SAF-RC-107
100-H Remaining Sites Burial Grounds – Soil Full Protocol
FINAL VALIDATION PACKAGE

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Kathy Wendt H4-21

COMMENTS:

SDG JP0677 SAF-RC-107

Waste Site: 100-H-46

Date: 6 January 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-46
Subject: Inorganic - Data Package No. JP0677-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0677 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
J1T6M8	12/13/13	Soil	C	See note 1
J1T6M9	12/13/13	Soil	C	See note 1
J1T6N0	12/13/13	Soil	C	See note 1
J1T6N1	12/13/13	Soil	C	See note 1
J1T6N2	12/13/13	Soil	C	See note 1
J1T6N3	12/13/13	Soil	C	See note 1
J1T6N4	12/13/13	Soil	C	See note 1
J1T6N5	12/13/13	Soil	C	See note 1
J1T6N6	12/13/13	Soil	C	See note 1
J1T6N7	12/13/13	Soil	C	See note 1
J1T6N8	12/13/13	Soil	C	See note 1
J1T6N9	12/13/13	Soil	C	See note 1
J1T6P0	12/13/13	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (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, Rev. 4, February 2005). 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 28 days for mercury and 6 months for ICP metals.

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.

All preparation blank results were acceptable.

Field (Equipment) Blank

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 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 (69%) and silicon (29%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (8%), 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 (J1T6N8/J1T6P0) was 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. JP0677 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 matrix spike recoveries outside QC limits, all antimony (69%) and silicon (29%) results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits (8%), 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. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

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

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP0677	**REVIEWER: ELR**	**Project: 100-H-46**	**PAGE 1 OF 1**
COMPOUND	*QUALIFIER*	*SAMPLES AFFECTED*	*REASON*
Antimony Silicon	J	All	MS recovery
Silicon	J	All	LCS 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

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6M8

Lab Sample ID: 280-50371-1
Client Matrix: Solid

% Moisture: 1.5

Date Sampled: 12/13/2013 1315
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	12/19/2013 1422			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4410		1.5	4.9
Antimony		0.37	U J	0.37	0.59
Arsenic		2.1		0.64	0.98
Barium		36.0		0.074	0.49
Beryllium		0.14	B	0.032	0.20
Boron		0.96	U	0.96	2.0
Cadmium		0.23		0.040	0.20
Calcium		6300		13.8	48.8
Chromium		7.9		0.057	0.20
Cobalt		3.8	M	0.098	0.98
Copper		13.7		0.21	0.98
Iron		12500		3.7	4.9
Lead		2.2		0.26	0.49
Magnesium		3140		3.6	19.5
Manganese		200		0.098	0.98
Molybdenum		0.25	U	0.25	2.0
Nickel		8.2		0.12	3.9
Potassium		494		40.0	293
Selenium		0.84	U	0.84	0.98
Silicon		134	N J	5.5	9.8
Silver		0.16	U	0.16	0.20
Sodium		165		57.6	117
Vanadium		31.2		0.092	2.0
Zinc		22.6	X	0.39	0.98

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.55 g
Analysis Date:	12/19/2013 1241			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

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

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6M9

Lab Sample ID: 280-50371-2
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 12/13/2013 1324
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	12/19/2013 1432			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4780		1.4	4.4
Antimony		0.33	U J	0.33	0.52
Arsenic		2.2		0.58	0.87
Barium		56.5		0.066	0.44
Beryllium		0.14	B	0.029	0.17
Boron		0.86	U	0.86	1.7
Cadmium		0.22		0.036	0.17
Calcium		4720		12.3	43.7
Chromium		7.2		0.051	0.17
Cobalt		4.5		0.087	0.87
Copper		12.9		0.19	0.87
Iron		14500		3.3	4.4
Lead		2.3		0.24	0.44
Magnesium		3440		3.2	17.5
Manganese		191		0.087	0.87
Molybdenum		0.24	B	0.23	1.7
Nickel		7.5		0.11	3.5
Potassium		567		35.8	262
Selenium		0.75	U	0.75	0.87
Silicon		121	N J	4.9	8.7
Silver		0.14	U	0.14	0.17
Sodium		165		51.6	105
Vanadium		40.4		0.082	1.7
Zinc		25.9	X	0.35	0.87

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.52 g
Analysis Date:	12/19/2013 1248			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0065	U	0.0065	0.020

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N0

Lab Sample ID: 280-50371-3
Client Matrix: Solid

% Moisture: 1.9

Date Sampled: 12/13/2013 1308
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.02 g
Analysis Date:	12/19/2013 1434			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5260		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		3.1		0.66	1.0
Barium		32.4		0.076	0.50
Beryllium		0.17	B	0.033	0.20
Boron		0.98	U	0.98	2.0
Cadmium		0.26		0.041	0.20
Calcium		5400		14.1	50.0
Chromium		8.6		0.058	0.20
Cobalt		4.9		0.10	1.0
Copper		15.3		0.22	1.0
Iron		16300		3.8	5.0
Lead		2.5		0.27	0.50
Magnesium		3760		3.7	20.0
Manganese		212		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		8.4		0.12	4.0
Potassium		541		41.0	300
Selenium		0.86	U	0.86	1.0
Silicon		132	N J	5.7	10
Silver		0.16	U	0.16	0.20
Sodium		174		58.9	120
Vanadium		47.2		0.094	2.0
Zinc		28.3	X	0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.59 g
Analysis Date:	12/19/2013 1255			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

