SAF-RC-238
Characterization of Surface Soils
At 100-K-64 & 100-K-111
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt	H4-21	KW 9/4/13 INITIAL/DATE

COMMENTS:

SDG J01892 SAF-RC-238

Sample Location: 100-K-111

Date: 29 August 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Surface Soils at 100-K-64 & 100-K-111 - Waste Site 100-K-111
Subject: Wet Chemistry - Data Package No. J01892-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01892 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
J1RR04	7/30/13	Soil	C	See note 1
J1RR05	7/30/13	Soil	C	See note 1
J1RR06	7/30/13	Soil	C	See note 1
J1RR07	7/30/13	Soil	C	See note 1
J1RR08	7/30/13	Soil	C	See note 1
J1RR09	7/31/13	Soil	C	See note 1
J1RR10	7/31/13	Soil	C	See note 1
J1RR95	7/31/13	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 Sampling and Analysis Instruction for Characterization of Surface Soils in the 100-K-64 and 100-K-111 Waste Site Areas (WHC-570, Rev. 1, May 2013). 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 (J1RR10/J1RR95) 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 J01892 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*.

WCH-570, Rev. 1, Sampling and Analysis Instruction for Characterization of Surface Soils in the 100-K-64 and 100-K-111 Waste Site Areas, May 2013.

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: J01892	REVIEWER: ELR	Project: 100-K-64 & 100-K-111	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
TestAmerica Inc TARL

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

Date: 20-Aug-13

8/29/17

Report No. : 56601

SDG No: J01892

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3214034 SRTOT_SEP_PRECIP_GPC									
	J1RR05 M1H331AC	STRONTIUM	1.21E-01 +- 1.2E-01	U	pCi/g	87%	2.38E-01		
	J1RR06 M1H341AC	STRONTIUM	1.20E-02 +- 1.0E-01	U	pCi/g	83%	2.39E-01		
	J1RR07 M1H351AC	STRONTIUM	-1.35E-02 +- 1.0E-01	U	pCi/g	87%	2.53E-01		
	J1RR08 M1H371AC	STRONTIUM	1.75E-01 +- 1.2E-01	U	pCi/g	87%	2.21E-01		
	J1RR08 DUP M1H371AJ	STRONTIUM	1.39E-01 +- 1.2E-01	U	pCi/g	86%	2.32E-01		23.1
	J1RR09 M1H6W1AC	STRONTIUM	-5.96E-04 +- 8.7E-02	U	pCi/g	90%	2.10E-01		
	J1RR10 M1H6X1AC	STRONTIUM	1.63E-02 +- 9.4E-02	U	pCi/g	90%	2.19E-01		
	J1RR95 M1H601AC	STRONTIUM	3.43E-02 +- 1.1E-01	U	pCi/g	84%	2.51E-01		
3129054 7196_CR6									
	J1RR09 M1H6W1AA	HEXCHROME	3.43E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M1H6W1AL	HEXCHROME	5.00E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	37.2
	J1RR10 M1H6X1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR95 M1H601AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
3214036 906.0_H3_LSC									
	J1RR04 M1H321AF	H-3	-1.22E-02 +- 2.0E-02	U	pCi/g	100%	4.61E-02	4.00E+02	
	J1RR04 DUP M1H321AK	H-3	9.64E-03 +- 2.1E-02	U	pCi/g	100%	4.61E-02	4.00E+02	-1712.2
	J1RR05 M1H331AF	H-3	-1.44E-02 +- 1.6E-02	U	pCi/g	100%	3.78E-02	4.00E+02	
	J1RR06 M1H341AF	H-3	1.10E-03 +- 1.9E-02	U	pCi/g	100%	4.14E-02	4.00E+02	
	J1RR07 M1H351AF	H-3	-2.62E-02 +- 2.5E-02	U	pCi/g	100%	6.43E-02	4.00E+02	
	J1RR08 M1H371AF	H-3	1.08E-02 +- 2.3E-02	U	pCi/g	100%	4.88E-02	4.00E+02	
	J1RR09 M1H6W1AF	H-3	-2.42E-02 +- 6.2E-02	U	pCi/g	100%	1.40E-01	4.00E+02	

TestAmerica Inc

rptSTLRchSaSummary2 V6.2.23 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.

8/29/13

Sample Results Summary

TestAmerica Inc TARL

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

Date: 20-Aug-13

Report No. : 56601

SDG No: J01892

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3214036 906.0_H3_LSC									
	J1RR10								
	M1H6X1AF	H-3	6.43E-03 +- 2.0E-02	U	pCi/g	100%	4.46E-02	4.00E+02	
	J1RR95								
	M1H601AF	H-3	1.88E-02 +- 5.0E-02	U	pCi/g	100%	1.09E-01	4.00E+02	
3214037 NI63_LSC									
	J1RR04								
	M1H321AD	NI-63	-2.98E+00 +- 7.0E+00	U	pCi/g	93%	1.48E+01	3.00E+01	
	J1RR05								
	M1H331AD	NI-63	1.87E+01 +- 9.3E+00		pCi/g	79%	1.86E+01	3.00E+01	
	J1RR06								
	M1H341AD	NI-63	-9.91E+00 +- 6.5E+00	U	pCi/g	94%	1.45E+01	3.00E+01	
	J1RR06 DUP								
	M1H341AJ	NI-63	1.00E+01 +- 8.0E+00	U	pCi/g	94%	1.53E+01	3.00E+01	29618.0
	J1RR07								
	M1H351AD	NI-63	-9.68E+00 +- 6.5E+00	U	pCi/g	95%	1.43E+01	3.00E+01	
	J1RR08								
	M1H371AD	NI-63	4.62E+01 +- 1.2E+01		pCi/g	83%	1.98E+01	3.00E+01	
	J1RR09								
	M1H6W1AD	NI-63	5.64E-01 +- 7.3E+00	U	pCi/g	90%	1.52E+01	3.00E+01	
	J1RR10								
	M1H6X1AD	NI-63	-3.80E+00 +- 6.9E+00	U	pCi/g	94%	1.46E+01	3.00E+01	
	J1RR95								
	M1H601AD	NI-63	-4.02E-01 +- 7.3E+00	U	pCi/g	91%	1.50E+01	3.00E+01	
3219053 7196_CR6									
	J1RR04								
	M1H321AA	HEXCHROME	1.67E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M1H321AN	HEXCHROME	1.87E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	11.3
	J1RR05								
	M1H331AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR06								
	M1H341AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR07								
	M1H351AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR08								
	M1H371AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 118

TestAmerica Inc

rptSTLRchSaSummary2 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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

August 20, 2013

Attention: Joan Kessner

SAF Number	:	RC-238
Date SDG Closed	:	August 1, 2013
Number of Samples	:	Eight (8)
Sample Type	:	Soil
SDG Number	:	J01892
Data Deliverable	:	15– Day / Summary

CASE NARRATIVE

I. Introduction

On August 1, 2013, eight soil samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1RR04	M1H32	SOIL	08/01/13
J1RR05	M1H33	SOIL	08/01/13
J1RR06	M1H34	SOIL	08/01/13
J1RR07	M1H35	SOIL	08/01/13
J1RR08	M1H37	SOIL	08/01/13
J1RR09	M1H6W	SOIL	08/01/13
J1RR10	M1H6X	SOIL	08/01/13
J1RR95	M1H60	SOIL	08/01/13

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 analyses were:

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002
Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Liquid Scintillation Counting
Tritium by method RL-LSC-005
Carbon-14 by method RL-LSC-008
Nickel-63 by method RL-LCS-017
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

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002:
The LCS, batch blank, samples and sample duplicate (J1RR05) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1RR08) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The CRDL was not met for some of the analytes. Except as noted, the LCS, batch blank, samples and sample duplicate (J1RR07) results are within contractual requirements.

Liquid Scintillation Counting
Tritium by method RL-LSC-005:
The LCS, batch blank, samples and sample duplicate (J1RR04) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:
The LCS, batch blank, samples and sample duplicate (J1RR04) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:
The negative result for sample J1RR06 is greater than 3 times the uncertainty due to the count rate below the background. Its duplicate analysis meets acceptance criteria and both results are below the CRDL.

Except as noted; the LCS, batch blank, samples and sample duplicate (J1RR06) results are within contractual requirements.

Chemical Analysis
Two batches were analyzed.

Batch #: 3219053:
Hexavalent Chromium by EPA method 7196A
The LCS, batch blank, samples, sample duplicate (J1RR04) and sample matrix spike (J1RR04) results are within contractual requirements.

