SW846 8260B
m-Xylene & p-Xylene	100	107	ug/kg	107	SW846 8260B
o-Xylene	50.0	53.3	ug/kg	107	SW846 8260B
1,3-Dichlorobenzene	50.0	52.2	ug/kg	104	SW846 8260B
1,4-Dichlorobenzene	50.0	50.6	ug/kg	101	SW846 8260B
1,2-Dichlorobenzene	50.0	51.4	ug/kg	103	SW846 8260B
Bromobenzene	50.0	50.2	ug/kg	100	SW846 8260B
Bromochloromethane	50.0	49.7	ug/kg	99	SW846 8260B
sec-Butylbenzene	50.0	51.7	ug/kg	103	SW846 8260B
tert-Butylbenzene	50.0	46.6	ug/kg	93	SW846 8260B
Allyl chloride	50.0	57.3	ug/kg	115	SW846 8260B
2-Chlorotoluene	50.0	56.4	ug/kg	113	SW846 8260B
4-Chlorotoluene	50.0	52.1	ug/kg	104	SW846 8260B
Cyclohexanone	500	703	ug/kg	141	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	50.0	54.4	ug/kg	109	SW846 8260B
1,2-Dibromoethane (EDB)	50.0	53.0	ug/kg	106	SW846 8260B
trans-1,4-Dichloro-2-butene	50.0	57.7	ug/kg	115	SW846 8260B
Dichlorodifluoromethane (Freon 12)	50.0	34.0	ug/kg	68	SW846 8260B
1,3-Dichloropropane	50.0	56.6	ug/kg	113	SW846 8260B
2,2-Dichloropropane	50.0	53.3	ug/kg	107	SW846 8260B
1,1-Dichloropropene	50.0	55.5	ug/kg	111	SW846 8260B
Ethyl methacrylate	50.0	58.0	ug/kg	116	SW846 8260B
Freon 113	50.0	54.2	ug/kg	108	SW846 8260B
Hexachlorobutadiene	50.0	46.3	ug/kg	93	SW846 8260B
n-Hexane	50.0	48.3	ug/kg	97	SW846 8260B
Isopropylbenzene	50.0	60.0	ug/kg	120	SW846 8260B
4-Isopropyltoluene	50.0	55.5	ug/kg	111	SW846 8260B
Methyl methacrylate	50.0	58.0	ug/kg	116	SW846 8260B
Methyl tert-butyl ether (MTBE)	50.0	54.5	ug/kg	109	SW846 8260B
Naphthalene	50.0	46.1	ug/kg	92	SW846 8260B
n-Propylbenzene	50.0	55.8	ug/kg	112	SW846 8260B
1,1,1,2-Tetrachloroethane	50.0	51.0	ug/kg	102	SW846 8260B

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F4H120314 Work Order #...: GNF9N1AC Matrix.....: SOLID
 LCS Lot-Sample#: F4H190000-079

<u>PARAMETER</u>	<u>SPIKE AMOUNT</u>	<u>MEASURED AMOUNT</u>	<u>UNITS</u>	<u>PERCENT RECOVERY</u>	<u>METHOD</u>
Tetrahydrofuran	50.0	46.6	ug/kg	93	SW846 8260B
1,2,3-Trichlorobenzene	50.0	46.6	ug/kg	93	SW846 8260B
1,2,4-Trichloro- benzene	50.0	47.5	ug/kg	95	SW846 8260B
Trichlorofluoromethane	50.0	51.8	ug/kg	104	SW846 8260B
1,3,5-Trimethylbenzene	50.0	54.2	ug/kg	108	SW846 8260B
Ethyl ether	50.0	44.0	ug/kg	88	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Toluene-d8	101	(88 - 115)
Dibromofluoromethane	94	(84 - 120)
1,2-Dichloroethane-d4	98	(78 - 122)
4-Bromofluorobenzene	97	(80 - 120)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Date: 09 August 2007
To: Fluor Hanford Inc. (technical representative)
From: Analytical Quality Associates, Inc.
Project: CPP 200 Area
Subject: Semivolatile Organics - Sample Data Group (SDG) W04150

INTRODUCTION

This memorandum presents the results of data validation for SDG W04150 prepared by STL St. Louis. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B195W2	07/21/04	Soil	C	See note 1

1 - Semivolatile organics by 8270C and petroleum hydrocarbons by 8015

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench, DOE/RL-2006-47, Rev. 0 (SAP). 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. 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 and Sample Preservation

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements for semivolatile organics and WTPH-D are extraction within 14 days of sample collection and analysis within 40 days of sample extraction. WTPH-G requires analysis within 14 days from sample collection. Sample preservation requires chilling to 4 degrees Celsius.

Sample B195W2 was properly preserved but extracted beyond the holding time and within 2X the holding time for SVOA and WTPH-D, and analyzed beyond 2X the holding time for WTPH-G. Sample results for all SVOCs, WTPH-D and kerosene were non-detects and should be qualified as estimates and flagged "UJ." The sample result for WTPH-G was a non-detect and should be qualified as unusable and flagged "UR." It should be noted that the SAP states that the WTPH-D holding time is 14 days from sample collection to analysis. This guidance is incorrect and was not followed for data validation.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Equipment Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by reviewing surrogate results, matrix spike sample results, and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Surrogates

All surrogate recoveries were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable with the following exceptions. The MS and MSD recoveries for WTPH-D were below the lower acceptance limit. The sample results for WTPH-D and kerosene were non-detects and should be qualified as estimates and flagged "UJ." Tributyl phosphate (SAP analyte) and 1,4-dichlorobenzene (non-SAP analyte) were not represented in the SVOA MS/MSD spiking solution (large list). The sample result for tributyl phosphate was a non-detect and should be qualified as an estimate and flagged "UJ." The sample result for 1,4-dichlorobenzene was not qualified for the lack of MS/MSD data. Finally, the SVOA MS/MSD were performed on an unknown solid sample from another SDG. No sample data were qualified as a result.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable. Tributyl phosphate (SAP analyte) and 1,4-dichlorobenzene (non-SAP analyte) were not represented in the SVOA LCS spiking solution (large list). The sample result for tributyl phosphate was a non-detect and should

be qualified as an estimate and flagged “UJ.” The sample result for 1,4-dichlorobenzene was not qualified for the lack of LCS data.

- **Precision**

Precision is evaluated by reviewing MS/MSD results and field duplicate sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference limits are $\pm 30\%$. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

MS/MSD Samples

All MS/MSD relative percent difference values were acceptable.

Field Duplicate Samples

All field duplicate results were acceptable.

- **Detection Limits**

Reported method detection limits (MDLs) are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDG W04150 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 for WTPH-G was 0%. The completion percentage for SVOA and WTPH-D were both 100%.

MAJOR DEFICIENCIES

A major deficiency leading to qualification of the WTPH-G result for sample B195W2 as unusable was due to a holding time infraction.

MINOR DEFICIENCIES

Minor deficiencies leading to qualification of sample results as estimates were due to a SVOA holding time infraction, lack of tributyl phosphate MS/MSD and LCS data, and WTPH-D holding time and MS/MSD recovery infractions. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

FHI, Contract #29774, *Validation of Radiological and Chemical Analytical Data*, Fluor Hanford Incorporated, August 24, 2006.

DOE/RL-2006-47, Rev. 0, *Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench*, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.
- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDL. The data should be considered usable for decision-making purposes.
- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.
- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.
- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2
Summary of Data Qualification

Semivolatile Organics Data Qualification Summary			
SDG W04150	Reviewer: AQA	Project: CPP200 Area	Page 1 of 1
Analyte(s)	Qualifier	Samples Affected	Reason
WTPH-Gasoline	UR	B195W2	Analyzed beyond 2X the holding time.
WTPH-Diesel & Kerosene	UJ	B195W2	Extracted beyond the holding time but within 2X the holding time, low MS & MSD recoveries.
Tributyl phosphate	UJ	B195W2	Extracted beyond the holding time but within 2X the holding time, lack of MS/MSD & LCS data
All remaining SVOCs	UJ	B195W2	Extracted beyond the holding time but within 2X the holding time.

Comments: None

Appendix 3

Annotated Laboratory Reports

FLUOR HANFORD IC

Client Sample ID: B195W2

GC/MS Semivolatiles

Lot-Sample #....: F4H120314-001 Work Order #....: GM17P1A4 Matrix.....: SOLID
 Date Sampled....: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 08/14/04 Analysis Date...: 08/18/04
 Prep Batch #....: 4227121
 Dilution Factor: 1
 % Moisture.....: 7.3 Method.....: SW846 8270C

PARAMETER	RESULT		REPORTING		
			LIMIT	UNITS	MDL
Phenol	ND	UJ	360	ug/kg	94
2-Chlorophenol	ND	UJ	360	ug/kg	15
N-Nitrosodi-n-propyl-amine	ND	UJ	360	ug/kg	21
1,2,4-Trichloro-benzene	ND	7-31-07 UJ	360	ug/kg	19
4-Chloro-3-methylphenol	ND	UJ	360	ug/kg	29
Acenaphthene	ND	UJ	360	ug/kg	18
4-Nitrophenol	ND	UJ	1700	ug/kg	46
2,4-Dinitrotoluene	ND	UJ	360	ug/kg	19
Diethyl phthalate	ND	UJ	360	ug/kg	44
Pentachlorophenol	ND	UJ	1700	ug/kg	130
Di-n-butyl phthalate	ND	UJ	360	ug/kg	30
Pyrene	ND	UJ	360	ug/kg	24
Tributyl phosphate	ND	UJ	360	ug/kg	360
1,4-Dichlorobenzene	ND	UJ	360	ug/kg	15

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
2-Fluorophenol	70	(40 - 103)
Phenol-d5	67	(36 - 105)
Nitrobenzene-d5	76	(45 - 114)
2-Fluorobiphenyl	80	(49 - 120)
2,4,6-Tribromophenol	79	(39 - 114)
Terphenyl-d14	88	(42 - 108)

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

REVISED
W. Myers

7/19/05

~~0000024~~

FLUOR HANFORD IC

Client Sample ID: B195W2

GC Volatiles

Lot-Sample #....: F4H120314-001 Work Order #....: GM17P1A6 Matrix.....: SOLID
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 09/07/04 Analysis Date...: 09/07/04
 Prep Batch #....: 4252070
 Dilution Factor: 1
 % Moisture.....: 7.3 Method.....: SW846 8015 MOD

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>	<u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
Volatile Petroleum Hydrocarbons	ND <i>LS</i> UR 7-31-07		0.10	mg/kg	0.029
<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>			
Trifluorotoluene	RECOVERY	LIMITS			
	61	(28 - 124)			

FLUOR HANFORD IC

Client Sample ID: B195W2

GC Semivolatiles

Lot-Sample #...: F4H120314-001 Work Order #...: GM17P1A5 Matrix.....: SOLID
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 08/13/04 Analysis Date...: 08/18/04
 Prep Batch #...: 4226332
 Dilution Factor: 1
 % Moisture.....: 7.3 Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Kerosene	ND UJ	27	mg/kg	27
TPH - Diesel Range - WTPH-D	ND UJ 7-31-07	27	mg/kg	2.0
<u>SURROGATE</u>		<u>PERCENT</u>	<u>RECOVERY</u>	
o-Terphenyl	32	<u>RECOVERY</u>	<u>LIMITS</u>	
			(10 - 150)	

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F4H120314
W04150

This report contains the analytical results for the sample received under chain of custody by STL St. Louis on August 12, 2004. This sample is associated with your F04-015 project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

The samples were analyzed outside the 14-day holding time for soils for all parameters except metals. The lab did not receive the samples until after the holding time had expired.

Observations/Nonconformances

Metals

The MS/MSD recovery for Mercury is outside the established QC limits. The Mercury concentration in the original sample is greater than 4 times the amount spiked, making percent recovery information ineffective. Method performance is demonstrated by acceptable LCS recovery.

The MS recovery for Silver is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH - Diesel & Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples associated with this method blank demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Case Narrative
LOT NUMBER: F4H120314
W04150

Semi-Volatiles

The LCS recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable MS/MSD recoveries.

Volatiles

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis.

The surrogate recovery of DBFM is out high in MS, which caused four front end compounds to be out high and the Bromomethane RPD to be out. Sample purge efficiency and compliance is demonstrated by the remaining acceptable MS/MSD and LCS recoveries.

