

SAF-RC-232
100-IU-2 & 100-IU-6 Remaining
Waste Sites – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt

H4-21

KW 8/19/13
INITIAL/DATE

COMMENTS:

SDG J01846

SAF-RC-232

Sample Location: 600-381

Date: 15 August 2013
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-381
 Subject: Herbicides/Diesel Range Organics/Polyaromatic Hydrocarbons - Data Package No. J01846-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01846 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RNL8	6/28/13	Soil	C	See note 1
J1RNL9	6/28/13	Soil	C	See note 1
J1RNM1	6/28/13	Soil	C	See note 1
J1RNM3	6/28/13	Soil	C	See note 1

1 – Herbicides by 8151A & diesel range organics by NWTPH-D, polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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 Data Requested by Client

DATA QUALITY OBJECTIVES

· Holding Times

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

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

associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blanks

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

Due to method blank contamination, the C10-C36 result in sample J1RNL8 was qualified as undetected and flagged "U".

Due to method blank contamination, the C10-C36 result in sample J1RNM1 was qualified as undetected, raised to the RQL and flagged "U".

Due to method blank contamination, all C10-C28 results were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field (equipment) Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as

estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to an LCS recovery outside QC limits, all dinoseb (9%) results were qualified as estimates and flagged "J".

Due to a matrix spike duplicate recovery outside QC limits, all dinoseb (2%) results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits, all dinoseb (10%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits, all dinoseb (145%) results were qualified as estimates and flagged "J".

Due to RPDs outside QC limits, all PAH results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1RNL8/J1RNM3) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. J01846 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the C10-C36 result in sample J1RNL8 was qualified as undetected and flagged "U".
- Due to method blank contamination, the C10-C36 result in sample J1RNM1 was qualified as undetected, raised to the RQL and flagged "U".
- Due to method blank contamination, all C10-C28 results were qualified as undetected, raised to the RQL and flagged "U".

- Due to an LCS recovery outside QC limits, all dinoseb (9%) results were qualified as estimates and flagged "J".
- Due to a matrix spike duplicate recovery outside QC limits, all dinoseb (2%) results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits, all dinoseb (10%) results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all dinoseb (145%) results were qualified as estimates and flagged "J".
- Due to RPDs outside QC limits, all PAH results were qualified as estimates and flagged "J".

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

PAH/DIESEL RANGE ORGANIC/HERBICIDE DATA QUALIFICATION
SUMMARY*

SDG: J01846	REVIEWER: ELR	Project: 600-381	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Dinoseb	J	All	MS, MSD, LCS and RPD
C10-C36	U	J1RNL8	Method blank contamination
C10-C36	U at RQL	J1RNM1	Method blank contamination
C10-C28	U at RQL	All	Method blank contamination
All PAHs	J	All	RPD

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

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-182699	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-182163	Initial Weight/Volume: 32.9 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 07/15/2013 2246		Injection Volume: 20 uL
Prep Date: 07/10/2013 1810		Result Type: PRIMARY

✓ 6/14/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.5	U J	9.5	95
Acenaphthylene		8.5	U	8.5	95
Anthracene		2.9	U	2.9	19
Benzo[a]anthracene		3.8	J X	3.0	14
Benzo[a]pyrene		20		6.1	14
Benzo[b]fluoranthene		6.4	J X	4.0	14
Benzo[g,h,i]perylene		9.9	J	6.8	28
Benzo[k]fluoranthene		3.7	U	3.7	14
Chrysene		14	J	4.6	38
Dibenzo(a,h)anthracene		10	U	10	28
Fluoranthene		14	J X	12	38
Fluorene		5.0	U	5.0	28
Indeno[1,2,3-cd]pyrene		11	U	11	28
Naphthalene		11	U	11	95
Phenanthrene		11	U	11	38
Pyrene		19	J	11	38

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	91		72 - 115

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-182699	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-182163	Initial Weight/Volume: 31.1 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 07/15/2013 2317		Injection Volume: 20 uL
Prep Date: 07/10/2013 1810		Result Type: PRIMARY

W 8/14/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		11	U J	11	110
Acenaphthylene		9.5	U	9.5	110
Anthracene		3.2	U	3.2	21
Benzo[a]anthracene		3.4	U	3.4	16
Benzo[a]pyrene		6.8	U	6.8	16
Benzo[b]fluoranthene		4.4	U	4.4	16
Benzo[g,h,i]perylene		7.6	U	7.6	32
Benzo[k]fluoranthene		4.2	U	4.2	16
Chrysene		5.1	U	5.1	42
Dibenzo(a,h)anthracene		12	U	12	32
Fluoranthene		14	U	14	42
Fluorene		5.6	U	5.6	32
Indeno[1,2,3-cd]pyrene		13	U	13	32
Naphthalene		13	U	13	110
Phenanthrene		13	U	13	42
Pyrene		13	U	13	42
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		92		72 - 115	

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3
Client Matrix: Solid

% Moisture: 14.7

Date Sampled: 06/28/2013 0950
Date Received: 07/02/2013 0945

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-182699	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-182163	Initial Weight/Volume: 30.6 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 07/15/2013 2347		Injection Volume: 20 uL
Prep Date: 07/10/2013 1810		Result Type: PRIMARY

h g/mc/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		11	U	11	110
Acenaphthylene		10	U	10	110
Anthracene		3.5	U	3.5	23
Benzo[a]anthracene		3.7	U	3.7	17
Benzo[a]pyrene		7.4	U	7.4	17
Benzo[b]fluoranthene		4.8	U	4.8	17
Benzo[g,h,i]perylene		8.3	U	8.3	34
Benzo[k]fluoranthene		4.5	U	4.5	17
Chrysene		5.6	U	5.6	46
Dibenzo(a,h)anthracene		13	U	13	34
Fluoranthene		15	U	15	46
Fluorene		6.1	U	6.1	34
Indeno[1,2,3-cd]pyrene		14	U	14	34
Naphthalene		14	U	14	110
Phenanthrene		14	U	14	46
Pyrene		14	U	14	46
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		91		72 - 115	

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-182699	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-182163	Initial Weight/Volume: 32.6 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 07/16/2013 0018		Injection Volume: 20 uL
Prep Date: 07/10/2013 1810		Result Type: PRIMARY

W of 1/4/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.6	UN J	9.6	96
Acenaphthylene		8.6	UN	8.6	96
Anthracene		2.9	UN	2.9	19
Benzo[a]anthracene		3.1	UN	3.1	14
Benzo[a]pyrene		16	N	6.2	14
Benzo[b]fluoranthene		5.0	JN	4.0	14
Benzo[g,h,i]perylene		6.9	UN	6.9	29
Benzo[k]fluoranthene		3.8	UN	3.8	14
Chrysene		12	JXN	4.6	38
Dibenzo(a,h)anthracene		11	UN	11	29
Fluoranthene		15	JN	12	38
Fluorene		5.1	UN	5.1	29
Indeno[1,2,3-cd]pyrene		12	UN	12	29
Naphthalene		12	UN	12	96
Phenanthrene		12	UN	12	38
Pyrene		17	JN	12	38
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Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		90		72 - 115	

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1

Date Sampled: 06/28/2013 0830

Client Matrix: Solid

% Moisture: 3.8

Date Received: 07/02/2013 0945

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-182231	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-182166	Lab File ID:	07110024.D
Dilution:	1.0			Initial Weight/Volume:	30.7 g
Analysis Date:	07/11/2013 2030			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2115			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		6000	B U	1000	4100
C10-C28		2200 5000 U	J B U	690	4100
Surrogate		%Rec	Qualifier	Acceptance Limits	
o-Terphenyl		73		49 - 115	

Handwritten: 4/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-182231	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-182166	Lab File ID:	07110027.D
Dilution:	1.0			Initial Weight/Volume:	30.6 g
Analysis Date:	07/11/2013 2158			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2115			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C38		7000	B	1100	4300
C10-C28		5000 2400 ^u	J B	730	4300
Surrogate		%Rec	Qualifier	Acceptance Limits	
o-Terphenyl		76		49 - 115	

✓ 9/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3
Client Matrix: Solid

% Moisture: 14.7

Date Sampled: 06/28/2013 0950
Date Received: 07/02/2013 0945

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-182231	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-182166	Lab File ID:	07110028.D
Dilution:	1.0			Initial Weight/Volume:	30.1 g
Analysis Date:	07/11/2013 2227			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2115			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		1800	J B U	1200	4700
C10-C28	5000 5000	1100	J B U	790	4700
Surrogate		%Rec	Qualifier	Acceptance Limits	
o-Terphenyl		69		49 - 115	

8/10/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-182231	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-182166	Lab File ID:	07110029.D
Dilution:	1.0			Initial Weight/Volume:	30.6 g
Analysis Date:	07/11/2013 2255			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2115			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		6600	B	1000	4100
C10-C28		2000 5000	J B U	690	4100
Surrogate		%Rec	Qualifier	Acceptance Limits	
o-Terphenyl		76		49 - 115	

Handwritten note: ✓ 4 levels

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8151A Herbicides (GC)

Analysis Method: 8151A	Analysis Batch: 280-181744	Instrument ID: SGC_M
Prep Method: 8151A	Prep Batch: 280-181362	Initial Weight/Volume: 50.5 g
Dilution: 1.0		Final Weight/Volume: 10000 uL
Analysis Date: 07/08/2013 1502		Injection Volume: 1 uL
Prep Date: 07/02/2013 1755		Result Type: PRIMARY

✓ 8/14/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2,4,5-T		2.4	U	2.4	21
2,4-Dichlorophenoxyacetic acid		14	U	14	82
2,4-DB		7.7	U	7.7	82
Dalapon		1.4	U	1.4	41
Dicamba		1.4	U	1.4	41
Dichlorprop		3.3	U	3.3	82
Dinoseb		1.4	U N <i>J</i>	1.4	12
MCPA		2100	U	2100	8200
2,4,5-TP (Silvex)		1.4	U	1.4	21
MCPP		2100	U	2100	8200

Surrogate	%Rec	Qualifier	Acceptance Limits
DCAA	76		31 - 105

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

8151A Herbicides (GC)

Analysis Method: 8151A	Analysis Batch: 280-181744	Instrument ID: SGC_M
Prep Method: 8151A	Prep Batch: 280-181362	Initial Weight/Volume: 50.4 g
Dilution: 1.0		Final Weight/Volume: 10000 uL
Analysis Date: 07/08/2013 1610	<i>✓ 8/14/13</i>	Injection Volume: 1 uL
Prep Date: 07/02/2013 1755		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2,4,5-T		2.5	U	2.5	22
2,4-Dichlorophenoxyacetic acid		15	U	.15	87
2,4-DB		8.1	U	8.1	87
Dalapon		1.5	U	1.5	44
Dicamba		1.5	U	1.5	44
Dichlorprop		3.5	U	3.5	87
Dinoseb		1.5	U <i>J</i>	1.5	13
MCPA		2200	U	2200	8700
2,4,5-TP (Silvex)		1.5	U	1.5	22
MCPP		2200	U	2200	8700
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Surrogate		%Rec	Qualifier	Acceptance Limits	
DCAA		59		31 - 105	

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3

Date Sampled: 06/28/2013 0950

Client Matrix: Solid

% Moisture: 14.7

Date Received: 07/02/2013 0945

8151A Herbicides (GC)

Analysis Method: 8151A

Analysis Batch: 280-181744

Instrument ID: SGC_M

Prep Method: 8151A

Prep Batch: 280-181362

Initial Weight/Volume: 50.9 g

Dilution: 1.0

Final Weight/Volume: 10000 uL

Analysis Date: 07/08/2013 1633

W 8/14/13

Injection Volume: 1 uL

Prep Date: 07/02/2013 1755

Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2,4,5-T		2.6	U	2.6	23
2,4-Dichlorophenoxyacetic acid		16	U	16	92
2,4-DB		8.6	U	8.6	92
Dalapon		1.6	U	1.6	46
Dicamba		1.6	U	1.6	46
Dichlorprop		3.7	U	3.7	92
Dinoseb		1.6	U <i>J</i>	1.6	14
MCPA		2300	U	2300	9200
2,4,5-TP (Silvex)		1.6	U	1.6	23
MCPP		2300	U	2300	9200

Surrogate	%Rec	Qualifier	Acceptance Limits
DCAA	81		31 - 105

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8151A Herbicides (GC)

Analysis Method: 8151A
Prep Method: 8151A
Dilution: 1.0
Analysis Date: 07/08/2013 1656
Prep Date: 07/02/2013 1755

Analysis Batch: 280-181744
Prep Batch: 280-181362

Instrument ID: SGC_M
Initial Weight/Volume: 50.7 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Result Type: PRIMARY

Handwritten: 2/1/14/12

Analyte	DryWT Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2,4,5-T		2.4	U	2.4	21
2,4-Dichlorophenoxyacetic acid		14	U	14	82
2,4-DB		13	J	7.7	82
Dalapon		1.4	U	1.4	41
Dicamba		1.4	U	1.4	41
Dichlorprop		3.3	U	3.3	82
Dinoseb		1.4	U J	1.4	12
MCPA		2100	U	2100	8200
2,4,5-TP (Silvex)		1.4	U	1.4	21
MCPP		2100	U	2100	8200

Surrogate	%Rec	Qualifier	Acceptance Limits
DCAA	73		31 - 105

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-43949-1

SDG #: J01846

SAF#: RC-232

Date SDG Closed: July 2, 2013

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1RNL8	280-43949-1	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNL9	280-43949-2	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM1	280-43949-3	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM3	280-43949-4	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM4	280-43949-5	6010/7471/8270A	6010B/7471A/8270C

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 7/2/2013 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° C.

GC/MS SEMIVOLATILES - SW846 8270C

The LCS associated with batch 280-182197 exhibited the percent recovery outside the control limits, biased low, for 3-Nitroaniline at 44% (lower limit 47%). A full list spike was utilized, and although this compound was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits (lower limit 38%). This marginal exceedance has been determined to be sporadic, not systematic; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "T". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - SW846 8081A - Pesticides

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8151A - Herbicides

Dinoseb results in soil are reported for this project at the request of the client with the qualifier that the laboratory is not certified for this analyte and the reported results are considered biased low. The laboratory consistently obtains very low recoveries, typically $\leq 10\%$.

The MSD aliquot of the MS/MSD performed on sample J1RNL8 exhibited the percent recovery outside the control limits for Dinoseb, and the associated sample result has been flagged "N". In addition, the RPD limit was exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

Low levels of C10-C36 and C10-C28 are present in the method blank associated with batch 280-182166. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1RNL8 and J1RNM3. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The MS aliquot of the MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries and the surrogate recovery outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-181392 indicates that physical and chemical interferences are present for Aluminum, Barium, Zinc, Cobalt and Nickel. Results have been flagged with an "X".

Low levels of Zinc are present in the method blank associated with batch 280-181392. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Low levels of Iron are present at a level greater than half the reporting limit in the method blank associated with batch 280-181392. As the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1RNL8; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1RNL8 exhibited percent recoveries outside the control limits for Boron and Silicon, and the associated sample results have been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The duplicate analysis of sample J1RNL8 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spike performed on sample J1RNM3 exhibited percent recoveries outside the control limits for Sulfate and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9045C - PH

SU = standard units

No anomalies were encountered

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-232-025		Page 1 of 2	
Collector SAGDAL, PA		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8D	
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites		Sampling Location 600-381		SAF No. RC-232		Data Turnaround 21 Day			
Ice Chest No. RCC-08-016		Field Logbook No. EL-1667		COA 060381A000		Method of Shipment Commercial Carrier		Fed Ex	
Shipped To TestAmerica - Denver		Offsite Property No. A120866		Bill of Lading/Air Bill No. See OSPC					
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Go to #C - 04/6/13 See Preservation				Preservation		Freeze	Cool 4C	Cool 4C	Cool 4C
				Type of Container		Gal	Gal	Gal	Gal
				No. of Container(s)		5	1	1	1
				Volume		40mL	125mL	125mL	1000mL
SAMPLE ANALYSIS				VOA - 5035/8260 (TCL)		See item (1) in Special Instructions		Semi-VOA - 8270A (TCL)	
				See item (2) in Special Instructions					
Sample No.		Matrix	Sample Date	Sample Time					
JRN18		SOIL	6/28/13	0830	7-13	X	X	X	
JRN19		SOIL	6/28/13	0915	7-13	X	X	X	
JRN20 04/6/13		SOIL	6/28/13	0950	7-13	X	X	X	
JRN21		SOIL	6/28/13	0950	7-13	X	X	X	
JRN22 04/6/13		SOIL	6/28/13	0950	7-13	X	X	X	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS	
Relinquished By/Removed From Pat Sarda		Date/Time 6-28-13 1030		Received By/Stored In Don Heibelberg		Date/Time 6/28/13 1030		(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury) (2) IC Anions - 9056 Modified (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); NO2/NO3 - 353.2 (Nitrogen in Nitrite and Nitrate); TPH-Diesel Range - WTPH-D +; pH (Soil) - 9045 (pH Measurement); PAHs - 8310; PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPAB151	
Relinquished By/Removed From Pat Sarda		Date/Time 6-28-13 0830		Received By/Stored In Erin Blinghame		Date/Time 6/28/13 0830			
Relinquished By/Removed From Pat Sarda		Date/Time 7-1-13 1130		Received By/Stored In Fed Ex		Date/Time 7-1-13 0830			
Relinquished By/Removed From Pat Sarda		Date/Time 7-1-13 1130		Received By/Stored In Fed Ex		Date/Time 7-1-13 0945			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time			

WCH-EE-011

Generated Date/Time: 06/05/2013 10:00, PDT



SG JK 7/2/13
JK
SDG
J01846

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Appendix 5
Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	600-381		DATA PACKAGE: J01846		
VALIDATOR:	ELR	LAB:	TAC	DATE: 8/13/13	
			SDG:	J01846	
ANALYSES PERFORMED					
8015	8021	8141	<u>815A</u>	8315	<u>8316</u>
		WTPH-HCID	WTPH-G	<u>WTPH-D</u>	
SAMPLES/MATRIX:					
JIRULY JIRULA JIRUMI JIRUM3					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

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 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: C10-C36 - LR - U
C10-C36 - MI - U at RQL
C10-C28 - ~~MI~~ - U at RQL
NO PD

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: LCS - dinoseb 97% - July
MS - dinoseb 107% + 27% J all
MSD/
NO PD

GENERAL ORGANIC 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: RPD - 2,4-DB dinoseb - J all
PAT - RPD - J all

6. HOLDING TIMES (all levels)

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

Comments: _____

GENERAL ORGANIC 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: _____

9. SAMPLE CLEANUP (Levels D and E)

- Fluoricult ® (or other absorbant) 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

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182163

Method: 8310
Preparation: 3550C

Lab Sample ID: MB 280-182163/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/15/2013 2145
Prep Date: 07/10/2013 1810
Leach Date: N/A

Analysis Batch: 280-182699
Prep Batch: 280-182163
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0715015.D
Initial Weight/Volume: 30.8 g
Final Weight/Volume: 4000 uL
Injection Volume: 20 uL
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	9.7	U	9.7	97
Acenaphthylene	8.8	U	8.8	97
Anthracene	3.0	U	3.0	19
Benzo[a]anthracene	3.1	U	3.1	15
Benzo[a]pyrene	6.2	U	6.2	15
Benzo[b]fluoranthene	4.1	U	4.1	15
Benzo[g,h,i]perylene	7.0	U	7.0	29
Benzo[k]fluoranthene	3.8	U	3.8	15
Chrysene	4.7	U	4.7	39
Dibenzo(a,h)anthracene	11	U	11	29
Fluoranthene	13	U	13	39
Fluorene	5.1	U	5.1	29
Indeno[1,2,3-cd]pyrene	12	U	12	29
Naphthalene	12	U	12	97
Phenanthrene	12	U	12	39
Pyrene	12	U	12	39
Surrogate	% Rec		Acceptance Limits	
Terphenyl-d14 (SUR)	93		72 - 115	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Lab Control Sample - Batch: 280-182163

Method: 8310
Preparation: 3550C

Lab Sample ID: LCS 280-182163/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/15/2013 2216
Prep Date: 07/10/2013 1810
Leach Date: N/A