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

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N1

Lab Sample ID: 280-50371-4
Client Matrix: Solid % Moisture: 1.6

Date Sampled: 12/13/2013 1311
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.00 g
Analysis Date:	12/19/2013 1437			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4650		1.6	5.1
Antimony		0.39	U J	0.39	0.61
Arsenic		1.6		0.67	1.0
Barium		35.0		0.077	0.51
Beryllium		0.15	B	0.034	0.20
Boron		1.0	U	1.0	2.0
Cadmium		0.23		0.042	0.20
Calcium		5040		14.3	50.8
Chromium		8.6		0.059	0.20
Cobalt		4.7		0.10	1.0
Copper		11.8		0.22	1.0
Iron		14200		3.9	5.1
Lead		2.2		0.27	0.51
Magnesium		3620		3.8	20.3
Manganese		192		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		9.4		0.12	4.1
Potassium		565		41.6	305
Selenium		0.87	U	0.87	1.0
Silicon		102	N J	5.7	10.2
Silver		0.16	U	0.16	0.20
Sodium		152		59.9	122
Vanadium		38.2		0.095	2.0
Zinc		25.6	X	0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.48 g
Analysis Date:	12/19/2013 1258			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0070	U	0.0070	0.022

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N2

Lab Sample ID: 280-50371-5
Client Matrix: Solid

% Moisture: 1.3

Date Sampled: 12/13/2013 1345
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	12/19/2013 1449			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4070		1.4	4.6
Antimony		0.35	U J	0.35	0.55
Arsenic		1.6		0.61	0.92
Barium		35.7		0.070	0.46
Beryllium		0.14	B	0.030	0.18
Boron		0.90	U	0.90	1.8
Cadmium		0.25		0.038	0.18
Calcium		4300		13.0	46.1
Chromium		6.8		0.053	0.18
Cobalt		4.5		0.092	0.92
Copper		11.6		0.20	0.92
Iron		14000		3.5	4.6
Lead		2.0		0.25	0.46
Magnesium		3090		3.4	18.4
Manganese		177		0.092	0.92
Molybdenum		0.30	B	0.24	1.8
Nickel		6.6		0.11	3.7
Potassium		470		37.8	276
Selenium		0.79	U	0.79	0.92
Silicon		145	N J	5.2	9.2
Silver		0.15	U	0.15	0.18
Sodium		152		54.3	111
Vanadium		36.0		0.087	1.8
Zinc		24.7	X	0.37	0.92

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.56 g
Analysis Date:	12/19/2013 1300			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0060	U	0.0060	0.018

1/15/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N3

Lab Sample ID: 280-50371-6
Client Matrix: Solid

% Moisture: 1.7

Date Sampled: 12/13/2013 1329
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.09 g
Analysis Date:	12/19/2013 1451			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5190		1.4	4.7
Antimony		0.35	U J	0.35	0.56
Arsenic		2.4		0.62	0.93
Barium		40.0		0.071	0.47
Beryllium		0.15	B	0.031	0.19
Boron		0.91	U	0.91	1.9
Cadmium		0.26		0.038	0.19
Calcium		5450		13.2	46.7
Chromium		8.2		0.054	0.19
Cobalt		4.7		0.093	0.93
Copper		12.8		0.20	0.93
Iron		15500		3.5	4.7
Lead		2.5		0.25	0.47
Magnesium		3590		3.5	18.7
Manganese		204		0.093	0.93
Molybdenum		0.33	B	0.24	1.9
Nickel		8.5		0.11	3.7
Potassium		562		38.3	280
Selenium		0.80	U	0.80	0.93
Silicon		214	N J	5.3	9.3
Silver		0.15	U	0.15	0.19
Sodium		183		55.1	112
Vanadium		42.9		0.088	1.9
Zinc		27.2	X	0.37	0.93

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.62 g
Analysis Date:	12/19/2013 1302			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	U	0.0054	0.017

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N4

Lab Sample ID: 280-50371-7
Client Matrix: Solid

% Moisture: 1.7

Date Sampled: 12/13/2013 1303
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.03 g
Analysis Date:	12/19/2013 1454			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5510		1.5	4.9
Antimony		0.38	U J	0.38	0.59
Arsenic		2.1		0.65	0.99
Barium		44.1		0.075	0.49
Beryllium		0.16	B	0.033	0.20
Boron		0.97	U	0.97	2.0
Cadmium		0.26		0.040	0.20
Calcium		5820		13.9	49.4
Chromium		7.9		0.057	0.20
Cobalt		4.6		0.099	0.99
Copper		12.4		0.21	0.99
Iron		15200		3.8	4.9
Lead		2.2		0.27	0.49
Magnesium		3700		3.7	19.8
Manganese		206		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		7.9		0.12	4.0
Potassium		614		40.5	296
Selenium		0.85	U	0.85	0.99
Silicon		103	N J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		174		58.3	119
Vanadium		42.2		0.093	2.0
Zinc		28.0	X	0.39	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.65 g
Analysis Date:	12/19/2013 1305			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0052	U	0.0052	0.016