Oil & Grease

The MS/MSD associated with this sample was run on sample B193K0 from SD6 W04366. both samples were included in the same analytical batch.

FLUOR Hanford Inc. Collector: Pope/Pfister/Hughes/Wiberg Project Designation: 200-MW-1 Characterization Sampling and Analysis - Soil Ice Chest No.: <i>SIN 2/03-050024</i> Shipped To: <i>Severn Trent Waste Sampling & Characterization AT 8/11/04</i> POSSIBLE SAMPLE HAZARDS/REMARKS: <i>N/A</i>		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST Company Contact: CS Clearlock Telephone No.: 372-9638 Sampling Location: 216-A-4 Crib, 18.5'±21' Field Logbook No.: HNF-N-3861 Offsite Property No.: <i>N/A AT 8/11/04 RSR 00006.11</i> Method of Shipment: <i>FED Ex</i> Government Vehicle: <i>N/A</i> Bill of Lading/Air Bill No.: <i>N/A</i>		Project Coordinator: TRENT, SJ SAF No.: F04-015 Price Code: 8N Air Quality: <input type="checkbox"/>		Page 1 of 1 Data Turnaround: 45 Days
Preservation: Cool 4C Type of Container: aG No. of Container(s): 1 Volume: 250mL		Cool 4C: aG Cool 4C: aG Cool 4C: aG Cool 4C: aG* Cool 4C: 1 Cool 4C: 3 Cool 4C: 1 Cool 4C: 120mL Cool 4C: 40mL Cool 4C: 250mL Cool 4C: 120mL Cool 4C: 500mL		None P 1 1 500mL See item (4) in Special Instructions. See item (3) in Special Instructions. See item (2) in Special Instructions. See item (1) in Special Instructions. PCBs - 8082		See item (5) in Special Instructions. <i>NO₂/NO₃ (5)</i> <i>353.25</i> <i>0.1165000</i> <i>433mL Chromium</i> <i>NAI - 7196</i>
SAMPLE ANALYSIS						
Sample No.: W04150 Matrix: SOIL Sample Date: 7/21/04 Sample Time: 1054	SPECIAL INSTRUCTIONS ** The laboratory is to report both kerene and diesel range compounds from the WTPH-D analysis. (1) IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Total Cyanide - 9010; pH (Soil) - 9045; Ammonia by 350.3 (2) ICP/MS - 200.0 (As-Cadmium, Chromium, Cobalt, Silver, Lead, Manganese, Mercury by 7471 (3) VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene) (4) Semi-VOA - 8270A (Add-On) (Triethyl phosphate); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerene range) (5) Gamma-Spectroscopy - (Cesium-137, Cobalt-60, Europium-152, Europium-154, Americium-241, Strontium-90, Total for 8/11/04) (6) NO ₂ /NO ₃ - 353.2, oil & Grease - 413.1, Chromium Hex - 7196					
CHAIN OF POSSESSION						
Relinquished By/Removed From: <i>W04150</i> Date/Time: 7/21/04 0800 Relinquished By/Removed From: <i>Silk Frick</i> Date/Time: 8/11/04 0800 Relinquished By/Removed From: <i>Greg Thomas</i> Date/Time: 8/11/04 0800 Relinquished By/Removed From: <i>FED Ex</i> Date/Time: 8/12/04 0900	Received By/Stored In: <i>SIR FX 168</i> Date/Time: 8/21/04 0800 Received By/Stored In: <i>Greg Thomas</i> Date/Time: 8/11/04 Received By/Stored In: <i>FED Ex</i> Date/Time: 8/12/04 0900 Received By/Stored In: <i>W04150</i>	Title:				
Relinquished By/Removed From: _____ Date/Time: _____ Relinquished By/Removed From: _____ Date/Time: _____	Received By/Stored In: _____ Date/Time: _____ Received By/Stored In: _____ Date/Time: _____	Disposed By: _____ Date/Time: _____				
Relinquished By/Removed From: _____ Date/Time: _____	Received By/Stored In: _____ Date/Time: _____	Disposed By: _____ Date/Time: _____				

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: CPP 200 Area			DATA PACKAGE: VSR07-017		
VALIDATOR: Carl Schloesslin		LAB: STL St. Louis		DATE: 07-31-2007	
			SDG: W04150		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
			X		
SAMPLES/MATRIX Soil sample B195W2					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: None

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: None

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: Tributyl phosphate & 1,4-dichlorobenzene not spiked in MS/MSD or LCS -
large analyte list reported for both.

MS/MSD performed on unknown solid sample.

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: None

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No N/A
Internal 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: Sample extracted 24 days after collection.

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: None

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: _____

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: CPP 200 Area			DATA PACKAGE: VSR07-017		
VALIDATOR: Carl Schloesslin		LAB: STL St. Louis		DATE: 08-03-2007	
			SDG: W04150		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
X		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX: Soil sample B195W2					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: None

2. INSTRUMENT TUNING AND CALIBRATION (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

Comments: _____

GENERAL ORGANIC ANALYSIS 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: None

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 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: WTPH-D MS %R = 58%, MSD %R = 51%

Kerosene part of WTPH-D

GENERAL ORGANIC 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: None

6. HOLDING TIMES (all levels)

Samples properly preserved? Yes No N/A
Sample holding times acceptable? Yes No N/A

Comments: Sample analyzed for WTPH-G 48 days after collection.
Sample extracted for WTPH-D 23 days after collection.

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, 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: None

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed?..... Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable?..... Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired? Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested By Client

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #....: F4H120314 Work Order #....: GMG1E1CP-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H040341-004 GMG1E1CQ-MSD
 Date Sampled....: 08/02/04 Date Received...: 08/04/04
 Prep Date.....: 08/14/04 Analysis Date...: 08/19/04
 Prep Batch #....: 4227121
 Dilution Factor: 1 % Moisture.....: 12

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Phenol	ND	3790	2960	ug/kg	78		SW846 8270C
	ND	3780	3040	ug/kg	80	2.6	SW846 8270C
bis(2-Chloroethyl)- ether	ND	3790	2980	ug/kg	79		SW846 8270C
	ND	3780	3070	ug/kg	81	2.7	SW846 8270C
2-Chlorophenol	ND	3790	2930	ug/kg	77		SW846 8270C
	ND	3780	3020	ug/kg	80	3.0	SW846 8270C
2-Methylphenol	ND	3790	2890	ug/kg	76		SW846 8270C
	ND	3780	2940	ug/kg	78	1.7	SW846 8270C
2,2'-oxybis(1-Chloropropa	ND	3790	3010	ug/kg	79		SW846 8270C
	ND	3780	3090	ug/kg	82	2.8	SW846 8270C
3-Methylphenol & 4-Methylphenol	ND	3790	2980	ug/kg	79		SW846 8270C
	ND	3780	3030	ug/kg	80	1.9	SW846 8270C
N-Nitrosodi-n-propyl- amine	ND	3790	3400	ug/kg	90		SW846 8270C
	ND	3780	3470	ug/kg	92	2.0	SW846 8270C
Hexachloroethane	ND	3790	2920	ug/kg	77		SW846 8270C
	ND	3780	3010	ug/kg	79	2.9	SW846 8270C
Nitrobenzene	ND	3790	2160	ug/kg	57		SW846 8270C
	ND	3780	2110	ug/kg	56	2.4	SW846 8270C
Isophorone	ND	3790	3260	ug/kg	86		SW846 8270C
	ND	3780	3330	ug/kg	88	2.0	SW846 8270C
2-Nitrophenol	ND	3790	3160	ug/kg	84		SW846 8270C
	ND	3780	3250	ug/kg	86	2.6	SW846 8270C
2,4-Dimethylphenol	ND	3790	3020	ug/kg	80		SW846 8270C
	ND	3780	3160	ug/kg	83	4.4	SW846 8270C
bis(2-Chloroethoxy) methane	ND	3790	3200	ug/kg	84		SW846 8270C
	ND	3780	3240	ug/kg	86	1.3	SW846 8270C
2,4-Dichlorophenol	ND	3790	3070	ug/kg	81		SW846 8270C
	ND	3780	3160	ug/kg	84	2.8	SW846 8270C
1,2,4-Trichloro- benzene	ND	3790	3120	ug/kg	82		SW846 8270C
	ND	3780	3180	ug/kg	84	2.1	SW846 8270C

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #...: F4H120314
MS Lot-Sample #: F4H040341-004

Work Order #...: GMG1E1CP-MS
GMG1E1CQ-MSD

Matrix.....: SOLID

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Naphthalene	ND	3790	3140	ug/kg	83		SW846 8270C
	ND	3780	3220	ug/kg	85	2.5	SW846 8270C
4-Chloroaniline	ND	3790	2170	ug/kg	57		SW846 8270C
	ND	3780	2310	ug/kg	61	6.2	SW846 8270C
Hexachlorobutadiene	ND	3790	3070	ug/kg	81		SW846 8270C
	ND	3780	3150	ug/kg	83	2.5	SW846 8270C
4-Chloro-3-methylphenol	ND	3790	3100	ug/kg	82		SW846 8270C
	ND	3780	3350	ug/kg	88	7.5	SW846 8270C
2-Methylnaphthalene	ND	3790	3050	ug/kg	81		SW846 8270C
	ND	3780	3140	ug/kg	83	2.8	SW846 8270C
Hexachlorocyclopenta- diene	ND	3790	4270	ug/kg	113		SW846 8270C
	ND	3780	4230	ug/kg	112	0.77	SW846 8270C
2,4,6-Trichloro- phenol	ND	3790	3150	ug/kg	83		SW846 8270C
	ND	3780	3360	ug/kg	89	6.7	SW846 8270C
2,4,5-Trichloro- phenol	ND	3790	3200	ug/kg	84		SW846 8270C
	ND	3780	3500	ug/kg	92	8.9	SW846 8270C
2-Nitroaniline	ND	3790	3290	ug/kg	87		SW846 8270C
	ND	3780	3630	ug/kg	96	9.8	SW846 8270C
Dimethyl phthalate	ND	3790	3310	ug/kg	87		SW846 8270C
	ND	3780	3610	ug/kg	95	8.6	SW846 8270C
Acenaphthylene	ND	3790	3400	ug/kg	90		SW846 8270C
	ND	3780	3580	ug/kg	95	5.0	SW846 8270C
2,6-Dinitrotoluene	ND	3790	3410	ug/kg	90		SW846 8270C
	ND	3780	3740	ug/kg	99	9.2	SW846 8270C
3-Nitroaniline	ND	3790	2440	ug/kg	64		SW846 8270C
	ND	3780	2880	ug/kg	76	17	SW846 8270C
Acenaphthene	ND	3790	3220	ug/kg	85		SW846 8270C
	ND	3780	3400	ug/kg	90	5.2	SW846 8270C
2,4-Dinitrophenol	ND	3790	2950	ug/kg	78		SW846 8270C
	ND	3780	3270	ug/kg	86	10	SW846 8270C
4-Nitrophenol	ND	3790	3150	ug/kg	83		SW846 8270C
	ND	3780	3610	ug/kg	95	14	SW846 8270C
Dibenzofuran	ND	3790	3090	ug/kg	82		SW846 8270C
	ND	3780	3290	ug/kg	87	6.3	SW846 8270C
2,4-Dinitrotoluene	ND	3790	3530	ug/kg	93		SW846 8270C
	ND	3780	3910	ug/kg	103	10	SW846 8270C

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #...: F4H120314 Work Order #...: GMG1E1CP-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H040341-004 GMG1E1CQ-MSD