Analysis Batch: 280-182699
Prep Batch: 280-182163
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0715016.D
Initial Weight/Volume: 32.8 g
Final Weight/Volume: 4000 uL
Injection Volume: 20 uL
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1830	1630	89	78 - 116	
Acenaphthylene	1830	1570	86	76 - 115	
Anthracene	1830	1720	94	74 - 115	
Benzo[a]anthracene	1830	1650	90	85 - 120	
Benzo[a]pyrene	1830	1680	92	74 - 121	
Benzo[b]fluoranthene	1830	1690	92	85 - 115	
Benzo[g,h,i]perylene	1830	1730	95	85 - 120	
Benzo[k]fluoranthene	1830	1730	95	85 - 115	
Chrysene	1830	1670	91	83 - 115	
Dibenzo(a,h)anthracene	1830	1690	92	83 - 115	
Fluoranthene	1830	1720	94	83 - 115	
Fluorene	1830	1620	89	80 - 115	
Indeno[1,2,3-cd]pyrene	1830	1670	91	85 - 123	
Naphthalene	1830	1650	90	80 - 121	
Phenanthrene	1830	1690	93	80 - 115	
Pyrene	1830	1620	88	75 - 116	
Surrogate		% Rec		Acceptance Limits	
Terphenyl-d14 (SUR)		92		72 - 115	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182163**

**Method: 8310
Preparation: 3550C**

MS Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/16/2013 0048
Prep Date: 07/10/2013 1810
Leach Date: N/A

Analysis Batch: 280-182699
Prep Batch: 280-182163
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0715021.D
Initial Weight/Volume: 31.4 g
Final Weight/Volume: 4000 uL
Injection Volume: 20 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/16/2013 0119
Prep Date: 07/10/2013 1810
Leach Date: N/A

Analysis Batch: 280-182699
Prep Batch: 280-182163
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0715022.D
Initial Weight/Volume: 30.2 g
Final Weight/Volume: 4000 uL
Injection Volume: 20 uL
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Acenaphthene	61	91	78 - 116	43	20	N	*
Acenaphthylene	58	87	76 - 115	43	21	N	*
Anthracene	63	93	74 - 115	42	20	N	*
Benzo[a]anthracene	63	93	85 - 120	43	20	N	*
Benzo[a]pyrene	67	99	74 - 121	42	20	N	*
Benzo[b]fluoranthene	64	97	85 - 115	44	20	N	*
Benzo[g,h,i]perylene	63	95	85 - 120	43	20	N	*
Benzo[k]fluoranthene	67	99	85 - 115	43	20	N	*
Chrysene	62	93	83 - 115	43	20	N	*
Dibenzo(a,h)anthracene	65	96	83 - 115	42	20	N	*
Fluoranthene	64	95	83 - 115	42	20	N	*
Fluorene	60	90	80 - 115	43	20	N	*
Indeno[1,2,3-cd]pyrene	64	94	85 - 123	42	20	N	*
Naphthalene	61	91	80 - 121	43	20	N	*
Phenanthrene	63	95	80 - 115	43	20	N	*
Pyrene	61	90	75 - 116	41	20	N	*
Surrogate	MS % Rec		MSD % Rec	Acceptance Limits			
Terphenyl-d14 (SUR)	62	*	92	72 - 115			

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182166

**Method: NWTPH-Dx
Preparation: 3550C**

Lab Sample ID: MB 280-182166/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/11/2013 1930
Prep Date: 07/10/2013 2115
Leach Date: N/A

Analysis Batch: 280-182231
Prep Batch: 280-182166
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_U
Lab File ID: 07110022.D
Initial Weight/Volume: 30.4 g
Final Weight/Volume: 1000 uL
Injection Volume: 1 uL

Analyte	Result	Qual	MDL	RL
C10-C36	1310	J	980	3900
C10-C28	1050	J	670	3900

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	78	49 - 115

Lab Control Sample - Batch: 280-182166

**Method: NWTPH-Dx
Preparation: 3550C**

Lab Sample ID: LCS 280-182166/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/11/2013 2000
Prep Date: 07/10/2013 2115
Leach Date: N/A

Analysis Batch: 280-182231
Prep Batch: 280-182166
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_U
Lab File ID: 07110023.D
Initial Weight/Volume: 31.2 g
Final Weight/Volume: 1000 uL
Injection Volume: 1 uL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
C10-C36	64200	58000	90	57 - 115	
C10-C28	64200	57900	90	53 - 115	

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	78	49 - 115

MS Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/11/2013 2059
Prep Date: 07/10/2013 2115

Analysis Batch: 280-182231
Prep Batch: 280-182166
Leach Batch: 36 N/A

Instrument ID: SGC_U
Lab File ID: 07110025.D
Initial Weight/Volume: 30.7 g
Final Weight/Volume: 1000 uL
Injection Volume: 1 uL

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-181362

**Method: 8151A
Preparation: 8151A**

Lab Sample ID: MB 280-181362/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 1417
Prep Date: 07/02/2013 1755
Leach Date: N/A

Analysis Batch: 280-181744
Prep Batch: 280-181362
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_M
Lab File ID: 07080016.D
Initial Weight/Volume: 50 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
2,4,5-T	2.3	U	2.3	20
2,4-Dichlorophenoxyacetic acid	14	U	14	80
2,4-DB	7.5	U	7.5	80
Dalapon	1.4	U	1.4	40
Dicamba	1.4	U	1.4	40
Dichlorprop	3.2	U	3.2	80
Dinoseb	1.4	U	1.4	12
MCPA	2000	U	2000	8000
2,4,5-TP (Silvex)	1.4	U	1.4	20
MCPP	2000	U	2000	8000

Surrogate	% Rec	Acceptance Limits
DCAA	81	31 - 105

Lab Control Sample - Batch: 280-181362

**Method: 8151A
Preparation: 8151A**

Lab Sample ID: LCS 280-181362/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 1440
Prep Date: 07/02/2013 1755
Leach Date: N/A

Analysis Batch: 280-181744
Prep Batch: 280-181362
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_M
Lab File ID: 07080017.D
Initial Weight/Volume: 50 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
2,4,5-T	92.3	67.5	73	53 - 129	
2,4-Dichlorophenoxyacetic acid	91.5	70.5	77	50 - 136	J
2,4-DB	91.7	73.7	80	29 - 134	J
Dalapon	92.4	61.9	67	35 - 105	
Dicamba	90.4	59.6	66	45 - 120	
Dichlorprop	90.4	64.8	72	50 - 118	J
Dinoseb	92.2	8.06	9	5 - 166	J
MCPA	9270	6320	68	42 - 123	J
2,4,5-TP (Silvex)	91.4	63.9	70	52 - 130	
MCPP	9320	6630	71	40 - 127	J

Surrogate	% Rec	Acceptance Limits
DCAA	61	31 - 105

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-181362**

**Method: 8151A
Preparation: 8151A**

MS Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 1525
Prep Date: 07/02/2013 1755
Leach Date: N/A

Analysis Batch: 280-181744
Prep Batch: 280-181362
Leach Batch: N/A

Instrument ID: SGC_M
Lab File ID: 07080019.D
Initial Weight/Volume: 50.6 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 1548
Prep Date: 07/02/2013 1755
Leach Date: N/A

Analysis Batch: 280-181744
Prep Batch: 280-181362
Leach Batch: N/A

Instrument ID: SGC_M
Lab File ID: 07080020.D
Initial Weight/Volume: 51.5 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
2,4,5-T	76	93	24 - 115	18	40		
2,4-Dichlorophenoxyacetic acid	71	83	32 - 115	13	40	J	J
2,4-DB	63	47	37 - 119	32	50	J	J
Dalapon	83	100	11 - 115	16	50		
Dicamba	70	82	11 - 115	14	50		
Dichlorprop	72	86	35 - 115	15	50	J	J
Dinoseb	10	2	5 - 166	145	50	J	J N*
MCPA	68	82	37 - 115	16	50	J	J
2,4,5-TP (Silvex)	66	79	53 - 134	15	40		
MCPP	75	85	48 - 132	12	50	J	J
Surrogate	MS % Rec		MSD % Rec	Acceptance Limits			
DCAA	63		64	31 - 105			

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-181362**

**Method: 8151A
Preparation: 8151A**

MS Lab Sample ID: 280-43949-1 Units: ug/Kg
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 1525
Prep Date: 07/02/2013 1755
Leach Date: N/A

MSD Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 1548
Prep Date: 07/02/2013 1755
Leach Date: N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual		
2,4,5-T	2.4	U	94.8	93.1	72.4		86.6	
2,4-Dichlorophenoxyacetic acid	14	U	93.9	92.3	66.8	J	76.3	J
2,4-DB	7.7	U	94.1	92.5	59.6	J	43.0	J
Dalapon	1.4	U	94.9	93.2	79.1		93.3	
Dicamba	1.4	U	92.8	91.2	65.1		74.9	
Dichlorprop	3.3	U	92.8	91.2	67.1	J	78.0	J
Dinoseb	1.4	U	94.6	93.0	9.32	J	1.49	J N *
MCPA	2100	U	9520	9350	6460	J	7620	J
2,4,5-TP (Silvex)	1.4	U	93.8	92.2	62.4		72.6	
MCPP	2100	U	9570	9400	7140	J	8020	J

Date: 15 August 2013
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-381
 Subject: Semivolatile Organics - Data Package No. J01846-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01846 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RNL8	6/28/13	Soil	C	See note 1
J1RNL9	6/28/13	Soil	C	See note 1
J1RNM1	6/28/13	Soil	C	See note 1
J1RNM3	6/28/13	Soil	C	See note 1
J1RNM4	6/28/13	Soil	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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 Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

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

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

associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blanks

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

All method blank results were acceptable.

Field (equipment) Blanks

One field (equipment) blank (J1RNM4) was submitted for analysis. No analytes were detected in the field blank.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

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

Due to an LCS recovery outside QC limits, all 4-chloroaniline (28%), 3,3-dichlorobenzene (46%) and 3-nitroaniline (44%) results were qualified as estimates and flagged "J".

Due to a matrix spike duplicate recovery outside QC limits, all 4,6-dinitro-2-methylphenol (27%), 2,4-dinitrophenol (13%) and hexachlorocyclopentadiene (7%) results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits, all 4,6-dinitro-2-methylphenol (28%), 2,4-dinitrophenol (14%) and hexachlorocyclopentadiene (6%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1RNL8/J1RNM3) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. J01846 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to an LCS recovery outside QC limits, all 4-chloroaniline (28%), 3,3-dichlorobenzene (46%) and 3-nitroaniline (44%) results were qualified as estimates and flagged "J".
- Due to a matrix spike duplicate recovery outside QC limits, all 4,6-dinitro-2-methylphenol (27%), 2,4-dinitrophenol (13%) and hexachlorocyclopentadiene (7%) results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits, all 4,6-dinitro-2-methylphenol (28%), 2,4-dinitrophenol (14%) and hexachlorocyclopentadiene (6%) results were qualified as estimates and flagged "J".

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
 - UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
 - J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
 - R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
 - UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
 - NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
 - N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).
-

Appendix 2
Summary of Data Qualification

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: J01846	REVIEWER: ELR	Project: 600-381	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
4-chloroaniline 3,3-dichlorobenzene 3-nitroaniline	J	All	LCS recovery
4,6-dinitro-2-methylphenol 2,4-dinitrophenol hexachlorocyclopentadiene	J	All	MS & MSD recovery

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

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C Analysis Batch: 280-182487 Instrument ID: SMS_K
Prep Method: 3550C Prep Batch: 280-182197 Lab File ID: K2518.D
Dilution: 1.0 Initial Weight/Volume: 30.5 g
Analysis Date: 07/12/2013 2048 Final Weight/Volume: 1000 uL
Prep Date: 07/10/2013 2020 Injection Volume: 0.5 uL

K
6/14/13

Analyte	DryWT Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		11	U	11	340
Acenaphthylene		17	U	17	340
Anthracene		17	U	17	340
Benzo[a]anthracene		32	J	20	340
Benzo[a]pyrene		36	J	20	340
Benzo[b]fluoranthene		42	J	27	340
Benzo[ghi]perylene		19	J	16	340
Benzo[k]fluoranthene		41	U	41	340
Bis(2-chloroethoxy)methane		24	U	24	340
Bis(2-chloroethyl)ether		17	U	17	340
bis(2-chloroisopropyl) ether		24	U	24	340
Bis(2-ethylhexyl) phthalate		47	U	47	340
4-Bromophenyl phenyl ether		19	U	19	340
Butyl benzyl phthalate		44	U	44	340
Carbazole		37	U	37	340
4-Chloroaniline		84	U J	84	340
4-Chloro-3-methylphenol		67	U	67	340
2-Chloronaphthalene		10	U	10	340
2-Chlorophenol		21	U	21	340
4-Chlorophenyl phenyl ether		21	U	21	340
Chrysene		37	J	28	340
Dibenz(a,h)anthracene		19	U	19	340
Dibenzofuran		20	U	20	340
1,2-Dichlorobenzene		22	U	22	340
1,3-Dichlorobenzene		12	U	12	340
1,4-Dichlorobenzene		14	U	14	340
3,3'-Dichlorobenzidine		92	U J	92	670
2,4-Dichlorophenol		10	U	10	340
Diethyl phthalate		27	U	27	340
2,4-Dimethylphenol		67	U	67	340
Dimethyl phthalate		24	U	24	340
Di-n-butyl phthalate		30	U	30	340
4,6-Dinitro-2-methylphenol		340	U J	340	670
2,4-Dinitrophenol		340	U J	340	840
2,4-Dinitrotoluene		67	U	67	340
2,6-Dinitrotoluene		29	U	29	340
Di-n-octyl phthalate		15	U	15	340
Fluoranthene		58	J	37	340
Fluorene		18	U	18	340
Hexachlorobenzene		30	U	30	340
Hexachlorobutadiene		10	U	10	340
Hexachlorocyclopentadiene		51	U J	51	340
Hexachloroethane		22	U	22	340
Indeno[1,2,3-cd]pyrene		25	J	22	340
Isophorone		17	U	17	340
2-Methylnaphthalene		19	U	19	340

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1

Date Sampled: 06/28/2013 0830

Client Matrix: Solid

% Moisture: 3.8

Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2518.D
Dilution:	1.0			Initial Weight/Volume:	30.5 g
Analysis Date:	07/12/2013 2048			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

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Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2-Methylphenol		13	U	13	340
3 & 4 Methylphenol		34	U	34	340
Naphthalene		32	U	32	340
2-Nitroaniline		51	U	51	340
3-Nitroaniline		75	U ^J	75	340
4-Nitroaniline		74	U	74	340
Nitrobenzene		22	U	22	340
2-Nitrophenol		10	U	10	340
4-Nitrophenol		99	U	99	670
N-Nitrosodi-n-propylamine		32	U	32	340
N-Nitrosodiphenylamine		21	U	21	340
Pentachlorophenol		340	U	340	670
Phenanthrene		34	J	17	340
Phenol		18	U	18	340
Pyrene		67	J	12	340
1,2,4-Trichlorobenzene		29	U	29	340
2,4,5-Trichlorophenol		10	U	10	340
2,4,6-Trichlorophenol		10	U	10	340

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorobiphenyl	75		50 - 120
2-Fluorophenol	75		53 - 120
Nitrobenzene-d5	76		50 - 120
Phenol-d5	78		52 - 120
Terphenyl-d14	81		55 - 120
2,4,6-Tribromophenol	59		51 - 120

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2518.D
Dilution:	1.0			Initial Weight/Volume:	30.5 g
Analysis Date:	07/12/2013 2048			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

Tentatively Identified Compounds Number TIC's Found: 2

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.27	9600	N J
107-70-0	2-Pentanone, 4-methoxy-4-methyl-	3.84	620	N J

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g/ct/03

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2519.D
Dilution:	1.0			Initial Weight/Volume:	30.9 g
Analysis Date:	07/12/2013 2116			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

M 8/14/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		11	U	11	350
Acenaphthylene		18	U	18	350
Anthracene		18	U	18	350
Benzo[a]anthracene		21	U	21	350
Benzo[a]pyrene		21	U	21	350
Benzo[b]fluoranthene		28	U	28	350
Benzo[ghi]perylene		17	U	17	350
Benzo[k]fluoranthene		43	U	43	350
Bis(2-chloroethoxy)methane		25	U	25	350
Bis(2-chloroethyl)ether		18	U	18	350
bis (2-chloroisopropyl) ether		25	U	25	350
Bis(2-ethylhexyl) phthalate		49	U	49	350
4-Bromophenyl phenyl ether		20	U	20	350
Butyl benzyl phthalate		46	U	46	350
Carbazole		38	U	38	350
4-Chloroaniline		87	U J	87	350
4-Chloro-3-methylphenol		70	U	70	350
2-Chloronaphthalene		11	U	11	350
2-Chlorophenol		22	U	22	350
4-Chlorophenyl phenyl ether		22	U	22	350
Chrysene		29	U	29	350
Dibenz(a,h)anthracene		20	U	20	350
Dibenzofuran		21	U	21	350
1,2-Dichlorobenzene		23	U	23	350
1,3-Dichlorobenzene		13	U	13	350
1,4-Dichlorobenzene		14	U	14	350
3,3'-Dichlorobenzidine		96	U J	96	700
2,4-Dichlorophenol		11	U	11	350
Diethyl phthalate		28	U	28	350
2,4-Dimethylphenol		70	U	70	350
Dimethyl phthalate		25	U	25	350
Di-n-butyl phthalate		31	U	31	350
4,6-Dinitro-2-methylphenol		350	U J	350	700
2,4-Dinitrophenol		350	U J	350	880
2,4-Dinitrotoluene		70	U	70	350
2,6-Dinitrotoluene		30	U	30	350
Di-n-octyl phthalate		15	U	15	350
Fluoranthene		38	U	38	350
Fluorene		19	U	19	350
Hexachlorobenzene		31	U	31	350
Hexachlorobutadiene		11	U	11	350
Hexachlorocyclopentadiene		53	U J	53	350
Hexachloroethane		23	U	23	350
Indeno[1,2,3-cd]pyrene		23	U	23	350
Isophorone		18	U	18	350
2-Methylnaphthalene		20	U	20	350

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2519.D
Dilution:	1.0			Initial Weight/Volume:	30.9 g
Analysis Date:	07/12/2013 2116			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

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Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2-Methylphenol		14	U	14	350
3 & 4 Methylphenol		35	U	35	350
Naphthalene		33	U	33	350
2-Nitroaniline		53	U	53	350
3-Nitroaniline		78	U J	78	350
4-Nitroaniline		77	U	77	350
Nitrobenzene		23	U	23	350
2-Nitrophenol		11	U	11	350
4-Nitrophenol		100	U	100	700
N-Nitrosodi-n-propylamine		33	U	33	350
N-Nitrosodiphenylamine		22	U	22	350
Pentachlorophenol		350	U	350	700
Phenanthrene		18	U	18	350
Phenol		19	U	19	350
Pyrene		13	U	13	350
1,2,4-Trichlorobenzene		30	U	30	350
2,4,5-Trichlorophenol		11	U	11	350
2,4,6-Trichlorophenol		11	U	11	350

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorobiphenyl	75		50 - 120
2-Fluorophenol	77		53 - 120
Nitrobenzene-d5	77		50 - 120
Phenol-d5	80		52 - 120
Terphenyl-d14	80		55 - 120
2,4,6-Tribromophenol	64		51 - 120

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2519.D
Dilution:	1.0			Initial Weight/Volume:	30.9 g
Analysis Date:	07/12/2013 2116			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

Tentatively Identified Compounds Number TIC's Found: 2

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.27	11000	N J
107-70-0	2-Pentanone, 4-methoxy-4-methyl-	3.83	690	N J

Handwritten signature and date: 8/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Client Sample ID: J1RNMM1

Lab Sample ID: 280-43949-3

Date Sampled: 06/28/2013 0950

Client Matrix: Solid

% Moisture: 14.7

Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C	Analysis Batch: 280-182487	Instrument ID: SMS_K
Prep Method: 3550C	Prep Batch: 280-182197	Lab File ID: K2520.D
Dilution: 1.0		Initial Weight/Volume: 31.3 g
Analysis Date: 07/12/2013 2143		Final Weight/Volume: 1000 uL
Prep Date: 07/10/2013 2020		Injection Volume: 0.5 uL

