

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 9/24/13
INITIAL/DATE

COMMENTS:

SDG J01921

SAF-RC-238

Sample Location: 100-K-64

Date: 23 September 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-64
Subject: Inorganics - Data Package No. J01921-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01921 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
J1RP04	8/15/13	Soil	C	See note 1
J1RP05	8/14/13	Soil	C	See note 1
J1RP06	8/15/13	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 (45%) and silicon (14%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (1%) 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

No field duplicates were submitted for analysis.

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. J01921 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 (45%) and silicon (14%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (1%) 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: J01921	REVIEWER: ELR	Project: 100-K-64	PAGE <u>1</u> OF <u>1</u>
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

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-45712-1
Sdg Number: J01921

Client Sample ID: J1RP04

Lab Sample ID: 280-45712-2
Client Matrix: Solid

% Moisture: 1.8

Date Sampled: 08/15/2013 0705
Date Received: 08/20/2013 0900

6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-188536	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-188133	Lab File ID: N/A
Dilution: 1.0		Initial Weight/Volume: 1.04 g
Analysis Date: 08/22/2013 1835		Final Weight/Volume: 100 mL
Prep Date: 08/22/2013 0700		

W 9/22/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7160	X	1.5	4.9
Antimony		0.37	U J	0.37	0.59
Arsenic		7.5		0.65	0.98
Barium		69.9	X	0.074	0.49
Beryllium		0.24		0.032	0.20
Boron		0.96	U	0.96	2.0
Cadmium		0.56		0.040	0.20
Calcium		5200	X	13.8	48.9
Chromium		17.8	X	0.057	0.20
Cobalt		5.5	X	0.098	0.98
Copper		17.4		0.21	0.98
Iron		15000	X	3.7	4.9
Lead		26.7		0.26	0.49
Magnesium		4540	X	3.6	19.6
Manganese		230	X	0.098	0.98
Molybdenum		0.42	B	0.25	2.0
Nickel		15.1	X	0.12	3.9
Potassium		906		40.1	294
Selenium		0.84	U J	0.84	0.98
Silicon		235	N J	5.5	9.8
Silver		0.16	U	0.16	0.20
Sodium		154		57.7	117
Vanadium		29.7		0.092	2.0
Zinc		135	X	0.39	0.98

7471A Mercury (CVAA)

Analysis Method: 7471A	Analysis Batch: 280-188829	Instrument ID: MT_033
Prep Method: 7471A	Prep Batch: 280-188530	Lab File ID: 130823aa.txt
Dilution: 1.0		Initial Weight/Volume: .59 g
Analysis Date: 08/23/2013 1840		Final Weight/Volume: 50 mL
Prep Date: 08/23/2013 1230		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0065	B	0.0057	0.018

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-45712-1

Sdg Number: J01921

Client Sample ID: J1RP05

Lab Sample ID: 280-45712-1

Date Sampled: 08/14/2013 0830

Client Matrix: Solid

% Moisture: 4.3

Date Received: 08/20/2013 0900

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-188536	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-188133	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.14 g
Analysis Date:	08/22/2013 1825			Final Weight/Volume:	100 mL
Prep Date:	08/22/2013 0700				

79/22/13

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4780	X	1.4	4.6
Antimony		0.35	U J	0.35	0.55
Arsenic		2.2		0.61	0.92
Barium		57.6	X	0.070	0.46
Beryllium		0.20		0.030	0.18
Boron		0.90	U	0.90	1.8
Cadmium		0.39		0.038	0.18
Calcium		4070	X	12.9	45.8
Chromium		7.4	X	0.053	0.18
Cobalt		6.9	X	0.092	0.92
Copper		14.7		0.20	0.92
Iron		18400	X	3.5	4.6
Lead		6.4		0.25	0.46
Magnesium		3630	X	3.4	18.3
Manganese		255	X	0.092	0.92
Molybdenum		0.38	B	0.24	1.8
Nickel		10.5	X	0.11	3.7
Potassium		995		37.6	275
Selenium		0.79	U	0.79	0.92
Silicon		355	N J	5.2	9.2
Silver		0.15	U	0.15	0.18
Sodium		171		54.1	110
Vanadium		44.6		0.086	1.8
Zinc		51.9	X	0.36	0.92