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Diethyl phthalate	ND	3790	3360	ug/kg	89		SW846 8270C
	ND	3780	3680	ug/kg	97	9.2	SW846 8270C
4-Chlorophenyl phenyl ether	ND	3790	3220	ug/kg	85		SW846 8270C
	ND	3780	3450	ug/kg	91	7.0	SW846 8270C
Fluorene	ND	3790	3300	ug/kg	87		SW846 8270C
	ND	3780	3570	ug/kg	94	7.8	SW846 8270C
4-Nitroaniline	ND	3790	3080	ug/kg	81		SW846 8270C
	ND	3780	3510	ug/kg	93	13	SW846 8270C
4,6-Dinitro- 2-methylphenol	ND	3790	3310	ug/kg	87		SW846 8270C
	ND	3780	3510	ug/kg	93	5.7	SW846 8270C
N-Nitrosodiphenylamine	ND	3790	3580	ug/kg	95		SW846 8270C
	ND	3780	3830	ug/kg	101	6.8	SW846 8270C
4-Bromophenyl phenyl ether	ND	3790	3390	ug/kg	90		SW846 8270C
	ND	3780	3600	ug/kg	95	5.9	SW846 8270C
Hexachlorobenzene	ND	3790	3340	ug/kg	88		SW846 8270C
	ND	3780	3580	ug/kg	95	7.0	SW846 8270C
Pentachlorophenol	ND	3790	3320	ug/kg	88		SW846 8270C
	ND	3780	3610	ug/kg	95	8.4	SW846 8270C
Phenanthrene	ND	3790	3220	ug/kg	85		SW846 8270C
	ND	3780	3480	ug/kg	92	7.5	SW846 8270C
Anthracene	ND	3790	3340	ug/kg	88		SW846 8270C
	ND	3780	3580	ug/kg	95	7.2	SW846 8270C
Carbazole	ND	3790	3310	ug/kg	88		SW846 8270C
	ND	3780	3620	ug/kg	96	8.8	SW846 8270C
Di-n-butyl phthalate	ND	3790	3550	ug/kg	94		SW846 8270C
	ND	3780	3890	ug/kg	103	9.0	SW846 8270C
Fluoranthene	ND	3790	3370	ug/kg	89		SW846 8270C
	ND	3780	3720	ug/kg	98	9.9	SW846 8270C
Pyrene	ND	3790	3610	ug/kg	95		SW846 8270C
	ND	3780	3780	ug/kg	100	4.5	SW846 8270C
Butyl benzyl phthalate	ND	3790	3720	ug/kg	98		SW846 8270C
	ND	3780	3920	ug/kg	104	5.1	SW846 8270C
3,3'-Dichlorobenzidine	ND	3790	2620	ug/kg	69		SW846 8270C
	ND	3780	2920	ug/kg	77	11	SW846 8270C
Benzo (a) anthracene	ND	3790	3590	ug/kg	95		SW846 8270C
	ND	3780	3890	ug/kg	103	8.2	SW846 8270C

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #...: F4H120314 Work Order #...: GMG1E1CP-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H040341-004 GMG1E1CQ-MSD

PARAMETER	SAMPLE	SPIKE	MEASRD	UNITS	PERCNT		METHOD
	AMOUNT	AMT	AMOUNT		RECVRY	RPD	
Chrysene	ND	3790	3700	ug/kg	98		SW846 8270C
	ND	3780	4020	ug/kg	106	8.1	SW846 8270C
bis(2-Ethylhexyl) phthalate	ND	3790	3860	ug/kg	102		SW846 8270C
	ND	3780	4110	ug/kg	109	6.4	SW846 8270C
Di-n-octyl phthalate	ND	3790	4380	ug/kg	116		SW846 8270C
	ND	3780	4510	ug/kg	119	3.0	SW846 8270C
Benzo (b) fluoranthene	ND	3790	4390	ug/kg	116		SW846 8270C
	ND	3780	4720	ug/kg	125 a	7.1	SW846 8270C
Benzo (k) fluoranthene	ND	3790	4350	ug/kg	115		SW846 8270C
	ND	3780	4590	ug/kg	121	5.4	SW846 8270C
Benzo (a) pyrene	ND	3790	4360	ug/kg	115 a		SW846 8270C
	ND	3780	4680	ug/kg	124 a	7.0	SW846 8270C
Indeno (1, 2, 3-cd) pyrene	ND	3790	4670	ug/kg	123		SW846 8270C
	ND	3780	5180	ug/kg	137 a	10	SW846 8270C
Dibenz (a, h) anthracene	ND	3790	4550	ug/kg	120		SW846 8270C
	ND	3780	5080	ug/kg	134 a	11	SW846 8270C
Benzo (ghi) perylene	ND	3790	4420	ug/kg	117		SW846 8270C
	ND	3780	4920	ug/kg	130	11	SW846 8270C

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
2-Fluorophenol	81	(40 - 103)
	81	(40 - 103)
Phenol-d5	83	(36 - 105)
	82	(36 - 105)
Nitrobenzene-d5	87	(45 - 114)
	86	(45 - 114)
2-Fluorobiphenyl	90	(49 - 120)
	89	(49 - 120)
2,4,6-Tribromophenol	90	(39 - 114)
	95	(39 - 114)
Terphenyl-d14	91	(42 - 108)
	91	(42 - 108)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

a Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: F4H120314 Work Order #...: GM17P1C3-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H120314-001 GM17P1C4-MSD
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 09/07/04 Analysis Date...: 09/07/04
 Prep Batch #...: 4252070
 Dilution Factor: 1 % Moisture.....: 7.3

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCENT RECVRY	RPD	METHOD
Volatile Petroleum Hydrocarbons	ND	1.00	0.710	mg/kg	71		SW846 8015 MOD
	ND	1.00	0.697	mg/kg	70	1.9	SW846 8015 MOD

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Trifluorotoluene	94	(28 - 124)
	91	(28 - 124)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #....: F4H120314 Work Order #....: GM17P1C1-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H120314-001 GM17P1C2-MSD
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 08/13/04 Analysis Date...: 08/18/04
 Prep Batch #....: 4226332
 Dilution Factor: 1 % Moisture.....: 7.3

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
TPH - Diesel Range - WTPH	ND	89.6	52.2	mg/kg	58		SW846 8015 MOD
	ND	89.8	46.2	mg/kg	51	12	SW846 8015 MOD

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	46	(10 - 150)
	45	(10 - 150)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters
 Results and reporting limits have been adjusted for dry weight.

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #....: F4H120314
 MB Lot-Sample #: F4H140000-121
 Analysis Date...: 08/17/04
 Dilution Factor: 1

Work Order #....: GM67V1AA
 Prep Date.....: 08/14/04
 Prep Batch #....: 4227121

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
Phenol	ND	330	ug/kg	SW846 8270C
2-Chlorophenol	ND	330	ug/kg	SW846 8270C
N-Nitrosodi-n-propyl-amine	ND	330	ug/kg	SW846 8270C
1,2,4-Trichloro-benzene	ND	330	ug/kg	SW846 8270C
4-Chloro-3-methylphenol	ND	330	ug/kg	SW846 8270C
Acenaphthene	ND	330	ug/kg	SW846 8270C
4-Nitrophenol	ND	1600	ug/kg	SW846 8270C
2,4-Dinitrotoluene	ND	330	ug/kg	SW846 8270C
Diethyl phthalate	ND	330	ug/kg	SW846 8270C
Pentachlorophenol	ND	1600	ug/kg	SW846 8270C
Di-n-butyl phthalate	ND	330	ug/kg	SW846 8270C
Pyrene	ND	330	ug/kg	SW846 8270C
Tributyl phosphate	ND	330	ug/kg	SW846 8270C
1,4-Dichlorobenzene	ND	330	ug/kg	SW846 8270C

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
2-Fluorophenol	82	(40 - 103)
Phenol-d5	78	(36 - 105)
Nitrobenzene-d5	86	(45 - 114)
2-Fluorobiphenyl	89	(49 - 120)
2,4,6-Tribromophenol	72	(39 - 114)
Terphenyl-d14	94	(42 - 108)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

REVISED

7/19/05

0000030

FLUOR HANFORD IC

Method Blank Report

GC/MS Semivolatiles

Lot-Sample #: F4H140000-121 B Work Order #: GM67V1AA Matrix: SOLID

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

<u>PARAMETER</u>	<u>CAS #</u>	<u>ESTIMATED RESULT</u>	<u>RETENTION TIME</u>	<u>UNITS</u>
Unknown aldol condensate		4600	M 2.221	ug/kg

NOTE(S) :

M: Result was measured against nearest internal standard assuming a response factor of 1.

REVISED
R. Dayer

7/19/05

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METHOD BLANK REPORT

GC Volatiles

Client Lot #...: F4H120314 Work Order #...: GPQTA1AA Matrix.....: SOLID
MB Lot-Sample #: F4I080000-070
Prep Date.....: 09/07/04
Analysis Date...: 09/07/04 Prep Batch #...: 4252070
Dilution Factor: 1

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>		<u>METHOD</u>
		<u>LIMIT</u>	<u>UNITS</u>	
Volatile Petroleum Hydrocarbons	ND	0.10	mg/kg	SW846 8015 MOD

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Trifluorotoluene	95	(28 - 124)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: F4H120314
MB Lot-Sample #: F4H130000-332
Analysis Date...: 08/18/04
Dilution Factor: 1

Work Order #...: GM4PK1AA
Prep Date.....: 08/13/04
Prep Batch #...: 4226332

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Kerosene	ND	25	mg/kg	SW846 8015 MOD
TPH - Diesel Range - WTPH	ND	25	mg/kg	SW846 8015 MOD

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
o-Terphenyl	65 *	(78 - 150)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

* Surrogate recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #....: F4H120314 Work Order #....: GM67V1AC Matrix.....: SOLID
 LCS Lot-Sample#: F4H140000-121
 Prep Date.....: 08/14/04 Analysis Date...: 08/17/04
 Prep Batch #....: 4227121
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
Phenol	3330	2750	ug/kg	82	SW846 8270C
bis(2-Chloroethyl) - ether	3330	2770	ug/kg	83	SW846 8270C
2-Chlorophenol	3330	2730	ug/kg	82	SW846 8270C
2-Methylphenol	3330	2670	ug/kg	80	SW846 8270C
2,2'-oxybis(1-Chloropropa	3330	2780	ug/kg	83	SW846 8270C
3-Methylphenol & 4-Methylphenol	3330	2730	ug/kg	82	SW846 8270C
N-Nitrosodi-n-propyl- amine	3330	3090	ug/kg	93	SW846 8270C
Hexachloroethane	3330	2670	ug/kg	80	SW846 8270C
Nitrobenzene	3330	2390	ug/kg	72	SW846 8270C
Isophorone	3330	3020	ug/kg	91	SW846 8270C
2-Nitrophenol	3330	2930	ug/kg	88	SW846 8270C
2,4-Dimethylphenol	3330	2790	ug/kg	84	SW846 8270C
bis(2-Chloroethoxy) methane	3330	2960	ug/kg	89	SW846 8270C
2,4-Dichlorophenol	3330	2860	ug/kg	86	SW846 8270C
1,2,4-Trichloro- benzene	3330	2900	ug/kg	87	SW846 8270C
Naphthalene	3330	2930	ug/kg	88	SW846 8270C
4-Chloroaniline	3330	2340	ug/kg	70	SW846 8270C
Hexachlorobutadiene	3330	2840	ug/kg	85	SW846 8270C
4-Chloro-3-methylphenol	3330	2850	ug/kg	85	SW846 8270C
2-Methylnaphthalene	3330	2840	ug/kg	85	SW846 8270C
Hexachlorocyclopenta- diene	3330	3690	ug/kg	111	SW846 8270C
2,4,6-Trichloro- phenol	3330	2940	ug/kg	88	SW846 8270C
2,4,5-Trichloro- phenol	3330	2960	ug/kg	89	SW846 8270C
2-Nitroaniline	3330	3100	ug/kg	93	SW846 8270C
Dimethyl phthalate	3330	3060	ug/kg	92	SW846 8270C
Acenaphthylene	3330	3200	ug/kg	96	SW846 8270C

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #...: F4H120314
 LCS Lot-Sample#: F4H140000-121