W
4/14/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		12	U	12	370
Acenaphthylene		19	U	19	370
Anthracene		19	U	19	370
Benzo[a]anthracene		22	U	22	370
Benzo[a]pyrene		22	U	22	370
Benzo[b]fluoranthene		29	U	29	370
Benzo[ghi]perylene		18	U	18	370
Benzo[k]fluoranthene		45	U	45	370
Bis(2-chloroethoxy)methane		26	U	26	370
Bis(2-chloroethyl)ether		19	U	19	370
bis (2-chloroisopropyl) ether		26	U	26	370
Bis(2-ethylhexyl) phthalate		52	U	52	370
4-Bromophenyl phenyl ether		21	U	21	370
Butyl benzyl phthalate		48	U	48	370
Carbazole		40	U	40	370
4-Chloroaniline		92	U J	92	370
4-Chloro-3-methylphenol		74	U	74	370
2-Chloronaphthalene		11	U	11	370
2-Chlorophenol		24	U	24	370
4-Chlorophenyl phenyl ether		24	U	24	370
Chrysene		30	U	30	370
Dibenz(a,h)anthracene		21	U	21	370
Dibenzofuran		22	U	22	370
1,2-Dichlorobenzene		25	U	25	370
1,3-Dichlorobenzene		13	U	13	370
1,4-Dichlorobenzene		15	U	15	370
3,3'-Dichlorobenzidine		100	U J	100	740
2,4-Dichlorophenol		11	U	11	370
Diethyl phthalate		29	U	29	370
2,4-Dimethylphenol		74	U	74	370
Dimethyl phthalate		26	U	26	370
Di-n-butyl phthalate		52	J	33	370
4,6-Dinitro-2-methylphenol		370	U J	370	740
2,4-Dinitrophenol		370	U J	370	930
2,4-Dinitrotoluene		74	U	74	370
2,6-Dinitrotoluene		31	U	31	370
Di-n-octyl phthalate		16	U	16	370
Fluoranthene		40	U	40	370
Fluorene		20	U	20	370
Hexachlorobenzene		33	U	33	370
Hexachlorobutadiene		11	U	11	370
Hexachlorocyclopentadiene		56	U J	56	370
Hexachloroethane		24	U	24	370
Indeno[1,2,3-cd]pyrene		25	U	25	370
Isophorone		19	U	19	370
2-Methylnaphthalene		21	U	21	370

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3
Client Matrix: Solid

% Moisture: 14.7

Date Sampled: 06/28/2013 0950
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C	Analysis Batch: 280-182487	Instrument ID: SMS_K
Prep Method: 3550C	Prep Batch: 280-182197	Lab File ID: K2520.D
Dilution: 1.0		Initial Weight/Volume: 31.3 g
Analysis Date: 07/12/2013 2143		Final Weight/Volume: 1000 uL
Prep Date: 07/10/2013 2020		Injection Volume: 0.5 uL

8/14/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2-Methylphenol		15	U	15	370
3 & 4 Methylphenol		37	U	37	370
Naphthalene		35	U	35	370
2-Nitroaniline		56	U	56	370
3-Nitroaniline		82	U <i>J</i>	82	370
4-Nitroaniline		81	U	81	370
Nitrobenzene		25	U	25	370
2-Nitrophenol		11	U	11	370
4-Nitrophenol		110	U	110	740
N-Nitrosodi-n-propylamine		35	U	35	370
N-Nitrosodiphenylamine		24	U	24	370
Pentachlorophenol		370	U	370	740
Phenanthrene		19	U	19	370
Phenol		20	U	20	370
Pyrene		14	U	14	370
1,2,4-Trichlorobenzene		31	U	31	370
2,4,5-Trichlorophenol		11	U	11	370
2,4,6-Trichlorophenol		11	U	11	370

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorobiphenyl	75		50 - 120
2-Fluorophenol	73		53 - 120
Nitrobenzene-d5	77		50 - 120
Phenol-d5	78		52 - 120
Terphenyl-d14	80		55 - 120
2,4,6-Tribromophenol	63		51 - 120

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3

Date Sampled: 06/28/2013 0950

Client Matrix: Solid

% Moisture: 14.7

Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C

Analysis Batch: 280-182487

Instrument ID: SMS_K

Prep Method: 3550C

Prep Batch: 280-182197

Lab File ID: K2520.D

Dilution: 1.0

Initial Weight/Volume: 31.3 g

Analysis Date: 07/12/2013 2143

Final Weight/Volume: 1000 uL

Prep Date: 07/10/2013 2020

Injection Volume: 0.5 uL

Tentatively Identified Compounds

Number TIC's Found: 2

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.27	11000	N J
107-70-0	2-Pentanone, 4-methoxy-4-methyl-	3.83	710	N J

Handwritten signature and date: 8/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C	Analysis Batch: 280-182487	Instrument ID: SMS_K
Prep Method: 3550C	Prep Batch: 280-182197	Lab File ID: K2521.D
Dilution: 1.0		Initial Weight/Volume: 31.4 g
Analysis Date: 07/12/2013 2211		Final Weight/Volume: 1000 uL
Prep Date: 07/10/2013 2020		Injection Volume: 0.5 uL

W 8/14/13

Analyte	DryVM Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	330
Acenaphthylene		17	U	17	330
Anthracene		17	U	17	330
Benzo[a]anthracene		20	U	20	330
Benzo[a]pyrene		20	U	20	330
Benzo[b]fluoranthene		26	U	26	330
Benzo[ghi]perylene		16	U	16	330
Benzo[k]fluoranthene		40	U	40	330
Bis(2-chloroethoxy)methane		23	U	23	330
Bis(2-chloroethyl)ether		17	U	17	330
bis (2-chloroisopropyl) ether		23	U	23	330
Bis(2-ethylhexyl) phthalate		46	U	46	330
4-Bromophenyl phenyl ether		19	U	19	330
Butyl benzyl phthalate		43	U	43	330
Carbazole		36	U	36	330
4-Chloroaniline		82	U J	82	330
4-Chloro-3-methylphenol		66	U	66	330
2-Chloronaphthalene		10	U	10	330
2-Chlorophenol		21	U	21	330
4-Chlorophenyl phenyl ether		21	U	21	330
Chrysene		27	U	27	330
Dibenz(a,h)anthracene		19	U	19	330
Dibenzofuran		20	U	20	330
1,2-Dichlorobenzene		22	U	22	330
1,3-Dichlorobenzene		12	U	12	330
1,4-Dichlorobenzene		14	U	14	330
3,3'-Dichlorobenzidine		90	U J	90	660
2,4-Dichlorophenol		10	U	10	330
Diethyl phthalate		26	U	26	330
2,4-Dimethylphenol		66	U	66	330
Dimethyl phthalate		23	U	23	330
Di-n-butyl phthalate		29	U	29	330
4,6-Dinitro-2-methylphenol		330	U T J	330	660
2,4-Dinitrophenol		330	U T J	330	820
2,4-Dinitrotoluene		66	U	66	330
2,6-Dinitrotoluene		28	U	28	330
Di-n-octyl phthalate		14	U	14	330
Fluoranthene		36	U	36	330
Fluorene		18	U	18	330
Hexachlorobenzene		29	U	29	330
Hexachlorobutadiene		10	U	10	330
Hexachlorocyclopentadiene		50	U T J	50	330
Hexachloroethane		21	U	21	330
Indeno[1,2,3-cd]pyrene		22	U	22	330
Isophorone		17	U	17	330
2-Methylnaphthalene		19	U	19	330

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2521.D
Dilution:	1.0			Initial Weight/Volume:	31.4 g
Analysis Date:	07/12/2013 2211			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

W 8/14/13

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2-Methylphenol		13	U	13	330
3 & 4 Methylphenol		33	U	33	330
Naphthalene		31	U	31	330
2-Nitroaniline		50	U	50	330
3-Nitroaniline		73	U J	73	330
4-Nitroaniline		72	U	72	330
Nitrobenzene		22	U	22	330
2-Nitrophenol		10	U	10	330
4-Nitrophenol		97	U	97	660
N-Nitrosodi-n-propylamine		31	U	31	330
N-Nitrosodiphenylamine		21	U	21	330
Pentachlorophenol		330	U T	330	660
Phenanthrene		17	U	17	330
Phenol		18	U	18	330
Pyrene		14	J	12	330
1,2,4-Trichlorobenzene		28	U	28	330
2,4,5-Trichlorophenol		10	U	10	330
2,4,6-Trichlorophenol		10	U	10	330

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorobiphenyl	68		50 - 120
2-Fluorophenol	67		53 - 120
Nitrobenzene-d5	69		50 - 120
Phenol-d5	71		52 - 120
Terphenyl-d14	75		55 - 120
2,4,6-Tribromophenol	60		51 - 120

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4
Client Matrix: Solid

% Moisture: 4.1

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2521.D
Dilution:	1.0			Initial Weight/Volume:	31.4 g
Analysis Date:	07/12/2013 2211			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

Tentatively Identified Compounds Number TIC's Found: 2

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.27	8700	N J
107-70-0	2-Pentanone, 4-methoxy-4-methyl-	3.83	550	N J

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8/14/13*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNMM4

Lab Sample ID: 280-43949-5
Client Matrix: Solid

% Moisture: 0.0

Date Sampled: 06/28/2013 1008
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C Analysis Batch: 280-182487 Instrument ID: SMS_K
Prep Method: 3550C Prep Batch: 280-182197 Lab File ID: K2524.D
Dilution: 1.0 Initial Weight/Volume: 31.8 g
Analysis Date: 07/12/2013 2334 Final Weight/Volume: 1000 uL
Prep Date: 07/10/2013 2020 Injection Volume: 0.5 uL

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Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.7	U	9.7	310
Acenaphthylene		16	U	16	310
Anthracene		16	U	16	310
Benzo[a]anthracene		19	U	19	310
Benzo[a]pyrene		19	U	19	310
Benzo[b]fluoranthene		25	U	25	310
Benzo[ghi]perylene		15	U	15	310
Benzo[k]fluoranthene		38	U	38	310
Bis(2-chloroethoxy)methane		22	U	22	310
Bis(2-chloroethyl)ether		16	U	16	310
bis(2-chloroisopropyl) ether		22	U	22	310
Bis(2-ethylhexyl) phthalate		43	U	43	310
4-Bromophenyl phenyl ether		18	U	18	310
Butyl benzyl phthalate		41	U	41	310
Carbazole		34	U	34	310
4-Chloroaniline		77	U J	77	310
4-Chloro-3-methylphenol		62	U	62	310
2-Chloronaphthalene		9.4	U	9.4	310
2-Chlorophenol		20	U	20	310
4-Chlorophenyl phenyl ether		20	U	20	310
Chrysene		25	U	25	310
Dibenz(a,h)anthracene		18	U	18	310
Dibenzofuran		19	U	19	310
1,2-Dichlorobenzene		21	U	21	310
1,3-Dichlorobenzene		11	U	11	310
1,4-Dichlorobenzene		13	U	13	310
3,3'-Dichlorobenzidine		85	U J	85	620
2,4-Dichlorophenol		9.4	U	9.4	310
Diethyl phthalate		25	U	25	310
2,4-Dimethylphenol		62	U	62	310
Dimethyl phthalate		22	U	22	310
Di-n-butyl phthalate		27	U	27	310
4,6-Dinitro-2-methylphenol		310	U HH	310	620
2,4-Dinitrophenol		310	U HH	310	780
2,4-Dinitrotoluene		62	U	62	310
2,6-Dinitrotoluene		26	U	26	310
Di-n-octyl phthalate		14	U	14	310
Fluoranthene		34	U	34	310
Fluorene		17	U	17	310
Hexachlorobenzene		27	U	27	310
Hexachlorobutadiene		9.4	U	9.4	310
Hexachlorocyclopentadiene		47	U J	47	310
Hexachloroethane		20	U	20	310
Indeno[1,2,3-cd]pyrene		21	U	21	310
Isophorone		16	U	16	310
2-Methylnaphthalene		18	U	18	310

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Client Sample ID: J1RNMM4

Lab Sample ID: 280-43949-5

Date Sampled: 06/28/2013 1008

Client Matrix: Solid

% Moisture: 0.0

Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Prep Method:	3550C	Prep Batch:	280-182197	Lab File ID:	K2524.D
Dilution:	1.0			Initial Weight/Volume:	31.8 g
Analysis Date:	07/12/2013 2334			Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2-Methylphenol		12	U	12	310
3 & 4 Methylphenol		31	U	31	310
Naphthalene		29	U	29	310
2-Nitroaniline		47	U	47	310
3-Nitroaniline		69	U J	69	310
4-Nitroaniline		68	U	68	310
Nitrobenzene		21	U	21	310
2-Nitrophenol		9.4	U	9.4	310
4-Nitrophenol		92	U	92	620
N-Nitrosodi-n-propylamine		29	U	29	310
N-Nitrosodiphenylamine		20	U	20	310
Pentachlorophenol		310	U	310	620
Phenanthrene		16	U	16	310
Phenol		17	U	17	310
Pyrene		11	U	11	310
1,2,4-Trichlorobenzene		26	U	26	310
2,4,5-Trichlorophenol		9.4	U	9.4	310
2,4,6-Trichlorophenol		9.4	U	9.4	310

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorobiphenyl	74		50 - 120
2-Fluorophenol	76		53 - 120
Nitrobenzene-d5	78		50 - 120
Phenol-d5	82		52 - 120
Terphenyl-d14	81		55 - 120
2,4,6-Tribromophenol	66		51 - 120

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8/12/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM4

Lab Sample ID: 280-43949-5
Client Matrix: Solid

% Moisture: 0.0

Date Sampled: 06/28/2013 1008
Date Received: 07/02/2013 0945

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method: 8270C
Prep Method: 3550C
Dilution: 1.0
Analysis Date: 07/12/2013 2334
Prep Date: 07/10/2013 2020

Analysis Batch: 280-182487
Prep Batch: 280-182197

Instrument ID: SMS_K
Lab File ID: K2524.D
Initial Weight/Volume: 31.8 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

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Tentatively Identified Compounds

Number TIC's Found: 3

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.27	9000	N J
107-70-0	2-Pentanone, 4-methoxy-4-methyl-	3.83	560	N J
301-2-0	9-Octadecenamide, (Z)-	15.94	370	N J

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-43949-1

SDG #: J01846

SAF#: RC-232

Date SDG Closed: July 2, 2013

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1RNL8	280-43949-1	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNL9	280-43949-2	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM1	280-43949-3	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM3	280-43949-4	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM4	280-43949-5	6010/7471/8270A	6010B/7471A/8270C

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 7/2/2013 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° C.

GC/MS SEMIVOLATILES - SW846 8270C

The LCS associated with batch 280-182197 exhibited the percent recovery outside the control limits, biased low, for 3-Nitroaniline at 44% (lower limit 47%). A full list spike was utilized, and although this compound was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits (lower limit 38%). This marginal exceedance has been determined to be sporadic, not systematic; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "T". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - SW846 8081A - Pesticides

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8151A - Herbicides

Dinoseb results in soil are reported for this project at the request of the client with the qualifier that the laboratory is not certified for this analyte and the reported results are considered biased low. The laboratory consistently obtains very low recoveries, typically $\leq 10\%$.

The MSD aliquot of the MS/MSD performed on sample J1RNL8 exhibited the percent recovery outside the control limits for Dinoseb, and the associated sample result has been flagged "N". In addition, the RPD limit was exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

Low levels of C10-C36 and C10-C28 are present in the method blank associated with batch 280-182166. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1RNL8 and J1RNM3. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The MS aliquot of the MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries and the surrogate recovery outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-181392 indicates that physical and chemical interferences are present for Aluminum, Barium, Zinc, Cobalt and Nickel. Results have been flagged with an "X".

Low levels of Zinc are present in the method blank associated with batch 280-181392. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Low levels of Iron are present at a level greater than half the reporting limit in the method blank associated with batch 280-181392. As the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1RNL8; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1RNL8 exhibited percent recoveries outside the control limits for Boron and Silicon, and the associated sample results have been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The duplicate analysis of sample J1RNL8 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spike performed on sample J1RNM3 exhibited percent recoveries outside the control limits for Sulfate and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9045G - PH

SU = standard units

No anomalies were encountered

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-232-025	Page 1 of 2
Collector SAGDAL, PA	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code EP	Data Turnaround 21 Day		
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-381	SAF No. RC-232	Method of Shipment Commercial Carrier Fed Ex				
Ice Chest No. RCC-08-016	Field Logbook No. EL-1667	COA 060381A000	Bill of Lading/Air Bill No. See OSPC				
Shipped To TestAmerica - Denver	Offsite Property No. A120866						
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Good to go - 04/15/13 See Preservation	Preservation	Freeze	Cool 4C	Cool 4C	Cool 4C		
	Type of Container	Gs*	GP	gG	gG		
	No. of Container(s)	5	1	1	1		
	Volume	40mL	125mL	125mL	1000mL		
SAMPLE ANALYSIS		VOA - 5035/5260 (TCL)	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions		
Sample No.	Matrix	Sample Date	Sample Time				
IRNL8	SOIL	6/28/13	0830	X	X	X	
IRNL9	SOIL	6/28/13	0915	X	X	X	
IRNM0	SOIL	6/28/13	0915				
IRNM1	SOIL	6/28/13	0950	X	X	X	
IRNM2	SOIL	6/28/13	0950				
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS		
Relinquished By/Removed From Pat Sarda	Date/Time 6-28-13 1030	Received By/Stored In Don Heibel	Date/Time 6/28/13 1030	(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury) (2) IC Anions - 9056 Modified (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); NO2/NO3 - 353.2 (Nitrogen in Nitrite and Nitrate); TPH-Diesel Range - WTPH-D +; pH (Soil) - 9045 (pH Measurement); PAHs - 8310; PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPAB151 56 JK 7/2/13 IR 506 J01846			
Relinquished By/Removed From Pat Sarda	Date/Time 6-28-13 0830	Received By/Stored In Don Heibel	Date/Time 6/28/13 0830				
Relinquished By/Removed From Pat Sarda	Date/Time 7-1-13 1130	Received By/Stored In Fed Ex	Date/Time 7-1-13 0945				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time				

Appendix 5
Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	600-381		DATA PACKAGE: J01846		
VALIDATOR:	ELR	LAB:	TAL	DATE: 8/15/13	
			SDG:	J01846	
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
JIRUL8		JIRULS		JIRUM1	
JIRUM4				JIRUM3	
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

GC/MS tuning/performance check acceptable? Yes No N/A
 Initial calibrations acceptable? Yes No N/A
 Continuing calibrations acceptable? Yes No N/A
 Standards traceable? Yes No N/A
 Standards expired? Yes No N/A
 Calculation check acceptable? Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: _____

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: LCS - III - J all no PAS
MS - III
MSD - III

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

MS/MSD samples analyzed? Yes No N/A
 MS/MSD RPD values acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards expired? (Levels D, E) Yes No N/A
 Field duplicate RPD values acceptable? Yes No N/A
 Field split RPD values acceptable? Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No N/A
 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: _____

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: _____

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

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182197

**Method: 8270C
Preparation: 3550C**

Lab Sample ID: MB 280-182197/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 1408
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analysis Batch: 280-182487
Prep Batch: 280-182197
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SMS_K
Lab File ID: K2503.D
Initial Weight/Volume: 32.5 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