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N5

Lab Sample ID: 280-50371-8
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 12/13/2013 1333
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	12/19/2013 1456			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4930		1.5	4.8
Antimony		0.37	U J	0.37	0.58
Arsenic		1.9		0.64	0.97
Barium		37.7		0.073	0.48
Beryllium		0.15	B	0.032	0.19
Boron		0.95	U	0.95	1.9
Cadmium		0.25		0.040	0.19
Calcium		5210		13.6	48.3
Chromium		8.1		0.056	0.19
Cobalt		4.6		0.097	0.97
Copper		14.1		0.21	0.97
Iron		16100		3.7	4.8
Lead		2.2		0.26	0.48
Magnesium		3570		3.6	19.3
Manganese		195		0.097	0.97
Molybdenum		0.25	U	0.25	1.9
Nickel		7.4		0.12	3.9
Potassium		558		39.6	290
Selenium		0.83	U	0.83	0.97
Silicon		96.6	N J	5.5	9.7
Silver		0.15	U	0.15	0.19
Sodium		163		57.0	116
Vanadium		43.1		0.091	1.9
Zinc		27.3	X	0.38	0.97

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.65 g
Analysis Date:	12/19/2013 1307			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0052	U	0.0052	0.016

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N6

Lab Sample ID: 280-50371-9
Client Matrix: Solid

% Moisture: 1.3

Date Sampled: 12/13/2013 1258
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	12/19/2013 1459			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5110		1.5	4.9
Antimony		0.37	U J	0.37	0.58
Arsenic		2.2		0.64	0.97
Barium		38.5		0.074	0.49
Beryllium		0.13	B	0.032	0.19
Boron		0.95	U	0.95	1.9
Cadmium		0.24		0.040	0.19
Calcium		5050		13.7	48.7
Chromium		9.0		0.057	0.19
Cobalt		4.9		0.097	0.97
Copper		17.3		0.21	0.97
Iron		15400		3.7	4.9
Lead		2.4		0.26	0.49
Magnesium		3860		3.6	19.5
Manganese		221		0.097	0.97
Molybdenum		0.28	B	0.25	1.9
Nickel		10.1		0.12	3.9
Potassium		580		40.0	292
Selenium		0.84	U	0.84	0.97
Silicon		101	N J	5.5	9.7
Silver		0.16	U	0.16	0.19
Sodium		189		57.5	117
Vanadium		43.7		0.092	1.9
Zinc		27.7	X	0.39	0.97

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.61 g
Analysis Date:	12/19/2013 1309			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

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

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N7

Lab Sample ID: 280-50371-10
Client Matrix: Solid

% Moisture: 2.1

Date Sampled: 12/13/2013 1339
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	12/19/2013 1501			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6530		1.5	4.8
Antimony		0.36	U J	0.36	0.57
Arsenic		7.5		0.63	0.96
Barium		49.5		0.073	0.48
Beryllium		0.20		0.032	0.19
Boron		1.2	B	0.94	1.9
Cadmium		0.28		0.039	0.19
Calcium		5380		13.5	47.8
Chromium		12.9		0.055	0.19
Cobalt		5.5		0.096	0.96
Copper		15.5		0.21	0.96
Iron		16100		3.6	4.8
Lead		32.7		0.26	0.48
Magnesium		4090		3.5	19.1
Manganese		246		0.096	0.96
Molybdenum		0.72	B	0.25	1.9
Nickel		10.3		0.12	3.8
Potassium		898		39.2	287
Selenium		0.82	U	0.82	0.96
Silicon		267	N J	5.4	9.6
Silver		0.15	U	0.15	0.19
Sodium		169		56.3	115
Vanadium		39.3		0.090	1.9
Zinc		36.0	X	0.38	0.96

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.58 g
Analysis Date:	12/19/2013 1311			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0058	U	0.0058	0.018

M 1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N8

Lab Sample ID: 280-50371-11
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 12/13/2013 1249
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 12/19/2013 1504
Prep Date: 12/18/2013 1252

Analysis Batch: 280-206062
Prep Batch: 280-205755

Instrument ID: MT_025
Lab File ID: 25A1121913.asc
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5150		1.4	4.7
Antimony		0.35	U J	0.35	0.56
Arsenic		2.1		0.61	0.93
Barium		30.0		0.071	0.47
Beryllium		0.15	B	0.031	0.19
Boron		0.91	U	0.91	1.9
Cadmium		0.25		0.038	0.19
Calcium		5400		13.1	46.5
Chromium		7.9		0.054	0.19
Cobalt		4.8		0.093	0.93
Copper		13.4		0.20	0.93
Iron		16000		3.5	4.7
Lead		2.1		0.25	0.47
Magnesium		3890		3.4	18.6
Manganese		216		0.093	0.93
Molybdenum		0.24	B	0.24	1.9
Nickel		8.1		0.11	3.7
Potassium		525		38.1	279
Selenium		0.80	U	0.80	0.93
Silicon		85.6	N J	5.3	9.3
Silver		0.15	U	0.15	0.19
Sodium		146		54.9	112
Vanadium		44.5		0.087	1.9
Zinc		28.5	X	0.37	0.93