Batch #: 3219054:
Hexavalent Chromium by EPA method 7196A
The sample and sample duplicate (J1RR09) agreement is outside the acceptance limits. This maybe attributed to the inhomogeniety of the matrix. Except as noted; the LCS, batch blank, samples, sample duplicate (J1RR09) and sample matrix spike (J1RR09) 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-238-003

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: TestAmerica - Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Price Code: 8C

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

RCF 35900, 35901

J3H010422
Jo1892
Due 8-16-13

SAMPLE ANALYSI J3H010422

Preservation	Cool 4C	None	None	None
Type of Container	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1
Volume	250mL	500mL	250mL	250mL
	hromium Hex - 7196 [Hexavalent Chromium]	See item (2) in Special Instructions	Isotopic Plutonium; Nickel-63; Strontium-89,90 -- Total Sr	Carbon-14; Tritium - H3

Sample No.	Matrix	Sample Date	Sample Time								
J1RR04	SOIL	7-30-13	0929	X	X	X	X	W-4B	L	M1H32	
J1RR05	SOIL	7-30-13	0940	X	X	X	X	W-4B	4	M1H33	
	SOIL										
	SOIL										
	SOIL										

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White Sr WCH	7-30-13 1000	Doug Bowers Bowers	7-30-13/1000
Doug Bowers Bowers	7-30-13/1540	Joel John Harrie	7.30.13 1540
Joel John Harrie	7.30.13 1541	Fri #3C 1060 Battelle	7.30.13 1541
Fri #3C 1060 Battelle	8.1.13 0940	Joel John Harrie	8.1.13 0940
Joel John Harrie WCH	8.1.13 1000	Stock Stock TALR	8-1-13 1000

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(2) Gamma Spec (Client List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

* RCF Samples (500 ml G/P) SUBMITTED TO TALR FOR GEA JH 8.1.13

From page 2 of THIS COC JH 8.1.13

RECEIVED BY CMB DATE 7-31-13

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

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-003

Page 1 of 2

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: TestAmerica - Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Price Code: 8C

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

RCF 35902, 35903, 35904

J3H010422
J01892
Due 8-16-13

SAMPLE ANALYSIS

Preservation	Cool 4C	None	None	None
Type of Container	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1
Volume	250mL	500mL	250mL	250mL
	Chromium Hex - 7196 (Hexavalent Chromium)	See item (2) in Special Instructions *	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3

Sample No.	Matrix	Sample Date	Sample Time	Chromium Hex - 7196 (Hexavalent Chromium)	See item (2) in Special Instructions *	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3						
J1RR06	SOIL	7-30-13	1240	X	X	X	X	K-111-1A L		MIH	34		
J1RR07	SOIL	7-30-13	1248	X	X	X	X	K-111-1A 4		MIH	35		
J1RR08	SOIL	7-30-13	1320	X	X	X	X	W-3A		MIH	37		
	SOIL												
	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White Sm [signature]	7-30-13 1340	Doug Bowers Bowers	7-30-13/1340
Doug Bowers/Doug Bowers	7-30-13/1540	Joe John Harrie	7.30.13 1540
Joe John Harrie	7.30.13 1541	Fry #3C 1060 Battelle	7.30.13 1541
Fry #3C 1060 Battelle	8.1.13 0940	Joe John Harrie	8.1.13 0940
Joe John Harrie	8.1.13 1000	J. Bock [signature]	8-1-13 1000

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

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(2) Gamma Spec (Client List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

REVIEWED BY [signature] DATE 7-31-13

* 500ml GP for GEA from page 2 of this COC
JH 8.1.13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-003

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: TestAmerica - Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

J3H010435 RCF 35918-20

J01892

Due 8-16-13

SAMPLE ANALYS J3H010435

Preservation	Cool 4C	None	None	None
Type of Container	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1
Volume	250mL	500mL	250mL	250mL
	Chromium Hex - 7196 (Hexavalent Chromium)	* See item (2) in Special Instructions	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3

Sample No.	Matrix	Sample Date	Sample Time	Chromium Hex - 7196 (Hexavalent Chromium)	* See item (2) in Special Instructions	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3						
										7-31-13			
J1RR09	SOIL	7-31-13	0943	X	X	X	X	WB	WL			MIH	60
J1RR10	SOIL	7-31-13	0955	X	X	X	X	WB	4			MIH	60
J1RR95	SOIL	7-31-13	1003	X	X	X	X	WB	4-1	7-31-13		MIH	60
	SOIL												
	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White	7-31-13 1029	Doug Bowers	7-31-13 1029
Doug Bowers	7-31-13 1340	Cindy Bingham	7-31-13 1340
Cindy Bingham	7-31-13 1345	Ref #1A, 1060 Battelle	7-31-13 1345
Ref #1A 1060 Battelle	8-1-13 1330	Cindy Bingham	8-1-13 1330
Cindy Bingham WCH	8-1-13 1440	Tom McGinnis	8/1/13 1440

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

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(2) Gamma Spec (Client List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

* Samples from RCF page 2 of this COC
8-1-13
CMB

REVIEWED BY JH
DATE 8-1-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-K-111			DATA PACKAGE: J01892		
VALIDATOR: ELR		LAB: TAL ~~TOB~~		DATE: 8/29/13	
			SDG: J01892		

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
J1RR04 J1RR05 J1RR06 J1RR07 J1RR08
J1RR09 J1RR10 J1RR15
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 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:

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

Date: 20-Aug-13

QC Results Summary
TestAmerica Inc TARL
Ordered by Method, Batch No, QC Type,.

Report No. : 56601

SDG No.: J01892

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_LSC								
3214035 BLANK QC,								
M1H981AA	C-14	-1.39E-02 +- 2.3E-01	U	pCi/g	100%			4.46E-01
3214035 LCS,								
M1H981AC	C-14	7.84E+00 +- 7.8E-01		pCi/g	100%	106%	0.1	4.49E-01
PUISO_PLATE_AEA								
3214038 BLANK QC,								
M1JAC1AA	Pu-238	0.00E+00 +- 3.1E-02	U	pCi/g	86%			5.64E-02
	PU239/40	4.59E-02 +- 5.4E-02	U	pCi/g	86%			5.64E-02
3214038 LCS,								
M1JAC1AC	PU239/40	7.24E+00 +- 1.5E+00		pCi/g	88%	106%	0.1	6.10E-02
GAMMA_GS								
3214033 BLANK QC,								
M1H961AA	CO-60	-4.00E-03 +- 1.1E-02	U	pCi/g				1.94E-02
	CS-137	1.26E-02 +- 1.2E-02	U	pCi/g				2.23E-02
	EU-152	3.91E-03 +- 2.8E-02	U	pCi/g				4.87E-02
	EU-154	-7.13E-03 +- 3.3E-02	U	pCi/g				5.76E-02
	EU-155	-7.22E-03 +- 2.7E-02	U	pCi/g				4.52E-02
	K-40	-5.10E-01 +- 3.5E-01	U	pCi/g				7.08E-01
3214033 LCS,								
M1H961AC	CS-137	9.98E-01 +- 1.2E-01		pCi/g		97%	0.0	2.77E-02
	RA-226	8.90E-01 +- 1.3E-01		pCi/g		78%	-0.2	4.85E-02
	RA-228	7.22E-01 +- 1.5E-01		pCi/g		102%	0.0	8.77E-02
	U-238	9.28E-01 +- 1.4E-01		pCi/g		77%	-0.2	5.07E-02
SRTOT_SEP_PRECIP_GPC								
3214034 BLANK QC,								
M1H971AA	STRONTIUM	4.91E-02 +- 1.2E-01	U	pCi/g	79%			2.59E-01
3214034 LCS,								
M1H971AC	STRONTIUM	2.58E+00 +- 6.5E-01		pCi/g	83%	114%	0.1	2.40E-01
7196_CR6								
3129054 MATRIX SPIKE, J1RR09								
M1H601AJ	HEXCHROME	2.51E+01 +- 0.0E+00		mg/kg	N/A	85%	-0.2	1.55E-01
3129054 LCS,								
M1KK11AC	HEXCHROME	1.78E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
3129054 BLANK QC,								
M1KK11AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01
906.0_H3_LSC								
3214036 BLANK QC,								
M1H991AA	H-3	1.44E-02 +- 2.6E-02	U	pCi/g	100%			5.58E-02
3214036 LCS,								
M1H991AC	H-3	2.96E-01 +- 4.2E-02		pCi/g	100%	86%	-0.1	6.04E-02
NI63_LSC								
3214037 BLANK QC,								

TestAmerica Inc
rptSTLRchQcSummary V5.2.23
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.

QC Results Summary
TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 20-Aug-13

Report No. : 56601

SDG No.: J01892

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
M1JAA1AA	NI-63	1.36E+01 +- 8.9E+00	U	pCi/g	73%			1.90E+01
3214037 LCS, M1JAA1AC	NI-63	5.45E+02 +- 5.7E+01		pCi/g	78%	92%	-0.1	1.75E+01
7196_CR6								
3219053 MATRIX SPIKE, J1RR04 M1H321AL	HEXCHROME	2.61E+01 +- 0.0E+00		mg/kg	N/A	89%	-0.1	1.55E-01
3219053 LCS, M1KKR1AC	HEXCHROME	1.80E+01 +- 0.0E+00		mg/kg	N/A	95%	-0.1	1.55E-01
3219053 BLANK QC, M1KKR1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 27

TestAmerica Inc
rptSTLRchQcSummary V5.2.23
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/Mds/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

Date: 29 August 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Surface Soils at 100-K-64 & 100-K-111 - Waste Site 100-K-111
Subject: Radiochemistry - Data Package No. J01892-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01892 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
J1RR04	7/30/13	Soil	C	See note 1
J1RR05	7/30/13	Soil	C	See note 1
J1RR06	7/30/13	Soil	C	See note 1
J1RR07	7/30/13	Soil	C	See note 1
J1RR08	7/30/13	Soil	C	See note 1
J1RR09	7/31/13	Soil	C	See note 1
J1RR10	7/31/13	Soil	C	See note 1
J1RR95	7/31/13	Soil	C	See note 1

1 – Gamma spectroscopy.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the Sampling and Analysis Instruction for Characterization of Surface Soils in the 100-K-64 and 100-K-111 Waste Site Areas (WHC-570, Rev. 1, May 2013). 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 PARAMETERS

Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of an LCS analysis, all plutonium-238 results were qualified as estimates and flagged "J".

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

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike 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 contract required detection limit (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 duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J1RR10/J1RR95) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Six analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. J01892 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 an LCS analysis, all plutonium-238 results were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike analysis, all tritium and carbon-14 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.