Analyte	Result	Qual	MDL	RL
Acenaphthene	9.5	U	9.5	300
Acenaphthylene	16	U	16	300
Anthracene	16	U	16	300
Benzo[a]anthracene	18	U	18	300
Benzo[a]pyrene	18	U	18	300
Benzo[b]fluoranthene	24	U	24	300
Benzo[ghi]perylene	15	U	15	300
Benzo[k]fluoranthene	37	U	37	300
Bis(2-chloroethoxy)methane	21	U	21	300
Bis(2-chloroethyl)ether	15	U	15	300
bis (2-chloroisopropyl) ether	21	U	21	300
Bis(2-ethylhexyl) phthalate	42	U	42	300
4-Bromophenyl phenyl ether	18	U	18	300
Butyl benzyl phthalate	40	U	40	300
Carbazole	33	U	33	300
4-Chloroaniline	76	U	76	300
4-Chloro-3-methylphenol	61	U	61	300
2-Chloronaphthalene	9.2	U	9.2	300
2-Chlorophenol	19	U	19	300
4-Chlorophenyl phenyl ether	19	U	19	300
Chrysene	25	U	25	300
Dibenz(a,h)anthracene	18	U	18	300
Dibenzofuran	18	U	18	300
1,2-Dichlorobenzene	20	U	20	300
1,3-Dichlorobenzene	11	U	11	300
1,4-Dichlorobenzene	13	U	13	300
3,3'-Dichlorobenzidine	83	U	83	610
2,4-Dichlorophenol	9.2	U	9.2	300
Diethyl phthalate	24	U	24	300
2,4-Dimethylphenol	61	U	61	300
Dimethyl phthalate	21	U	21	300
Di-n-butyl phthalate	27	U	27	300
4,6-Dinitro-2-methylphenol	300	U	300	610
2,4-Dinitrophenol	310	U	310	760
2,4-Dinitrotoluene	61	U	61	300
2,6-Dinitrotoluene	26	U	26	300
Di-n-octyl phthalate	13	U	13	300
Fluoranthene	33	U	33	300
Fluorene	17	U	17	300
Hexachlorobenzene	27	U	27	300
Hexachlorobutadiene	9.2	U	9.2	300
Hexachlorocyclopentadiene	46	U	46	300
Hexachloroethane	20	U	20	300
Indeno[1,2,3-cd]pyrene	20	U	20	300
Isophorone	16	U	16	300

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Method Blank - Batch: 280-182197

**Method: 8270C
Preparation: 3550C**

Lab Sample ID: MB 280-182197/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 1408
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analysis Batch: 280-182487
Prep Batch: 280-182197
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SMS_K
Lab File ID: K2503.D
Initial Weight/Volume: 32.5 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

Analyte	Result	Qual	MDL	RL
2-Methylnaphthalene	18	U	18	300
2-Methylphenol	12	U	12	300
3 & 4 Methylphenol	30	U	30	300
Naphthalene	29	U	29	300
2-Nitroaniline	46	U	46	300
3-Nitroaniline	67	U	67	300
4-Nitroaniline	67	U	67	300
Nitrobenzene	20	U	20	300
2-Nitrophenol	9.2	U	9.2	300
4-Nitrophenol	90	U	90	610
N-Nitrosodi-n-propylamine	29	U	29	300
N-Nitrosodiphenylamine	19	U	19	300
Pentachlorophenol	300	U	300	610
Phenanthrene	16	U	16	300
Phenol	17	U	17	300
Pyrene	11	U	11	300
1,2,4-Trichlorobenzene	26	U	26	300
2,4,5-Trichlorophenol	9.2	U	9.2	300
2,4,6-Trichlorophenol	9.2	U	9.2	300

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	70	50 - 120
2-Fluorophenol	71	53 - 120
Nitrobenzene-d5	72	50 - 120
Phenol-d5	73	52 - 120
Terphenyl-d14	78	55 - 120
2,4,6-Tribromophenol	68	51 - 120

Method Blank TICs- Batch: 280-182197

Cas Number	Analyte	RT	Est. Result	Qual
	Unknown	3.27	7970	N J
107-70-0	2-Pentanone, 4-methoxy-4-methyl-	3.83	535	N J

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Lab Control Sample - Batch: 280-182197

Method: 8270C

Preparation: 3550C

Lab Sample ID:	LCS 280-182197/2-A	Analysis Batch:	280-182487	Instrument ID:	SMS_K
Client Matrix:	Solid	Prep Batch:	280-182197	Lab File ID:	K2504.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	31.8 g
Analysis Date:	07/12/2013 1436	Units:	ug/Kg	Final Weight/Volume:	1000 uL
Prep Date:	07/10/2013 2020			Injection Volume:	0.5 uL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	2520	1980	79	60 - 120	
Acenaphthylene	2520	1980	79	64 - 120	
Anthracene	2520	1970	78	63 - 120	
Benzo[a]anthracene	2520	2060	82	65 - 120	
Benzo[a]pyrene	2520	2340	93	59 - 120	
Benzo[b]fluoranthene	2520	2620	104	47 - 129	
Benzo[ghi]perylene	2520	2510	100	55 - 126	
Benzo[k]fluoranthene	2520	2500	99	48 - 130	
Bis(2-chloroethoxy)methane	2520	1930	77	56 - 120	
Bis(2-chloroethyl)ether	2520	2520	100	51 - 120	
bis (2-chloroisopropyl) ether	2520	1840	73	49 - 120	
Bis(2-ethylhexyl) phthalate	2520	2150	85	65 - 120	
4-Bromophenyl phenyl ether	2520	2000	79	64 - 120	
Butyl benzyl phthalate	2520	2080	83	65 - 120	
Carbazole	2520	2000	79	64 - 120	
4-Chloroaniline	2520	706	28	28 - 120	
4-Chloro-3-methylphenol	2520	2070	82	63 - 120	
2-Chloronaphthalene	2520	1940	77	59 - 120	
2-Chlorophenol	2520	2000	79	57 - 120	
4-Chlorophenyl phenyl ether	2520	2070	82	64 - 120	
Chrysene	2520	2050	82	64 - 120	
Dibenz(a,h)anthracene	2520	2450	98	50 - 133	
Dibenzofuran	2520	2010	80	61 - 120	
1,2-Dichlorobenzene	2520	1900	75	53 - 120	
1,3-Dichlorobenzene	2520	1910	76	52 - 120	
1,4-Dichlorobenzene	2520	1930	77	52 - 120	
3,3'-Dichlorobenzidine	2520	1150	46	30 - 120	
2,4-Dichlorophenol	2520	1970	78	60 - 120	
Diethyl phthalate	2520	2130	85	66 - 120	
2,4-Dimethylphenol	2520	1970	78	54 - 120	
Dimethyl phthalate	2520	2090	83	65 - 120	
Di-n-butyl phthalate	2520	2120	84	67 - 120	
4,6-Dinitro-2-methylphenol	5030	4000	80	57 - 120	
2,4-Dinitrophenol	5030	3690	73	46 - 120	
2,4-Dinitrotoluene	2520	2150	86	68 - 120	
2,6-Dinitrotoluene	2520	2090	83	64 - 120	
Di-n-octyl phthalate	2520	2190	87	66 - 120	
Fluoranthene	2520	2060	82	66 - 120	
Fluorene	2520	2060	82	64 - 120	
Hexachlorobenzene	2520	2010	80	62 - 120	
Hexachlorobutadiene	2520	1930	77	53 - 120	
Hexachlorocyclopentadiene	2520	1720	69	47 - 120	
Hexachloroethane	2520	1900	76	51 - 120	
Indeno[1,2,3-cd]pyrene	2520	2170	86	63 - 120	
Isophorone	2520	1860	74	56 - 120	
2-Methylnaphthalene	2520	1970	78	57 - 120	

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Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Lab Control Sample - Batch: 280-182197

Method: 8270C
Preparation: 3550C

Lab Sample ID: LCS 280-182197/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 1436
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analysis Batch: 280-182487
Prep Batch: 280-182197
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SMS_K
Lab File ID: K2504.D
Initial Weight/Volume: 31.8 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
2-Methylphenol	2520	1940	77	56 - 120	
3 & 4 Methylphenol	2520	1900	76	53 - 120	
Naphthalene	2520	1960	78	57 - 120	
2-Nitroaniline	2520	1980	79	63 - 120	
3-Nitroaniline	2520	1100	44	47 - 120	
4-Nitroaniline	2520	1800	72	64 - 120	
Nitrobenzene	2520	1910	76	54 - 120	
2-Nitrophenol	2520	2050	82	56 - 120	
4-Nitrophenol	5030	4170	83	63 - 121	
N-Nitrosodi-n-propylamine	2520	1910	76	51 - 120	
N-Nitrosodiphenylamine	2520	1950	78	61 - 120	
Pentachlorophenol	5030	3560	71	56 - 120	
Phenanthrene	2520	2030	81	64 - 120	
Phenol	2520	1920	76	56 - 120	
Pyrene	2520	2030	81	64 - 120	
1,2,4-Trichlorobenzene	2520	1930	77	52 - 120	
2,4,5-Trichlorophenol	2520	2010	80	64 - 120	
2,4,6-Trichlorophenol	2520	2040	81	61 - 120	
Surrogate			% Rec	Acceptance Limits	
2-Fluorobiphenyl			75	50 - 120	
2-Fluorophenol			76	53 - 120	
Nitrobenzene-d5			76	50 - 120	
Phenol-d5			77	52 - 120	
Terphenyl-d14			81	55 - 120	
2,4,6-Tribromophenol			83	51 - 120	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182197**

**Method: 8270C
Preparation: 3550C**

MS Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2239
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analysis Batch: 280-182487
Prep Batch: 280-182197
Leach Batch: N/A

Instrument ID: SMS_K
Lab File ID: K2522.D
Initial Weight/Volume: 31.8 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

MSD Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2307
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analysis Batch: 280-182487
Prep Batch: 280-182197
Leach Batch: N/A

Instrument ID: SMS_K
Lab File ID: K2523.D
Initial Weight/Volume: 30.7 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Acenaphthene	79	77	60 - 120	1	30		
Acenaphthylene	79	76	64 - 120	0	30		
Anthracene	82	77	63 - 120	2	30		
Benzo[a]anthracene	83	79	65 - 120	2	30		
Benzo[a]pyrene	84	79	59 - 120	2	30		
Benzo[b]fluoranthene	88	82	47 - 129	4	44		
Benzo[ghi]perylene	82	78	55 - 128	2	31		
Benzo[k]fluoranthene	82	78	48 - 130	1	30		
Bis(2-chloroethoxy)methane	77	75	56 - 120	0	30		
Bis(2-chloroethyl)ether	78	77	51 - 120	2	30		
bis (2-chloroisopropyl) ether	74	72	49 - 120	1	30		
Bis(2-ethylhexyl) phthalate	88	83	65 - 120	3	30		
4-Bromophenyl phenyl ether	82	77	84 - 120	2	30		
Butyl benzyl phthalate	84	80	65 - 120	2	30		
Carbazole	82	78	64 - 120	1	30		
4-Chloroaniline	61	59	28 - 120	2	30		
4-Chloro-3-methylphenol	83	78	63 - 120	3	30		
2-Chloronaphthalene	77	74	59 - 120	1	30		
2-Chlorophenol	78	76	57 - 120	0	30		
4-Chlorophenyl phenyl ether	81	78	64 - 120	1	30		
Chrysene	82	78	64 - 120	1	35		
Dibenz(a,h)anthracene	82	81	50 - 133	2	30		
Dibenzofuran	80	77	61 - 120	0	30		
1,2-Dichlorobenzene	75	74	53 - 120	2	30		
1,3-Dichlorobenzene	75	74	52 - 120	3	32		
1,4-Dichlorobenzene	75	75	52 - 120	3	30		
3,3'-Dichlorobenzidine	80	77	30 - 120	0	30		
2,4-Dichlorophenol	78	73	60 - 120	0	30		
Diethyl phthalate	86	83	66 - 120	1	30		
2,4-Dimethylphenol	70	66	54 - 120	3	30		
Dimethyl phthalate	83	80	65 - 120	0	30		
Di-n-butyl phthalate	86	81	67 - 120	2	30		
4,6-Dinitro-2-methylphenol	28	27	57 - 120	1	30	T	T

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182197**

**Method: 8270C
Preparation: 3550C**

MS Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2239
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analysis Batch: 280-182487
Prep Batch: 280-182197
Leach Batch: N/A

Instrument ID: SMS_K
Lab File ID: K2522.D
Initial Weight/Volume: 31.8 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

MSD Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2307
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analysis Batch: 280-182487
Prep Batch: 280-182197
Leach Batch: N/A

Instrument ID: SMS_K
Lab File ID: K2523.D
Initial Weight/Volume: 30.7 g
Final Weight/Volume: 1000 uL
Injection Volume: 0.5 uL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
2,4-Dinitrophenol	14	13	46 - 120	1	34	JT	JT
2,4-Dinitrotoluene	86	84	68 - 120	1	30		
2,6-Dinitrotoluene	86	82	64 - 120	1	30		
Di-n-octyl phthalate	92	87	66 - 120	3	30		
Fluoranthene	84	80	66 - 120	1	30		
Fluorene	83	80	64 - 120	0	30		
Hexachlorobenzene	82	78	62 - 120	2	30		
Hexachlorobutadiene	76	74	53 - 120	1	30		
Hexachlorocyclopentadiene	6	7	47 - 120	21	30	JT	JT
Hexachloroethane	56	56	51 - 120	5	30		
Indeno[1,2,3-cd]pyrene	86	81	63 - 120	3	30		
Isophorone	75	72	56 - 120	1	30		
2-Methylnaphthalene	80	77	57 - 120	1	30		
2-Methylphenol	85	82	56 - 120	1	30		
3 & 4 Methylphenol	99	85	53 - 120	11	30		
Naphthalene	78	75	57 - 120	0	30		
2-Nitroaniline	81	78	63 - 120	0	30		
3-Nitroaniline	70	71	47 - 120	4	30		
4-Nitroaniline	80	77	64 - 120	0	30		
Nitrobenzene	78	77	54 - 120	2	30		
2-Nitrophenol	81	79	56 - 120	1	30		
4-Nitrophenol	71	76	63 - 121	11	30		
N-Nitrosodi-n-propylamine	78	76	51 - 120	1	30		
N-Nitrosodiphenylamine	82	77	61 - 120	2	36		
Pentachlorophenol	54	51	56 - 120	1	30	T	T
Phenanthrene	83	78	64 - 120	2	30		
Phenol	71	70	56 - 120	2	30		
Pyrene	81	76	64 - 120	2	38		
1,2,4-Trichlorobenzene	76	74	52 - 120	1	30		
2,4,5-Trichlorophenol	81	81	64 - 120	3	30		
2,4,6-Trichlorophenol	70	67	61 - 120	1	30		
Surrogate	MS % Rec		MSD % Rec	Acceptance Limits			
2-Fluorobiphenyl	75		73	50 - 120			

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
2-Fluorophenol	76	74	53 - 120
Nitrobenzene-d5	77	72	50 - 120
Phenol-d5	77	76	52 - 120
Terphenyl-d14	81	76	55 - 120
2,4,6-Tribromophenol	59	64	51 - 120

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182197**

**Method: 8270C
Preparation: 3550C**

MS Lab Sample ID: 280-43949-4 Units: ug/Kg
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2239
Prep Date: 07/10/2013 2020
Leach Date: N/A

MSD Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2307
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Acenaphthene	10 U	2620	2720	2080	2090
Acenaphthylene	17 U	2620	2720	2060	2060
Anthracene	17 U	2620	2720	2140	2100
Benzo[a]anthracene	20 U	2620	2720	2180	2140
Benzo[a]pyrene	20 U	2620	2720	2190	2150
Benzo[b]fluoranthene	26 U	2620	2720	2320	2230
Benzo[ghi]perylene	16 U	2620	2720	2150	2110
Benzo[k]fluoranthene	40 U	2620	2720	2150	2130
Bis(2-chloroethoxy)methane	23 U	2620	2720	2030	2030
Bis(2-chloroethyl)ether	17 U	2620	2720	2060	2090
bis (2-chloroisopropyl) ether	23 U	2620	2720	1940	1970
Bis(2-ethylhexyl) phthalate	46 U	2620	2720	2320	2250
4-Bromophenyl phenyl ether	19 U	2620	2720	2150	2090
Butyl benzyl phthalate	43 U	2620	2720	2220	2160
Carbazole	36 U	2620	2720	2140	2120
4-Chloroaniline	82 U	2620	2720	1590	1620
4-Chloro-3-methylphenol	66 U	2620	2720	2190	2120
2-Chloronaphthalene	10 U	2620	2720	2010	2020
2-Chlorophenol	21 U	2620	2720	2060	2050
4-Chlorophenyl phenyl ether	21 U	2620	2720	2130	2120
Chrysene	27 U	2620	2720	2160	2130
Dibenz(a,h)anthracene	19 U	2620	2720	2160	2210
Dibenzofuran	20 U	2620	2720	2100	2100
1,2-Dichlorobenzene	22 U	2620	2720	1980	2020
1,3-Dichlorobenzene	12 U	2620	2720	1960	2020
1,4-Dichlorobenzene	14 U	2620	2720	1980	2030
3,3'-Dichlorobenzidine	90 U	2620	2720	2100	2090
2,4-Dichlorophenol	10 U	2620	2720	2000	2000
Diethyl phthalate	26 U	2620	2720	2250	2260
2,4-Dimethylphenol	66 U	2620	2720	1840	1780
Dimethyl phthalate	23 U	2620	2720	2190	2180
Di-n-butyl phthalate	29 U	2620	2720	2250	2200
4,6-Dinitro-2-methylphenol	330 U	5250	5440	1470	1460
2,4-Dinitrophenol	330 U	5250	5440	722	714
2,4-Dinitrotoluene	66 U	2620	2720	2250	2280
2,6-Dinitrotoluene	28 U	2620	2720	2250	2230
Di-n-octyl phthalate	14 U	2620	2720	2420	2360
Fluoranthene	36 U	2620	2720	2210	2180
Fluorene	18 U	2620	2720	2170	2170
Hexachlorobenzene	29 U	2620	2720	2160	2110
Hexachlorobutadiene	10 U	2620	2720	1990	2000
Hexachlorocyclopentadiene	50 U	2620	2720	151	186
Hexachloroethane	21 U	2620	2720	1460	1530

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182197**

**Method: 8270C
Preparation: 3550C**

MS Lab Sample ID: 280-43949-4 Units: ug/Kg
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2239
Prep Date: 07/10/2013 2020
Leach Date: N/A

MSD Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 2307
Prep Date: 07/10/2013 2020
Leach Date: N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Indeno[1,2,3-cd]pyrene	22 U	2620	2720	2260	2210
Isophorone	17 U	2620	2720	1980	1960
2-Methylnaphthalene	19 U	2620	2720	2100	2080
2-Methylphenol	13 U	2620	2720	2240	2220
3 & 4 Methylphenol	33 U	2620	2720	2590	2320
Naphthalene	31 U	2620	2720	2040	2030
2-Nitroaniline	50 U	2620	2720	2130	2130
3-Nitroaniline	73 U	2620	2720	1840	1920
4-Nitroaniline	72 U	2620	2720	2100	2100
Nitrobenzene	22 U	2620	2720	2040	2080
2-Nitrophenol	10 U	2620	2720	2130	2160
4-Nitrophenol	97 U	5250	5440	3730	4160
N-Nitrosodi-n-propylamine	31 U	2620	2720	2040	2070
N-Nitrosodiphenylamine	21 U	2620	2720	2140	2100
Pentachlorophenol	330 U	5250	5440	2810 T	2800 T
Phenanthrene	17 U	2620	2720	2170	2130
Phenol	18 U	2620	2720	1860	1900
Pyrene	14 J	2620	2720	2140	2090
1,2,4-Trichlorobenzene	28 U	2620	2720	2000	2020
2,4,5-Trichlorophenol	10 U	2620	2720	2120	2200
2,4,6-Trichlorophenol	10 U	2620	2720	1840	1830

Date: 15 August 2013
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-381
 Subject: Wet Chemistry - Data Package No. J01846-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01846 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analytes reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RNL8	6/28/13	Soil	C	See note 1
J1RNL9	6/28/13	Soil	C	See note 1
J1RNM1	6/28/13	Soil	C	See note 1
J1RNM3	6/28/13	Soil	C	See note 1

1 – Chromium VI by 7196A, IC anions by 300.0, nitrate/nitrite by 353.2 and pH by 9045C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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 PARAMETERS

Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI, 28 days for nitrate/nitrite, chloride, fluoride, bromide, sulfate; 48 hours for nitrate, nitrite and orthophosphate; and immediate (24 hours) for pH.

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

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

Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

All other holding times were acceptable.

Method Blanks

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits, all fluoride (54%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Precision

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1RNL8/J1RNM3) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package J01846 was submitted for validation and verified for completeness. Completeness is based on the percentage data determined to be valid (i.e., not rejected). The completion percentage was 85%.

MAJOR DEFICIENCIES

The following major deficiencies were noted:

- Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by greater than twice the limit, all detected pH, nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits, all fluoride (54%) results were qualified as estimates and flagged "J".