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 12/19/2013 1314
Prep Date: 12/19/2013 0950

Analysis Batch: 280-205984
Prep Batch: 280-205679

Instrument ID: MT_033
Lab File ID: 131219aa.txt
Initial Weight/Volume: .62 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	U	0.0054	0.017

1/5/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6N9

Lab Sample ID: 280-50371-12
Client Matrix: Solid

% Moisture: 1.7

Date Sampled: 12/13/2013 1225
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.09 g
Analysis Date:	12/19/2013 1506			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4890		1.4	4.7
Antimony		0.35	U J	0.35	0.56
Arsenic		1.7		0.62	0.93
Barium		36.9		0.071	0.47
Beryllium		0.14	B	0.031	0.19
Boron		0.91	U	0.91	1.9
Cadmium		0.24		0.038	0.19
Calcium		4870		13.2	46.7
Chromium		7.6		0.054	0.19
Cobalt		4.6		0.093	0.93
Copper		*12.8*		*0.20*	*0.93*
Iron		14700		3.5	4.7
Lead		2.1		0.25	0.47
Magnesium		3650		3.5	18.7
Manganese		201		0.093	0.93
Molybdenum		0.27	B	0.24	1.9
Nickel		8.1		0.11	3.7
Potassium		557		38.3	280
Selenium		0.80	U	0.80	0.93
Silicon		82.9	N J	5.3	9.3
Silver		0.15	U	0.15	0.19
Sodium		146		55.1	112
Vanadium		39.2		0.088	1.9
Zinc		26.2	X	0.37	0.93

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.53 g
Analysis Date:	12/19/2013 1316			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0064	U	0.0064	0.020

1/15/14

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Client Sample ID: J1T6P0

Lab Sample ID: 280-50371-13
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 12/13/2013 1249
Date Received: 12/17/2013 0945

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-206062	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0			Initial Weight/Volume:	1.08 g
Analysis Date:	12/19/2013 1509			Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4590		1.5	4.7
Antimony		0.36	U J	0.36	0.56
Arsenic		1.5		0.62	0.94
Barium		37.1		0.071	0.47
Beryllium		0.13	B	0.031	0.19
Boron		0.92	U	0.92	1.9
Cadmium		0.21		0.039	0.19
Calcium		4590		13.2	47.0
Chromium		8.2		0.054	0.19
Cobalt		4.1		0.094	0.94
Copper		12.2		0.20	0.94
Iron		13500		3.6	4.7
Lead		2.2		0.25	0.47
Magnesium		3390		3.5	18.8
Manganese		175		0.094	0.94
Molybdenum		0.24	B	0.24	1.9
Nickel		8.2		0.12	3.8
Potassium		475		38.5	282
Selenium		0.81	U	0.81	0.94
Silicon		68.6	N J	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		144		55.4	113
Vanadium		38.0		0.088	1.9
Zinc		23.7	X	0.37	0.94

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0			Initial Weight/Volume:	.50 g
Analysis Date:	12/19/2013 1323			Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0067	U	0.0067	0.021

1/5/14

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-50371-1

SDG #: JP0677
SAF#: RC-107

Date SDG Closed: December 17, 2013
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1T6M8	280-50371-1	6010/7471	6010B/7471A
J1T6M9	280-50371-2	6010/7471	6010B/7471A
J1T6N0	280-50371-3	6010/7471	6010B/7471A
J1T6N1	280-50371-4	6010/7471	6010B/7471A
J1T6N2	280-50371-5	6010/7471	6010B/7471A
J1T6N3	280-50371-6	6010/7471	6010B/7471A
J1T6N4	280-50371-7	6010/7471	6010B/7471A
J1T6N5	280-50371-8	6010/7471	6010B/7471A
J1T6N6	280-50371-9	6010/7471	6010B/7471A
J1T6N7	280-50371-10	6010/7471	6010B/7471A
J1T6N8	280-50371-11	6010/7471	6010B/7471A
J1T6N9	280-50371-12	6010/7471	6010B/7471A
J1T6P0	280-50371-13	6010/7471	6010B/7471A

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 12/17/2013 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9° C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-203876 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Chromium and Manganese are present in the method blank associated with batch 280-206062. Because the concentrations in the method blank are not present at levels greater than half the reporting limit or the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the method blank associated with batch 280-206062. As the associated sample amount is twenty times greater than the method blank concentration, corrective action is deemed

unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-206062. The associated sample results have been flagged "N". Silicon is a poor performer and has a history of reacting inconsistently. Data are reported as is.