Work Order #...: GM67V1AC

Matrix.....: SOLID

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
2,6-Dinitrotoluene	3330	3200	ug/kg	96	SW846 8270C
3-Nitroaniline	3330	2430	ug/kg	73	SW846 8270C
Acenaphthene	3330	3040	ug/kg	91	SW846 8270C
2,4-Dinitrophenol	3330	1430	ug/kg	43	SW846 8270C
4-Nitrophenol	3330	2960	ug/kg	89	SW846 8270C
Dibenzofuran	3330	2900	ug/kg	87	SW846 8270C
2,4-Dinitrotoluene	3330	3320	ug/kg	100	SW846 8270C
Diethyl phthalate	3330	3130	ug/kg	94	SW846 8270C
4-Chlorophenyl phenyl ether	3330	3010	ug/kg	90	SW846 8270C
Fluorene	3330	3100	ug/kg	93	SW846 8270C
4-Nitroaniline	3330	3020	ug/kg	91	SW846 8270C
4,6-Dinitro- 2-methylphenol	3330	2270	ug/kg	68	SW846 8270C
N-Nitrosodiphenylamine	3330	3370	ug/kg	101	SW846 8270C
4-Bromophenyl phenyl ether	3330	3170	ug/kg	95	SW846 8270C
Hexachlorobenzene	3330	3130	ug/kg	94	SW846 8270C
Pentachlorophenol	3330	3020	ug/kg	91	SW846 8270C
Phenanthrene	3330	3050	ug/kg	91	SW846 8270C
Anthracene	3330	3150	ug/kg	95	SW846 8270C
Carbazole	3330	3150	ug/kg	94	SW846 8270C
Di-n-butyl phthalate	3330	3350	ug/kg	100	SW846 8270C
Fluoranthene	3330	3230	ug/kg	97	SW846 8270C
Pyrene	3330	3300	ug/kg	99	SW846 8270C
Butyl benzyl phthalate	3330	3390	ug/kg	102	SW846 8270C
3,3'-Dichlorobenzidine	3330	2620	ug/kg	79	SW846 8270C
Benzo (a) anthracene	3330	3340	ug/kg	100	SW846 8270C
Chrysene	3330	3470	ug/kg	104	SW846 8270C
bis (2-Ethylhexyl) phthalate	3330	3530	ug/kg	106	SW846 8270C
Di-n-octyl phthalate	3330	3950 a	ug/kg	118	SW846 8270C
Benzo (b) fluoranthene	3330	4200 a	ug/kg	126	SW846 8270C
Benzo (k) fluoranthene	3330	3970	ug/kg	119	SW846 8270C
Benzo (a) pyrene	3330	4090 a	ug/kg	123	SW846 8270C
Indeno (1,2,3-cd) pyrene	3330	4380 a	ug/kg	131	SW846 8270C
Dibenz (a,h) anthracene	3330	4340	ug/kg	130	SW846 8270C

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #....: F4H120314 Work Order #....: GM67V1AC Matrix.....: SOLID
 LCS Lot-Sample#: F4H140000-121
 Prep Date.....: 08/14/04 Analysis Date...: 08/17/04
 Prep Batch #....: 4227121
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
Phenol	3330	2750	ug/kg	82	SW846 8270C
2-Chlorophenol	3330	2730	ug/kg	82	SW846 8270C
N-Nitrosodi-n-propyl-amine	3330	3090	ug/kg	93	SW846 8270C
1,2,4-Trichloro-benzene	3330	2900	ug/kg	87	SW846 8270C
4-Chloro-3-methylphenol	3330	2850	ug/kg	85	SW846 8270C
Acenaphthene	3330	3040	ug/kg	91	SW846 8270C
4-Nitrophenol	3330	2960	ug/kg	89	SW846 8270C
2,4-Dinitrotoluene	3330	3320	ug/kg	100	SW846 8270C
Diethyl phthalate	3330	3130	ug/kg	94	SW846 8270C
Pentachlorophenol	3330	3020	ug/kg	91	SW846 8270C
Di-n-butyl phthalate	3330	3350	ug/kg	100	SW846 8270C
Pyrene	3330	3300	ug/kg	99	SW846 8270C

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
2-Fluorophenol	84	(50 - 98)
Phenol-d5	86	(51 - 95)
Nitrobenzene-d5	89	(50 - 111)
2-Fluorobiphenyl	95	(57 - 117)
2,4,6-Tribromophenol	92	(53 - 108)
Terphenyl-d14	92	(49 - 107)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

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LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: F4H120314 Work Order #...: GPQTALAC Matrix.....: SOLID
 LCS Lot-Sample#: F4I080000-070
 Prep Date.....: 09/07/04 Analysis Date...: 09/07/04
 Prep Batch #...: 4252070
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
Volatile Petroleum Hydrocarbons	1.00	0.998	mg/kg	100	SW846 8015 MO

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
Trifluorotoluene	106	(85 - 108)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: F4H120314 Work Order #...: GM4PK1AC Matrix.....: SOLID
 LCS Lot-Sample#: F4H130000-332
 Prep Date.....: 08/13/04 Analysis Date...: 08/18/04
 Prep Batch #...: 4226332
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
TPH - Diesel Range - WTPH	83.3	60.7	mg/kg	73	SW846 8015 MO
<u>SURROGATE</u>		<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>		
o-Terphenyl		101	(78 - 150)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

Date: 03 August 2007
To: Fluor Hanford Inc. (technical representative)
From: Analytical Quality Associates, Inc.
Project: CPP 200 Area
Subject: PCBs - Sample Data Group (SDG) W04150

INTRODUCTION

This memorandum presents the results of data validation for SDG W04150 prepared by STL St. Louis. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Method
B195W2	07/21/04	Soil	C	8082

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench, DOE/RL-2006-47, Rev. 0 (SAP). 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. 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 and Sample Preservation

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements for PCBs are extraction within 14 days of sample collection and analysis within 40 days of sample extraction. Sample preservation requires chilling to 4 degrees Celsius.

Sample B195W2 was properly preserved but extracted beyond the holding time and within 2X the holding time. All sample results except aroclor-1254 and aroclor-1260 were non-detects and should be qualified as estimates and flagged "UJ." Aroclor-1254 and aroclor-1260 should be qualified as estimates and flagged "J." It should be noted that the SAP states that the PCB holding time is 14 days from sample collection to analysis. This guidance is incorrect and was not followed for data validation.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Equipment Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by reviewing surrogate results, matrix spike sample results, and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130%.

Surrogates

All surrogate recoveries were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

- **Precision**

Precision is evaluated by reviewing MS/MSD results and field duplicate sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference limits are $\pm 30\%$.

MS/MSD Samples

All MS/MSD relative percent difference values were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported method detection limits (MDLs) are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDG W04150 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

Minor deficiencies leading to qualification of sample results as estimates were due to a holding time infraction. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

FHI, Contract #29774, *Validation of Radiological and Chemical Analytical Data*, Fluor Hanford Incorporated, August 24, 2006.

DOE/RL-2006-47, Rev. 0, *Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench*, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.
- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDL. The data should be considered usable for decision-making purposes.
- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.
- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.
- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2
Summary of Data Qualification

PCB Data Qualification Summary			
SDG W04150	Reviewer: AQA	Project: CPP 200 Area	Page 1 of 1
Analyte(s)	Qualifier	Samples Affected	Reason
Aroclor-1016, -1221, -1232, -1242 & -1248	UJ	B195W2	Extracted beyond the holding time but within 2X the holding time.
Aroclor-1254 & -1260	J	B195W2	Extracted beyond the holding time but within 2X the holding time.

Comments: None

Appendix 3

Annotated Laboratory Reports

FLUOR HANFORD IC

Client Sample ID: B195W2

GC Semivolatiles

Lot-Sample #...: F4H120314-001 Work Order #...: GM17P1C9 Matrix.....: SOLID
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 08/14/04 Analysis Date...: 08/17/04
 Prep Batch #...: 4227118
 Dilution Factor: 1
 % Moisture.....: 7.3 Method.....: SW846 8082

PARAMETER	RESULT		REPORTING LIMIT	UNITS	MDL
Aroclor 1016	ND	UJ	36	ug/kg	6.9
Aroclor 1221	ND	UJ	36	ug/kg	7.6
Aroclor 1232	ND	UJ	36	ug/kg	8.7
Aroclor 1242	ND	UJ	36	ug/kg	8.1
Aroclor 1248	ND	UJ	36	ug/kg	10
Aroclor 1254	56	J	36	ug/kg	8.5
Aroclor 1260	47	J	36	ug/kg	8.1

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	117	(10 - 150)

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F4H120314
W04150

This report contains the analytical results for the sample received under chain of custody by STL St. Louis on August 12, 2004. This sample is associated with your F04-015 project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

The samples were analyzed outside the 14-day holding time for soils for all parameters except metals. The lab did not receive the samples until after the holding time had expired.

Observations/Nonconformances

Metals

The MS/MSD recovery for Mercury is outside the established QC limits. The Mercury concentration in the original sample is greater than 4 times the amount spiked, making percent recovery information ineffective. Method performance is demonstrated by acceptable LCS recovery.

The MS recovery for Silver is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH - Diesel & Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples associated with this method blank demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Case Narrative
LOT NUMBER: F4H120314
W04150

Semi-Volatiles

The LCS recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable MS/MSD recoveries.

Volatiles

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis.

The surrogate recovery of DBFM is out high in MS, which caused four front end compounds to be out high and the Bromomethane RPD to be out. Sample purge efficiency and compliance is demonstrated by the remaining acceptable MS/MSD and LCS recoveries.

Oil & Grease

The MS/MSD associated with this sample was run on sample B193K0 from SD6 W04366. both samples were included in the same analytical batch.

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: CPP 200 Area			DATA PACKAGE: VSR07-017		
VALIDATOR: Carl Schloesslin		LAB: STL St. Louis		DATE: 08-03-2007	
			SDG: W04150		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082 X	SW-846 8081 (TCLP)		
SAMPLES/MATRIX Soil sample B195W2					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: None

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: _____

PESTICIDE/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: None

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: None

PESTICIDE/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: None

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: Sample extracted 24 days after collection.

PESTICIDE/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: None

9. SAMPLE CLEANUP (Levels D and E)

Fluorilic ® (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: _____

Appendix 6

Additional Documentation Requested By Client

MATRIX SPIKE SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: F4H120314 Work Order #...: GM17P1DA-MS Matrix.....: SOLID
 MS Lot-Sample #: F4H120314-001 GM17P1DC-MSD
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 Prep Date.....: 08/14/04 Analysis Date...: 08/17/04
 Prep Batch #...: 4227118
 Dilution Factor: 1 % Moisture.....: 7.3

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Aroclor 1016	ND	179	179	ug/kg	100		SW846 8082
	ND	179	179	ug/kg	100	0.30	SW846 8082
Aroclor 1260	47	179	214	ug/kg	93		SW846 8082
	47	179	211	ug/kg	92	1.6	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	114	(10 - 150)
	112	(10 - 150)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters
 Results and reporting limits have been adjusted for dry weight.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: F4H120314 Work Order #...: GM6611AA Matrix.....: SOLID
MB Lot-Sample #: F4H140000-118
Prep Date.....: 08/14/04
Analysis Date...: 08/17/04 Prep Batch #...: 4227118
Dilution Factor: 1

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Decachlorobiphenyl	123	(10 - 150)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: F4H120314 Work Order #...: GM6611AC Matrix.....: SOLID
 LCS Lot-Sample#: F4H140000-118
 Prep Date.....: 08/14/04 Analysis Date...: 08/17/04
 Prep Batch #...: 4227118
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
Aroclor 1016	167	189	ug/kg	114	SW846 8082
Aroclor 1260	167	192	ug/kg	115	SW846 8082
<u>SURROGATE</u>		<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>		
Decachlorobiphenyl		128	(68 - 150)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

Date: 09 August 2007
To: Fluor Hanford Inc. (technical representative)
From: Analytical Quality Associates, Inc.
Project: CPP 200 Area
Subject: Inorganics - Sample Data Group (SDG) W04150

INTRODUCTION

This memorandum presents the results of data validation for SDG W04150 prepared by STL St. Louis. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B195W2	07/21/04	Soil	C	6010B & 7471A

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench, DOE/RL-2006-47, Rev. 0 (SAP). 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. 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 and Sample Preservation

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirement for ICP metals are analysis within 180 days of sample collection, and the holding time requirement for mercury is analysis within 28 days of sample collection. Sample preservation for all analytes requires chilling to 4 degrees Celsius.

The sample was analyzed within the prescribed holding times and properly preserved.

• Blanks

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable with the following exceptions. The B, Ba and Ni laboratory blank results were > the method detection limits (MDLs). The B result for sample B195W2 was a detect at <5X the blank result and should be qualified as a non-detect estimate and flagged "UJ." The Ba and Ni results for sample B195W2 were detects >5X the blank results and should not be qualified for blank infractions.

Field Blanks

No field blanks were submitted for analysis.

Equipment Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable with the following exceptions. The MS recovery for Ag was >130%. The associated sample result was a detect and should be qualified as an estimate and flagged "J." MS/MSD data were not reported for As, Ba, Be, Cd, Cr, Cu, Ni, Pb and Sb. All associated sample results *except* Cd were detects and should be qualified as estimates and flagged "J." The sample result for Cd was non-detect and should be qualified as an estimate and flagged "UJ." The Hg concentration in the sample used for the MS/MSD was >4X the spike concentration. Therefore, MS/MSD recoveries were not assessed for Hg. No sample data were qualified as a result.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

- **Precision**

Precision is evaluated by reviewing MS/MSD results and field duplicate sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference limits are $\pm 30\%$. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

MS/MSD Samples

All MS/MSD relative percent difference values were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs with the following exception. The sample MDL for Ag was > the CRDL. The Ag sample result was > the MDL. No sample data were qualified as a result.