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: J01846	REVIEWER: ELR	Project: 600-381	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate pH	J	All	Hold time
Nitrite Orthophosphate	J	J1RNL9	Hold time
Nitrite Orthophosphate	UR	J1RNL8, J1RNM1 J1RNM3	Hold time
Fluoride	J	All	MS recovery

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

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

General Chemistry

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1

Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830

Date Received: 07/02/2013 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	1.5	M	mg/Kg	0.32	0.80	1.0	353.2
	Analysis Batch: 280-182533		Analysis Date: 07/12/2013 1451				DryWt Corrected: Y
Chloride-Soluble	2.0	U	mg/Kg	2.0	5.0	1.0	9056M
	Analysis Batch: 280-182382		Analysis Date: 07/10/2013 1517				DryWt Corrected: Y
Nitrate as N-Soluble	1.8	B J	mg/Kg	0.32	2.5	1.0	9056M
	Analysis Batch: 280-182004		Analysis Date: 07/09/2013 1123				DryWt Corrected: Y
Bromide-Soluble	0.39	U	mg/Kg	0.39	2.0	1.0	9056M
	Analysis Batch: 280-182005		Analysis Date: 07/09/2013 1123				DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U R	mg/Kg	0.34	2.5	1.0	9056M
	Analysis Batch: 280-182004		Analysis Date: 07/09/2013 1123				DryWt Corrected: Y
Orthophosphate as P-Soluble	1.3	U R	mg/Kg	1.3	5.0	1.0	9056M
	Analysis Batch: 280-182004		Analysis Date: 07/09/2013 1123				DryWt Corrected: Y
Sulfate-Soluble	5.1		mg/Kg	1.7	5.0	1.0	9056M
	Analysis Batch: 280-182005		Analysis Date: 07/09/2013 1123				DryWt Corrected: Y
Fluoride-Soluble	0.83	U J	mg/Kg	0.83	5.0	1.0	9056M
	Analysis Batch: 280-182005		Analysis Date: 07/09/2013 1123				DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	9.14	J	SU	0.100	0.100	1.0	9045C
	Analysis Batch: 280-181376		Analysis Date: 07/02/2013 1729				DryWt Corrected: N
Percent Moisture	3.8		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-182013		Analysis Date: 07/09/2013 2126				DryWt Corrected: N

W #100173

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

General Chemistry

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2

Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915

Date Received: 07/02/2013 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	17.3		mg/Kg	0.34	0.86	1.0	353.2
	Analysis Batch: 280-182533			Analysis Date: 07/12/2013 1455			DryWt Corrected: Y
Chloride-Soluble	3.5	B	mg/Kg	2.1	5.4	1.0	9056M
	Analysis Batch: 280-182382			Analysis Date: 07/10/2013 1534			DryWt Corrected: Y
Nitrate as N-Soluble	14.1	J	mg/Kg	0.34	2.7	1.0	9056M
	Analysis Batch: 280-182004			Analysis Date: 07/09/2013 1140			DryWt Corrected: Y
Bromide-Soluble	0.42	U	mg/Kg	0.42	2.2	1.0	9056M
	Analysis Batch: 280-182005			Analysis Date: 07/09/2013 1140			DryWt Corrected: Y
Nitrite as N-Soluble	0.77	B J	mg/Kg	0.37	2.7	1.0	9056M
	Analysis Batch: 280-182004			Analysis Date: 07/09/2013 1140			DryWt Corrected: Y
Orthophosphate as P-Soluble	5.9	J	mg/Kg	1.3	5.4	1.0	9056M
	Analysis Batch: 280-182004			Analysis Date: 07/09/2013 1140			DryWt Corrected: Y
Sulfate-Soluble	20.2		mg/Kg	1.9	5.4	1.0	9056M
	Analysis Batch: 280-182005			Analysis Date: 07/09/2013 1140			DryWt Corrected: Y
Fluoride-Soluble	1.0	B J	mg/Kg	0.89	5.4	1.0	9056M
	Analysis Batch: 280-182005			Analysis Date: 07/09/2013 1140			DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.74	J	SU	0.100	0.100	1.0	9045C
	Analysis Batch: 280-181376			Analysis Date: 07/02/2013 1729			DryWt Corrected: N
Percent Moisture	8.9		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-182013			Analysis Date: 07/09/2013 2126			DryWt Corrected: N

K 8/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

General Chemistry

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3

Date Sampled: 06/28/2013 0950

Client Matrix: Solid

% Moisture: 14.7

Date Received: 07/02/2013 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	5.0		mg/Kg	0.33	0.84	1.0	353.2
	Analysis Batch: 280-182533			Analysis Date: 07/12/2013 1457			DryWt Corrected: Y
Chloride-Soluble	2.3	U	mg/Kg	2.3	5.7	1.0	9056M
	Analysis Batch: 280-182382			Analysis Date: 07/10/2013 1552			DryWt Corrected: Y
Nitrate as N-Soluble	4.5	J	mg/Kg	0.36	2.9	1.0	9056M
	Analysis Batch: 280-182004			Analysis Date: 07/09/2013 1156			DryWt Corrected: Y
Bromide-Soluble	0.45	U	mg/Kg	0.45	2.3	1.0	9056M
	Analysis Batch: 280-182005			Analysis Date: 07/09/2013 1156			DryWt Corrected: Y
Nitrite as N-Soluble	0.39	U R	mg/Kg	0.39	2.9	1.0	9056M
	Analysis Batch: 280-182004			Analysis Date: 07/09/2013 1156			DryWt Corrected: Y
Orthophosphate as P-Soluble	1.4	U R	mg/Kg	1.4	5.7	1.0	9056M
	Analysis Batch: 280-182004			Analysis Date: 07/09/2013 1156			DryWt Corrected: Y
Sulfate-Soluble	5.7		mg/Kg	2.0	5.7	1.0	9056M
	Analysis Batch: 280-182005			Analysis Date: 07/09/2013 1156			DryWt Corrected: Y
Fluoride-Soluble	0.94	U J	mg/Kg	0.94	5.7	1.0	9056M
	Analysis Batch: 280-182005			Analysis Date: 07/09/2013 1156			DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.43	J	SU	0.100	0.100	1.0	9045C
	Analysis Batch: 280-181376			Analysis Date: 07/02/2013 1729			DryWt Corrected: N
Percent Moisture	14.7		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-182013			Analysis Date: 07/09/2013 2126			DryWt Corrected: N

8/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

General Chemistry

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4

Date Sampled: 06/28/2013 0830

Client Matrix: Solid

% Moisture: 4.1

Date Received: 07/02/2013 0945

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	1.9		mg/Kg	0.30	0.76	1.0	353.2
	Analysis Batch: 280-182533		Analysis Date: 07/12/2013 1458				DryWt Corrected: Y
Chloride-Soluble	2.0	U	mg/Kg	2.0	5.0	1.0	9056M
	Analysis Batch: 280-182382		Analysis Date: 07/10/2013 1609				DryWt Corrected: Y
Nitrate as N-Soluble	1.6	B J	mg/Kg	0.31	2.5	1.0	9056M
	Analysis Batch: 280-182004		Analysis Date: 07/09/2013 1213				DryWt Corrected: Y
Bromide-Soluble	0.39	U	mg/Kg	0.39	2.0	1.0	9056M
	Analysis Batch: 280-182005		Analysis Date: 07/09/2013 1213				DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U R	mg/Kg	0.34	2.5	1.0	9056M
	Analysis Batch: 280-182004		Analysis Date: 07/09/2013 1213				DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U R	mg/Kg	1.2	5.0	1.0	9056M
	Analysis Batch: 280-182004		Analysis Date: 07/09/2013 1213				DryWt Corrected: Y
Sulfate-Soluble	5.0	N	mg/Kg	1.7	5.0	1.0	9056M
	Analysis Batch: 280-182005		Analysis Date: 07/09/2013 1213				DryWt Corrected: Y
Fluoride-Soluble	0.82	U N J	mg/Kg	0.82	5.0	1.0	9056M
	Analysis Batch: 280-182005		Analysis Date: 07/09/2013 1213				DryWt Corrected: Y
Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.85	J	SU	0.100	0.100	1.0	9045C
	Analysis Batch: 280-181376		Analysis Date: 07/02/2013 1729				DryWt Corrected: N
Percent Moisture	4.1		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-182013		Analysis Date: 07/09/2013 2126				DryWt Corrected: N

*✓
8/14/13*

Sample Results Summary

Date: 15-Jul-13

TestAmerica TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 56134

SDG No: J01846

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3183051	7196_CR6								
	J1RNL8								
	M09H51AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	M09H51AC	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	0.0
	J1RNL9								
	M09JC1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RNM1								
	M09JE1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RNM3								
	M09JF1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
No. of Results: 5									

✓ 8/14/13

TestAmerica
rptSTLRchSaSum
mary2 V5.2.23
A2002

RPD - Relative Percent Difference.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/MDL, Total Uncert, CRDL, RDL or not identified by gamma scan software.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-43949-1

SDG #: J01846

SAF#: RC-232

Date SDG Closed: July 2, 2013

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1RNL8	280-43949-1	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNL9	280-43949-2	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM1	280-43949-3	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM3	280-43949-4	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM4	280-43949-5	6010/7471/8270A	6010B/7471A/8270C

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 7/2/2013 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on-ice. The temperature of the cooler at receipt was 5.6° C.

GC/MS SEMIVOLATILES - SW846 8270C

The LCS associated with batch 280-182197 exhibited the percent recovery outside the control limits, biased low, for 3-Nitroaniline at 44% (lower limit 47%). A full list spike was utilized, and although this compound was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits (lower limit 38%). This marginal exceedance has been determined to be sporadic, not systematic; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "T". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - SW846 8081A - Pesticides

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8151A - Herbicides

Dinoseb results in soil are reported for this project at the request of the client with the qualifier that the laboratory is not certified for this analyte and the reported results are considered biased low. The laboratory consistently obtains very low recoveries, typically $\leq 10\%$.

The MSD aliquot of the MS/MSD performed on sample J1RNL8 exhibited the percent recovery outside the control limits for Dinoseb, and the associated sample result has been flagged "N". In addition, the RPD limit was exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

Low levels of C10-C36 and C10-C28 are present in the method blank associated with batch 280-182166. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1RNL8 and J1RNM3. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The MS aliquot of the MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries and the surrogate recovery outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-181392 indicates that physical and chemical interferences are present for Aluminum, Barium, Zinc, Cobalt and Nickel. Results have been flagged with an "X".

Low levels of Zinc are present in the method blank associated with batch 280-181392. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Low levels of Iron are present at a level greater than half the reporting limit in the method blank associated with batch 280-181392. As the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1RNL8; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1RNL8 exhibited percent recoveries outside the control limits for Boron and Silicon, and the associated sample results have been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The duplicate analysis of sample J1RNL8 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spike performed on sample J1RNM3 exhibited percent recoveries outside the control limits for Sulfate and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9045C - PH

SU = standard units

No anomalies were encountered

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-232-025		Page 1 of 2			
Collector SAGDAL, PA		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8P			
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites		Sampling Location 600-381		SAF No. RC-232		Data Turnaround 21 Day					
Ice Chest No. RCC-08-016		Field Logbook No. EL-1667		COA 060381A000		Method of Shipment Commercial Carrier		Fed EX			
Shipped To TestAmerica - Denver		Offsite Property No. A120866		Bill of Lading/Air Bill No. See OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Go to #8 - 04/5/13 See Preservation				Preservation		Freeze	Cool 4C	Cool 4C	Cool 4C		
				Type of Container		Gs*	GP	gG	gG		
				No. of Container(s)		5	1	1	1		
				Volume		40mL	125mL	125mL	1000mL		
SAMPLE ANALYSIS				VOA - 5035/8260 (TCL)		See item (1) in Special Instructions		Semi-VOA - 8270A (TCL)		See item (2) in Special Instructions	
				Sample No.	Matrix	Sample Date	Sample Time				
	JRN18	SOIL	6/28/13	0830	X	X	X				
	JRN19	SOIL	6/28/13	0915	X	X	X				
	JRN20	SOIL	6/28/13								
	JRN21	SOIL	6/28/13	0950	X	X	X				
	JRN22	SOIL	6/28/13								
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From Pat Sarda		Date/Time 6-28-13 1030		Received By/Stored In Don Heibel		Date/Time 7-1-13 1045		(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury) (2) IC Anions - 9058 Modified (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); NO2/NO3 - 353.2 (Nitrogen in Nitrite and Nitrate); TPH-Diesel Range - WTPH-D +; pH (Soil) - 9045 (pH Measurement); PAHs - 8310; PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPAS151 56 JK 7/2/13 II SDG J01846			
Relinquished By/Removed From Pat Sarda		Date/Time 6-28-13 0830		Received By/Stored In Cynthia Bringham		Date/Time 7-1-13 0830					
Relinquished By/Removed From Pat Sarda		Date/Time 7-1-13 1130		Received By/Stored In Fed EX		Date/Time 7/2/13 0945					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

WCH-EE-011

Generated Date/Time: 08/05/2013 10:00, PDT

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-232-025		Page 2 of 2			
Collector SAGDAL, PA	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH		Price Code SD	Data Turnaround 21 Days					
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-381	SAF No. RC-232	Method of Shipment Commercial Carrier Fed EX								
Ice Chest No. RC-08-016	Field Logbook No. EL-1667	COA 060381A000	Bill of Lading/Air Bill No. See OS PC								
Shipped To TestAmerica - Denver	Offsite Property No. A120866										
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Cool to 4C OH 6/15/13 See Preservation				Preservation	Freeze	Cool 4C	Cool 4C	Cool 4C			
				Type of Container	Gs*	G/P	gG	gG			
				No. of Container(s)	5	1	1	1			
				Volume	40mL	125mL	125mL	1000mL			
SAMPLE ANALYSIS				VQA - 5035/8280 (TCL)	See item (1) in Special Instructions	Semi-VQA - 8270A (TCL)	See item (2) in Special Instructions				
				Sample No.	Matrix	Sample Date	Sample Time				
JRN3	SOIL	6/28/13	0830	X	X	X					
JRN4	SOIL	6/28/13	1008	X	X						
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS					
Relinquished By/Removed From Pat Sagdal	Date/Time 6-28-13 1030	Received By/Stored In D. Delberg	Date/Time 6/28/13 1030	(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury) (2) IC Anions - 9056 Modified (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); NO2/NO3 - 353.2 (Nitrogen in Nitrite and Nitrate); TPH-Diesel Range - WTPH-D +; pH (Soil) - 9045 (pH Measurement); PAHs - 8310; PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151 506 501846							
Relinquished By/Removed From D. Delberg	Date/Time 7/1/13 0830	Received By/Stored In C. Bingham	Date/Time 7-1-13 0830								
Relinquished By/Removed From C. Bingham	Date/Time 7-1-13 1130	Received By/Stored In Fed EX	Date/Time								
Relinquished By/Removed From	Date/Time	Received By/Stored In D. Bingham	Date/Time 7/2/13 0945								
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time								
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time								
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time								
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time	REVIEWED BY JT DATE 7.1.13							

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

July 15, 2013

Attention: Joan Kessner

SAF Number	:	RC-232
Date SDG Closed	:	July 1, 2013
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	J01846
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On July 1, 2013, four soil samples were received at TestAmerica for chemistry analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID:

<u>WCH ID#</u>	<u>TARL ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
J1RNL8	M09H5	SOIL	07/01/13
J1RNL9	M09JC	SOIL	07/01/13
J1RNM1	M09JE	SOIL	07/01/13
J1RNM3	M09JF	SOIL	07/01/13

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Chemical Analysis
Hexavalent Chromium by EPA method 7196A

Washington Closure Hanford

July 15, 2013

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

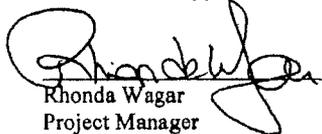
Chemical Analysis

Hexavalent Chromium by EPA method 7196A:

The LCS, batch blank, samples, sample duplicate (J1RNL8) and sample matrix spike (J1RNL8) results are within contractual requirements.

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

Reviewed and approved:


Rhonda Wagar
Project Manager

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-232-025	Page 1 of 2
Collector SAGDAL, PA	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 8D	Data Turnaround 21 Days	
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-381	SAF No. RC-232				
Ice Chest No. NA	Field Logbook No. EL-1667	COA 060381A000	Method of Shipment Local Delivery			
Shipped To TestAmerica - Richland	Offsite Property No. NA	Bill of Lading/Air Bill No. NA				
POSSIBLE SAMPLE HAZARDS/REMARKS		Preservation	Cool 4C	None		
Special Handling and/or Storage Cool to 4C		Type of Container	GP	GP		
J3G020430 301850 Rev Due 7-22-13 J01846		No. of Container(s)	1	1		
J3G020430		Volume	125mL			
		Chromium Hex - 7196 (Hexavalent Chromium)	See item (3) in Special Instructions			
Sample No.	Matrix	Sample Date	Sample Time			
J1RNL8	MO9HS	6/28/13	0830	X		
J1RNL9	MO9JC	6/28/13	0915	X		
J1RNM0	MO9SE	6/28/13				
J1RNM1	MO9SE	6/28/13	0950	X		
J1RNM2	MO9SE	6/28/13				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS		
Sign/Print Names				(3) Gamma Spec (Client List) (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta		
Relinquished By/Removed From Pat SAGDAL	Date/Time 6-28-13 1030	Received By/Stored In Dante...	Date/Time 6/28/13 1030			
Relinquished By/Removed From Dante...	Date/Time 6/28/13 0830	Received By/Stored In John...	Date/Time 7-1-13 0530			
Relinquished By/Removed From John...	Date/Time 7-1-13 1050	Received By/Stored In John...	Date/Time 7-1-13 1050			
Relinquished By/Removed From John...	Date/Time 7-1-13 1130	Received By/Stored In John...	Date/Time 7-1-13 1130			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time			



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-232-025	Page 2 of 2
Collector SAGDAL, PA	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 6D	Data Turnaround 21 Days	
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-381	SAF No. RC-232				
Ice Chest No. MM	Field Logbook No. EL-1667	COA 060381A000	Method of Shipment Local Delivery			
Shipped To TestAmerica - Richland	Offsite Property No. MM	Bill of Lading/Air Bill No. NA				
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Cool to 4C J55020430 Jorissa JO1846 RW 7/8/13 Duo 7-22-13	Preservation	Cool 4C	None			
	Type of Container	G/P	G/P			
	No. of Container(s)	1	1			
	Volume	125mL				
SAMPLE ANALYSIS		Chromium Hex - 7196 (Hexavalent Chromium)	See item (3) in Special Instructions			
Sample No.	Matrix	Sample Date	Sample Time			
J1RNM3 M09JF	SOIL	6/28/13	0830	X		
7-1-13 Cont.						
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS	
Relinquished By/Removed From Pete Sargdal	Date/Time 6-28-13	Received By/Stored In Joan Kessner	Date/Time 6-28-13	(3) Gamma Spec (Client List) (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta		
Relinquished By/Removed From Joan Kessner	Date/Time 7/1/13	Received By/Stored In John Harrie	Date/Time 7-1-13 0830			
Relinquished By/Removed From John Harrie	Date/Time 7-1-13 1050	Received By/Stored In John Harrie	Date/Time 7-1-13			
Relinquished By/Removed From John Harrie	Date/Time 7-1-13 1130	Received By/Stored In John Harrie	Date/Time 7-1-13			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time			



Appendix 5
Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-381		DATA PACKAGE: J01846		
VALIDATOR:	ELR	LAB:	DATE: 8/13/13		
		SDG:	J01846		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
JIRNL8		JIRNL9		JIRNM1 JIRNM3	
soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

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

Initial calibrations acceptable? Yes No N/A

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

ICV and CCV checks acceptable? Yes No N/A

Standards traceable? Yes No N/A

Standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

- ICB and CCB checks performed for all applicable analyses? (Levels D, E)..... Yes No N/A
- ICB and CCB results acceptable? (Levels D, E) Yes No N/A
- Laboratory blanks analyzed? Yes No N/A
- Laboratory blank results acceptable?..... Yes No N/A
- Field blanks analyzed? (Levels C, D, E) Yes No N/A
- Field blank results acceptable? (Levels C, D, E)..... Yes No N/A
- Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: no FR

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: MS - Standards (54%) - Jell

no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable? Yes No N/A
- Duplicate results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