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 J1T6M8; therefore, control limits are not applicable.

The duplicate analysis of sample J1T6M8 exhibited RPD data outside the control limits for Cobalt, 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.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-107-095	Page 1 of 3
Collector: Whitney Sexsmith	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7 DAY / Data Turnaround
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-46 Decision Unit 2 Verification Samples		SAF No.: RC-107	
Ice Chest No.: RCC-07-014	Field Logbook No.: EL-1627-07	COA: 010H462000	Method of Shipment: Commercial Carrier ~ fed EX	
Shipped To: TestAmerica Denver	Offsite Property No.: A 131023		Bill of Lading/Air Bill No.: See OSPC	
Other Labs Shipped To: TestAmerica Richland				

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
Sample Analysis	See item (1) in Special Instructions										

Sample No.	Matrix	Sample Date	Sample Time								
J1T6M8	SOIL	12/13/13	1315	✓							
J1T6M9	SOIL	12/13/13	1324	✓							
J1T6N0	SOIL	12/13/13	1308	✓							
J1T6N1	SOIL	12/13/13	1311	✓							
J1T6N2	SOIL	12/13/13	1345	✓							

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Whitney Sexsmith	12-13-13 1350	WCH Sam Saxton	12/13/13 1350
Sam Saxton	12/13/13 1600	1060 Battelle Fridge 1B	12/13/13 1600 *
1060 Battelle, Fridge 1B	12-16-13 0800	C Bingham	12-16-13 0800
C Bingham	12-16-13 0805	fed ex	
			12-17-13 9:45

FINAL SAMPLE DISPOSITION — Disposal Method: — Disposed By: — Date/Time:

WCH-EE-011

SPECIAL INSTRUCTIONS

(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)

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

d.9 JK
JK 12-17-13

RECEIVED BY K Woodward DATE 12-16-13

JP0677

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-107-095	Page 2 of 3
Collector: Whitney Sexsmith	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7 DAY / Data Turnaround
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-46 Decision Unit 2 Verification Samples		SAF No.: RC-107	
Ice Chest No.: RCC-07-014	Field Logbook No.: EL-1627-07	COA: 010H462000	Method of Shipment: Commercial Carrier - fed EX	
Shipped To: TestAmerica Denver	Offsite Property No.: A131023		Bill of Lading/Air Bill No.: See SPC	
Other Labs Shipped To: TestAmerica Richland				

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C												
Type of Container	G/P												
No. of Container(s)	1												
Volume	125mL												
Sample Analysis	See item (1) in Special Instructions												

Sample No.	Matrix	Sample Date	Sample Time										
J1T6N3	SOIL	12/13/13	1329	✓									
J1T6N4	SOIL	12/13/13	1303	✓									
J1T6N5	SOIL	12/13/13	1333	✓									
J1T6N6	SOIL	12/13/13	1256	✓									
J1T6N7	SOIL	12/13/13	1339	✓									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Whitney Sexsmith	12-13-13 1350	SM Sexton	12/13/13 1350
SM Sexton	12/13/13 1600	1060 Battelle Fridge 1B	12/13/13 1600
1060 Battelle, fridge 1B	12-16-13 0800	C. Bingham	12-16-13 0800
C. Bingham WCH	12-16-13 0805	fed EX	
			12-17-13 9115

FINAL SAMPLE DISPOSITION: Disposal Method — Disposed By — Date/Time

WCH-EE-011

SPECIAL INSTRUCTIONS

(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)

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

RECEIVED BY Kwood Vlaeminck DATE 12-16-13

JP0677

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-095 | Page 3 of 3

Collector: Whitney Sexsmith	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-46 Decision Unit 2 Verification Samples		SAF No.: RC-107
Ice Chest No.: RCC-07-014	Field Logbook No.: EL-1627-07	COA: 010H462000	Method of Shipment: Commercial Carrier - fed EX
Shipped To: TestAmerica Denver	Offsite Property No.: A131023		Bill of Lading/Air Bill No.: See OSPC
Other Labs Shipped To: TestAmerica Richland			

Price Code: 7 DAY

Data Turnaround:

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
Sample Analysis	See item (1) in Special Instructions										

Page 3 of 3	Sample No.	Matrix	Sample Date	Sample Time									
1	1T6N8	SOIL	12/13/13	1249	✓								
2	1T6N9	SOIL	12/13/13	1225	✓								
3	1T6P0	SOIL	12/13/13	1249	✓								

CHAIN OF POSSESSION / Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Whitney Sexsmith	12-13-13 1350	WCH SM Sexton	12/13/13 1350
SM Sexton	12/13/13 1600	1060 Battelle Fridge 1B	12/13/13 1600
1060 Battelle, Fridge 1B	12-16-13 0800	C Bingham	12-16-13 0800
C Bingham WCH	12-16-13 0805	fed EX	
		Eric Kivel	12-17-13 9:45

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

SPECIAL INSTRUCTIONS

(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)