- **Completeness**

SDG W04150 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

Minor deficiencies leading to qualification of sample results as estimates were due to a laboratory blank infraction, a MS recovery infraction, and lack of MS/MSD data. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

FHI, Contract #29774, *Validation of Radiological and Chemical Analytical Data*, Fluor Hanford Incorporated, August 24, 2006.

DOE/RL-2006-47, Rev. 0, *Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench*, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.
- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDL. The data should be considered usable for decision-making purposes.
- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.
- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.
- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2
Summary of Data Qualification

Inorganic Data Qualification Summary			
SDG W04150	Reviewer: AQA	Project: CPP 200 Area	Page 1 of 1
Analyte(s)	Qualifier	Samples Affected	Reason
B	UJ	B195W2	Laboratory blank contamination
Ag	J	B195W2	High MS recovery
Cd	UJ	B195W2	Lack of MS/MSD data
As, Ba, Be, Cr, Cu, Ni, Pb & Sb	J	B195W2	Lack of MS/MSD data

Comments: None

Appendix 3

Annotated Laboratory Reports

FLUOR HANFORD IC

Client Sample ID: B195W2

TOTAL Metals

Lot-Sample #...: F4H120314-001

Date Sampled...: 07/21/04

% Moisture...: 7.3

Date Received...: 08/12/04

Matrix...: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4226071						
Antimony	J 0.66 B	1.1	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AN
		Dilution Factor: 1		MDL.....: 0.22		
Arsenic	J 2.3	1.1	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AP
		Dilution Factor: 1		MDL.....: 0.19		
Barium	J 68.3 J	21.6	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AQ
		Dilution Factor: 1		MDL.....: 0.047		
Beryllium	J 0.20 B	0.54	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AR
		Dilution Factor: 1		MDL.....: 0.041		
Cadmium	UJ ND	0.54	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AT
		Dilution Factor: 1		MDL.....: 0.024		
Chromium	J 13.5	1.1	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AU
		Dilution Factor: 1		MDL.....: 0.61		
Copper	J 15.0	2.7	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AV
		Dilution Factor: 1		MDL.....: 0.40		
Lead	J 5.5	0.54	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AW
		Dilution Factor: 1		MDL.....: 0.22		
Nickel	J 8.7 J	4.3	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1AX
		Dilution Factor: 1		MDL.....: 0.14		
Selenium	ND	0.54	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1A0
		Dilution Factor: 1		MDL.....: 0.32		
Silver	J 2.2	1.1	mg/kg	SW846 6010B	08/13-08/20/04	GM17P1A1
		Dilution Factor: 1		MDL.....: 0.63		
Bismuth	144	21.6	mg/kg	SW846 6010B	08/13-08/23/04	GM17P1A2
		Dilution Factor: 1		MDL.....: 2.2		
Boron	UJ 6.5 B,J	21.6	mg/kg	SW846 6010B	08/13-08/23/04	GM17P1A3
		Dilution Factor: 1		MDL.....: 0.61		
Prep Batch #...: 4230117						
Mercury	0.92	0.036	mg/kg	SW846 7471A	08/17/04	GM17P1AM
		Dilution Factor: 1		MDL.....: 0.018		

LS
08-09-07

(Continued on next page)

STL ST. LOUIS

FLUOR HANFORD IC

Client Sample ID: B195W2

TOTAL Metals

Lot-Sample #...: F4H120314-001

Matrix.....: SOLID

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F4H120314
W04150

This report contains the analytical results for the sample received under chain of custody by STL St. Louis on August 12, 2004. This sample is associated with your F04-015 project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

The samples were analyzed outside the 14-day holding time for soils for all parameters except metals. The lab did not receive the samples until after the holding time had expired.

Observations/Nonconformances

Metals

The MS/MSD recovery for Mercury is outside the established QC limits. The Mercury concentration in the original sample is greater than 4 times the amount spiked, making percent recovery information ineffective. Method performance is demonstrated by acceptable LCS recovery.

The MS recovery for Silver is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH - Diesel & Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples associated with this method blank demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Case Narrative
LOT NUMBER: F4H120314
W04150

Semi-Volatiles

The LCS recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable MS/MSD recoveries.

Volatiles

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis.

The surrogate recovery of DBFM is out high in MS, which caused four front end compounds to be out high and the Bromomethane RPD to be out. Sample purge efficiency and compliance is demonstrated by the remaining acceptable MS/MSD and LCS recoveries.

Oil & Grease

The MS/MSD associated with this sample was run on sample B193K0 from SD6 W04366. both samples were included in the same analytical batch.

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: CPP 200 Area			DATA PACKAGE: VSR07-017		
VALIDATOR: Carl Schloesslin		LAB: STL St. Louis		DATE: 08-09-2007	
			SDG: W04150		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
X		X			
SAMPLES/MATRIX Soil sample B195W2					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: None

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: MB detections: B 2.9 mg/kg, Ba 0.77 mg/kg, Ni 0.20 mg/kg

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: Ag MS %R = 139%

Hg MS %R = 172%, MSD %R = -106% - Hg sample concentration >4X
(5.1X) spike concentration.

No MS/MSD data for As, Ba, Be, Cd, Cr, Cu, Ni, Pb and Sb. This was
confirmed through a data package validation discrepancy report.

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: None

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: None _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? Yes No N/A
Results supported in the raw data? (Levels D, E)..... Yes No N/A
Samples properly prepared? (Levels D, E) Yes No N/A
Detection limits meet RDL? Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: Ag MDL (0.63 mg/kg) > CRDL (0.5 mg/kg). Ag sample result > the MDL.

Six target analytes specified on COC, 14 analytes reported in data package.

Appendix 6

Additional Documentation Requested By Client

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F4H120314

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
MB Lot-Sample #: F4H130000-071 Prep Batch #... : 4226071						
Antimony	ND	1.0	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AA
		Dilution Factor: 1				
Arsenic	ND	1.0	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AC
		Dilution Factor: 1				
Barium	0.77 B	20.0	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AD
		Dilution Factor: 1				
Beryllium	ND	0.50	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AE
		Dilution Factor: 1				
Cadmium	ND	0.50	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AF
		Dilution Factor: 1				
Chromium	ND	1.0	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AG
		Dilution Factor: 1				
Copper	ND	2.5	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AH
		Dilution Factor: 1				
Lead	ND	0.50	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AJ
		Dilution Factor: 1				
Nickel	0.20 B	4.0	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AK
		Dilution Factor: 1				
Selenium	ND	0.50	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AL
		Dilution Factor: 1				
Silver	ND	1.0	mg/kg	SW846 6010B	08/13-08/20/04	GM2611AM
		Dilution Factor: 1				
Bismuth	ND	20.0	mg/kg	SW846 6010B	08/13-08/23/04	GM2611AN
		Dilution Factor: 1				
Boron	2.9 B	20.0	mg/kg	SW846 6010B	08/13-08/23/04	GM2611AP
		Dilution Factor: 1				

(Continued on next page)

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: F4H120314

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
MB Lot-Sample #: F4H170000-117						
Prep Batch #....: 4230117						
Mercury	ND	0.033	mg/kg	SW846 7471A	08/17/04	GM9QG1AA
		Dilution Factor: 1				

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F4H120314

Matrix.....: SOLID

<u>PARAMETER</u>	<u>SPIKE AMOUNT</u>	<u>MEASURED AMOUNT</u>	<u>UNITS</u>	<u>PERCNT RECVRY</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#: F4H130000-071 Prep Batch #...: 4226071							
Antimony	65.2	51.5	mg/kg	79	SW846 6010B	08/13-08/20/04	GM2611AQ
			Dilution Factor: 1				
Arsenic	110	116	mg/kg	106	SW846 6010B	08/13-08/20/04	GM2611AR
			Dilution Factor: 1				
Barium	334	356	mg/kg	106	SW846 6010B	08/13-08/20/04	GM2611AT
			Dilution Factor: 1				
Beryllium	133	138	mg/kg	104	SW846 6010B	08/13-08/20/04	GM2611AU
			Dilution Factor: 1				
Cadmium	101	105	mg/kg	104	SW846 6010B	08/13-08/20/04	GM2611AV
			Dilution Factor: 1				
Chromium	167	176	mg/kg	105	SW846 6010B	08/13-08/20/04	GM2611AW
			Dilution Factor: 1				
Copper	118	129	mg/kg	109	SW846 6010B	08/13-08/20/04	GM2611AX
			Dilution Factor: 1				
Lead	102	108	mg/kg	106	SW846 6010B	08/13-08/20/04	GM2611A0
			Dilution Factor: 1				
Nickel	127	134	mg/kg	106	SW846 6010B	08/13-08/20/04	GM2611A1
			Dilution Factor: 1				
Selenium	166	175	mg/kg	105	SW846 6010B	08/13-08/20/04	GM2611A2
			Dilution Factor: 1				
Silver	82.9	85.1	mg/kg	103	SW846 6010B	08/13-08/20/04	GM2611A3
			Dilution Factor: 1				
Bismuth	200	196	mg/kg	98	SW846 6010B	08/13-08/23/04	GM2611A4
			Dilution Factor: 1				
Boron	59.1	61.6	mg/kg	104	SW846 6010B	08/13-08/23/04	GM2611A5
			Dilution Factor: 1				

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F4H120314

Matrix.....: SOLID

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCNT</u> <u>RECVRY</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>WORK</u> <u>ORDER #</u>
LCS Lot-Sample#: F4H170000-117 Prep Batch #...: 4230117							
Mercury	4.04	3.65	mg/kg	90	SW846 7471A	08/17/04	GM9QG1AC
Dilution Factor: 5							

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #....: F4H120314
 Date Sampled....: 07/21/04

Date Received...: 08/12/04

Matrix.....: SOLID

PARAMETER	AMOUNT	SAMPLE SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
-----------	--------	------------------	---------------	-------	---------------	-----	--------	----------------------------	--------------

MS Lot-Sample #: F4H120314-001 Prep Batch #....: 4226071

% Moisture.....: 7.3

Selenium

ND	216	209	mg/kg	97			SW846 6010B	08/13-08/20/04	GM17P1CN
ND	216	211	mg/kg	98	0.64		SW846 6010B	08/13-08/20/04	GM17P1CP

Dilution Factor: 1

Silver

2.2	5.39	9.71 N	mg/kg	139			SW846 6010B	08/13-08/20/04	GM17P1CQ
2.2	5.39	7.45	mg/kg	97	26		SW846 6010B	08/13-08/20/04	GM17P1CR

Dilution Factor: 1

Bismuth

144	216	333	mg/kg	88			SW846 6010B	08/13-08/23/04	GM17P1CT
144	216	331	mg/kg	87	0.55		SW846 6010B	08/13-08/23/04	GM17P1CU

Dilution Factor: 1

Boron

6.5	216	217	mg/kg	98			SW846 6010B	08/13-08/23/04	GM17P1CV
6.5	216	213	mg/kg	96	1.9		SW846 6010B	08/13-08/23/04	GM17P1CW

Dilution Factor: 1

MS Lot-Sample #: F4H120314-001 Prep Batch #....: 4230117

% Moisture.....: 7.3

Mercury

0.92	0.180	1.22 N	mg/kg	172			SW846 7471A	08/17/04	GM17P1DR
0.92	0.180	0.901 N	mg/kg	0.0	0.0		SW846 7471A	08/17/04	GM17P1DT

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Results and reporting limits have been adjusted for dry weight.
 N Spiked analyte recovery is outside stated control limits.