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

Comments: *plt, ortho, nitrat, h ure -> 2A - J/UR del*

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182533

Method: 353.2
Preparation: N/A

Lab Sample ID: MB 280-182480/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 1448
Prep Date: N/A
Leach Date: 07/12/2013 1017

Analysis Batch: 280-182533
Prep Batch: N/A
Leach Batch: 280-182480
Units: mg/Kg

Instrument ID: WC_Alp 2
Lab File ID: C:\FLOW_4\0712NXNT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	MDL	RL
Nitrate Nitrite as N-Soluble	0.30	U	0.30	0.75

Method Reporting Limit Check - Batch: 280-182533

Method: 353.2
Preparation: N/A

Lab Sample ID: MRL 280-182533/18
Client Matrix: Water
Dilution: 1.0
Analysis Date: 07/12/2013 1424
Prep Date: N/A
Leach Date: N/A

Analysis Batch: 280-182533
Prep Batch: N/A
Leach Batch: N/A
Units: mg/L

Instrument ID: WC_Alp 2
Lab File ID: C:\FLOW_4\0712NXNT
Initial Weight/Volume: 100 mL
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	0.100	0.0843	84	50 - 150	B

Lab Control Sample - Batch: 280-182533

Method: 353.2
Preparation: N/A

Lab Sample ID: LCS 280-182480/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 1449
Prep Date: N/A
Leach Date: 07/12/2013 1017

Analysis Batch: 280-182533
Prep Batch: N/A
Leach Batch: 280-182480
Units: mg/Kg

Instrument ID: WC_Alp 2
Lab File ID: C:\FLOW_4\0712NXNT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	47.6	49.21	103	90 - 110	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Matrix Spike - Batch: 280-182533

Method: 353.2
Preparation: N/A

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 1454
Prep Date: N/A
Leach Date: 07/12/2013 1017

Analysis Batch: 280-182533
Prep Batch: N/A
Leach Batch: 280-182480
Units: mg/Kg

Instrument ID: WC_Alp 2
Lab File ID: C:\FLOW_4\0712NXNT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	1.5	40.4	37.83	90	90 - 110	

Duplicate - Batch: 280-182533

Method: 353.2
Preparation: N/A

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/12/2013 1452
Prep Date: N/A
Leach Date: 07/12/2013 1017

Analysis Batch: 280-182533
Prep Batch: N/A
Leach Batch: 280-182480
Units: mg/Kg

Instrument ID: WC_Alp 2
Lab File ID: C:\FLOW_4\0712NXNT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N-Soluble	1.5	1.33	13	10	M

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-181376**

**Method: 9045C
Preparation: N/A**

LCS Lab Sample ID:	LCS 280-181376/4	Analysis Batch:	280-181376	Instrument ID:	No Equipment
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/02/2013 1729	Units:	SU	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-181376/5	Analysis Batch:	280-181376	Instrument ID:	No Equipment
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	07/02/2013 1729	Units:	SU	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
pH adj. to 25 deg C-Soluble	100	100	97 - 103	0	5		

**Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-181376**

**Method: 9045C
Preparation: N/A**

LCS Lab Sample ID:	LCS 280-181376/4	Units:	SU	LCSD Lab Sample ID:	LCSD 280-181376/5
Client Matrix:	Solid			Client Matrix:	Solid
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/02/2013 1729			Analysis Date:	07/02/2013 1729
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
pH adj. to 25 deg C-Soluble	7.00	7.00	7.000	7.000

Duplicate - Batch: 280-181376

**Method: 9045C
Preparation: N/A**

Lab Sample ID:	280-43949-1	Analysis Batch:	280-181376	Instrument ID:	No Equipment
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	280-181370	Initial Weight/Volume:	
Analysis Date:	07/02/2013 1729	Units:	SU	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	07/02/2013 1629				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
pH adj. to 25 deg C-Soluble	9.14	9.120	0.2	5	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182004

Method: 9056M
Preparation: N/A

Lab Sample ID: MB 280-181827/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1107
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182004
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 137.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	MDL	RL
Nitrate as N-Soluble	0.31	U	0.31	2.5
Nitrite as N-Soluble	0.34	U	0.34	2.5
Orthophosphate as P-Soluble	1.2	U	1.2	5.0

Method Reporting Limit Check - Batch: 280-182004

Method: 9056M
Preparation: N/A

Lab Sample ID: MRL 280-182004/11
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 2038
Prep Date: N/A
Leach Date: N/A

Analysis Batch: 280-182004
Prep Batch: N/A
Leach Batch: N/A
Units: mg/L

Instrument ID: WC_IC3
Lab File ID: 110.TXT
Initial Weight/Volume:
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	0.200	0.217	109	50 - 150	B
Nitrite as N-Soluble	0.200	0.212	106	50 - 150	B
Orthophosphate as P-Soluble	0.200	0.202	101	50 - 150	B

Lab Control Sample - Batch: 280-182004

Method: 9056M
Preparation: N/A

Lab Sample ID: LCS 280-181827/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1050
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182004
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 136.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	50.0	46.24	92	90 - 110	
Nitrite as N-Soluble	50.0	48.17	96	90 - 110	
Orthophosphate as P-Soluble	50.0	48.50	97	90 - 110	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Matrix Spike - Batch: 280-182004

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1410
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182004
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 145.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	1.6	B	51.6	42.83	80	80 - 120	
Nitrite as N-Soluble	0.34	U	51.6	42.99	83	80 - 120	
Orthophosphate as P-Soluble	1.2	U	51.7	48.90	95	80 - 120	

Duplicate - Batch: 280-182004

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1354
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182004
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 144.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrate as N-Soluble	1.6	B	1.81	11	15	B
Nitrite as N-Soluble	0.34	U	0.34	NC	15	U
Orthophosphate as P-Soluble	1.2	U	1.2	NC	15	U

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182005

Method: 9056M
Preparation: N/A

Lab Sample ID: MB 280-181827/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1107
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182005
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 137.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	MDL	RL
Bromide-Soluble	0.39	U	0.39	2.0
Sulfate-Soluble	1.7	U	1.7	5.0
Fluoride-Soluble	0.82	U	0.82	5.0

Method Reporting Limit Check - Batch: 280-182005

Method: 9056M
Preparation: N/A

Lab Sample ID: MRL 280-182005/11
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/08/2013 2038
Prep Date: N/A
Leach Date: N/A

Analysis Batch: 280-182005
Prep Batch: N/A
Leach Batch: N/A
Units: mg/L

Instrument ID: WC_IC3
Lab File ID: 110.TXT
Initial Weight/Volume:
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Bromide-Soluble	0.200	0.167	84	50 - 150	B
Sulfate-Soluble	1.00	1.09	109	50 - 150	B
Fluoride-Soluble	0.200	0.216	108	50 - 150	B

Lab Control Sample - Batch: 280-182005

Method: 9056M
Preparation: N/A

Lab Sample ID: LCS 280-181827/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1050
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182005
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 136.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Bromide-Soluble	50.0	46.67	93	90 - 110	
Sulfate-Soluble	250	235.3	94	90 - 110	
Fluoride-Soluble	50.0	46.02	92	90 - 110	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Matrix Spike - Batch: 280-182005

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1410
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182005
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 145.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Bromide-Soluble	0.39 U	51.6	43.84	85	80 - 120	
Sulfate-Soluble	5.0	258	196.5	74	80 - 120	N
Fluoride-Soluble	0.82 U	51.6	28.09	54	80 - 120	N

Duplicate - Batch: 280-182005

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1354
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182005
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC3
Lab File ID: 144.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Bromide-Soluble	0.39 U	0.39	NC	15	U
Sulfate-Soluble	5.0	5.03	0.1	15	
Fluoride-Soluble	0.82 U	0.82	NC	15	U

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182382

Method: 9056M
Preparation: N/A

Lab Sample ID: MB 280-181827/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 1500
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182382
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC6
Lab File ID: 117.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	MDL	RL
Chloride-Soluble	2.0	U	2.0	5.0

Method Reporting Limit Check - Batch: 280-182382

Method: 9056M
Preparation: N/A

Lab Sample ID: MRL 280-182382/3
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 1312
Prep Date: N/A
Leach Date: N/A

Analysis Batch: 280-182382
Prep Batch: N/A
Leach Batch: N/A
Units: mg/L

Instrument ID: WC_IC6
Lab File ID: 112.TXT
Initial Weight/Volume:
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	1.00	0.972	97	50 - 150	B
Bromide-Soluble	0.200	0.196	98	50 - 150	B
Sulfate-Soluble	1.00	1.17	117	50 - 150	B
Fluoride-Soluble	0.200	0.180	90	50 - 150	B

Lab Control Sample - Batch: 280-182382

Method: 9056M
Preparation: N/A

Lab Sample ID: LCS 280-181827/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 1442
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182382
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC6
Lab File ID: 116.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	250	242.6	97	90 - 110	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Matrix Spike - Batch: 280-182382

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 1644
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182382
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC6
Lab File ID: 123.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	2.0 U	258	218.0	84	80 - 120	

Duplicate - Batch: 280-182382

Method: 9056M
Preparation: N/A

Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 1626
Prep Date: N/A
Leach Date: 07/08/2013 1513

Analysis Batch: 280-182382
Prep Batch: N/A
Leach Batch: 280-181827
Units: mg/Kg

Instrument ID: WC_IC6
Lab File ID: 122.TXT
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Chloride-Soluble	2.0 U	2.0	NC	15	U

QC Results Summary

Date: 15-Jul-13

TestAmerica TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 56134

SDG No.: J01846

Batch	Work Order	Parameter	Result +- Uncertainty (2σ)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
7196_CR6									
3183051	MATRIX SPIKE, J1RNL8								
	M09H61AC	HEXCHROME	2.44E+01 +- 0.0E+00		mg/kg	N/A	82%	-0.2	1.55E-01
3183051	LCS,								
	M09J81AC	HEXCHROME	1.67E+01 +- 0.0E+00		mg/kg	N/A	88%	-0.1	1.55E-01
3183051	BLANK QC,								
	M09J81AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01
No. of Results: 3									

TestAmerica Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRchQcSummary V6.2.23 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or
 A2002 not identified by gamma scan software.

Date: 15 August 2013
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-381
 Subject: Pesticide/PCB - Data Package No. J01846-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01846 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RNL8	6/28/13	Soil	C	See note 1
J1RNL9	6/28/13	Soil	C	See note 1
J1RNM1	6/28/13	Soil	C	See note 1
J1RNM3	6/28/13	Soil	C	See note 1

1 – Pesticides by 8081A & PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Analytes must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction. Holding times are not applicable for PCB analysis.

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

associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blank

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

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

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been

established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

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

All other precision results were acceptable.

Field Duplicate Samples

One set field duplicates (J1RNL8/J1RNM3) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory results. All field duplicate results are acceptable.

Analytical Detection Levels

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

Completeness

Data Package No. J01846 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

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

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: J01846	REVIEWER: ELR	Project: 600-381	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS, MSD or LCS analysis

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

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-182949	Instrument ID:	SGC_P3b
Prep Method:	3550C	Prep Batch:	280-182157	Initial Weight/Volume:	31.0 g
Dilution:	1.0			Final Weight/Volume:	5000 uL
Analysis Date:	07/17/2013 1650			Injection Volume:	1 uL
Prep Date:	07/10/2013 1745			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.1	U	8.1	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	93		59 - 130
Tetrachloro-m-xylene	90		53 - 128

W
8/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-182949	Instrument ID:	SGC_P3b
Prep Method:	3550C	Prep Batch:	280-182157	Initial Weight/Volume:	30.4 g
Dilution:	1.0			Final Weight/Volume:	5000 uL
Analysis Date:	07/17/2013 1754			Injection Volume:	1 uL
Prep Date:	07/10/2013 1745			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		3.0	U	3.0	11
Aroclor 1221		8.7	U	8.7	18
Aroclor 1232		2.2	U	2.2	11
Aroclor 1242		5.0	U	5.0	11
Aroclor 1248		5.0	U	5.0	11
Aroclor 1254		2.8	U	2.8	11
Aroclor 1260		2.8	U	2.8	11
Surrogate					
		%Rec	Qualifier	Acceptance Limits	
Decachlorobiphenyl		93		59 - 130	
Tetrachloro-m-xylene		87		53 - 128	

W
8/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3
Client Matrix: Solid

% Moisture: 14.7

Date Sampled: 06/28/2013 0950
Date Received: 07/02/2013 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method: 8082 Analysis Batch: 280-182949 Instrument ID: SGC_P3b
Prep Method: 3550C Prep Batch: 280-182157 Initial Weight/Volume: 30.7 g
Dilution: 1.0 Final Weight/Volume: 5000 uL
Analysis Date: 07/17/2013 1815 Injection Volume: 1 uL
Prep Date: 07/10/2013 1745 Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1018		3.2	U	3.2	11
Aroclor 1221		9.2	U	9.2	19
Aroclor 1232		2.3	U	2.3	11
Aroclor 1242		5.3	U	5.3	11
Aroclor 1248		5.3	U	5.3	11
Aroclor 1254		3.0	U	3.0	11
Aroclor 1260		3.0	U	3.0	11

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	95		59 - 130
Tetrachloro-m-xylene	88		53 - 128

Handwritten signature and date: 8/1/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4

Date Sampled: 06/28/2013 0830

Client Matrix: Solid

% Moisture: 4.1

Date Received: 07/02/2013 0945

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-182949	Instrument ID:	SGC_P3b
Prep Method:	3550C	Prep Batch:	280-182157	Initial Weight/Volume:	31.6 g
Dilution:	1.0			Final Weight/Volume:	5000 uL
Analysis Date:	07/17/2013 1837			Injection Volume:	1 uL
Prep Date:	07/10/2013 1745			Result Type:	PRIMARY

Analyte	DryWM Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.7	U	2.7	9.9
Aroclor 1221		7.9	U	7.9	16
Aroclor 1232		2.0	U	2.0	9.9
Aroclor 1242		4.6	U	4.6	9.9
Aroclor 1248		4.6	U	4.6	9.9
Aroclor 1254		2.6	U	2.6	9.9
Aroclor 1260		2.6	U	2.6	9.9

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	87		59 - 130
Tetrachloro-m-xylene	93		53 - 128

*W
8/14/13*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

8081A Organochlorine Pesticides (GC)

Analysis Method:	8081A	Analysis Batch:	280-182797	Instrument ID:	SGC_P1
Prep Method:	3550C	Prep Batch:	280-182162	Initial Weight/Volume:	32.4 g
Dilution:	1.0			Final Weight/Volume:	10000 uL
Analysis Date:	07/17/2013 0211			Injection Volume:	1 uL
Prep Date:	07/10/2013 1850			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.53	U	0.53	1.6
4,4'-DDE		0.23	U	0.23	1.6
4,4'-DDT		0.57	U	0.57	1.6
Aldrin		0.24	U	0.24	1.6
alpha-BHC		0.21	U	0.21	1.6
beta-BHC		0.64	U	0.64	1.6
delta-BHC		0.39	U	0.39	1.6
gamma-BHC (Lindane)		0.45	U	0.45	1.6
Heptachlor		0.21	U	0.21	1.6
Heptachlor epoxide		0.41	U	0.41	1.6
Endosulfan I		0.17	U	0.17	1.6
Endosulfan II		0.28	U	0.28	1.6
Endosulfan sulfate		0.27	U	0.27	1.6
Endrin		0.29	U	0.29	1.6
Endrin aldehyde		0.16	U	0.16	1.6
Endrin ketone		0.47	U	0.47	1.6
gamma-Chlordane		0.26	U	0.26	1.6
Methoxychlor		0.43	U	0.43	3.2
alpha-Chlordane		0.31	U	0.31	1.6
Dieldrin		0.20	U	0.20	1.6
Toxaphene		15	U <i>J</i>	15	160

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	78		59 - 115
Decachlorobiphenyl	100		63 - 124

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

8081A Organochlorine Pesticides (GC)

Analysis Method:	8081A	Analysis Batch:	280-182797	Instrument ID:	SGC_P1
Prep Method:	3550C	Prep Batch:	280-182162	Initial Weight/Volume:	32.4 g
Dilution:	1.0			Final Weight/Volume:	10000 uL
Analysis Date:	07/17/2013 0228			Injection Volume:	1 uL
Prep Date:	07/10/2013 1850			Result Type:	PRIMARY

Analyte	DryWT Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.56	U	0.56	1.7
4,4'-DDE		0.24	U	0.24	1.7
4,4'-DDT		0.60	U	0.60	1.7
Aldrin		0.26	U	0.26	1.7
alpha-BHC		0.22	U	0.22	1.7
beta-BHC		0.67	U	0.67	1.7
delta-BHC		0.41	U	0.41	1.7
gamma-BHC (Lindane)		0.47	U	0.47	1.7
Heptachlor		0.22	U	0.22	1.7
Heptachlor epoxide		0.43	U	0.43	1.7
Endosulfan I		0.18	U	0.18	1.7
Endosulfan II		0.29	U	0.29	1.7
Endosulfan sulfate		0.28	U	0.28	1.7
Endrin		0.31	U	0.31	1.7
Endrin aldehyde		0.17	U	0.17	1.7
Endrin ketone		0.50	U	0.50	1.7
gamma-Chlordane		0.27	U	0.27	1.7
Methoxychlor		0.46	U	0.46	3.4
alpha-Chlordane		0.33	U	0.33	1.7
Dieldrin		0.21	U	0.21	1.7
Toxaphene		16	U J	16	170

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	78		59 - 115
Decachlorobiphenyl	95		63 - 124

8/14/13

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3
Client Matrix: Solid

% Moisture: 14.7

Date Sampled: 06/28/2013 0950
Date Received: 07/02/2013 0945

8081A Organochlorine Pesticides (GC)

Analysis Method:	8081A	Analysis Batch:	280-182797	Instrument ID:	SGC_P1
Prep Method:	3550C	Prep Batch:	280-182162	Initial Weight/Volume:	30.9 g
Dilution:	1.0			Final Weight/Volume:	10000 uL
Analysis Date:	07/17/2013 0246			Injection Volume:	1 uL
Prep Date:	07/10/2013 1850			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.62	U	0.62	1.9
4,4'-DDE		0.27	U	0.27	1.9
4,4'-DDT		0.67	U	0.67	1.9
Aldrin		0.29	U	0.29	1.9
alpha-BHC		0.24	U	0.24	1.9
beta-BHC		0.76	U	0.76	1.9
delta-BHC		0.46	U	0.46	1.9
gamma-BHC (Lindane)		0.53	U	0.53	1.9
Heptachlor		0.24	U	0.24	1.9
Heptachlor epoxide		0.48	U	0.48	1.9
Endosulfan I		0.20	U	0.20	1.9
Endosulfan II		0.33	U	0.33	1.9
Endosulfan sulfate		0.31	U	0.31	1.9
Endrin		0.35	U	0.35	1.9
Endrin aldehyde		0.19	U	0.19	1.9
Endrin ketone		0.56	U	0.56	1.9
gamma-Chlordane		0.30	U	0.30	1.9
Methoxychlor		0.51	U	0.51	3.8
alpha-Chlordane		0.37	U	0.37	1.9
Dieldrin		0.24	U	0.24	1.9
Toxaphene		18	U J	18	190

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	79		59 - 115
Decachlorobiphenyl	96		63 - 124

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4

Date Sampled: 06/28/2013 0830

Client Matrix: Solid

% Moisture: 4.1

Date Received: 07/02/2013 0945

8081A Organochlorine Pesticides (GC)

Analysis Method: 8081A
Prep Method: 3550C
Dilution: 1.0
Analysis Date: 07/17/2013 0303
Prep Date: 07/10/2013 1850

Analysis Batch: 280-182797
Prep Batch: 280-182162

Instrument ID: SGC_P1
Initial Weight/Volume: 30.4 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.56	U	0.56	1.8
4,4'-DDE		0.25	U	0.25	1.8
4,4'-DDT		0.61	U	0.61	1.8
Aldrin		0.26	U	0.26	1.7
alpha-BHC		0.22	U	0.22	1.7
beta-BHC		0.68	U	0.68	1.7
delta-BHC		0.41	U	0.41	1.7
gamma-BHC (Lindane)		0.48	U	0.48	1.7
Heptachlor		0.22	U	0.22	1.7
Heptachlor epoxide		0.44	U	0.44	1.7
Endosulfan I		0.18	U	0.18	1.7
Endosulfan II		0.30	U	0.30	1.8
Endosulfan sulfate		0.28	U	0.28	1.8
Endrin		0.32	U	0.32	1.8
Endrin aldehyde		0.18	U	0.18	1.8
Endrin ketone		0.50	U	0.50	1.8
gamma-Chlordane		0.27	U	0.27	1.8
Methoxychlor		0.46	U	0.46	3.4
alpha-Chlordane		0.33	U	0.33	1.8
Dieldrin		0.22	U	0.22	1.8
Toxaphene		16	U J	16	170

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	79		59 - 115
Decachlorobiphenyl	101		63 - 124

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-43949-1

SDG #: J01846

SAF#: RC-232

Date SDG Closed: July 2, 2013

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1RNL8	280-43949-1	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNL9	280-43949-2	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM1	280-43949-3	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM3	280-43949-4	6010/7471/9056M/353.2/9045/8082/8081/ WTPH-D+/8270A/8310/8151	6010B/7471A/9056M/353.2/9045C/8082/8081A/ NWTPH-Dx/8270C/8310/8151A
J1RNM4	280-43949-5	6010/7471/8270A	6010B/7471A/8270C

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 7/2/2013 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° C.