Six analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

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

WCH-570, Rev. 1, Sampling and Analysis Instruction for Characterization of Surface Soils in the 100-K-64 and 100-K-111 Waste Site Areas, May 2013.

Appendix 1

Glossary of Data Reporting Qualifiers

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

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: J01892	**REVIEWER: ELR**	**Project: 100-K-111**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Plutonium-238	J	All	No LCS analysis
Tritium Carbon-14	J	All	No MS 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

Sample Results Summary

TestAmerica Inc TARL

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

Date: 20-Aug-13

Report No. : 56601

SDG No: J01892

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3214035 C14_LSC									
J1RR04									
	M1H321AH	C-14	1.19E-01 +- 2.4E-01	U J	pCi/g	100%	4.50E-01	5.00E+01	
J1RR04 DUP									
	M1H321AJ	C-14	1.36E-02 +- 2.3E-01	U	pCi/g	100%	4.43E-01	5.00E+01	158.9
J1RR05									
	M1H331AH	C-14	7.52E-02 +- 2.4E-01	U J	pCi/g	100%	4.46E-01	5.00E+01	
J1RR06									
	M1H341AH	C-14	1.31E-01 +- 2.4E-01	U J	pCi/g	100%	4.48E-01	5.00E+01	
J1RR07									
	M1H351AH	C-14	1.80E-01 +- 2.4E-01	U J	pCi/g	100%	4.51E-01	5.00E+01	
J1RR08									
	M1H371AH	C-14	1.30E-01 +- 2.4E-01	U J	pCi/g	100%	4.50E-01	5.00E+01	
J1RR09									
	M1H6W1AH	C-14	2.82E-01 +- 2.5E-01	U J	pCi/g	100%	4.48E-01	5.00E+01	
J1RR10									
	M1H6X1AH	C-14	-1.01E-02 +- 2.3E-01	U J	pCi/g	100%	4.48E-01	5.00E+01	
J1RR95									
	M1H601AH	C-14	-1.52E-02 +- 2.3E-01	U J	pCi/g	100%	4.48E-01	5.00E+01	
3214038 PUISO_PLATE_AEA									
J1RR04									
	M1H321AE	Pu-238	-2.00E-03 +- 3.3E-02	U J	pCi/g	89%	7.19E-02	1.00E+00	
		PU239/40	1.60E-02 +- 3.3E-02	U	pCi/g	89%	6.06E-02	1.00E+00	
J1RR05									
	M1H331AE	Pu-238	-1.29E-03 +- 3.2E-02	U J	pCi/g	90%	6.47E-02	1.00E+00	
		PU239/40	4.69E-02 +- 5.6E-02	U	pCi/g	90%	6.47E-02	1.00E+00	
J1RR05 DUP									
	M1H331AJ	Pu-238	-3.77E-03 +- 3.8E-02	U	pCi/g	74%	9.03E-02	1.00E+00	-98.2
		PU239/40	1.73E-02 +- 3.8E-02	U	pCi/g	74%	7.58E-02	1.00E+00	92.1
J1RR06									
	M1H341AE	Pu-238	-1.46E-03 +- 3.6E-02	U J	pCi/g	76%	7.33E-02	1.00E+00	
		PU239/40	-1.46E-03 +- 3.6E-02	U	pCi/g	76%	7.32E-02	1.00E+00	
J1RR07									
	M1H351AE	Pu-238	0.00E+00 +- 5.3E-02	U J	pCi/g	53%	9.67E-02	1.00E+00	
		PU239/40	-2.12E-03 +- 5.3E-02	U	pCi/g	53%	1.07E-01	1.00E+00	
J1RR08									
	M1H371AE	Pu-238	-2.46E-03 +- 4.1E-02	U J	pCi/g	69%	8.86E-02	1.00E+00	
		PU239/40	-4.10E-03 +- 4.1E-02	U	pCi/g	69%	9.82E-02	1.00E+00	
J1RR09									

TestAmerica Inc

rptSTLRchSaSummary2 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.

Sample Results Summary

TestAmerica Inc TARL

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

Date: 20-Aug-13

Report No. : 56601

SDG No: J01892

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3214038 PUISO_PLATE_AEA									
J1RR09									
	M1H6W1AE	Pu-238	0.00E+00 +- 2.9E-02	U J	pCi/g	93%	5.36E-02	1.00E+00	
		PU239/40	0.00E+00 +- 2.9E-02	U	pCi/g	93%	5.35E-02	1.00E+00	
J1RR10									
	M1H6X1AE	Pu-238	-1.19E-03 +- 3.0E-02	U J	pCi/g	94%	5.96E-02	1.00E+00	
		PU239/40	1.48E-02 +- 3.0E-02	U	pCi/g	94%	5.39E-02	1.00E+00	
J1RR95									
	M1H601AE	Pu-238	-1.41E-03 +- 3.5E-02	U J	pCi/g	81%	7.09E-02	1.00E+00	
		PU239/40	0.00E+00 +- 3.5E-02	U	pCi/g	81%	6.41E-02	1.00E+00	
3214033 GAMMA_GS									
J1RR04									
	M1H321AG	CO-60	-9.59E-03 +- 2.3E-02	U	pCi/g		3.97E-02	5.00E-02	
		CS-137	-1.05E-02 +- 2.2E-02	U	pCi/g		3.72E-02	1.00E-01	
		EU-152	-2.22E-02 +- 5.7E-02	U	pCi/g		9.63E-02	1.00E-01	
		EU-154	-3.39E-02 +- 7.4E-02	U	pCi/g		1.25E-01	1.00E-01	
		EU-155	2.41E-02 +- 5.8E-02	U	pCi/g		9.77E-02	1.00E-01	
		K-40	1.45E+01 +- 2.0E+00		pCi/g		3.59E-01		
J1RR05									
	M1H331AG	CO-60	1.17E-02 +- 2.2E-02	U	pCi/g		4.00E-02	5.00E-02	
		CS-137	1.37E-01 +- 3.9E-02		pCi/g		3.29E-02	1.00E-01	
		EU-152	7.01E-02 +- 5.6E-02	U	pCi/g		1.00E-01	1.00E-01	
		EU-154	2.93E-02 +- 6.9E-02	U	pCi/g		1.26E-01	1.00E-01	
		EU-155	5.03E-02 +- 5.3E-02	U	pCi/g		9.06E-02	1.00E-01	
		K-40	1.32E+01 +- 1.8E+00		pCi/g		2.80E-01		
J1RR06									
	M1H341AG	CO-60	-1.51E-04 +- 1.4E-02	U	pCi/g		2.52E-02	5.00E-02	
		CS-137	-2.06E-02 +- 1.4E-02	U	pCi/g		2.20E-02	1.00E-01	
		EU-152	-1.63E-02 +- 3.0E-02	U	pCi/g		4.98E-02	1.00E-01	
		EU-154	-4.32E-03 +- 5.3E-02	U	pCi/g		9.21E-02	1.00E-01	
		EU-155	4.73E-02 +- 2.9E-02	U	pCi/g		5.12E-02	1.00E-01	
		K-40	1.65E+01 +- 2.0E+00		pCi/g		1.90E-01		
J1RR07									
	M1H351AG	CO-60	-4.14E-03 +- 1.9E-02	U	pCi/g		3.32E-02	5.00E-02	
		CS-137	1.73E-01 +- 3.8E-02		pCi/g		2.75E-02	1.00E-01	
		EU-152	6.64E-02 +- 3.7E-02	U	pCi/g		6.73E-02	1.00E-01	
		EU-154	9.18E-02 +- 5.9E-02	U	pCi/g		1.12E-01	1.00E-01	
		EU-155	4.87E-02 +- 3.0E-02	U	pCi/g		5.36E-02	1.00E-01	
		K-40	1.62E+01 +- 1.9E+00		pCi/g		2.64E-01		

TestAmerica Inc

rptSTLRchSaSummary2 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.