Date: 05 September 2007
 To: Fluor Hanford Inc. (technical representative)
 From: Analytical Quality Associates, Inc.
 Project: 200 CPP Area
 Subject: General Chemistry - Sample Data Group (SDG) W04150

INTRODUCTION

This memorandum presents the results of data validation for SDG W04150 prepared by STL St. Louis. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B195W2	07/21/04	Soil	C	See note 1

1 – 300.0 (fluoride, nitrate, nitrite, phosphate and sulfate); 350.1 (ammonia); 353.1 (nitrate/nitrite); 7196A (chromium-VI); 9010A (total cyanide); 9045A (pH) and 9071A (oil and grease)

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench, DOE/RL-2006-47, Rev. 0 (SAP). 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. 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 and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements are as follows:

- All anions except nitrate, nitrite, and phosphate – analysis within 28 days of sample collection
- Nitrate, nitrite, and phosphate – extraction within 28 days of sample collection and analysis within 48 hours of extraction
- Chromium(VI) – analysis within 30 days of sample collection
- pH – analysis as soon as possible after sample collection
- Total cyanide – analysis within 14 days of sample collection
- Ammonia, nitrate/nitrite and oil & grease – analysis within 28 days of sample collection

Sample preservation requires chilling to 4 degrees Celsius.

The sample was extracted and/or analyzed within the prescribed holding times and properly preserved with the following exceptions. Total cyanide and pH were analyzed beyond 2X the holding times. The sample result for total cyanide was a non-detect and should be qualified as unusable and flagged "UR." The sample result for pH should be qualified as an estimate and flagged "J." Fluoride, sulfate, chromium(VI) and oil & grease were analyzed beyond the holding times but within 2X the holding times. The sample results for fluoride and chromium(VI) were non-detects and should be qualified as estimates and flagged "UJ." The sample results for sulfate and oil & grease were detects and should be qualified as estimates and flagged "J."

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

The laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Equipment Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130%.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable.

Laboratory Control Samples (LCSs)

The LCS recoveries were acceptable.

- **Precision**

Precision is evaluated by reviewing MS/MSD results, laboratory duplicate sample results, and field duplicate sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference limits are $\pm 30\%$.

MS/MSD Samples

All MS/MSD relative percent difference values were acceptable.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported method detection limits (MDLs) are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDG W04150 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 for method 9010A was 0%. The completion percentages for all remaining analyses were 100%.

MAJOR DEFICIENCIES

A major deficiency leading to qualification of the total cyanide sample result as unusable was due to a holding time infraction. See the table in Appendix 2 for a listing of all affected sample results.

MINOR DEFICIENCIES

Minor deficiencies leading to qualification of chromium(VI), fluoride, oil & grease, pH and sulfate sample results as estimates were due to holding time infractions. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

FHI, Contract #29774, *Validation of Radiological and Chemical Analytical Data*, Fluor Hanford Incorporated, August 24, 2006.

DOE/RL-2006-47, Rev. 0, *Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench*, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.
- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDL. The data should be considered usable for decision-making purposes.
- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.
- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.
- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2
Summary of Data Qualification

General Chemistry Data Qualification Summary			
SDG W04150	Reviewer: AQA	Project: CPP 200 Area	Page 1 of 1
Analyte(s)	Qualifier	Samples Affected	Reason
Total Cyanide	UR	B195W2	Analysis beyond 2X the holding time
pH	J	B195W2	Analysis beyond 2X the holding time
Chromium(VI) & Fluoride	UJ	B195W2	Analysis beyond the holding time but within 2X the holding time
Oil & Grease & Sulfate	J	B195W2	Analysis beyond the holding time but within 2X the holding time

Comments: None

Appendix 3

Annotated Laboratory Reports

FLUOR HANFORD IC

Client Sample ID: B195W2

General Chemistry

Lot-Sample #...: F4H120314-001 Work Order #...: GM17P Matrix.....: SOLID
 Date Sampled...: 07/21/04 Date Received...: 08/12/04
 % Moisture.....: 7.3

PARAMETER	09-05-07	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho		ND	50.0	mg/kg	MCAWW 300.0A	08/18-08/19/04	4233266
			Dilution Factor: 1		MDL.....: 0.50		
pH (solid)	J	9.2		No Units	SW846 9045A	08/16/04	4229405
			Dilution Factor: 1		MDL.....:		
Fluoride	UJ	ND	10.0	mg/kg	MCAWW 300.0A	08/18-08/19/04	4233263
			Dilution Factor: 1		MDL.....: 0.10		
Hexavalent Chromium	UJ	ND	0.43	mg/kg	SW846 7196A	08/20-08/23/04	4236221
			Dilution Factor: 1		MDL.....: 0.27		
Nitrate		1.9 B	2.0	mg/kg	MCAWW 300.0A	08/18-08/19/04	4233264
			Dilution Factor: 1		MDL.....: 0.040		
Nitrate/Nitrite as N		2.1	0.50	mg/kg	MCAWW 353.1	08/18/04	4233377
			Dilution Factor: 1		MDL.....: 0.036		
Nitrite		ND	2.0	mg/kg	MCAWW 300.0A	08/18-08/19/04	4233265
			Dilution Factor: 1		MDL.....: 0.040		
Nitrogen, as Ammonia		0.83	0.50	mg/kg	MCAWW 350.1	08/16/04	4230066
			Dilution Factor: 1		MDL.....: 0.22		
Oil and Grease (Gravimetric)	J	197 B	216	mg/kg	SW846 9071A	09/06-09/07/04	4251073
			Dilution Factor: 1		MDL.....:		
Percent Moisture		7.3	0.10	%	MCAWW 160.3 MOD	08/19-08/20/04	4232368
			Dilution Factor: 1		MDL.....:		
Sulfate	J	8.0 B	50.0	mg/kg	MCAWW 300.0A	08/18-08/19/04	4233267
			Dilution Factor: 1		MDL.....: 0.37		
Total Cyanide	UR	ND	0.50	mg/kg	SW846 9010A	08/26/04	4239316
			Dilution Factor: 1		MDL.....: 0.13		

NOTE(S):

RL Reporting Limit
 Results and reporting limits have been adjusted for dry weight.
 B Estimated result. Result is less than RL.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative
LOT NUMBER: F4H120314
W04150

This report contains the analytical results for the sample received under chain of custody by STL St. Louis on August 12, 2004. This sample is associated with your F04-015 project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise.

The samples were analyzed outside the 14-day holding time for soils for all parameters except metals. The lab did not receive the samples until after the holding time had expired.

Observations/Nonconformances

Metals

The MS/MSD recovery for Mercury is outside the established QC limits. The Mercury concentration in the original sample is greater than 4 times the amount spiked, making percent recovery information ineffective. Method performance is demonstrated by acceptable LCS recovery.

The MS recovery for Silver is outside the established QC limits. The RPD is within method acceptance criteria indicating possible matrix interference. Method performance is demonstrated by acceptable LCS recovery. No further action is required.

TPH - Diesel & Kerosene

The Method Blank surrogate recovery is outside acceptance limits. Samples associated with this method blank demonstrated acceptable surrogate recoveries indicating the surrogate excursion is isolated to the method blank and not indicative of the batch.

Case Narrative
LOT NUMBER: F4H120314
W04150

Semi-Volatiles

The LCS recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable LCS recoveries.

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample extraction efficiency and compliance is demonstrated by the remaining acceptable MS/MSD recoveries.

Volatiles

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis.

The surrogate recovery of DBFM is out high in MS, which caused four front end compounds to be out high and the Bromomethane RPD to be out. Sample purge efficiency and compliance is demonstrated by the remaining acceptable MS/MSD and LCS recoveries.

Oil & Grease

The MS/MSD associated with this sample was run on sample B193K0 from SD6 W04366. both samples were included in the same analytical batch.

FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F04-015-003		Page 1 of 1	
Collector Pope/Pfister/Hughes/Wiberg	Company Contact CS Cearlock	Telephone No. 372-9638	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days		
Project Designation 200-MW-1 Characterization Sampling and Analysis - Soil	Sampling Location 216-A-4 Crib, 18.5'±21'		SAF No. F04-015	Air Quality			
Ice Chest No. SN 2103-050024	Field Logbook No. HNF-N-3861	COA 119144ES10	Method of Shipment Government Vehicle	FED Ex			
Shipped To Severn Trent Waste Sampling & Characterization AT 8/11/04	Offsite Property No. N/A	Bill of Lading/Air Bill No. N/A					
POSSIBLE SAMPLE HAZARDS/REMARKS N/A Special Handling and/or Storage Radioactive Tie To: B19620 W04150							
Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Cool 4C
B195W2	SOIL	7/21/04	1054	aG	aG	aG	aG
				Type of Container	1	3	1
				No. of Container(s)	1	1	1
				Volume	250mL	250mL	120mL
SPECIAL INSTRUCTIONS ** The laboratory is to report both kerene and diesel range compounds from the WTPH-D analysis. (1) IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Total Cyanide - 9010; pH (Soil) - 9045; Ammonia by 350.3 (2) ICP/MS - 200.0 (As-Cadmium, Chromium, Cobalt, Silver, Lead, Manganese, Mercury by 7471 (3) VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene) (4) Semi-VOA - 8270A (Add-On) (Triethyl phosphate); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerene range) (5) Gamma-Spectroscopy - (Cesium-137, Cobalt-60, Europium-152, Europium-154, Americium-241, Strontium-90, Technetium-99, Plutonium-239, Plutonium-241, Uranium-235, Uranium-238) (6) NO ₂ /NO ₃ - 353.2, Oil & Grease - 413.1, Chromium Hex - 7196							
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From Verna CW	Date/Time 7/21/04 11:30	Received By/Stored In SIR FX 168	Date/Time 8/21/04 0800	(1) IC Anions - 300.0 (Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Total Cyanide - 9010; pH (Soil) - 9045; Ammonia by 350.3 (2) ICP/MS - 200.0 (As-Cadmium, Chromium, Cobalt, Silver, Lead, Manganese, Mercury by 7471 (3) VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol, cis-1,2-Dichloroethylene, n-Butylbenzene, trans-1,2-Dichloroethylene) (4) Semi-VOA - 8270A (Add-On) (Triethyl phosphate); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerene range) (5) Gamma-Spectroscopy - (Cesium-137, Cobalt-60, Europium-152, Europium-154, Americium-241, Strontium-90, Technetium-99, Plutonium-239, Plutonium-241, Uranium-235, Uranium-238) (6) NO ₂ /NO ₃ - 353.2, Oil & Grease - 413.1, Chromium Hex - 7196			
Relinquished By/Removed From Sik Fridic 8/11/04	Date/Time 0800	Received By/Stored In Greg Thomas Dept Lams 8/11/04	Date/Time 8/11/04				
Relinquished By/Removed From Greg Thomas Dept Lams 8/11/04	Date/Time 8/11/04	Received By/Stored In FED Ex	Date/Time 8/12/04 0900				
Relinquished By/Removed From FED Ex	Date/Time 8/12/04 0900	Received By/Stored In Verna CW	Date/Time 8/12/04 0900				
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

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: CPP 200 Area			DATA PACKAGE: VSR07-017		
VALIDATOR: Carl Schloesslin		LAB: STL St. Louis		DATE: 09-05-2007	
			SDG: W04150		
ANALYSES PERFORMED					
Anions/IC X	TOC	TOX	TPH-418.1	Oil and Grease X	Alkalinity
Ammonia X	BOD/COD	Chloride	Chromium-VI X	pH X	NO ₃ /NO ₂ X
Sulfate	TDS	TKN	Phosphate	Total CN X	
SAMPLES/MATRIX Soil sample B195W2					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **No** N/A
 Comments: None

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: None

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: None

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: None

6. HOLDING TIMES (all levels)

Samples properly preserved? Yes No N/A
Sample holding times acceptable? Yes No N/A

Comments: pH: sample analyzed 26 days after collection
Cr(VI): sample analyzed 33 days after collection
Oil & Grease: sample analyzed 48 days after collection
Total CN: sample analyzed 36 days after collection
Fluoride & sulfate: sample analyzed 29 days after collection