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

RECEIVED BY K Woodward EMSL 12-16-13

JP0677

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-H-46			DATA PACKAGE: JP0677		
VALIDATOR: BLR		LAB: TAL		DATE: 1/5/13	
			SDG: JP0677		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
JJT6M8	JJT6M9	JJT6N0	JJT6N1	JJT6N2	
JJT6N3	JJT6N4	JJT6N5	JJT6N6	JJT6N7	
JJT6N8	JJT6N9	JJT6P0			
				Soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

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

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: no FB

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

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

Comments: LCS - silicon (8%) - J all
MS - antmy (67%) + silicon (27%) - 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

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Method Blank - Batch: 280-205755

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-205755/1-A	Analysis Batch:	280-206062	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	12/19/2013 1418	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Antimony	0.38	U	0.38	0.60
Arsenic	0.66	U	0.66	1.0
Barium	0.076	U	0.076	0.50
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	0.148	B	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Iron	15.51		3.8	5.0
Lead	0.27	U	0.27	0.50
Magnesium	3.7	U	3.7	20.0
Manganese	0.185	B	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
Zinc	0.40	U	0.40	1.0

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Lab Control Sample - Batch: 280-205755

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-205755/2-A	Analysis Batch:	280-206062	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	12/19/2013 1420	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	181.1	91	82 - 116	
Antimony	50.0	49.28	99	82 - 110	
Arsenic	100	97.40	97	85 - 110	
Barium	200	196.5	98	87 - 112	
Beryllium	5.00	4.85	97	84 - 114	
Boron	100	95.55	96	80 - 120	
Cadmium	10.0	9.78	98	87 - 110	
Calcium	5000	4777	96	82 - 114	
Chromium	20.0	19.92	100	84 - 114	
Cobalt	50.0	47.16	94	87 - 110	
Copper	25.0	25.00	100	88 - 110	
Iron	100	118.4	118	87 - 120	
Lead	50.0	48.89	98	86 - 110	
Magnesium	5000	4601	92	90 - 110	
Manganese	50.0	45.40	91	88 - 110	
Molybdenum	100	97.68	98	86 - 110	
Nickel	50.0	47.96	96	87 - 110	
Potassium	5000	4895	98	89 - 110	
Selenium	200	192.2	96	83 - 110	
Silicon	1000	82.01	8	10 - 70	N
Silver	5.00	4.83	97	87 - 114	
Sodium	5000	4952	99	90 - 112	
Vanadium	50.0	47.65	95	88 - 110	
Zinc	50.0	44.35	89	76 - 114	

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Matrix Spike - Batch: 280-205755

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-50371-1	Analysis Batch:	280-206062	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.02 g
Analysis Date:	12/19/2013 1429	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	4410		199	6391	994	50 - 200	4
Antimony	0.37	U	49.8	34.32	69	20 - 200	
Arsenic	2.1		99.6	89.64	88	76 - 111	
Barium	36.0		199	235.1	100	52 - 159	
Beryllium	0.14	B	4.98	4.64	90	72 - 105	
Boron	0.96	U	99.6	84.89	85	80 - 120	
Cadmium	0.23		9.96	9.25	91	40 - 130	
Calcium	6300		4980	10730	89	43 - 165	
Chromium	7.9		19.9	27.01	96	70 - 200	
Cobalt	3.8		49.8	47.45	88	72 - 106	
Copper	13.7		24.9	36.16	90	37 - 187	
Iron	12500		99.6	16030	3549	70 - 200	4
Lead	2.2		49.8	45.70	87	70 - 200	
Magnesium	3140		4980	8258	103	64 - 145	
Manganese	200		49.8	263.9	128	40 - 200	4
Molybdenum	0.25	U	99.6	87.01	87	75 - 103	
Nickel	8.2		49.8	52.37	89	61 - 126	
Potassium	494		4980	5251	96	56 - 172	
Selenium	0.84	U	199	174.1	87	76 - 104	
Silicon	134		996	425.6	29	20 - 200	
Silver	0.16	U	4.98	4.47	90	75 - 141	
Sodium	165		4980	4943	96	78 - 111	
Vanadium	31.2		49.8	87.00	112	50 - 169	
Zinc	22.6		49.8	67.67	91	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Duplicate - Batch: 280-205755

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-50371-1	Analysis Batch:	280-206062	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-205755	Lab File ID:	25A1121913.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.07 g
Analysis Date:	12/19/2013 1427	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	12/18/2013 1252				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	4410		4792	8	40	
Antimony	0.37	U	0.36	NC	40	U
Arsenic	2.1		2.06	3	30	
Barium	36.0		44.41	21	30	
Beryllium	0.14	B	0.148	5	30	B
Boron	0.96	U	0.93	NC	30	U
Cadmium	0.23		0.266	16	30	
Calcium	6300		5008	23	30	
Chromium	7.9		8.56	8	40	
Cobalt	3.8		5.25	31	30	M
Copper	13.7		13.85	0.9	30	
Iron	12500		14060	12	40	
Lead	2.2		2.32	4	40	
Magnesium	3140		3536	12	30	
Manganese	200		224.3	11	40	
Molybdenum	0.25	U	0.25	NC	30	U
Nickel	8.2		10.48	24	30	
Potassium	494		532.4	7	40	
Selenium	0.84	U	0.82	NC	30	U
Silicon	134		152.4	13	40	N
Silver	0.16	U	0.15	NC	30	U
Sodium	165		174.5	5	30	
Vanadium	31.2		37.67	19	30	
Zinc	22.6		25.41	12	40	