Sample Results Summary

TestAmerica Inc TARL

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

Date: 20-Aug-13

Report No. : 56601

4/29/13

SDG No: J01892

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3214033 GAMMA_GS									
J1RR07 DUP									
	M1H351AJ	CO-60	2.38E-02 +- 1.9E-02	U	pCi/g		3.62E-02	5.00E-02	284.2
		CS-137	1.90E-01 +- 3.8E-02		pCi/g		3.36E-02	1.00E-01	9.7
		EU-152	4.92E-02 +- 4.8E-02	U	pCi/g		8.32E-02	1.00E-01	29.8
		EU-154	1.08E-04 +- 6.0E-02	U	pCi/g		1.04E-01	1.00E-01	199.5
		EU-155	4.03E-02 +- 5.2E-02	U	pCi/g		8.97E-02	1.00E-01	18.9
		K-40	1.57E+01 +- 2.0E+00		pCi/g		2.72E-01		2.8
J1RR08									
	M1H371AG	CO-60	-8.96E-03 +- 2.5E-02	U	pCi/g		4.30E-02	5.00E-02	
		CS-137	1.89E-01 +- 5.1E-02		pCi/g		5.23E-02	1.00E-01	
		EU-152	6.66E-02 +- 7.0E-02	U	pCi/g		1.22E-01	1.00E-01	
		EU-154	-7.51E-03 +- 8.5E-02	U	pCi/g		1.48E-01	1.00E-01	
		EU-155	7.94E-02 +- 6.6E-02	U	pCi/g		1.16E-01	1.00E-01	
		K-40	1.76E+01 +- 2.4E+00		pCi/g		3.74E-01		
J1RR09									
	M1H6W1AG	CO-60	-7.00E-03 +- 1.7E-02	U	pCi/g		2.87E-02	5.00E-02	
		CS-137	-7.39E-03 +- 1.6E-02	U	pCi/g		2.74E-02	1.00E-01	
		EU-152	1.66E-03 +- 4.1E-02	U	pCi/g		6.98E-02	1.00E-01	
		EU-154	-2.36E-02 +- 5.5E-02	U	pCi/g		9.23E-02	1.00E-01	
		EU-155	4.57E-02 +- 4.9E-02	U	pCi/g		8.41E-02	1.00E-01	
		K-40	1.67E+01 +- 2.1E+00		pCi/g		2.60E-01		
J1RR10									
	M1H6X1AG	CO-60	2.49E-02 +- 1.7E-02	U	pCi/g		3.33E-02	5.00E-02	
		CS-137	8.28E-02 +- 3.1E-02		pCi/g		2.81E-02	1.00E-01	
		EU-152	1.61E-02 +- 3.5E-02	U	pCi/g		6.01E-02	1.00E-01	
		EU-154	-1.98E-02 +- 5.7E-02	U	pCi/g		9.63E-02	1.00E-01	
		EU-155	5.11E-02 +- 3.0E-02	U	pCi/g		5.22E-02	1.00E-01	
		K-40	1.59E+01 +- 1.9E+00		pCi/g		2.42E-01		
J1RR95									
	M1H601AG	CO-60	-8.48E-03 +- 1.9E-02	U	pCi/g		3.29E-02	5.00E-02	
		CS-137	2.34E-01 +- 4.4E-02		pCi/g		3.17E-02	1.00E-01	
		EU-152	3.44E-02 +- 4.0E-02	U	pCi/g		6.99E-02	1.00E-01	
		EU-154	2.95E-02 +- 5.6E-02	U	pCi/g		1.02E-01	1.00E-01	
		EU-155	2.00E-02 +- 3.7E-02	U	pCi/g		6.27E-02	1.00E-01	
		K-40	1.61E+01 +- 1.9E+00		pCi/g		2.44E-01		
3214034 SRTOT_SEP_PRECIP_GPC									
J1RR04									
	M1H321AC	STRONTIUM	3.95E-02 +- 1.1E-01	U	pCi/g	88%	2.43E-01		

TestAmerica Inc

rptSTLRchSaSummary2 V6.2.23 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.

Sample Results Summary

TestAmerica Inc TARL

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

Date: 20-Aug-13

Report No. : 56601

SDG No: J01892

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3214034 SRTOT_SEP_PRECIP_GPC									
	J1RR05								
	M1H331AC	STRONTIUM	1.21E-01 +- 1.2E-01	U	pCi/g	87%	2.38E-01		
	J1RR06								
	M1H341AC	STRONTIUM	1.20E-02 +- 1.0E-01	U	pCi/g	83%	2.39E-01		
	J1RR07								
	M1H351AC	STRONTIUM	-1.35E-02 +- 1.0E-01	U	pCi/g	87%	2.53E-01		
	J1RR08								
	M1H371AC	STRONTIUM	1.75E-01 +- 1.2E-01	U	pCi/g	87%	2.21E-01		
	J1RR08 DUP								
	M1H371AJ	STRONTIUM	1.39E-01 +- 1.2E-01	U	pCi/g	86%	2.32E-01		23.1
	J1RR09								
	M1H6W1AC	STRONTIUM	-5.96E-04 +- 8.7E-02	U	pCi/g	90%	2.10E-01		
	J1RR10								
	M1H6X1AC	STRONTIUM	1.63E-02 +- 9.4E-02	U	pCi/g	90%	2.19E-01		
	J1RR95								
	M1H601AC	STRONTIUM	3.43E-02 +- 1.1E-01	U	pCi/g	84%	2.51E-01		
3129054 7196_CR6									
	J1RR09								
	M1H6W1AA	HEXCHROME	3.43E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M1H6W1AL	HEXCHROME	5.00E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	37.2
	J1RR10								
	M1H6X1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR95								
	M1H601AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
3214036 906.0_H3_LSC									
	J1RR04								
	M1H321AF	H-3	-1.22E-02 +- 2.0E-02	U J	pCi/g	100%	4.61E-02	4.00E+02	
	J1RR04 DUP								
	M1H321AK	H-3	9.64E-03 +- 2.1E-02	U	pCi/g	100%	4.61E-02	4.00E+02	-1712.2
	J1RR05								
	M1H331AF	H-3	-1.44E-02 +- 1.6E-02	U J	pCi/g	100%	3.78E-02	4.00E+02	
	J1RR06								
	M1H341AF	H-3	1.10E-03 +- 1.9E-02	U J	pCi/g	100%	4.14E-02	4.00E+02	
	J1RR07								
	M1H351AF	H-3	-2.62E-02 +- 2.5E-02	U J	pCi/g	100%	6.43E-02	4.00E+02	
	J1RR08								
	M1H371AF	H-3	1.08E-02 +- 2.3E-02	U J	pCi/g	100%	4.88E-02	4.00E+02	
	J1RR09								
	M1H6W1AF	H-3	-2.42E-02 +- 6.2E-02	U J	pCi/g	100%	1.40E-01	4.00E+02	

TestAmerica Inc

rptSTLRchSaSummary2 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.

Date: 20-Aug-13

Sample Results Summary

TestAmerica Inc TARL

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

Report No. : 56601

8/29/13

SDG No: J01892

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3214036 906.0_H3_LSC									
	J1RR10								
	M1H6X1AF	H-3	6.43E-03 +- 2.0E-02	U J	pCi/g	100%	4.46E-02	4.00E+02	
	J1RR95								
	M1H601AF	H-3	1.88E-02 +- 5.0E-02	U J	pCi/g	100%	1.09E-01	4.00E+02	
3214037 NI63_LSC									
	J1RR04								
	M1H321AD	NI-63	-2.98E+00 +- 7.0E+00	U	pCi/g	93%	1.48E+01	3.00E+01	
	J1RR05								
	M1H331AD	NI-63	1.87E+01 +- 9.3E+00		pCi/g	79%	1.85E+01	3.00E+01	
	J1RR06								
	M1H341AD	NI-63	-9.91E+00 +- 6.5E+00	U	pCi/g	94%	1.45E+01	3.00E+01	
	J1RR06 DUP								
	M1H341AJ	NI-63	1.00E+01 +- 8.0E+00	U	pCi/g	94%	1.53E+01	3.00E+01	29618.0
	J1RR07								
	M1H351AD	NI-63	-9.68E+00 +- 6.5E+00	U	pCi/g	95%	1.43E+01	3.00E+01	
	J1RR08								
	M1H371AD	NI-63	4.62E+01 +- 1.2E+01		pCi/g	83%	1.98E+01	3.00E+01	
	J1RR09								
	M1H6W1AD	NI-63	5.64E-01 +- 7.3E+00	U	pCi/g	90%	1.52E+01	3.00E+01	
	J1RR10								
	M1H6X1AD	NI-63	-3.80E+00 +- 6.9E+00	U	pCi/g	94%	1.46E+01	3.00E+01	
	J1RR95								
	M1H601AD	NI-63	-4.02E-01 +- 7.3E+00	U	pCi/g	91%	1.50E+01	3.00E+01	
3219053 7196_CR6									
	J1RR04								
	M1H321AA	HEXCHROME	1.67E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M1H321AN	HEXCHROME	1.87E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	11.3
	J1RR05								
	M1H331AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR06								
	M1H341AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR07								
	M1H351AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RR08								
	M1H371AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	

8/29/13

No. of Results: 118

TestAmerica Inc
rptSTLRchSaSummary2 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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

August 20, 2013

Attention: Joan Kessner

SAF Number	:	RC-238
Date SDG Closed	:	August 1, 2013
Number of Samples	:	Eight (8)
Sample Type	:	Soil
SDG Number	:	J01892
Data Deliverable	:	15– Day / Summary

CASE NARRATIVE

I. Introduction

On August 1, 2013, eight soil samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1RR04	M1H32	SOIL	08/01/13
J1RR05	M1H33	SOIL	08/01/13
J1RR06	M1H34	SOIL	08/01/13
J1RR07	M1H35	SOIL	08/01/13
J1RR08	M1H37	SOIL	08/01/13
J1RR09	M1H6W	SOIL	08/01/13
J1RR10	M1H6X	SOIL	08/01/13
J1RR95	M1H60	SOIL	08/01/13

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 analyses were:

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002
Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Liquid Scintillation Counting
Tritium by method RL-LSC-005
Carbon-14 by method RL-LSC-008
Nickel-63 by method RL-LCS-017
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

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002:
The LCS, batch blank, samples and sample duplicate (J1RR05) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1RR08) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The CRDL was not met for some of the analytes. Except as noted, the LCS, batch blank, samples and sample duplicate (J1RR07) results are within contractual requirements.