GC/MS SEMIVOLATILES - SW846 8270C

The LCS associated with batch 280-182197 exhibited the percent recovery outside the control limits, biased low, for 3-Nitroaniline at 44% (lower limit 47%). A full list spike was utilized, and although this compound was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits (lower limit 38%). This marginal exceedance has been determined to be sporadic, not systematic; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "T". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - SW846 8081A - Pesticides

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8151A - Herbicides

Dinoseb results in soil are reported for this project at the request of the client with the qualifier that the laboratory is not certified for this analyte and the reported results are considered biased low. The laboratory consistently obtains very low recoveries, typically $\leq 10\%$.

The MSD aliquot of the MS/MSD performed on sample J1RNL8 exhibited the percent recovery outside the control limits for Dinoseb, and the associated sample result has been flagged "N". In addition, the RPD limit was exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

Low levels of C10-C36 and C10-C28 are present in the method blank associated with batch 280-182166. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1RNL8 and J1RNM3. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The MS aliquot of the MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries and the surrogate recovery outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-181392 indicates that physical and chemical interferences are present for Aluminum, Barium, Zinc, Cobalt and Nickel. Results have been flagged with an "X".

Low levels of Zinc are present in the method blank associated with batch 280-181392. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Low levels of Iron are present at a level greater than half the reporting limit in the method blank associated with batch 280-181392. As the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1RNL8; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1RNL8 exhibited percent recoveries outside the control limits for Boron and Silicon, and the associated sample results have been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The duplicate analysis of sample J1RNL8 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spike performed on sample J1RNM3 exhibited percent recoveries outside the control limits for Sulfate and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9045C - PH

SU = standard units

No anomalies were encountered

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-232-025		Page 1 of 2		
Collector SAGDAL, PA		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8P		
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites		Sampling Location 600-381		SAF No. RC-232		Data Turnaround 21 Day				
Ice Chest No. RCC-08-016		Field Logbook No. EL-1667		COA 060381A000		Method of Shipment Commercial Carrier Fed Ex				
Shipped To TestAmerica - Denver		Offsite Property No. A120866		Bill of Lading/Air Bill No. SEE OSPC						
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Go to 40-046/5/13 See Preservation				Preservation		Freeze	Cool 4C	Cool 4C	Cool 4C	
				Type of Container		Gal	GP	5G	5G	
				No. of Container(s)		5	1	1	1	
				Volume		40mL	125mL	125mL	1000mL	
SAMPLE ANALYSIS				VOA - 5035/8260 (TCL)	See Item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	See Item (2) in Special Instructions			
				Sample No.	Matrix	Sample Date	Sample Time			
JHRNL8	SOIL	6/28/13	0830	7-7-13	X	X	X			
JHRNL9	SOIL	6/28/13	0915	7-7-13	X	X	X			
JHRNM0	SOIL	6/28/13								
JHRNM1	SOIL	6/28/13	0950	7-7-13	X	X	X			
JHRNM2	SOIL	6/28/13								
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS		
Relinquished By/Removed From Pat Sada		Date/Time 6-28-13 1030		Received By/Stored In Don Hebelberg		Date/Time 7-1-13 1030		(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury) (2) IC Anions - 9056 Modified (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate); NO2/NO3 - 353.2 (Nitrogen in Nitrite and Nitrate); TPH-Diesel Range - WTPH-D +; pH (Soil) - 9045 (pH Measurement); PAHs - 8310; PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPAB151 56 JK 7/2/13 JK SDG J01846		
Relinquished By/Removed From Pat Sada		Date/Time 6-28-13 0830		Received By/Stored In Cynthia Stingham		Date/Time 7-1-13 0830				
Relinquished By/Removed From Pat Sada		Date/Time 7-1-13 1130		Received By/Stored In Fed Ex		Date/Time 7-1-13 0945				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time				

WCH-EE-011

Generated Date/Time: 06/05/2013 10:00, PDT

Appendix 5
Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-381		DATA PACKAGE: J01546		
VALIDATOR:	ELP	LAB:	TAL	DATE: 8/13/13	
			SDG:	J01546	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
JIRUL8 JIRUL9 JIRUM1 JIRUM3					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

Initial calibrations acceptable? Yes No **N/A**
 Continuing calibrations acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**
 DDT and endrin breakdowns acceptable? Yes No **N/A**

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

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

Comments: no PR

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

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

Comments: no PR

no top MS/MSD/LCS - J cell

PCB DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable? Yes No N/A
- Duplicate results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: no top ms/msd - J alj

6. SYSTEM PERFORMANCE (Levels D and E)

- Chromatographic performance acceptable? Yes No N/A
- Positive results resolved acceptably? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

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

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

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

Comments: _____

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

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182157

Method: 8082
Preparation: 3550C

Lab Sample ID: MB 280-182157/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 1607
Prep Date: 07/10/2013 1745
Leach Date: N/A

Analysis Batch: 280-182949
Prep Batch: 280-182157
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_P3b
Lab File ID: 0717B022.D
Initial Weight/Volume: 31.8 g
Final Weight/Volume: 5000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Aroclor 1016	2.6	U	2.6	9.4
Aroclor 1221	7.6	U	7.6	16
Aroclor 1232	1.9	U	1.9	9.4
Aroclor 1242	4.4	U	4.4	9.4
Aroclor 1248	4.4	U	4.4	9.4
Aroclor 1254	2.5	U	2.5	9.4
Aroclor 1260	2.5	U	2.5	9.4
Surrogate	% Rec		Acceptance Limits	
Decachlorobiphenyl	98		59 - 130	
Tetrachloro-m-xylene	99		53 - 128	

Lab Control Sample - Batch: 280-182157

Method: 8082
Preparation: 3550C

Lab Sample ID: LCS 280-182157/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 1628
Prep Date: 07/10/2013 1745
Leach Date: N/A

Analysis Batch: 280-182949
Prep Batch: 280-182157
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_P3b
Lab File ID: 0717B023.D
Initial Weight/Volume: 30.3 g
Final Weight/Volume: 5000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aroclor 1016	33.0	30.7	93	54 - 132	
Aroclor 1260	33.0	31.9	97	62 - 129	
Surrogate		% Rec		Acceptance Limits	
Decachlorobiphenyl		95		59 - 130	
Tetrachloro-m-xylene		97		53 - 128	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182157**

**Method: 8082
Preparation: 3550C**

MS Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 1711
Prep Date: 07/10/2013 1745
Leach Date: N/A

Analysis Batch: 280-182949
Prep Batch: 280-182157
Leach Batch: N/A

Instrument ID: SGC_P3b
Lab File ID: 0717B025.D
Initial Weight/Volume: 30.8 g
Final Weight/Volume: 5000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 1733
Prep Date: 07/10/2013 1745
Leach Date: N/A

Analysis Batch: 280-182949
Prep Batch: 280-182157
Leach Batch: N/A

Instrument ID: SGC_P3b
Lab File ID: 0717B026.D
Initial Weight/Volume: 30.1 g
Final Weight/Volume: 5000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aroclor 1016	97	100	54 - 132	5	26		
Aroclor 1260	95	98	62 - 129	5	26		
Surrogate	MS % Rec		MSD % Rec	Acceptance Limits			
Decachlorobiphenyl	88		93	59 - 130			
Tetrachloro-m-xylene	88		93	53 - 128			

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182157**

**Method: 8082
Preparation: 3550C**

MS Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 1711
Prep Date: 07/10/2013 1745
Leach Date: N/A

Units: ug/Kg

MSD Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 1733
Prep Date: 07/10/2013 1745
Leach Date: N/A

Analyte	Sample		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
	Result/Qual	Amount				
Aroclor 1016	2.8	U	33.7	34.5	32.8	34.4
Aroclor 1260	2.6	U	33.7	34.5	32.2	34.0

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-182162

Method: 8081A
Preparation: 3550C

Lab Sample ID: MB 280-182162/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 0355
Prep Date: 07/10/2013 1850
Leach Date: N/A

Analysis Batch: 280-182797
Prep Batch: 280-182162
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_P1
Lab File ID: 07160065.D
Initial Weight/Volume: 31.0 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
4,4'-DDD	0.53	U	0.53	1.6
4,4'-DDE	0.23	U	0.23	1.6
4,4'-DDT	0.57	U	0.57	1.6
Aldrin	0.24	U	0.24	1.6
alpha-BHC	0.21	U	0.21	1.6
beta-BHC	0.64	U	0.64	1.6
delta-BHC	0.39	U	0.39	1.6
gamma-BHC (Lindane)	0.45	U	0.45	1.6
Heptachlor	0.21	U	0.21	1.6
Heptachlor epoxide	0.41	U	0.41	1.6
Endosulfan I	0.17	U	0.17	1.6
Endosulfan II	0.28	U	0.28	1.6
Endosulfan sulfate	0.27	U	0.27	1.6
Endrin	0.30	U	0.30	1.6
Endrin aldehyde	0.17	U	0.17	1.6
Endrin ketone	0.47	U	0.47	1.6
gamma-Chlordane	0.26	U	0.26	1.6
Methoxychlor	0.44	U	0.44	3.2
alpha-Chlordane	0.31	U	0.31	1.6
Dieldrin	0.20	U	0.20	1.6
Toxaphene	15	U	15	160
Surrogate	% Rec	Acceptance Limits		
Tetrachloro-m-xylene	82	59 - 115		
Decachlorobiphenyl	101	63 - 124		

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Lab Control Sample - Batch: 280-182162

Method: 8081A
Preparation: 3550C

Lab Sample ID: LCS 280-182162/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 0154
Prep Date: 07/10/2013 1850
Leach Date: N/A

Analysis Batch: 280-182797
Prep Batch: 280-182162
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_P1
Lab File ID: 07160058.D
Initial Weight/Volume: 30.2 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
4,4'-DDD	16.6	15.4	93	54 - 130	
4,4'-DDE	16.6	14.1	85	58 - 121	
4,4'-DDT	16.6	16.9	102	57 - 133	
Aldrin	16.6	14.3	86	63 - 115	
alpha-BHC	16.6	14.5	87	64 - 116	
beta-BHC	16.6	14.6	88	67 - 115	
delta-BHC	16.6	14.8	89	67 - 115	
gamma-BHC (Lindane)	16.6	14.6	88	63 - 118	
Heptachlor	16.6	15.2	92	68 - 115	
Heptachlor epoxide	16.6	14.3	86	66 - 117	
Endosulfan I	16.6	12.8	77	65 - 118	
Endosulfan II	16.6	13.2	80	71 - 118	
Endosulfan sulfate	16.6	14.3	87	67 - 123	
Endrin	16.6	15.3	92	77 - 134	
Endrin aldehyde	16.6	12.4	75	47 - 115	
Endrin ketone	16.6	13.9	84	62 - 115	
gamma-Chlordane	16.6	14.2	86	65 - 117	
Methoxychlor	16.6	14.3	86	67 - 130	
alpha-Chlordane	16.6	14.1	85	63 - 120	
Dieldrin	16.6	14.4	87	65 - 127	
Surrogate		% Rec		Acceptance Limits	
Tetrachloro-m-xylene		81		59 - 115	
Decachlorobiphenyl		103		63 - 124	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182162**

**Method: 8081A
Preparation: 3550C**

MS Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 0320
Prep Date: 07/10/2013 1850
Leach Date: N/A

Analysis Batch: 280-182797
Prep Batch: 280-182162
Leach Batch: N/A

Instrument ID: SGC_P1
Lab File ID: 07160063.D
Initial Weight/Volume: 32.6 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 0337
Prep Date: 07/10/2013 1850
Leach Date: N/A

Analysis Batch: 280-182797
Prep Batch: 280-182162
Leach Batch: N/A

Instrument ID: SGC_P1
Lab File ID: 07160064.D
Initial Weight/Volume: 31.1 g
Final Weight/Volume: 10000 uL
Injection Volume: 1 uL
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
4,4'-DDD	86	84	54 - 130	1	20		
4,4'-DDE	78	72	58 - 121	3	15		
4,4'-DDT	95	96	57 - 133	6	29		
Aldrin	81	81	63 - 115	5	50		
alpha-BHC	85	85	64 - 116	5	17		
beta-BHC	84	83	67 - 115	4	17		
delta-BHC	85	84	67 - 115	3	19		
gamma-BHC (Lindane)	85	86	63 - 118	6	24		
Heptachlor	88	88	68 - 115	5	18		
Heptachlor epoxide	82	82	66 - 117	5	18		
Endosulfan I	74	72	65 - 118	3	26		
Endosulfan II	74	74	71 - 118	4	20		
Endosulfan sulfate	84	82	67 - 123	3	22		
Endrin	100	91	77 - 134	4	30		
Endrin aldehyde	69	70	47 - 115	6	29		
Endrin ketone	76	75	62 - 115	4	20		
gamma-Chlordane	79	78	65 - 117	2	21		
Methoxychlor	81	81	67 - 130	5	23		
alpha-Chlordane	80	79	63 - 120	3	18		
Dieldrin	82	81	65 - 127	4	25		
Surrogate		MS % Rec	MSD % Rec			Acceptance Limits	
Tetrachloro-m-xylene		80	79			59 - 115	
Decachlorobiphenyl		99	112			63 - 124	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-182162**

**Method: 8081A
Preparation: 3550C**

MS Lab Sample ID: 280-43949-4 Units: ug/Kg
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 0320
Prep Date: 07/10/2013 1850
Leach Date: N/A

MSD Lab Sample ID: 280-43949-4
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/17/2013 0337
Prep Date: 07/10/2013 1850
Leach Date: N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
4,4'-DDD	0.56 U	16.0	16.8	13.8	14.0
4,4'-DDE	0.25 U	16.0	16.8	12.4	12.0
4,4'-DDT	0.61 U	16.0	16.8	15.1	16.1
Aldrin	0.26 U	16.0	16.8	12.9	13.5
alpha-BHC	0.22 U	16.0	16.8	13.6	14.2
beta-BHC	0.68 U	16.0	16.8	13.4	14.0
delta-BHC	0.41 U	16.0	16.8	13.6	14.1
gamma-BHC (Lindane)	0.48 U	16.0	16.8	13.6	14.4
Heptachlor	0.22 U	16.0	16.8	14.1	14.7
Heptachlor epoxide	0.44 U	16.0	16.8	13.1	13.7
Endosulfan I	0.18 U	16.0	16.8	11.8	12.1
Endosulfan II	0.30 U	16.0	16.8	11.9	12.4
Endosulfan sulfate	0.28 U	16.0	16.8	13.4	13.8
Endrin	0.32 U	16.0	16.8	15.9	15.3
Endrin aldehyde	0.18 U	16.0	16.8	11.0	11.7
Endrin ketone	0.50 U	16.0	16.8	12.1	12.6
gamma-Chlordane	0.27 U	16.0	16.8	12.7	13.0
Methoxychlor	0.46 U	16.0	16.8	12.9	13.6
alpha-Chlordane	0.33 U	16.0	16.8	12.9	13.3
Dieldrin	0.22 U	16.0	16.8	13.1	13.6

Date: 15 August 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site
600-381
Subject: Inorganics - Data Package No. J01846-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01846 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RNL8	6/28/13	Soil	C	See note 1
J1RNL9	6/28/13	Soil	C	See note 1
J1RNM1	6/28/13	Soil	C	See note 1
J1RNM3	6/28/13	Soil	C	See note 1
J1RNM4	6/28/13	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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 PARAMETERS

Holding Times

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

All holding times were acceptable.

Preparation (Method) Blanks

Preparation Blanks

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

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

Due to method blank contamination, the zinc results in sample J1RNM4 was qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1RNM4) was submitted for analysis. Fourteen analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

Accuracy

Matrix Spike and Laboratory Control Sample

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

Due to matrix spike recoveries outside QC limits, all antimony (43%) and silicon (12%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (17%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

Precision

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1RNL8/J1RNM3) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

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

Completeness

Data package No. J01846 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the zinc results in sample J1RNM4 was qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all antimony (43%) and silicon (12%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (17%), all silicon results were qualified as estimates and flagged "J".

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
 - UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
 - J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
 - BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
 - R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
 - UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
 - NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
 - N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
-

Appendix 2
Summary of Data Qualification

INORGANICS DATA QUALIFICATION SUMMARY*

SDG: J01846	REVIEWER: ELR	Project: 600-381	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony Silicon	J	All	MS recovery
Silicon	J	All	LCS recovery
Zinc	UJ	J1RNM4	Method blank contamination

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

Appendix 3
Annotated Laboratory Reports



Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL8

Lab Sample ID: 280-43949-1
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 06/28/2013 0830
Date Received: 07/02/2013 0945

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-182038 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25b070913.asc
Dilution: 1.0
Analysis Date: 07/09/2013 1955 *K 8/10/13* Initial Weight/Volume: 1.17 g
Prep Date: 07/08/2013 0900 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10500	X	1.4	4.4
Antimony		0.43	B <i>J</i>	0.34	0.53
Barium		90.0	X	0.067	0.44
Zinc		46.8	X	0.35	0.89

Analysis Method: 6010B Analysis Batch: 280-182221 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25A5071013.asc
Dilution: 1.0
Analysis Date: 07/10/2013 2246 Initial Weight/Volume: 1.17 g
Prep Date: 07/08/2013 0900 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		3.6		0.59	0.89
Beryllium		0.029	U	0.029	0.18
Boron		2.4	N	0.87	1.8
Cadmium		0.42		0.036	0.18
Calcium		4400		12.5	44.4
Chromium		13.0		0.052	0.18
Cobalt		7.3	X	0.089	0.89
Copper		13.4		0.19	0.89
Iron		18100		3.4	4.4
Lead		7.5		0.24	0.44
Magnesium		5010		3.3	17.8
Manganese		357		0.089	0.89
Molybdenum		0.23	U	0.23	1.8
Nickel		11.8	X	0.11	3.6
Potassium		1960		36.4	266
Selenium		0.76	U	0.76	0.89
Silicon		353	N <i>J</i>	5.0	8.9
Silver		0.14	U	0.14	0.18
Sodium		192		52.4	107
Vanadium		40.7		0.083	1.8

7471A Mercury (CVAA)

Analysis Method: 7471A Analysis Batch: 280-181781 Instrument ID: MT_034
Prep Method: 7471A Prep Batch: 280-181605 Lab File ID: 130705taa.txt
Dilution: 1.0
Analysis Date: 07/05/2013 1509 Initial Weight/Volume: 0.63 g
Prep Date: 07/05/2013 1130 Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0055	U	0.0055	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNL9

Lab Sample ID: 280-43949-2
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 06/28/2013 0915
Date Received: 07/02/2013 0945

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-182038 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25b070913.asc
Dilution: 1.0 Initial Weight/Volume: 1.05 g
Analysis Date: 07/09/2013 2004 Final Weight/Volume: 100 mL
Prep Date: 07/08/2013 0900

K 8/14/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10000	X	1.8	5.2
Antimony		0.47	B J	0.40	0.63
Barium		77.1	X	0.079	0.52
Zinc		42.6	X	0.42	1.0