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: None

Appendix 6

Additional Documentation Requested By Client

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F4H120314

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING		METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
		LIMIT	UNITS			
Fluoride	ND	Work Order #: GNK0T1AA 10.0	mg/kg	MB Lot-Sample #: F4H200000-263 MCAWW 300.0A	08/18/04	4233263
		Dilution Factor: 1				
Hexavalent Chromium	ND	Work Order #: GNPAG1AA 0.40	mg/kg	MB Lot-Sample #: F4H230000-221 SW846 7196A	08/20-08/23/04	4236221
		Dilution Factor: 1				
Nitrate	ND	Work Order #: GNK0W1AA 2.0	mg/kg	MB Lot-Sample #: F4H200000-264 MCAWW 300.0A	08/18/04	4233264
		Dilution Factor: 1				
Nitrate/Nitrite as N	ND	Work Order #: GNNM11AA 0.50	mg/kg	MB Lot-Sample #: F4H200000-377 MCAWW 353.1	08/18-08/21/04	4233377
		Dilution Factor: 1				
Nitrite	ND	Work Order #: GNK001AA 2.0	mg/kg	MB Lot-Sample #: F4H200000-265 MCAWW 300.0A	08/18/04	4233265
		Dilution Factor: 1				
Nitrogen, as Ammonia	ND	Work Order #: GM9HA1AA 0.50	mg/kg	MB Lot-Sample #: F4H170000-066 MCAWW 350.1	08/16/04	4230066
		Dilution Factor: 1				
Oil and Grease (Gravimetric)	ND	Work Order #: GPNWT1AA 200	mg/kg	MB Lot-Sample #: F4I070000-073 SW846 9071A	09/06-09/07/04	4251073
		Dilution Factor: 1				
Phosphate as P, Ortho	ND	Work Order #: GNK021AA 50.0	mg/kg	MB Lot-Sample #: F4H200000-266 MCAWW 300.0A	08/18/04	4233266
		Dilution Factor: 1				
Sulfate	ND	Work Order #: GNK051AA 50.0	mg/kg	MB Lot-Sample #: F4H200000-267 MCAWW 300.0A	08/18/04	4233267
		Dilution Factor: 1				
Total Cyanide	ND	Work Order #: GN08D1AA 0.50	mg/kg	MB Lot-Sample #: F4H260000-316 SWB46 9010A	08/26/04	4239316
		Dilution Factor: 1				

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: F4H120314

Matrix.....: SOLID

PARAMETER	SPIKE	MEASURED	PERCENT		PREPARATION-		PREP
	AMOUNT	AMOUNT	UNITS	RECVRY	RPD	METHOD	ANALYSIS DATE
Fluoride			WO#:GNK0T1AC-LCS/GNK0T1AD-LCSD		LCS Lot-Sample#: F4H200000-263		
	5.00	5.15	mg/kg	103		MCAWW 300.0A	08/18/04 4233263
	5.00	4.84	mg/kg	97	6.3	MCAWW 300.0A	08/18/04 4233263
	Dilution Factor: 1						
Nitrate			WO#:GNK0W1AC-LCS/GNK0W1AD-LCSD		LCS Lot-Sample#: F4H200000-264		
	2.00	1.94	mg/kg	97		MCAWW 300.0A	08/18/04 4233264
	2.00	2.02	mg/kg	101	4.2	MCAWW 300.0A	08/18/04 4233264
	Dilution Factor: 1						
Nitrate/Nitrite as N			WO#:GNNM11AC-LCS/GNNM11AD-LCSD		LCS Lot-Sample#: F4H200000-377		
	4.00	3.62	mg/kg	90		MCAWW 353.1	08/18-08/21/04 4233377
	4.00	3.74	mg/kg	94	3.3	MCAWW 353.1	08/18-08/21/04 4233377
	Dilution Factor: 1						
Nitrite			WO#:GNK001AC-LCS/GNK001AD-LCSD		LCS Lot-Sample#: F4H200000-265		
	0.800	0.838	mg/kg	105		MCAWW 300.0A	08/18/04 4233265
	0.800	0.903	mg/kg	113	7.5	MCAWW 300.0A	08/18/04 4233265
	Dilution Factor: 1						
Nitrogen, as Ammonia			WO#:GM9HA1AC-LCS/GM9HA1AD-LCSD		LCS Lot-Sample#: F4H170000-066		
	4.00	3.72	mg/kg	93		MCAWW 350.1	08/16/04 4230066
	4.00	3.88	mg/kg	97	4.2	MCAWW 350.1	08/16/04 4230066
	Dilution Factor: 1						
Phosphate as P, Ortho			WO#:GNK021AC-LCS/GNK021AD-LCSD		LCS Lot-Sample#: F4H200000-266		
	40.0	36.3	mg/kg	91		MCAWW 300.0A	08/18/04 4233266
	40.0	37.0	mg/kg	93	2.0	MCAWW 300.0A	08/18/04 4233266
	Dilution Factor: 1						
Sulfate			WO#:GNK051AC-LCS/GNK051AD-LCSD		LCS Lot-Sample#: F4H200000-267		
	40.0	37.4	mg/kg	94		MCAWW 300.0A	08/18/04 4233267
	40.0	37.7	mg/kg	94	0.69	MCAWW 300.0A	08/18/04 4233267
	Dilution Factor: 1						

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F4H120314

Matrix.....: SOLID

<u>PARAMETER</u>	<u>SPIKE AMOUNT</u>	<u>MEASURED AMOUNT</u>	<u>UNITS</u>	<u>PERCENT RECVRY</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
pH (solid)	7.00	7.03	No Units	100	SW846 9045A	08/16/04	4229405
Work Order #: GM81J1AA LCS Lot-Sample#: F4H160000-405 Dilution Factor: 1							
Hexavalent Chromium	2.00	1.95	mg/kg	98	SW846 7196A	08/20-08/23/04	4236221
Work Order #: GNPAG1AC LCS Lot-Sample#: F4H230000-221 Dilution Factor: 1							
Oil and Grease (Gravimetric)	3330	3600	mg/kg	108	SW846 9071A	09/06-09/07/04	4251073
Work Order #: GPNWT1AC LCS Lot-Sample#: F4I070000-073 Dilution Factor: 1							
Total Cyanide	5.00	5.36	mg/kg	107	SW846 9010A	08/26/04	4239316
Work Order #: GN08D1AC LCS Lot-Sample#: F4H260000-316 Dilution Factor: 1							

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F4H120314
Date Sampled...: 08/18/04

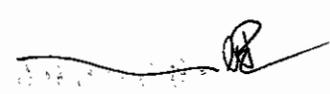
Date Received...: 08/28/04

Matrix.....: SOLID

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
								% Moisture.....: 7.3	
Hexavalent Chromium	WO#: GM17P1DV-MS/GM17P1DW-MSD MS Lot-Sample #: F4H120314-001								
ND	43.1		36.1	N mg/kg	84		SW846 7196A	08/20-08/23/04	4236221
ND	43.1		37.5	mg/kg	87	3.8	SW846 7196A	08/20-08/23/04	4236221
Dilution Factor: 1									

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Results and reporting limits have been adjusted for dry weight.
 N Spiked analyte recovery is outside stated control limits.



MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F4H120314
 Date Sampled...: 07/21/04

Date Received...: 08/12/04

Matrix.....: SOLID

Percent Moisture: 0.0

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Fluoride	ND	20.0	19.9	mg/kg	100	MCAWW 300.0A	08/18-08/19/04	4233263
			Work Order #...: GM17P1DF				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					
Nitrate	1.9	5.00	5.96	mg/kg	81	MCAWW 300.0A	08/18-08/19/04	4233264
			Work Order #...: GM17P1DG				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					
Nitrate/Nitrite as N	2.1	5.00	6.26 N	mg/kg	83	MCAWW 353.1	08/18-08/21/04	4233377
			Work Order #...: GM17P1DD				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					
Nitrite	ND	1.00	1.19	mg/kg	119	MCAWW 300.0A	08/18-08/19/04	4233265
			Work Order #...: GM17P1DH				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					
Nitrogen, as Ammonia	0.83	5.00	5.15 N	mg/kg	86	MCAWW 350.1	08/16/04	4230066
			Work Order #...: GM17P1DL				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					
Oil and Grease (Gravimetric)	ND	3330	3200	mg/kg	96	SW846 9071A	09/06-09/07/04	4251073
			Work Order #...: GN7DF1AQ				MS Lot-Sample #: F4H300104-001	
			Dilution Factor: 1					
Phosphate as P, Ortho	ND	40.0	42.3	mg/kg	106	MCAWW 300.0A	08/18-08/19/04	4233266
			Work Order #...: GM17P1DJ				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					
Sulfate	8.0	40.0	45.7	mg/kg	94	MCAWW 300.0A	08/18-08/19/04	4233267
			Work Order #...: GM17P1DK				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					
Total Cyanide	ND	5.00	5.40	mg/kg	108	SW846 9010A	08/26/04	4239316
			Work Order #...: GM17P1DM				MS Lot-Sample #: F4H120314-001	
			Dilution Factor: 1					

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 N Spiked analyte recovery is outside stated control limits.
 Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #....: F4H120314

Work Order #....: GM17P-SMP
GM17P-DUP

Matrix.....: SOLID

Date Sampled....: 07/21/04

Date Received...: 08/12/04

% Moisture.....: 7.3

PARAM RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Nitrate/Nitrite as N					SD Lot-Sample #: F4H120314-001		
2.1	2.1	mg/kg	0.95	(0-30)	MCAWW 353.1	08/18/04	4233377
		Dilution Factor: 1					
Fluoride					SD Lot-Sample #: F4H120314-001		
ND	ND	mg/kg	0	(0-30)	MCAWW 300.0A	08/18-08/19/04	4233263
		Dilution Factor: 1					
Nitrate					SD Lot-Sample #: F4H120314-001		
1.9 B	1.9 B	mg/kg	2.4	(0-30)	MCAWW 300.0A	08/18-08/19/04	4233264
		Dilution Factor: 1					
Nitrite					SD Lot-Sample #: F4H120314-001		
ND	ND	mg/kg	0	(0-30)	MCAWW 300.0A	08/18-08/19/04	4233265
		Dilution Factor: 1					
Phosphate as P, Ortho					SD Lot-Sample #: F4H120314-001		
ND	ND	mg/kg	0	(0-30)	MCAWW 300.0A	08/18-08/19/04	4233266
		Dilution Factor: 1					
Sulfate					SD Lot-Sample #: F4H120314-001		
8.0 B	7.4 B	mg/kg	8.7	(0-30)	MCAWW 300.0A	08/18-08/19/04	4233267
		Dilution Factor: 1					
Total Cyanide					SD Lot-Sample #: F4H120314-001		
ND	ND	mg/kg	0	(0-30)	SW846 9010A	08/26/04	4239316
		Dilution Factor: 1					
pH (solid)					SD Lot-Sample #: F4H120314-001		
9.2	9.1	No Units	0.11	(0-30)	SW846 9045A	08/16/04	4229405
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

Date: 03 September 2007
To: Fluor Hanford Inc. (technical representative)
From: Analytical Quality Associates, Inc.
Project: CPP 200 Area
Subject: Radiochemical - Sample Data Group (SDG) H2671

INTRODUCTION

This memorandum presents the results of data validation for SDG H2671 prepared by Eberline Services for radiochemical analysis. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B197F0	07/21/04	Soil	C	See note 1

1 - Alpha spectrometry, gamma spectrometry, iodine-129, strontium-89/90, technetium-99, tritium, and total uranium by KPA.

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench, DOE/RL-2006-47, Rev. 0 (SAP). 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. 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 and Sample Preservation

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 180 days, or five half-lives, whichever is shorter. There are no specific preservation requirements for radiochemical soil/solid analysis.

The samples were analyzed within the prescribed holding times.

• Blanks

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Equipment Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results, laboratory control sample results, and chemical recovery factors. Chemical recovery factors are determined through use of a carrier or tracer and provide assessment of the chemical separation process that is affected by the laboratory procedure, sample matrix, and/or interference. Chemical recovery factors are used to correct the sample concentration, uncertainty, and minimum detectable concentration (MDC) results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130% (65% to 135% for total uranium by KPA).

Matrix Spike (MS) Samples

MS analyses were not performed for total uranium by KPA and tritium. The total uranium result for sample B197F0 was a detect and should be qualified as an estimate and flagged "J." The tritium result for sample B197F0 was a non-detect and should be qualified as an estimate and flagged "UJ."

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

Carrier/Tracer Recovery Factors

All carrier/tracer recovery factors were acceptable.

- **Precision**

Precision is evaluated by reviewing laboratory and field duplicate sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are $\pm 30\%$ ($\pm 35\%$ for total uranium by KPA).

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable with the following exception. The Pu-238 RPD was 37%. The Pu-238 result for sample B197F0 should be qualified as an estimate and flagged “J.”

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported MDCs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

Due to elevated sample activity, reduced sample aliquot sizes were used for all analyses. As a result, most analyte MDCs were above the CRDLs. In all of these cases *except* non-detect SAP analytes Eu-152, Eu-155, I-129 and U-235, the sample results were significantly > the MDCs.