Liquid Scintillation Counting
Tritium by method RL-LSC-005:
The LCS, batch blank, samples and sample duplicate (J1RR04) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:
The LCS, batch blank, samples and sample duplicate (J1RR04) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:
The negative result for sample J1RR06 is greater than 3 times the uncertainty due to the count rate below the background. Its duplicate analysis meets acceptance criteria and both results are below the CRDL.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-238-003	Page 1 of 2

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: TestAmerica - Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Price Code: 8C

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

RCF 35900; 35901

J3H010422
J01892
Due 8-16-13

SAMPLE ANALYSI J3H010422

Preservation	Cool 4C	None	None	None						
Type of Container	G/P	G/P	G/P	G/P						
No. of Container(s)	1	1	1	1						
Volume	250mL	500mL	250mL	250mL						
	hromium Hex -7196 (Hexavalent Chromium)	See item (2) in Special Instructions *	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3						

Sample No.	Matrix	Sample Date	Sample Time										
J1RR04	SOIL	7-30-13	0929	X	X	X	X	W-4B	L	M1H	32		
J1RR05	SOIL	7-30-13	0940	X	X	X	X	W-4B	4	M1H	33		
	SOIL												
	SOIL												
	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White Sn Wis	7-30-13 1000	Doug Bowers Bowers	7-30-13/1000
Doug Bowers/Doug Bowers	7-30-13/1590	John Harrie	7.30.13 1540
John Harrie	7.30.13 1541	Fri #3C 1060 Battelle	7.30.13 1541
Fri #3C 1060 Battelle	8.1.13 0940	John Harrie	8.1.13 0940
John Harrie WCH	8.1.13 1000	J Bock Bock TAUR	8-1-13 1000

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

SPECIAL INSTRUCTIONS

All Test America Cr-VI snalyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(2) Gamma Spec (Client List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

* RCF Samples (500 ml G/P) Submitted To TALR For EEA JH 8.1.13 From Page 2 of This COC JH 8.1.13

REVIEWED BY CMB DATE 7-31-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-238-003	Page 2 of 2

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: Radiological Counting Facility	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Price Code: 8C

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

Preservation	None
Type of Container	G/P
No. of Container(s)	1
Volume	60g

J3H010422
J01892
Due 8-16-13

SAMPLE ANALYSIS

Sample No.	Matrix	Sample Date	Sample Time	RCF GEA Shipping Screen									
J1RR04	SOIL	7-30-13	0929	X		W-4B	L	358900		528g	MIH	32	
J1RR05	SOIL	7-30-13	0948	X		W-4B	U	35901		714g	MIH	33	
	SOIL												
	SOIL												
	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White Sn WH	7-30-13 1000	Doug Powers Powers	7-30-13/1000
Doug Powers/Doug Powers	7-30-13 1540	John Harrie	1540 7.30.13
John Harrie	1541 7.30.13	Fry #3C 1060 Battelle	1541 7.30.13
Fry #3C 1060 Battelle	0710 7.31.13	John Harrie	0710 7.31.13
John Harrie	0847 7.31.13	RCF D. Miller	0847 7-31-13
RCF D. Miller	0945 8-1-13	John Harrie	0945 8.1.13
John Harrie	1000 8.1.13	J. Beck / Beck TALR	8-1-13 1000

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

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

* RCF Samples (500 ml G/P) submitted to TALR for GEA under page 1 of this COC JH 8.1.13

REVIEWED BY CMB DATE 8-1-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-003 | Page 1 of 2

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: TestAmerica - Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

RCF 35902, 35903, 35904

J34010422
J01892
Due 8-16-13

SAMPLE ANALYSIS

Preservation	Cool 4C	None	None	None						
Type of Container	G/P	G/P	G/P	G/P						
No. of Container(s)	1	1	1	1						
Volume	250mL	500mL	250mL	250mL						
	Chromium Hex - 7196 (Hexavalent Chromium)	See item (2) in Special Instructions *	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3						
Sample No.	Matrix	Sample Date	Sample Time							
J1RR06	SOIL	7-30-13	1240	X	X	X	X	K-111-JAL	MIH	34
J1RR07	SOIL	7-30-13	1248	X	X	X	X	K-111-JA4	MIH	35
J1RR08	SOIL	7-30-13	1220	X	X	X	X	W-3A	MIH	37
	SOIL									
	SOIL									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White	7-30-13 1340	Doug Bowers	7-30-13/1340
Doug Bowers/Doug Bowers	7-30-13/1540	John Harrie	7-30-13 1540
John Harrie	7-30-13 1541	Fed Ex #3C 1060 Battelle	7-30-13 1541
Fed Ex #3C 1060 Battelle	8-1-13 0940	John Harrie	8-1-13 0940
John Harrie	8-1-13 1000	Jack Hock	8-1-13 1000

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

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(2) Gamma Spec (Client List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

REVIEWED BY CMB DATE 7-31-13

* 500ml GP for GEA from page 2 of 2 RTIO COC JH 8-1-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

TestAmerica Laboratories, Inc.

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-003 — Page 2 of 2

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: Radiological Counting Facility TO: TALR	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

J3H010422

J01892
Due 8-16-13

Preservation	None											
Type of Container	G/P											
No. of Container(s)	1											
Volume	60g											
SAMPLE ANALYSIS	RCF GEA Shipping Screen											
Sample No.	Matrix	Sample Date	Sample Time									
J1RR06	SOIL	7-30-13	1240 ✓	X		K-111-1A L		35902		535g	MIH	34
J1RR07	SOIL	7-30-13	1248 ✓	X		K-111-1A 4		35903		467g	MIH	35
J1RR08	SOIL	7-30-13	1320 ✓	X		W-3A		35904		468g	MIH	37
	SOIL											
	SOIL											

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: E. White — Date/Time: 7-30-13 1340	Received By/Stored In: Doug Bowers — Date/Time: 7-30-13/1340
Relinquished By/Removed From: Doug Bowers — Date/Time: 7-30-13/1540	Received By/Stored In: John Harris — Date/Time: 7-30-13 1540
Relinquished By/Removed From: John Harris — Date/Time: 7-30-13 1541	Received By/Stored In: Frig #3C 1000 Battelle — Date/Time: 7-30-13 1541
Relinquished By/Removed From: Frig #3C 1000 Battelle — Date/Time: 7-31-13 0710	Received By/Stored In: John Harris — Date/Time: 7-31-13 0710
Relinquished By/Removed From: John Harris — Date/Time: 7-31-13 0847	Received By/Stored In: RCF — Date/Time: 7-31-13 0847
Relinquished By/Removed From: D. Miller — Date/Time: 8-1-13 0945	Received By/Stored In: John Harris — Date/Time: 8-1-13 0945
Relinquished By/Removed From: John Harris — Date/Time: 8-1-13 1000	Received By/Stored In: Steve Jack TALR — Date/Time: 8-1-13 1000
FINAL SAMPLE DISPOSITION: Disposal Method	Disposed By — Date/Time

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

* RCF Samples Submitted to TARL (500ml G/P) For GEA under page 1 of this COC
JH 8-1-13

REVIEWED BY MMB
DATE 8-1-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-003

Page 1 of 2

Collector	WHITE, EC
Company Contact	Joan Kessner
Telephone No.	375-4688
Project Coordinator	KESSNER, JH
Price Code	8C
Data Turnaround	15 Days
Project Designation	100K Shoreline Characterization
Sampling Location	100-K-111 - 100-K-111 West Sample Area
SAF No.	RC-238
Ice Chest No.	NA
Field Logbook No.	EL-1668
COA	0ESKSH6520
Method of Shipment	Local Delivery
Shipped To	TestAmerica - Richland
Offsite Property No.	NA
Bill of Lading/Air Bill No.	NA

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

J3H010435 RCF 35918-20

J01892

Due 8-16-13

SAMPLE ANALYS J3H010435

Preservation	Cool 4C	None	None	None						
Type of Container	G/P	G/P	G/P	G/P						
No. of Container(s)	1	1	1	1						
Volume	250mL	500mL	250mL	250mL						
	Chromium Hex - 7196 (Hexavalent Chromium)	* See item (2) in Special Instructions	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3						

Sample No.	Matrix	Sample Date	Sample Time										
J1RR09	SOIL	7-31-13	0943	X	X	X	X	WB	4L			MIH	60
J1RR10	SOIL	7-31-13	0955	X	X	X	X	W-18	4			MIH	60
J1RR95	SOIL	7-31-13	1003	X	X	X	X	~~W-18~~	~~4-1~~		7-31-13	MIH	60
	SOIL												
	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White	7-31-13 1029	Doug Bowers	7-31-13 1029
Doug Bowers	7-31-13 1340	Chuck Birnham	7-31-13 1340
Chuck Birnham	7-31-13 1345	Ref # 1A, 1060 Battelle	7-31-13 1345
Ref # 1A 1060 Battelle	8-1-13 1330	Chuck Birnham	8-1-13 1330
Chuck Birnham	8-1-13 1440	Tom McGinnis	8/1/13 1440

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

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(2) Gamma Spec (Client List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

* Samples from RCF page 2 of this COC
8-1-13
CMB

REVIEWED BY JH
DATE 8-1-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-K-111			DATA PACKAGE: J01892		
VALIDATOR: ELR		LAB: TAL		DATE: 8/24/13	
			SDG: J01892		

ANALYSES PERFORMED

☐ Gross Alpha/Beta ☐ Total Uranium	☒ Strontium-90 ☐ Radium-22	☐ Technetium-99 ☒ Tritium	☒ Alpha Spectroscopy x C14	☒ Gamma Spectroscopy x Mn-63

SAMPLES/MATRIX

J1RR04 J1RR05 J1RR06 J1RR07 J1RR08
J1RR09 J1RR10 J1RR95

Soil

1. Completeness ..... ☐ N/A

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

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

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

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

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

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

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

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

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

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

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

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

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

Method blank results acceptable? ..... Yes No N/A

Analytes detected in method blank? ..... Yes No N/A

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

Field blank results acceptable? ..... Yes No N/A

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A

LCS/BSS recoveries acceptable? ..... Yes No N/A

LCS/BSS traceable? (Levels D,E) ..... Yes No N/A

LCS/BSS expired? (Levels D,E) ..... Yes No N/A

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no Pu-238 LCS - Jall

~~no 3H or C-14 MS - Jall~~ 8/24

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☒ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

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

Comments: _____

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

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

Comments: _____

9. Matrix Spikes (Levels C, D, E) ..... ☐ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no 3H or C-14 MS - Jeff

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

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

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

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

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

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

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

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

Comments: no FS or PAT

12. Holding Times (All levels)

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

Comments: _____

13. Results and Detection Limits (All Levels) ..... ☐ N/A

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

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

Results Acceptable? (Levels D, E) ..... Yes No N/A

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

MDA's meet required detection limits? ..... Yes No N/A

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

Comments: [illegible]

Appendix 6

Additional Documentation Requested by Client

Date: 20-Aug-13

QC Results Summary
TestAmerica Inc TARL
Ordered by Method, Batch No, QC Type,.