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Method Blank - Batch: 280-205679

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-205679/1-A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	12/19/2013 1237	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				
Leach Date:	N/A				

Analyte	*Result*	*Qual*	*MDL*	*RL*
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-205679

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-205679/2-A	Analysis Batch:	280-205984	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	12/19/2013 1239	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.453	109	87 - 111	

Matrix Spike - Batch: 280-205679

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-50371-1	Analysis Batch:	280-205984	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.65 g
Analysis Date:	12/19/2013 1246	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0061	U	0.391	0.421	108	87 - 111	

Client: Washington Closure Hanford

Job Number: 280-50371-1
Sdg Number: JP0677

Duplicate - Batch: 280-205679

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-50371-1	Analysis Batch:	280-205984	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-205679	Lab File ID:	131219aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.48 g
Analysis Date:	12/19/2013 1244	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	12/19/2013 0950				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0061	U	0.0070	NC	20	U

Date: 6 January 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-46
Subject: Wet Chemistry - Data Package No. JP0677-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0677 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
J1T6M8	12/13/13	Soil	C	See note 1
J1T6M9	12/13/13	Soil	C	See note 1
J1T6N0	12/13/13	Soil	C	See note 1
J1T6N1	12/13/13	Soil	C	See note 1
J1T6N2	12/13/13	Soil	C	See note 1
J1T6N3	12/13/13	Soil	C	See note 1
J1T6N4	12/13/13	Soil	C	See note 1
J1T6N5	12/13/13	Soil	C	See note 1
J1T6N6	12/13/13	Soil	C	See note 1
J1T6N7	12/13/13	Soil	C	See note 1
J1T6N8	12/13/13	Soil	C	See note 1
J1T6N9	12/13/13	Soil	C	See note 1
J1T6P0	12/13/13	Soil	C	See note 1

1 – Chromium VI by 7196A.

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.

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 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.

All 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 (J1T6N8/J1T6P0) 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 JP0677 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

None found.

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: JP0677	REVIEWER: ELR	Project: 100-N-46	PAGE_1_OF_1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

Sample Results Summary

Date: 18-Dec-13

TestAmerica Inc TARL

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

Report No. : 58116 **SDG No:** JP0677

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3360026 7196_CR6									
	J1T6M8								
	M2N2P1AA	HEXCHROME	1.64E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M2N2P1AD	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	5.6
	J1T6M9								
	M2N2Q1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N0								
	M2N2R1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N1								
	M2N2T1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N2								
	M2N2V1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N3								
	M2N2W1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N4								
	M2N2X1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N5								
	M2N201AA	HEXCHROME	2.03E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N6								
	M2N211AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N7								
	M2N221AA	HEXCHROME	2.26E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N8								
	M2N231AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6N9								
	M2N241AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1T6P0								
	M2N251AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 14

1/5/14

TestAmerica Inc
rptSTLRchSaSummary2 V6.2.25 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

December 18, 2013

Attention: Joan Kessner

SAF Number	:	RC-107
Date SDG Closed	:	December 16, 2013
Number of Samples	:	Thirteen (13)
Sample Type	:	Soil
SDG Number	:	JP0677
Data Deliverable	:	7-Day / Summary

CASE NARRATIVE

I. Introduction

On December 16, 2013, thirteen 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:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1T6M8	M2N2P	SOIL	12/16/13
J1T6M9	M2N2Q	SOIL	12/16/13
J1T6N0	M2N2R	SOIL	12/16/13
J1T6N1	M2N2T	SOIL	12/16/13
J1T6N2	M2N2V	SOIL	12/16/13
J1T6N3	M2N2W	SOIL	12/16/13
J1T6N4	M2N2X	SOIL	12/16/13
J1T6N5	M2N20	SOIL	12/16/13
J1T6N6	M2N21	SOIL	12/16/13
J1T6N7	M2N22	SOIL	12/16/13
J1T6N8	M2N23	SOIL	12/16/13
J1T6N9	M2N24	SOIL	12/16/13
J1T6P0	M2N25	SOIL	12/16/13

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

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 (J1T6M8) and sample matrix spike (J1T6M8) 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

TestAmerica Laboratories, Inc.