Analysis Method: 6010B Analysis Batch: 280-182221 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25A5071013.asc
Dilution: 1.0 Initial Weight/Volume: 1.05 g
Analysis Date: 07/10/2013 2256 Final Weight/Volume: 100 mL
Prep Date: 07/08/2013 0900

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		3.5		0.69	1.0
Beryllium		0.035	U	0.035	0.21
Boron		1.9	B	1.0	2.1
Cadmium		0.39		0.043	0.21
Calcium		6080		14.7	52.3
Chromium		12.6		0.061	0.21
Cobalt		7.4	X	0.10	1.0
Copper		14.5		0.23	1.0
Iron		17700		4.0	5.2
Lead		6.0		0.28	0.52
Magnesium		5300		3.9	20.9
Manganese		334		0.10	1.0
Molybdenum		0.27	B	0.27	2.1
Nickel		12.9	X	0.13	4.2
Potassium		2040		42.9	314
Selenium		0.90	U	0.90	1.0
Silicon		405		5.9	10.5
Silver		0.17	U J	0.17	0.21
Sodium		181		61.7	125
Vanadium		40.7		0.098	2.1

7471A Mercury (CVAA)

Analysis Method: 7471A Analysis Batch: 280-181781 Instrument ID: MT_034
Prep Method: 7471A Prep Batch: 280-181605 Lab File ID: 130705taa.txt
Dilution: 1.0 Initial Weight/Volume: 0.60 g
Analysis Date: 07/05/2013 1521 Final Weight/Volume: 50 mL
Prep Date: 07/05/2013 1130

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0061	U	0.0061	0.019

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM1

Lab Sample ID: 280-43949-3
Client Matrix: Solid

% Moisture: 14.7

Date Sampled: 06/28/2013 0950
Date Received: 07/02/2013 0945

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-182038 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25b070913.asc
Dilution: 1.0
Analysis Date: 07/09/2013 2006 *✓ 8/14/13* Initial Weight/Volume: 1.15 g
Prep Date: 07/08/2013 0900 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10900	X	1.6	5.1
Antimony		1.1	J	0.39	0.61
Barium		85.5	X	0.077	0.51
Zinc		52.7	X	0.41	1.0

Analysis Method: 6010B Analysis Batch: 280-182221 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25A5071013.asc
Dilution: 1.0
Analysis Date: 07/10/2013 2258 Initial Weight/Volume: 1.15 g
Prep Date: 07/08/2013 0900 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		3.8		0.67	1.0
Beryllium		0.034	U	0.034	0.20
Boron		1.7	B	1.0	2.0
Cadmium		0.41		0.042	0.20
Calcium		3760		14.4	51.0
Chromium		12.9		0.059	0.20
Cobalt		7.6	X	0.10	1.0
Copper		14.1		0.22	1.0
Iron		18600		3.9	5.1
Lead		6.1		0.28	0.51
Magnesium		5260		3.8	20.4
Manganese		359		0.10	1.0
Molybdenum		0.27	U	0.27	2.0
Nickel		12.7	X	0.13	4.1
Potassium		2140		41.8	306
Selenium		0.88	U	0.88	1.0
Silicon		401	J	5.8	10.2
Silver		0.16	U	0.16	0.20
Sodium		182		60.1	122
Vanadium		42.2		0.096	2.0

7471A Mercury (CVAA)

Analysis Method: 7471A Analysis Batch: 280-181781 Instrument ID: MT_034
Prep Method: 7471A Prep Batch: 280-181605 Lab File ID: 130705taa.bt
Dilution: 1.0
Analysis Date: 07/05/2013 1523 Initial Weight/Volume: 0.68 g
Prep Date: 07/05/2013 1130 Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.018

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1

Sdg Number: J01846

Client Sample ID: J1RNM3

Lab Sample ID: 280-43949-4

Date Sampled: 06/28/2013 0830

Client Matrix: Solid

% Moisture: 4.1

Date Received: 07/02/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-182038	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-181392	Lab File ID:	25b070913.asc
Dilution:	1.0			Initial Weight/Volume:	1.13 g
Analysis Date:	07/09/2013 2009			Final Weight/Volume:	100 mL
Prep Date:	07/08/2013 0900				

8/10/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10400	X	1.4	4.6
Antimony		0.67	J	0.35	0.55
Barium		91.9	X	0.070	0.46
Zinc		46.1	X	0.37	0.92

Analysis Method:	6010B	Analysis Batch:	280-182221	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-181392	Lab File ID:	25A5071013.asc
Dilution:	1.0			Initial Weight/Volume:	1.13 g
Analysis Date:	07/10/2013 2301			Final Weight/Volume:	100 mL
Prep Date:	07/08/2013 0900				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		3.5		0.61	0.92
Beryllium		0.036	B	0.030	0.18
Boron		2.3		0.90	1.8
Cadmium		0.40		0.038	0.18
Calcium		4280		13.0	46.2
Chromium		12.0		0.054	0.18
Cobalt		7.4	X	0.092	0.92
Copper		13.7		0.20	0.92
Iron		17900		3.5	4.6
Lead		7.6		0.25	0.46
Magnesium		5050		3.4	18.5
Manganese		352		0.092	0.92
Molybdenum		0.24	U	0.24	1.8
Nickel		13.4	X	0.11	3.7
Potassium		1980		37.9	277
Selenium		0.79	U	0.79	0.92
Silicon		373	J	5.2	9.2
Silver		0.15	U	0.15	0.18
Sodium		189		54.5	111
Vanadium		40.0		0.087	1.8

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-181781	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-181605	Lab File ID:	1307051aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.61 g
Analysis Date:	07/05/2013 1526			Final Weight/Volume:	50 mL
Prep Date:	07/05/2013 1130				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Client Sample ID: J1RNM4

Lab Sample ID: 280-43949-5
Client Matrix: Solid

% Moisture: 0.0

Date Sampled: 06/28/2013 1008
Date Received: 07/02/2013 0945

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-182038 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25b070913.asc
Dilution: 1.0
Analysis Date: 07/09/2013 2011 *U 8/10/13* Initial Weight/Volume: 1.04 g
Prep Date: 07/08/2013 0900 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		222	X	1.5	4.8
Antimony		0.37	U <i>J</i>	0.37	0.58
Barium		3.4	X	0.073	0.48
Zinc		1.8	X C <i>UJ</i>	0.38	0.96

Analysis Method: 6010B Analysis Batch: 280-182221 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-181392 Lab File ID: 25A5071013.asc
Dilution: 1.0
Analysis Date: 07/10/2013 2303 Initial Weight/Volume: 1.04 g
Prep Date: 07/08/2013 0900 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		0.63	U	0.63	0.96
Beryllium		0.047	B	0.032	0.19
Boron		0.94	U	0.94	1.9
Cadmium		0.039	U	0.039	0.19
Calcium		49.7		13.6	48.1
Chromium		0.13	B	0.056	0.19
Cobalt		0.14	B X	0.096	0.96
Copper		0.21	U	0.21	0.96
Iron		411		3.7	4.8
Lead		0.44	B	0.26	0.48
Magnesium		29.8		3.6	19.2
Manganese		24.0		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		0.20	B X	0.12	3.8
Potassium		61.3	B	39.4	288
Selenium		0.83	U	0.83	0.96
Silicon		139	<i>J</i>	5.4	9.6
Silver		0.15	U	0.15	0.19
Sodium		56.7	U	56.7	115
Vanadium		0.53	B	0.090	1.9

7471A Mercury (CVAA)

Analysis Method: 7471A Analysis Batch: 280-181781 Instrument ID: MT_034
Prep Method: 7471A Prep Batch: 280-181605 Lab File ID: 130705taa.txt
Dilution: 1.0
Analysis Date: 07/05/2013 1528 Initial Weight/Volume: 0.56 g
Prep Date: 07/05/2013 1130 Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0059	U	0.0059	0.018

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-43949-1

SDG #: J01846
SAF#: RC-232

Date SDG Closed: July 2, 2013
Data Deliverable: 21 Day / Summary

Table with 4 columns: CLIENT ID, LAB ID, ANALYSES REQUESTED, ANALYSES PERFORMED. Rows include J1RNL8, J1RNL9, J1RNM1, J1RNM3, J1RNM4.

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 7/2/2013 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° C.

GC/MS SEMIVOLATILES - SW846 8270C

The LCS associated with batch 280-182197 exhibited the percent recovery outside the control limits, biased low, for 3-Nitroaniline at 44% (lower limit 47%). A full list spike was utilized, and although this compound was recovered outside current historical control limits, the recovery was within the allowed Marginal Exceedance control limits (lower limit 38%). This marginal exceedance has been determined to be sporadic, not systematic; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "T". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - SW846 8081A - Pesticides

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

GC SEMIVOLATILES - SW846 8151A - Herbicides

Dinoseb results in soil are reported for this project at the request of the client with the qualifier that the laboratory is not certified for this analyte and the reported results are considered biased low. The laboratory consistently obtains very low recoveries, typically $\leq 10\%$.

The MSD aliquot of the MS/MSD performed on sample J1RNL8 exhibited the percent recovery outside the control limits for Dinoseb, and the associated sample result has been flagged "N". In addition, the RPD limit was exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

Low levels of C10-C36 and C10-C28 are present in the method blank associated with batch 280-182166. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary. Associated sample results present above the MDL and/or RL have been flagged with a "B".

No other anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for analytes in samples J1RNL8 and J1RNM3. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

The MS aliquot of the MS/MSD performed on sample J1RNM3 exhibited spike compound recoveries and the surrogate recovery outside the control limits, and the associated sample results have been flagged "N". In addition, the RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-181392 indicates that physical and chemical interferences are present for Aluminum, Barium, Zinc, Cobalt and Nickel. Results have been flagged with an "X".

Low levels of Zinc are present in the method blank associated with batch 280-181392. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Low levels of Iron are present at a level greater than half the reporting limit in the method blank associated with batch 280-181392. As the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1RNL8; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1RNL8 exhibited percent recoveries outside the control limits for Boron and Silicon, and the associated sample results have been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The duplicate analysis of sample J1RNL8 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Matrix Spike performed on sample J1RNM3 exhibited percent recoveries outside the control limits for Sulfate and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9045C - PH

SU = standard units

No anomalies were encountered

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-232-025		Page 2 of 2	
Collector SAGDAL, PA		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8D	
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites		Sampling Location 600-381		SAF No. RC-232		Data Turnaround 21 Days			
Ice Chest No. RCC-08-016		Field Logbook No. EL-1667		COA 060381A000		Method of Shipment Commercial Carrier Fed EX			
Shipped To TestAmerica - Denver		Offsite Property No. A120866		Bill of Lading/Air Bill No. See O5PC					
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Cooling - OH 6/15/13 See Preservation				Preservation		Freeze	Cool 4C	Cool 4C	Cool 4C
				Type of Container		Gal	G/P	gG	gG
				No. of Container(s)		5	1	1	1
				Volume		40mL	125mL	125mL	1000mL
SAMPLE ANALYSIS				VOA - 5035/8260 (TCL)	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions		
				Sample No.	Matrix	Sample Date	Sample Time		
Page 1				JERNM3	SOIL	6/28/13	0830	X X X	
Page 2				JERNM4	SOIL	6/28/13	1008	X X X	
Page 3									
Page 4									
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Appendix 5
Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-381		DATA PACKAGE: J01846		
VALIDATOR:	ELR	LAB:	TAC	DATE: 8/13/13	
			SDG: J01846		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
JIRNL8		JIRNL7		JIRNL1 JIRNL3	
JIRNL4					
5061					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No **N/A**
 Comments: _____

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

Initial calibrations performed on all instruments? Yes No **N/A**
 Initial calibrations acceptable? Yes No **N/A**
 ICP interference checks acceptable? Yes No **N/A**
 ICV and CCV checks performed on all instruments? Yes No **N/A**
 ICV and CCV checks acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**
 Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

ICB and CCB checks performed for all applicable analyses? (Levels D, E)..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable?..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) Yes No N/A
Field blank results acceptable? (Levels C, D, E)..... Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A
Comments: zinc - M4 - U5

FB - 10/1 detected

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: LCS - silicon (17%) - J all
MS - antimony (43%) silica (12%) - J all

no PAs

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable? Yes No N/A
- Duplicate results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

- ICP serial dilution samples analyzed? Yes No N/A
- ICP serial dilution %D values acceptable? Yes No N/A
- ICP post digestion spike required? Yes No N/A
- ICP post digestion spike values acceptable? Yes No N/A
- Standards traceable? Yes No N/A
- Standards expired? Yes No N/A
- Transcription/calculation errors? Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

- | | | | |
|---|-----|----|-----|
| Duplicate injections performed as required? | Yes | No | N/A |
| Duplicate injection %RSD values acceptable? | Yes | No | N/A |
| Analytical spikes performed as required? | Yes | No | N/A |
| Analytical spike recoveries acceptable? | Yes | No | N/A |
| Standards traceable? | Yes | No | N/A |
| Standards expired? | Yes | No | N/A |
| MSA performed as required? | Yes | No | N/A |
| MSA results acceptable? | Yes | No | N/A |
| Transcription/calculation errors? | Yes | No | N/A |

Comments: _____

8. HOLDING TIMES (all levels)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-181392

**Method: 6010B
Preparation: 3050B**

Lab Sample ID: MB 280-181392/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1953
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182038
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25b070913.asc
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Antimony	0.38	U	0.38	0.60
Barium	0.076	U	0.076	0.50
Zinc	0.405	B	0.40	1.0

Method Blank - Batch: 280-181392

**Method: 6010B
Preparation: 3050B**

Lab Sample ID: MB 280-181392/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 2244
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182221
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25A5071013.asc
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Arsenic	0.66	U	0.66	1.0
Beryllium	0.033	U	0.033	0.20
Boron	0.98	U	0.98	2.0
Cadmium	0.041	U	0.041	0.20
Calcium	14.1	U	14.1	50.0
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Iron	4.41	B	3.8	5.0
Lead	0.27	U	0.27	0.50
Magnesium	3.7	U	3.7	20.0
Manganese	0.10	U	0.10	1.0
Molybdenum	0.26	U	0.26	2.0
Nickel	0.12	U	0.12	4.0
Potassium	41.0	U	41.0	300
Selenium	0.86	U	0.86	1.0
Silicon	5.7	U	5.7	10.0
Silver	0.16	U	0.16	0.20
Sodium	59.0	U	59.0	120
Vanadium	0.094	U	0.094	2.0

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Lab Control Sample - Batch: 280-181392

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 280-181392/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1950
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182038
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25b070913.asc
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	184.5	92	82 - 116	
Antimony	50.0	49.93	100	82 - 110	
Barium	200	194.4	97	87 - 112	
Zinc	50.0	49.98	100	76 - 114	

Lab Control Sample - Batch: 280-181392

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 280-181392/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 2242
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182221
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25A5071013.asc
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	100	93.86	94	85 - 110	
Beryllium	5.00	4.78	96	84 - 114	
Boron	100	91.00	91	80 - 120	
Cadmium	10.0	10.08	101	87 - 110	
Calcium	5000	4793	96	82 - 114	
Chromium	20.0	18.66	93	84 - 114	
Cobalt	50.0	49.42	99	87 - 110	
Copper	25.0	25.25	101	88 - 110	
Iron	100	96.79	97	87 - 120	
Lead	50.0	48.41	97	86 - 110	
Magnesium	5000	5224	104	90 - 110	
Manganese	50.0	50.08	100	88 - 110	
Molybdenum	100	107.8	108	86 - 110	
Nickel	50.0	46.59	93	87 - 110	
Potassium	5000	4894	98	89 - 110	
Selenium	200	183.6	92	83 - 110	
Silicon	1000	166.8	17	10 - 70	
Silver	5.00	4.45	89	87 - 114	
Sodium	5000	4889	98	90 - 112	
Vanadium	50.0	50.62	101	88 - 110	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Matrix Spike - Batch: 280-181392

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 2002
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182038
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25b070913.asc
Initial Weight/Volume: 1.12 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	10500	186	13590	1678	50 - 200	4
Antimony	0.43 B	46.4	20.27	43	20 - 200	
Barium	90.0	186	263.1	93	52 - 159	
Zinc	46.8	46.4	89.62	92	70 - 200	

Matrix Spike - Batch: 280-181392

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 2253
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182221
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25A5071013.asc
Initial Weight/Volume: 1.12 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	3.6	92.8	82.24	85	76 - 111	
Beryllium	0.029 U	4.64	4.02	87	72 - 105	
Boron	2.4	92.8	76.17	79	80 - 120	N
Cadmium	0.42	9.28	8.93	92	40 - 130	
Calcium	4400	4640	9387	107	43 - 165	
Chromium	13.0	18.6	29.50	89	70 - 200	
Cobalt	7.3	46.4	48.23	88	72 - 106	
Copper	13.4	23.2	34.96	93	37 - 187	
Iron	18100	92.8	19050	989	70 - 200	4
Lead	7.5	46.4	47.03	85	70 - 200	
Magnesium	5010	4640	9893	105	64 - 145	
Manganese	357	46.4	413.5	123	40 - 200	4
Molybdenum	0.23 U	92.8	86.92	94	75 - 103	
Nickel	11.8	46.4	50.37	83	61 - 126	
Potassium	1960	4640	6408	96	56 - 172	
Selenium	0.76 U	186	151.9	82	76 - 104	
Silicon	353	928	466.0	12	20 - 200	N
Silver	0.14 U	4.64	3.54	76	75 - 141	
Sodium	192	4640	4582	95	78 - 111	
Vanadium	40.7	46.4	89.18	104	50 - 169	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Duplicate - Batch: 280-181392

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/09/2013 1959
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182038
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25b070913.asc
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	10500	10670	2	40	
Antimony	0.43 B	0.632	38	40	
Barium	90.0	90.60	0.7	30	
Zinc	46.8	47.26	1	40	

Duplicate - Batch: 280-181392

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/10/2013 2251
Prep Date: 07/08/2013 0900
Leach Date: N/A

Analysis Batch: 280-182221
Prep Batch: 280-181392
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25A5071013.asc
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Arsenic	3.6	3.70	3	30	
Beryllium	0.029 U	0.032	NC	30	U
Boron	2.4	2.54	4	30	
Cadmium	0.42	0.407	3	30	
Calcium	4400	4367	0.9	30	
Chromium	13.0	12.59	3	40	
Cobalt	7.3	7.24	1	30	
Copper	13.4	13.22	1	30	
Iron	18100	18160	0.1	40	
Lead	7.5	7.86	4	40	
Magnesium	5010	5014	0.06	30	
Manganese	357	351.9	1	40	
Molybdenum	0.23 U	0.25	NC	30	U
Nickel	11.8	11.86	0.7	30	
Potassium	1960	1968	0.4	40	
Selenium	0.76 U	0.84	NC	30	U
Silicon	353	417.4	17	40	
Silver	0.14 U	0.16	NC	30	U
Sodium	192	201.9	5	30	
Vanadium	40.7	40.74	0.01	30	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Method Blank - Batch: 280-181605

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 280-181605/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/05/2013 1505
Prep Date: 07/05/2013 1130
Leach Date: N/A

Analysis Batch: 280-181781
Prep Batch: 280-181605
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_034
Lab File ID: 130705taa.txt
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-181605

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 280-181605/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/05/2013 1507
Prep Date: 07/05/2013 1130
Leach Date: N/A

Analysis Batch: 280-181781
Prep Batch: 280-181605
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_034
Lab File ID: 130705taa.txt
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.398	96	87 - 111	

Matrix Spike - Batch: 280-181605

Method: 7471A
Preparation: 7471A

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/05/2013 1519
Prep Date: 07/05/2013 1130
Leach Date: N/A

Analysis Batch: 280-181781
Prep Batch: 280-181605
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_034
Lab File ID: 130705taa.txt
Initial Weight/Volume: 0.63 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0055 U	0.412	0.392	95	87 - 111	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-43949-1
Sdg Number: J01846

Duplicate - Batch: 280-181605

Method: 7471A
Preparation: 7471A

Lab Sample ID: 280-43949-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 07/05/2013 1512
Prep Date: 07/05/2013 1130
Leach Date: N/A

Analysis Batch: 280-181781
Prep Batch: 280-181605
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_034
Lab File ID: 130705taa.txt
Initial Weight/Volume: 0.66 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	0.0055 U	0.00527	NC	20	B