Report No. : 56601

SDG No.: J01892

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_LSC								
3214035 BLANK QC, M1H981AA	C-14	-1.39E-02 +- 2.3E-01	U	pCi/g	100%			4.46E-01
3214035 LCS, M1H981AC	C-14	7.84E+00 +- 7.8E-01		pCi/g	100%	106%	0.1	4.49E-01
PUISO_PLATE_AEA								
3214038 BLANK QC, M1JAC1AA	Pu-238	0.00E+00 +- 3.1E-02	U	pCi/g	86%			5.64E-02
	PU239/40	4.59E-02 +- 5.4E-02	U	pCi/g	86%			5.64E-02
3214038 LCS, M1JAC1AC	PU239/40	7.24E+00 +- 1.5E+00		pCi/g	88%	106%	0.1	6.10E-02
GAMMA_GS								
3214033 BLANK QC, M1H961AA	CO-60	-4.00E-03 +- 1.1E-02	U	pCi/g				1.94E-02
	CS-137	1.26E-02 +- 1.2E-02	U	pCi/g				2.23E-02
	EU-152	3.91E-03 +- 2.8E-02	U	pCi/g				4.87E-02
	EU-154	-7.13E-03 +- 3.3E-02	U	pCi/g				5.76E-02
	EU-155	-7.22E-03 +- 2.7E-02	U	pCi/g				4.52E-02
	K-40	-5.10E-01 +- 3.5E-01	U	pCi/g				7.08E-01
3214033 LCS, M1H961AC	CS-137	9.98E-01 +- 1.2E-01		pCi/g		97%	0.0	2.77E-02
	RA-226	8.90E-01 +- 1.3E-01		pCi/g		78%	-0.2	4.85E-02
	RA-228	7.22E-01 +- 1.5E-01		pCi/g		102%	0.0	8.77E-02
	U-238	9.28E-01 +- 1.4E-01		pCi/g		77%	-0.2	5.07E-02
SRTOT_SEP_PRECIP_GPC								
3214034 BLANK QC, M1H971AA	STRONTIUM	4.91E-02 +- 1.2E-01	U	pCi/g	79%			2.59E-01
3214034 LCS, M1H971AC	STRONTIUM	2.58E+00 +- 6.5E-01		pCi/g	83%	114%	0.1	2.40E-01
7196_CR6								
3129054 MATRIX SPIKE, J1RR09 M1H601AJ	HEXCHROME	2.51E+01 +- 0.0E+00		mg/kg	N/A	85%	-0.2	1.55E-01
3129054 LCS, M1KK11AC	HEXCHROME	1.78E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
3129054 BLANK QC, M1KK11AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01
906.0_H3_LSC								
3214036 BLANK QC, M1H991AA	H-3	1.44E-02 +- 2.6E-02	U	pCi/g	100%			5.58E-02
3214036 LCS, M1H991AC	H-3	2.96E-01 +- 4.2E-02		pCi/g	100%	86%	-0.1	6.04E-02
NI63_LSC								
3214037 BLANK QC,								

TestAmerica Inc
rptSTLRchQcSummary V5.2.23
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.

Date: 20-Aug-13

QC Results Summary
TestAmerica Inc TARL
Ordered by Method, Batch No, QC Type,.

Report No. : 56601

SDG No.: J01892

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
M1JAA1AA	NI-63	1.36E+01 +- 8.9E+00	U	pCi/g	73%			1.90E+01
3214037 LCS, M1JAA1AC	NI-63	5.45E+02 +- 5.7E+01		pCi/g	78%	92%	-0.1	1.75E+01
7196_CR6								
3219053 MATRIX SPIKE, J1RR04 M1H321AL	HEXCHROME	2.61E+01 +- 0.0E+00		mg/kg	N/A	89%	-0.1	1.55E-01
3219053 LCS, M1KKR1AC	HEXCHROME	1.80E+01 +- 0.0E+00		mg/kg	N/A	95%	-0.1	1.55E-01
3219053 BLANK QC, M1KKR1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 27

TestAmerica Inc
rptSTLRchQcSummary V5.2.23
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.

Date: 29 August 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Surface Soils at 100-K-64 & 100-K-111 - Waste Site 100-K-111
Subject: Inorganics - Data Package No. J01892-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01892 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
J1RR04	7/30/13	Soil	C	See note 1
J1RR05	7/30/13	Soil	C	See note 1
J1RR06	7/30/13	Soil	C	See note 1
J1RR07	7/30/13	Soil	C	See note 1
J1RR08	7/30/13	Soil	C	See note 1
J1RR09	7/31/13	Soil	C	See note 1
J1RR10	7/31/13	Soil	C	See note 1
J1RR95	7/31/13	Soil	C	See note 1

1 – ICP metals by 6010B & mercury by 7471A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the Sampling and Analysis Instruction for Characterization of Surface Soils in the 100-K-64 and 100-K-111 Waste Site Areas (WHC-570, Rev. 1, May 2013). 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.

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 (46%) and silicon (21%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (9%) 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 (J1RR10/J1RR95) 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. J01892 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 (46%) and silicon (21%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (9%) 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.

WCH-570, Rev. 1, Sampling and Analysis Instruction for Characterization of Surface Soils in the 100-K-64 and 100-K-111 Waste Site Areas, May 2013.

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: J01892	**REVIEWER: ELR**	**Project: 100-K-111**	**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: 280-45011-1
Sdg Number: J01892

Client Sample ID: J1RR04

Lab Sample ID: 280-45011-1
Client Matrix: Solid

% Moisture: 2.7

Date Sampled: 07/30/2013 0929
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-186383	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0			Initial Weight/Volume:	1.08 g
Analysis Date:	08/07/2013 1425			Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				

4/29/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8690		1.5	4.8
Antimony		0.57	M J	0.36	0.57
Arsenic		4.1		0.63	0.95
Barium		66.6		0.072	0.48
Beryllium		0.28		0.031	0.19
Boron		1.7	B	0.93	1.9
Cadmium		0.10	B	0.039	0.19
Calcium		8210		13.4	47.6
Chromium		14.3		0.055	0.19
Cobalt		6.5		0.095	0.95
Copper		15.3		0.21	0.95
Iron		17200		3.6	4.8
Lead		4.3		0.26	0.48
Magnesium		4610		3.5	19.0
Manganese		277		0.095	0.95
Molybdenum		0.25	U	0.25	1.9
Nickel		14.0		0.12	3.8
Potassium		1490		39.0	286
Selenium		0.82	U	0.82	0.95
Silicon		230	N J	5.4	9.5
Silver		0.15	U	0.15	0.19
Sodium		167		56.2	114
Vanadium		33.3		0.089	1.9
Zinc		37.7		0.38	0.95

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0			Initial Weight/Volume:	0.72 g
Analysis Date:	08/06/2013 2248			Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	B	0.0047	0.015

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Client Sample ID: **J1RR05**

Lab Sample ID: 280-45011-2
Client Matrix: Solid
% Moisture: 0.8

Date Sampled: 07/30/2013 0940
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-186383	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	08/07/2013 1435			Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				

✓ 8/29/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6690		1.3	4.3
Antimony		0.33	U J	0.33	0.52
Arsenic		2.4		0.57	0.86
Barium		55.4		0.065	0.43
Beryllium		0.19		0.028	0.17
Boron		1.4	B	0.84	1.7
Cadmium		0.092	B	0.035	0.17
Calcium		3900		12.1	43.1
Chromium		15.0		0.050	0.17
Cobalt		6.9		0.086	0.86
Copper		14.7		0.19	0.86
Iron		18100		3.3	4.3
Lead		4.4		0.23	0.43
Magnesium		4340		3.2	17.2
Manganese		291		0.086	0.86
Molybdenum		0.22	U	0.22	1.7
Nickel		12.0		0.11	3.4
Potassium		1600		35.3	259
Selenium		0.74	U	0.74	0.86
Silicon		192	N J	4.9	8.6
Silver		0.14	U	0.14	0.17
Sodium		198		50.8	103
Vanadium		41.8		0.081	1.7
Zinc		41.1		0.34	0.86

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0			Initial Weight/Volume:	0.58 g
Analysis Date:	08/06/2013 2259			Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				

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

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Client Sample ID: J1RR06

Lab Sample ID: 280-45011-3
Client Matrix: Solid

% Moisture: 1.6

Date Sampled: 07/30/2013 1248
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-186383	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	08/07/2013 1446			Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				