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-188829	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-188530	Lab File ID:	130823aa.txt
Dilution:	1.0			Initial Weight/Volume:	.56 g
Analysis Date:	08/23/2013 1833			Final Weight/Volume:	50 mL
Prep Date:	08/23/2013 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.014	B	0.0062	0.019

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-45712-1
Sdg Number: J01921

Client Sample ID: J1RP06

Lab Sample ID: 280-45712-3
Client Matrix: Solid

% Moisture: 3.8

Date Sampled: 08/15/2013 0715
Date Received: 08/20/2013 0900

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-188536 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-188133 Lab File ID: N/A
Dilution: 1.0
Analysis Date: 08/22/2013 1837 *W 9/22/13* Initial Weight/Volume: 1.07 g
Prep Date: 08/22/2013 0700 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7830	X	1.5	4.9
Antimony		0.37	U J	0.37	0.58
Arsenic		5.5		0.64	0.97
Barium		75.9	X	0.074	0.49
Beryllium		0.26		0.032	0.19
Boron		1.3	B	0.95	1.9
Cadmium		0.47		0.040	0.19
Calcium		4490	X	13.7	48.6
Chromium		17.0	X	0.056	0.19
Cobalt		5.9	X	0.097	0.97
Copper		16.8		0.21	0.97
Iron		15600	X	3.7	4.9
Lead		16.7		0.26	0.49
Magnesium		4950	X	3.6	19.4
Manganese		261	X	0.097	0.97
Molybdenum		0.25	U	0.25	1.9
Nickel		15.7	X	0.12	3.9
Potassium		1820		39.8	291
Selenium		0.84	U	0.84	0.97
Silicon		338	N J	5.5	9.7
Silver		0.16	U	0.16	0.19
Sodium		121		57.3	117
Vanadium		31.5		0.091	1.9
Zinc		97.0	X	0.39	0.97

7471A Mercury (CVAA)

Analysis Method: 7471A Analysis Batch: 280-188829 Instrument ID: MT_033
Prep Method: 7471A Prep Batch: 280-188530 Lab File ID: 130823aa.txt
Dilution: 1.0
Analysis Date: 08/23/2013 1842 Initial Weight/Volume: .62 g
Prep Date: 08/23/2013 1230 Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.011	B	0.0056	0.017

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-45712-1

SDG #: J01921

SAF#: RC-238

Date SDG Closed: August 20, 2013

Data Deliverable: 15 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1RP05	280-45712-1	6010/7471	6010B/7471A
J1RP04	280-45712-2	6010/7471	6010B/7471A
J1RP06	280-45712-3	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 8/20/2013 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6° C.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-188133 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-188133 and in the Matrix Spike performed on sample J1RP05 in batch 280-188133. 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 J1RP05; therefore, control limits are not applicable.

No other anomalies were encountered.

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-238-001	Page 1 of 1
Collector <i>WCH-EE-011</i> <i>WHITE, EC B. Moeller</i>	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-64- Statistical Samples (64-1 thru 64-12)	SAF No. RC-238					
Ice Chest No. <i>WCH-11-059</i>	Field Logbook No. EL-1668	COA DESKSH6520	Method of Shipment Commercial Carrier - <i>fed EX</i>				
Shipped To TestAmerica - Denver	Offsite Property No. <i>A120969</i>	Bill of Lading/Air Bill No. <i>See OSPC</i>					
POSSIBLE SAMPLE HAZARDS/REMARKS <i>NA</i>		Preservation Cool 4C					
Special Handling and/or Storage <i>All Test America Cr-VI analyses must be processed at the Richland facility</i>		Type of Container G/P					
		No. of Container(s) 1					
		Volume 250mL					
SAMPLE ANALYSIS		See item (1) in Special Instructions <i>RCF</i>					
Page <i>1</i>	Sample No. <i>112P05</i>	Matrix SOIL	Sample Date <i>8.14.13</i>	Sample Time <i>0830</i>	<i>X</i>	<i>35997</i>	<i>64-4A</i>
<i>of</i>		SOIL					
<i>28</i>		SOIL					
		SOIL					
		SOIL					
CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS			
Relinquished By/Removed From <i>Booker Mader</i>	Date/Time <i>8/14/13 1420</i>	Received By/Stored In <i>Jo Jones</i>	Date/Time <i>8.14.13 1420</i>	All Test America CR-VI analyses must be processed at the Richland Facility. The 500 ml GEA samples will be sent to RCF for shipping screen then forwarded 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)			
Relinquished By/Removed From <i>Jo Jones</i>	Date/Time <i>8.14.13 1425</i>	Received By/Stored In <i>Chad Bingham</i>	Date/Time <i>8.14.13 1425</i>				
Relinquished By/Removed From <i>Chad Bingham</i>	Date/Time <i>8.14.13 1440</i>	Received By/Stored In <i>1060 Battelle, fridge 1A</i>	Date/Time <i>8.14.13 1440</i>				
Relinquished By/Removed From <i>1060 Battelle, fridge 1A</i>	Date/Time <i>8.19.13 1055</i>	Received By/Stored In <i>Chad Bingham</i>	Date/Time <i>8.19.13 1055</i>				
Relinquished By/Removed From <i>Chad Bingham</i>	Date/Time <i>8.19.13 1100</i>	Received By/Stored In <i>fed EX</i>	Date/Time <i>8.19.13 1100</i>				
Relinquished By/Removed From <i>Chad Bingham</i>	Date/Time <i>8.19.13</i>	Received By/Stored In <i>Chad Bingham</i>	Date/Time <i>8/20/13 0900</i>				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time	<div style="text-align: center;"> <p><i>506</i></p> <p><i>501921</i></p> </div> <div style="text-align: center;">  </div>			