- **Completeness**

SDG H2671 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

Minor deficiencies leading to qualification of sample results as estimates were due to lack of MS analyses for tritium and total uranium by KPA, and poor laboratory duplicate precision for Pu-238. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

FHI, Contract #29774, *Validation of Radiological and Chemical Analytical Data*, Fluor Hanford Incorporated, August 24, 2006.

DOE/RL-2006-47, Rev. 0, *Sampling and Analysis Plan for Additional Remedial Investigation Activities at the 216-A-4 Crib and the 200-E-102 Trench*, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.
- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDC. The data should be considered usable for decision-making purposes.
- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.
- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.
- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2
Summary of Data Qualification

Radiochemical Data Qualification Summary			
SDG H2671	Reviewer: AQA	Project: CPP 200 Area	Page 1 of 1
Analyte(s)	Qualifier	Samples Affected	Reason
Total Uranium	J	B197F0	MS not performed
Tritium	UJ	B197F0	MS not performed
Pu-238	J	B197F0	Poor laboratory duplicate precision

Comments: None

Appendix 3

Annotated Laboratory Reports

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2671

7065-001

B197F0

DATA SHEET

SDG <u>7065</u>	Client/Case no <u>Hanford</u>	SDG <u>H2671</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408104-01</u>	Client sample id <u>B197F0</u>	
Dept sample id <u>7065-001</u>	Location/Matrix <u>216-A-4 Crib</u>	<u>SOLID</u>
Received <u>08/12/04</u>	Collected/Weight <u>07/21/04 10:54</u>	<u>73.51 g</u>
% solids <u>84.3</u>	Custody/SAF No <u>F03-018-079</u>	<u>F04-015</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.801	1.4	2.4	400	U UJ	H
Total Strontium	SR-RAD	3860000	42000	1200	1.0		SR
Technetium 99	14133-76-7	5.61	4.4	10	15	U	TC
Total Uranium (ug/g)	7440-61-1	1970	240	1.8	1.0	J	U_T
Uranium 233/234	U-233/234	478	140	75	1.0		U
Uranium 235	15117-96-1	35.4	47	90	1.0	U	U
Uranium 238	U-238	683	160	75	1.0		U
Plutonium 238	13981-16-3	209	120	150	1.0	J	PU
Plutonium 239/240	PU-239/240	21400	2300	150	1.0		PU
Americium 241	14596-10-2	3810	200	23	1.0		AM
Iodine 129	15046-84-1	3.28	18	40	2.0	U	I
Potassium 40	13966-00-2	U		29		U	GAM
Cobalt 60	10198-40-0	14.3	3.6	4.6	0.050		GAM
Cesium 137	10045-97-3	63600	70	38	0.10		GAM
Radium 226	13982-63-3	U		33	0.10	U	GAM
Radium 228	15262-20-1	U		33	0.20	U	GAM
Europium 152	14683-23-9	U		71	0.10	U	GAM
Europium 154	15585-10-1	179	20	20	0.10		GAM
Europium 155	14391-16-3	U		85	0.10	U	GAM
Thorium 228	14274-82-9	U		33		U	GAM
Thorium 232	TH-232	U		33		U	GAM
Uranium 235	15117-96-1	U		100		U	GAM
Uranium 238	U-238	U		980		U	GAM
Americium 241	14596-10-2	U		2000		U	GAM

200 MW-1 Characterization Sampling

LS
09-03-07

0000015

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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>09/23/04</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2671 was composed of one solid (soil) sample designated under SAF No. F04-015 with a Project Designation of: 200-MW-1 Characterization Sampling and Analysis - Soil.

The sample was 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 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.3 Iodine-129 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 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.8 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.9 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F04-015-040	Page 1 of 1
Collector Pope/Pfister/Hughes/Wiberg	Company Contact CS Clearlock	Telephone No. 372-9638	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days
Project Designation 200-MW-1 Characterization Sampling and Analysis - Soil	Sampling Location 216-A-4 Crib; 18.5'-21'	H2671 (7065)	SAF No. F04-015	Air Quality <input type="checkbox"/>	
Ice Chest No. JN 12/03010536	Field Logbook No. HNF-N-3861	COA 119144ES10	Method of Shipment Federal Express		
Shipped To Shaw Group	Offsite Property No. PTR 13935	Bill of Lading/Air Bill No. See PTR 13935			
POSSIBLE SAMPLE HAZARDS/REMARKS N/A					
Special Handling and/or Storage Tie to WSCF Rad Screen: B19620					
SAMPLE ANALYSIS					
Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None
B19861	SOIL	7/21/04	1054	Moisture Resistant	Liner
				No. of Container(s)	1
				Volume	200g
				Moisture Content - D2977	
				Particle Size (Dry Sieve) - P422	
CHAIN OF POSSESSION					
Relinquished By/Removed From Dana Lee	Date/Time 7/21/04 13:00	Received By/Stored In SITE FRIGS	Date/Time 7/21/04 13:00		
Relinquished By/Removed From Site Frigs	Date/Time 8/11/04 8:00	Received By/Stored In Greg Thomas / Greg Thomas	Date/Time 8/11/04		
Relinquished By/Removed From Greg Thomas / Greg Thomas	Date/Time 8/12/04 9:40	Received By/Stored In Ted EA	Date/Time 8/12/04 12:15		
Relinquished By/Removed From Ted EA	Date/Time	Received By/Stored In	Date/Time		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time		
SPECIAL INSTRUCTIONS					
LABORATORY SECTION					
FINAL SAMPLE DISPOSITION					
Received By				Title	
Disposal Method				Date/Time	
Disposited By				Date/Time	

Appendix 5

Data Validation Supporting Documentation

APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: CPP 200 Area			DATA PACKAGE: VSR07-017		
VALIDATOR: Carl Schloesslin		LAB: Eberline Services		DATE: 07-31-2007	
			SDG: H2671		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Techneium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	I-129		
X	X	X	X	X	
SAMPLES/MATRIX					
Soil samples B197F0					

1. Completeness N/A

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

Comments: None

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: None

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: None

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: None

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: None

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 MS data for tritium and KPA uranium analyses.

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: Pu-238 RPD = 37%, RER < 1

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: None

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: Many MDCs > CRDLs, though most associated sample concentrations
are > the MDCs. The exceptions are the following non-detect SAP analytes:

Eu-152, Eu-155, I-129 & U-235

Appendix 6

Additional Documentation Requested By Client

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2671

7065-003

Method Blank

METHOD BLANK

SDG <u>7065</u>	Client/Case no <u>Hanford</u>	SDG <u>H2671</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R408104-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7065-003</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>F04-015</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.154	1.5	2.5	400	U	H
Total Strontium	SR-RAD	0.825	110	<u>180</u>	1.0	U	SR
Techneium 99	14133-76-7	7.60	3.7	8.6	15	U	TC
Total Uranium (ug/g)	7440-61-1	0.160	0.088	0.18	1.0	U	U_T
Uranium 233/234	U-233/234	0	24	<u>90</u>	1.0	U	U
Uranium 235	15117-96-1	0	29	<u>110</u>	1.0	U	U
Uranium 238	U-238	11.8	24	<u>90</u>	1.0	U	U
Plutonium 238	13981-16-3	2.13	13	<u>24</u>	1.0	U	PU
Plutonium 239/240	PU-239/240	6.38	8.5	<u>16</u>	1.0	U	PU
Americium 241	14596-10-2	34.6	69	<u>130</u>	1.0	U	AM
Iodine 129	15046-84-1	0.470	11	<u>25</u>	2.0	U	I
Potassium 40	13966-00-2	U		10		U	GAM
Cobalt 60	10198-40-0	U		<u>0.72</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.57</u>	0.10	U	GAM
Radium 226	13982-63-3	U		<u>1.1</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>2.6</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>1.4</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>2.0</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>1.1</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.73		U	GAM
Thorium 232	TH-232	U		2.6		U	GAM
Uranium 235	15117-96-1	U		1.7		U	GAM
Uranium 238	U-238	U		70		U	GAM
Americium 241	14596-10-2	U		1.4		U	GAM

200 MW-1 Characterization Sampling

QC-BLANK 48691

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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>09/23/04</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2671

7065-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7065</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG <u>H2671</u> Contract <u>No. 630</u>
Lab sample id <u>R408104-02</u> Dept sample id <u>7065-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>F04-015</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	557	7.7	2.3	400	H	586	23	95	84-116	80-120
Total Strontium	11800	440	<u>160</u>	1.0	SR	11200	450	105	82-118	80-120
Technetium 99	2740	58	12	15	TC	2320	93	118	81-119	80-120
Total Uranium (ug/g)	1960	230	<u>1.8</u>	1.0	U_T	1810	72	108	75-125	80-120
Uranium 233/234	4590	530	<u>280</u>	1.0	U	4830	190	95	81-119	80-120
Uranium 235	3660	460	<u>85</u>	1.0	U	3920	160	93	80-120	80-120
Uranium 238	4660	530	<u>270</u>	1.0	U	5240	210	89	82-118	80-120
Plutonium 238	12700	1500	<u>150</u>	1.0	PU	13300	530	95	81-119	80-120
Plutonium 239/240	13200	1600	<u>150</u>	1.0	PU	14500	580	91	81-119	80-120
Americium 241	9910	1100	<u>130</u>	1.0	AM	10400	420	95	82-118	80-120
Iodine 129	4050	44	<u>45</u>	2.0	I	4020	160	101	84-116	80-120
Cobalt 60	101	3.4	<u>1.5</u>	0.050	GAM	104	4.2	97	77-123	80-120
Cesium 137	102	2.7	<u>1.8</u>	0.10	GAM	101	4.0	101	76-124	80-120

200 MW-1 Characterization Sampling

QC-LCS 48690

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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>09/23/04</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2671

7065-004

B197F0

DUPLICATE

SDG <u>7065</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R408104-04</u> Dept sample id <u>7065-004</u> % solids <u>84.3</u>	Client/Case no <u>Hanford</u> SDG <u>H2671</u> Contract No. <u>630</u> ORIGINAL Lab sample id <u>R408104-01</u> Dept sample id <u>7065-001</u> Received <u>08/12/04</u> % solids <u>84.3</u>
Client sample id <u>B197F0</u> Location/Matrix <u>216-A-4 Crib</u> SOLID Collected/Weight <u>07/21/04 10:54</u> <u>73.51 g</u> Custody/SAF No <u>F03-018-079</u> <u>F04-015</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 TOT	PROT LIMIT
Tritium	1.58	1.5	2.5	400	U	H	-0.801	1.4	2.4	U	-		
Total Strontium	3830000	51000	1600	1.0		SR	3860000	42000	1200		1	21	
Technetium 99	7.49	5.0	13	15	U	TC	5.61	4.4	10	U	-		
Total Uranium (ug/g)	2000	240	1.8	1.0		U_T	1970	240	1.8		2	32	
Uranium 233/234	544	150	80	1.0		U	478	140	75		13	61	
Uranium 235	25.3	25	97	1.0	U	U	35.4	47	90	U	-		
Uranium 238	743	170	80	1.0		U	683	160	75		8	50	
Plutonium 238	304	47	20	1.0		PU	209	120	150		37	76	
Plutonium 239/240	20600	670	14	1.0		PU	21400	2300	150		4	20	
Americium 241	4340	630	130	1.0		AM	3810	200	23		13	27	
Iodine 129	-2.34	14	31	2.0	U	I	3.28	18	40	U	-		
Potassium 40	U		20			U	GAM	U	29	U	-		
Cobalt 60	17.1	2.4	2.8	0.050		GAM	14.3	3.6	4.6		18	52	
Cesium 137	70300	40	16	0.10		GAM	63600	70	38		10	32	
Radium 226	U		18	0.10	U	GAM	U		33	U	-		
Radium 228	U		21	0.20	U	GAM	U		33	U	-		
Europium 152	U		40	0.10	U	GAM	U		71	U	-		
Europium 154	191	12	12	0.10		GAM	179	20	20		6	37	
Europium 155	U		51	0.10	U	GAM	U		85	U	-		
Thorium 228	U		19		U	GAM	U		33	U	-		
Thorium 232	U		21		U	GAM	U		33	U	-		
Uranium 235	U		61		U	GAM	U		100	U	-		
Uranium 238	U		630		U	GAM	U		980	U	-		
Americium 241	U		2100		U	GAM	U		2000	U	-		

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QC-DUP#1 48692

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