8/29/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8210		1.5	4.8
Antimony		0.36	U J	0.36	0.57
Arsenic		4.0		0.63	0.96
Barium		70.6		0.073	0.48
Beryllium		0.24		0.032	0.19
Boron		1.5	B	0.94	1.9
Cadmium		0.12	B	0.039	0.19
Calcium		13600		13.5	47.9
Chromium		15.1		0.056	0.19
Cobalt		6.3		0.096	0.96
Copper		14.9		0.21	0.96
Iron		16100		3.6	4.8
Lead		3.9		0.26	0.48
Magnesium		5100		3.5	19.2
Manganese		261		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		15.2		0.12	3.8
Potassium		1460		39.3	287
Selenium		0.82	U	0.82	0.96
Silicon		244	N J	5.4	9.6
Silver		0.15	U	0.15	0.19
Sodium		176		56.5	115
Vanadium		31.0		0.090	1.9
Zinc		37.6		0.38	0.96

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0			Initial Weight/Volume:	0.69 g
Analysis Date:	08/06/2013 2302			Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0049	U	0.0049	0.015

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Client Sample ID: J1RR07

Lab Sample ID: 280-45011-4
Client Matrix: Solid

% Moisture: 1.5

Date Sampled: 07/30/2013 1249
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-186383	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0			Initial Weight/Volume:	1.01 g
Analysis Date:	08/07/2013 1449			Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				

8/29/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8810		1.6	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		3.6		0.66	1.0
Barium		77.1		0.076	0.50
Beryllium		0.27		0.033	0.20
Boron		2.2		0.99	2.0
Cadmium		0.16	B	0.041	0.20
Calcium		5000		14.2	50.3
Chromium		15.7		0.058	0.20
Cobalt		6.3		0.10	1.0
Copper		13.7		0.22	1.0
Iron		16800		3.8	5.0
Lead		6.4		0.27	0.50
Magnesium		4800		3.7	20.1
Manganese		287		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		14.6		0.12	4.0
Potassium		2070		41.2	302
Selenium		0.86	U	0.86	1.0
Silicon		303	N J	5.7	10.1
Silver		0.16	U	0.16	0.20
Sodium		170		59.3	121
Vanadium		31.7		0.095	2.0
Zinc		48.2		0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0			Initial Weight/Volume:	0.70 g
Analysis Date:	08/06/2013 2304			Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0075	B	0.0048	0.015

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Client Sample ID: J1RR08

Lab Sample ID: 280-45011-5
Client Matrix: Solid

% Moisture: 4.0

Date Sampled: 07/30/2013 1320
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 08/07/2013 1451
Prep Date: 08/06/2013 1330

Analysis Batch: 280-186383
Prep Batch: 280-185629

Instrument ID: MT_026
Lab File ID: 26a080713.asc
Initial Weight/Volume: 1.05 g
Final Weight/Volume: 100 mL

8/29/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		11300		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		4.0		0.65	0.99
Barium		97.7		0.075	0.50
Beryllium		0.36		0.033	0.20
Boron		1.9	B	0.97	2.0
Cadmium		0.22		0.041	0.20
Calcium		3810		14.0	49.6
Chromium		16.8		0.058	0.20
Cobalt		8.1		0.099	0.99
Copper		18.5		0.22	0.99
Iron		21700		3.8	5.0
Lead		8.9		0.27	0.50
Magnesium		5080		3.7	19.8
Manganese		393		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		15.2		0.12	4.0
Potassium		2860		40.7	298
Selenium		0.85	U	0.85	0.99
Silicon		300	N J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		180		58.5	119
Vanadium		43.2		0.093	2.0
Zinc		64.2		0.39	0.99

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 08/06/2013 2306
Prep Date: 08/06/2013 1820

Analysis Batch: 280-186149
Prep Batch: 280-186059

Instrument ID: MT_034
Lab File ID: 130806taa.txt
Initial Weight/Volume: 0.54 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0088	B	0.0064	0.020

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Client Sample ID: J1RR09

Lab Sample ID: 280-45011-6
Client Matrix: Solid

% Moisture: 3.1

Date Sampled: 07/31/2013 0943
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-186383	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	08/07/2013 1453			Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				

✓ 8/29/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10300		1.4	4.4
Antimony		0.34	U J	0.34	0.53
Arsenic		3.6		0.59	0.89
Barium		86.0		0.068	0.44
Beryllium		0.33		0.029	0.18
Boron		1.5	B	0.87	1.8
Cadmium		0.093	B	0.036	0.18
Calcium		3670		12.5	44.5
Chromium		14.1		0.052	0.18
Cobalt		8.1		0.089	0.89
Copper		14.6		0.19	0.89
Iron		21200		3.4	4.4
Lead		5.1		0.24	0.44
Magnesium		4890		3.3	17.8
Manganese		354		0.089	0.89
Molybdenum		0.23	U	0.23	1.8
Nickel		14.4		0.11	3.6
Potassium		2050		36.5	267
Selenium		0.77	U	0.77	0.89
Silicon		326	N J	5.0	8.9
Silver		0.14	U	0.14	0.18
Sodium		166		52.5	107
Vanadium		42.1		0.084	1.8
Zinc		44.4		0.35	0.89

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	08/06/2013 2309			Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				

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

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Client Sample ID: J1RR10

Lab Sample ID: 280-45011-7
Client Matrix: Solid

% Moisture: 1.3

Date Sampled: 07/31/2013 0955
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-186383	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0			Initial Weight/Volume:	1.08 g
Analysis Date:	08/07/2013 1456			Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				

6/29/17

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10300		1.5	4.7
Antimony		0.36	U J	0.36	0.56
Arsenic		3.6		0.62	0.94
Barium		96.8		0.071	0.47
Beryllium		0.34		0.031	0.19
Boron		1.9		0.92	1.9
Cadmium		0.18	B	0.038	0.19
Calcium		3530		13.2	46.9
Chromium		15.3		0.054	0.19
Cobalt		7.6		0.094	0.94
Copper		14.2		0.20	0.94
Iron		20400		3.6	4.7
Lead		6.3		0.25	0.47
Magnesium		4560		3.5	18.8
Manganese		371		0.094	0.94
Molybdenum		0.24	U	0.24	1.9
Nickel		13.4		0.12	3.8
Potassium		2350		38.5	282
Selenium		0.81	U	0.81	0.94
Silicon		299	N J	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		169		55.4	113
Vanadium		42.2		0.088	1.9
Zinc		54.3		0.37	0.94

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0			Initial Weight/Volume:	0.68 g
Analysis Date:	08/06/2013 2311			Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	B	0.0049	0.015

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Client Sample ID: J1RR95

Lab Sample ID: 280-45011-8
Client Matrix: Solid

% Moisture: 1.4

Date Sampled: 07/31/2013 1003
Date Received: 08/01/2013 0930

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 08/07/2013 1458
Prep Date: 08/06/2013 1330

Analysis Batch: 280-186383
Prep Batch: 280-185629

Instrument ID: MT_026
Lab File ID: 26a080713.asc
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

8/29/13

DryWt Corrected: Y

Analyte	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum	10400		1.4	4.7
Antimony	0.35	U J	0.35	0.56
Arsenic	3.4		0.61	0.93
Barium	95.4		0.071	0.47
Beryllium	0.32		0.031	0.19
Boron	1.8	B	0.91	1.9
Cadmium	0.17	B	0.038	0.19
Calcium	3690		13.1	46.5
Chromium	16.2		0.054	0.19
Cobalt	7.5		0.093	0.93
Copper	14.2		0.20	0.93
Iron	20100		3.5	4.7
Lead	6.3		0.25	0.47
Magnesium	4570		3.4	18.6
Manganese	361		0.093	0.93
Molybdenum	0.24	U	0.24	1.9
Nickel	13.5		0.11	3.7
Potassium	2310		38.2	279
Selenium	0.80	U	0.80	0.93
Silicon	331	N J	5.3	9.3
Silver	0.15	U	0.15	0.19
Sodium	203		54.9	112
Vanadium	41.8		0.088	1.9
Zinc	57.0		0.37	0.93

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 08/06/2013 2313
Prep Date: 08/06/2013 1820

Analysis Batch: 280-186149
Prep Batch: 280-186059

Instrument ID: MT_034
Lab File ID: 130806taa.txt
Initial Weight/Volume: 0.61 g
Final Weight/Volume: 50 mL

DryWt Corrected: Y

Analyte	Result (mg/Kg)	Qualifier	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-45011-1

SDG #: J01892
SAF#: RC-238

Date SDG Closed: August 1, 2013
Data Deliverable: 15 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1RR04	280-45011-1	6010/7471	6010B/7471A
J1RR05	280-45011-2	6010/7471	6010B/7471A
J1RR06	280-45011-3	6010/7471	6010B/7471A
J1RR07	280-45011-4	6010/7471	6010B/7471A
J1RR08	280-45011-5	6010/7471	6010B/7471A
J1RR09	280-45011-6	6010/7471	6010B/7471A
J1RR10	280-45011-7	6010/7471	6010B/7471A
J1RR95	280-45011-8	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 8/1/2013 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.6° C.

TOTAL METALS - SW846 6010B/7471A
Low levels of Copper and Zinc are present in the method blank associated with batch 280-185629. 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.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-185629, and 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 J1RR04; therefore, control limits are not applicable.