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-107-095	Page 1 of 3

Collector: Whitney Sexsmith	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-46 Decision Unit 2 Verification Samples		SAF No.: RC-107
Ice Chest No.: N/A	Field Logbook No.: EL-1627-07	COA: 010H462000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Price Code: 7 DAY

Data Turnaround

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: Cool 4C

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
Sample Analysis	Chromium Hex. - 7196										

Sample No.	Matrix	Sample Date	Sample Time	
J1T6M8 MANAP	SOIL	12/13/13	1315	✓
J1T6M9 MANAQ	SOIL	12/13/13	1324	✓
J1T6N0 MANAR	SOIL	12/13/13	1308	✓
J1T6N1 MANAT	SOIL	12/13/13	1311	✓
J1T6N2 MANAV	SOIL	12/13/13	1345	✓

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Whitney T. Sexsmith	12-13-13 1350	WCH Sam Sexton	12/13/13 1352
Sam Sexton	12/13/13 1600	1060 Battelle Fridge 1B	12/13/13 1600 *
1060 Battelle fridge 1B	12-16-13 0800	C. Bingham	12-16-13 0800
C. Bingham	12-16-13 0917	J. Bock J. Bock TALF	12-16-13 DAIY

Sign/Print Names

SPECIAL INSTRUCTIONS

J3L160408

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

J3L160408

Due 12-23-13

RECEIVED BY K. Woodward DATE 12-16-13

JP0677

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-107-095	Page 2 of 3

Collector: Whitney Sexsmith	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-46 Decision Unit 2 Verification Samples		SAF No.: RC-107
Ice Chest No.: N/A	Field Logbook No.: EL-1627-07	COA: 010H462000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Price Code: 7 DAY — Data Turnaround

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: Cool 4C

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
Sample Analysis	Chromium Hex - 7196										

Sample No.	Matrix	Sample Date	Sample Time	
J1T6N3 MANAW	SOIL	12/13/13	1329	✓
J1T6N4 MANAX	SOIL	12/13/13	1303	✓
J1T6N5 MANAD	SOIL	12/13/13	1333	✓
J1T6N6 MANAJ	SOIL	12/13/13	1256	✓
J1T6N7 MANAA	SOIL	12/13/13	1339	✓

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Whitney Sexsmith	12-13-13 1350	WCH SM Sexton	12/13/13 1350
SM Sexton	12/13/13 1600	1060 Battelle Fridge 1B	12/13/13 1600
1060 Battelle, fridge 1B	12-16-13 0800	C Birnham	12-16-13 0800
C Birnham	12-16-13 0917	J Sock Back TAL	12-16-13 0917

Sign/Print Names

SPECIAL INSTRUCTIONS

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

J3L160408

SIGNED BY K. Woodward via email DATE 12-16-13

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

JP0677

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-107-095	Page 3 of 3
Collector: Whitney Sexsmith	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7 DAY / Data Turnaround
Project Designation: 100-H Field Remediation	Sampling Location: 100-H-46 Decision Unit 2 Verification Samples		SAF No.: RC-107	
Ice Chest No.: N/A	Field Logbook No.: EL-1627-07	COA: 010H462000	Method of Shipment: Local Delivery	
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	

Other Labs Shipped To: TestAmerica Denver		
	Preservation	Cool 4C
	Type of Container	G/P
POSSIBLE SAMPLE HAZARDS/REMARKS: N/A	No. of Container(s)	1
	Volume	125mL
Special Handling and/or Storage: Cool 4C	Sample Analysis	Chromium Hex - 7196

Sample No.	Matrix	Sample Date	Sample Time	
J1T6N8 M2N23	SOIL	12/13/13	[illegible] 1249	✓
J1T6N9 M2N24	SOIL	12/12/13	1225	✓
J1T6P0 M2N25	SOIL	12/13/13	1249	✓

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Whitney T. Sexsmith	12-13-13 1350	SM Sexton	12/13/13 1350
SM Sexton	12/13/13 1600	1060 Battelle Fridge 1B	12/13/13 1600 *
1060 Battelle Fridge 1B	12-16-13 0800	C B Wyman	12-16-13 0800
C B Wyman	12-16-13 0917	Jack J. Bouchard	12-16-13 0917

SPECIAL INSTRUCTIONS

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

RECEIVED BY K Woodward via email DATE 12-16-13

JP0677

FINAL SAMPLE DISPOSITION — Disposal Method: ____ Disposed By: ____ Date/Time: ____

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-H-4C			DATA PACKAGE: JP0677		
VALIDATOR: ELR		LAB: TAL		DATE: 1/5/14	
			SDG: JP0677		

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
JJT6U8 JJT6U9 JJT6D0 JJT6D1 JJT6N2
JJT6N3 JJT6N4 JJT6N5 JJT6N6 JJT6N7
JJT6N8 JJT6N9 JJT6P0
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

_____

_____

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

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

Initial calibrations acceptable? ..... Yes No N/A

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

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: no FB

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

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

Comments:

no Pdf

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: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

Date: 18-Dec-13

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 58116 **SDG No.:** JP0677

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
7196_CR6								
3350028 MATRIX SPIKE, J1T6M8								
M2N2P1AC	HEXCHROME	2.73E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
3350026 LCS,								
M2N3H1AC	HEXCHROME	1.83E+01 +- 0.0E+00		mg/kg	N/A	97%	0.0	1.55E-01
3350026 BLANK QC,								
M2N3H1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 3

TestAmerica Inc

rptSTLRchQcSummary V5.2.25 A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

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.