The duplicate analysis of sample J1RR04 exhibited RPD data outside the control limits for Antimony, 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-238-003

Page 1 of 1

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: WCH-11-029	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Commercial Carrier fed Ex
Shipped To: TestAmerica - Denver	Offsite Property No.: A120936		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	250mL											
SAMPLE ANALYSIS	See Item (1) in Special Instructions											
Sample No.	Matrix	Sample Date	Sample Time									
5IRR04	SOIL	7-30-13	0929	X		W-4B	i					
2IRR05	SOIL	7-30-13	0940	X		W-4B	4					
	SOIL											
	SOIL											
	SOIL											

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CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: E. White & [illegible] Date/Time: 7-30-13 1000	Received By/Stored In: Doug Bowers Date/Time: 7-30-13/1000
Relinquished By/Removed From: Doug Bowers/Doug Bowers Date/Time: 7-30-13/1540	Received By/Stored In: John Harris Date/Time: 1540 7.30.13
Relinquished By/Removed From: John Harris Date/Time: 1541 7.30.13	Received By/Stored In: Frig #3C 1060 Battelle Date/Time: 1541 7.30.13
Relinquished By/Removed From: Frig #3C 1060 Battelle Date/Time: 0900 7.31.13	Received By/Stored In: John Harris Date/Time: 0900 7.31.13
Relinquished By/Removed From: John Harris Date/Time: 0901 7.31.13	Received By/Stored In: fed Ex Date/Time:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: [illegible] Date/Time: 8/1/13 0930
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(1) ICP Metals - 6010TR (Client 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)

SDG
J01892

REVIEWED BY CMB
DATE 7-31-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-003

Page 1 of 1

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: WCH-11-029	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Commercial Carrier fed EX
Shipped To: TestAmerica - Denver	Offsite Property No.: A120936		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	250mL											

SAMPLE ANALYSIS

Sample No.	Matrix	Sample Date	Sample Time	See item (1) in Special Instructions									
3 IRR06	SOIL	7-30-13	1248	X		K-111-1A	L						
3 IRR07	SOIL	7-30-13	1248	X		K-111-1A	U						
3 IRR08	SOIL	7-30-13	1320	X		W-3A							
	SOIL												
	SOIL												

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White Sam Wa	7-30-13 1340	Doug Bowers Doug Bowers	7-30-13/1340
Doug Bowers/Doug Bowers	7-30-13/1540	John Harrie	7-30-13 1540
John Harrie	7-30-13 1541	Fri #3C 1060 Battelle	7-30-13 1541
Fri #3C 1060 Battelle	7-31-13 0900	John Harrie	7-31-13 0900
John Harrie	7-31-13 0901	fed EX	

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

All Test America Cr-VI analyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(1) ICP Metals - 6010TR (Client 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)

SDG
J01892

REVIEWED BY CMG DATE 7-31-13

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-003 | Page 1 of 1

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K-111 - 100-K-111 West Sample Area		SAF No.: RC-238
Ice Chest No.: WCH-11-065	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Commercial Carrier fed EX
Shipped To: TestAmerica - Denver	Offsite Property No.: A120937		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8C

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

All Test america Cr-VI analyses must be preformed at the Richland facility

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	250mL										
SAMPLE ANALYSIS	See Item (1) in Special Instructions										
Sample No.	Matrix	Sample Date	Sample Time								
J1RR09	SOIL	7-31-13	0943	X		W-1B	2				
J1RR10	SOIL	7-31-13	0955	X		W-1B	4				
J1RR95	SOIL	7-31-13	1003	X		W-1B	4-1				
	SOIL										
	SOIL										

Page 37 of 37

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White [signature]	7-31-13 1029	Doug Bowers [signature]	7-31-13/1029
Doug Bowers/Doug Bowers	7-31-13/1340	Cinda Bingham [signature]	7-31-13 1340
Cinda Bingham [signature] WCH	7-31-13 1350	fed EX	
		[signature]	8/1/13 0915

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

SPECIAL INSTRUCTIONS

All Test America Cr-VI snalyses must be preformed at the Richland facility.
The 500 ml GEA samples will be sent to RCF for shipping screen then fowarded on to the rad lab.

(1) ICP Metals - 6010TR (Client 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}

2.6
[initials]
8/1/13

REVIEWED BY [initials] DATE 7/31/13

SDG
J01892

WCH-EE-011

Generated Date/Time: 06/26/2013 16:21, PDT

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-K-111			DATA PACKAGE: J01892		
VALIDATOR: ELR		LAB: TAL		DATE: 8/29/13	
			SDG: J01892		

ANALYSES PERFORMED

SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX

J1RR04 J1RR05 J1RR06 J1RR07
J1RR08 J1RR09 J1RR10 J1RR95

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:

FB - N/A

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 - (9%) - J all

MS - antimony (46%) Silicon (21%) - J all

no Pots

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: 280-45011-1
Sdg Number: J01892

Method Blank - Batch: 280-185629

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-185629/1-A	Analysis Batch:	280-186383	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	08/07/2013 1421	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				
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	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.254	B	0.22	1.0
Iron	3.8	U	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
Zinc	0.605	B	0.40	1.0

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Lab Control Sample - Batch: 280-185629

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-185629/2-A	Analysis Batch:	280-186383	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	08/07/2013 1423	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	190.6	95	82 - 116	
Antimony	50.0	46.84	94	82 - 110	
Arsenic	100	96.79	97	85 - 110	
Barium	200	199.2	100	87 - 112	
Beryllium	5.00	4.89	98	84 - 114	
Boron	100	93.07	93	80 - 120	
Cadmium	10.0	9.98	100	87 - 110	
Calcium	5000	4799	96	82 - 114	
Chromium	20.0	19.20	96	84 - 114	
Cobalt	50.0	47.55	95	87 - 110	
Copper	25.0	24.83	99	88 - 110	
Iron	100	99.90	100	87 - 120	
Lead	50.0	46.93	94	86 - 110	
Magnesium	5000	4935	99	90 - 110	
Manganese	50.0	48.87	98	88 - 110	
Molybdenum	100	96.92	97	86 - 110	
Nickel	50.0	47.50	95	87 - 110	
Potassium	5000	4919	98	89 - 110	
Selenium	200	185.8	93	83 - 110	
Silicon	1000	91.78	9	10 - 70	N
Silver	5.00	5.19	104	87 - 114	
Sodium	5000	5022	100	90 - 112	
Vanadium	50.0	49.58	99	88 - 110	
Zinc	50.0	50.87	102	76 - 114	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Matrix Spike - Batch: 280-185629

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-45011-1	Analysis Batch:	280-186383	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.04 g
Analysis Date:	08/07/2013 1432	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	8690		198	10900	1120	50 - 200	4
Antimony	0.57		49.4	23.16	46	20 - 200	
Arsenic	4.1		98.8	94.59	92	76 - 111	
Barium	66.6		198	261.3	98	52 - 159	
Beryllium	0.28		4.94	4.83	92	72 - 105	
Boron	1.7	B	98.8	82.63	82	80 - 120	
Cadmium	0.10	B	9.88	9.48	95	40 - 130	
Calcium	8210		4940	13370	104	43 - 165	
Chromium	14.3		19.8	34.69	103	70 - 200	
Cobalt	6.5		49.4	50.25	89	72 - 106	
Copper	15.3		24.7	38.73	95	37 - 187	
Iron	17200		98.8	17930	768	70 - 200	4
Lead	4.3		49.4	47.49	87	70 - 200	
Magnesium	4610		4940	9767	104	64 - 145	
Manganese	277		49.4	353.0	154	40 - 200	4
Molybdenum	0.25	U	98.8	84.16	85	75 - 103	
Nickel	14.0		49.4	58.47	90	61 - 126	
Potassium	1490		4940	6385	99	56 - 172	
Selenium	0.82	U	198	172.5	87	76 - 104	
Silicon	230		988	435.7	21	20 - 200	
Silver	0.15	U	4.94	4.97	101	75 - 141	
Sodium	167		4940	5086	100	78 - 111	
Vanadium	33.3		49.4	83.63	102	50 - 169	
Zinc	37.7		49.4	85.61	97	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Duplicate - Batch: 280-185629

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-45011-1	Analysis Batch:	280-186383	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-185629	Lab File ID:	26a080713.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.14 g
Analysis Date:	08/07/2013 1430	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/06/2013 1330				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	8690		8344	4	40	
Antimony	0.57		0.373	42	40	B M
Arsenic	4.1		4.04	1	30	
Barium	66.6		68.10	2	30	
Beryllium	0.28		0.245	12	30	
Boron	1.7	B	1.29	24	30	B
Cadmium	0.10	B	0.107	4	30	B
Calcium	8210		7915	4	30	
Chromium	14.3		14.11	1	40	
Cobalt	6.5		6.44	0.5	30	
Copper	15.3		15.11	1	30	
Iron	17200		17060	0.7	40	
Lead	4.3		4.32	0.02	40	
Magnesium	4610		4493	3	30	
Manganese	277		276.4	0.2	40	
Molybdenum	0.25	U	0.23	NC	30	U
Nickel	14.0		14.07	0.8	30	
Potassium	1490		1394	6	40	
Selenium	0.82	U	0.78	NC	30	U
Silicon	230		216.9	6	40	N
Silver	0.15	U	0.14	NC	30	U
Sodium	167		162.2	3	30	
Vanadium	33.3		36.39	9	30	
Zinc	37.7		38.34	2	40	

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Method Blank - Batch: 280-186059

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-186059/1-A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	08/06/2013 2243	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-186059

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-186059/2-A	Analysis Batch:	280-186149	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	08/06/2013 2245	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.411	99	87 - 111	

Matrix Spike - Batch: 280-186059

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-45011-1	Analysis Batch:	280-186149	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.56 g
Analysis Date:	08/06/2013 2257	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0054	B	0.459	0.451	97	87 - 111	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45011-1
Sdg Number: J01892

Duplicate - Batch: 280-186059

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-45011-1	Analysis Batch:	280-186149	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-186059	Lab File ID:	130806taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.58 g
Analysis Date:	08/06/2013 2255	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/06/2013 1820				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0054	B	0.0059	NC	20	U