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Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-238-001	Page 1 of 1
Collector <i>JH B. 8.15.13</i> <i>WHITE EG B. Mueller</i>	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-64- Statistical Samples (64-1 thru 64-12)		SAF No. RC-238			
Ice Chest No. <i>NCH-11-059</i>	Field Logbook No. EL-1668	COA 0ESKSH6520	Method of Shipment Commercial Carrier <i>Fed Ex</i>			
Shipped To TestAmerica - Denver	Offsite Property No. <i>A120969</i>		Bill of Lading/Air Bill No. <i>See OSPC</i>			

POSSIBLE SAMPLE HAZARDS/REMARKS <i>NA</i> Special Handling and/or Storage <i>All Test America Cr-VI analyses must be processed at the Richland facility</i>	Preservation	Cool 4C																		
	Type of Container	G/P																		
	No. of Container(s)	1																		
	Volume	250mL																		

SAMPLE ANALYSIS				See item (1) in Special Instructions																
<i>RCF</i>																				
<i>28</i>	Sample No.	Matrix	Sample Date	Sample Time																
	<i>ILR P04</i>	SOIL	<i>8.15.13</i>	<i>0705</i>	<i>X</i>	<i>35998</i>														
	<i>ILR P06</i>	SOIL	<i>8.15.13</i>	<i>0715</i>	<i>X</i>	<i>35999</i>														
		SOIL																		
		SOIL																		
		SOIL																		

CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS		
Relinquished By/Removed From <i>Joan Kessner</i>	Date/Time <i>8/15/13 1020</i>	Received By/Stored In <i>Joan Kessner</i>	Date/Time <i>8.15.13 1020</i>	All Test America CR-VI analyses must be processed at the Richland Facility. The 500 ml GEA samples will be sent to RCF for shipping screen then forwarded 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) <i>8.15.13 CMB</i>				
Relinquished By/Removed From <i>Joan Kessner</i>	Date/Time <i>8.15.13 1210</i>	Received By/Stored In <i>Christina Bingham</i>	Date/Time <i>8.15.13 1210</i>					
Relinquished By/Removed From <i>Christina Bingham</i>	Date/Time <i>8.15.13 1230</i>	Received By/Stored In <i>1060 Battelle</i>	Date/Time <i>8.15.13 1230</i>					
Relinquished By/Removed From <i>1060 Battelle, Endeavour</i>	Date/Time <i>8.19.13 1055</i>	Received By/Stored In <i>Christina Bingham</i>	Date/Time <i>8.19.13 1055</i>					
Relinquished By/Removed From <i>Christina Bingham</i>	Date/Time <i>8.19.13 1100</i>	Received By/Stored In <i>Fed Ex</i>	Date/Time <i>8.19.13 1100</i>					
Relinquished By/Removed From <i>Christina Bingham</i>	Date/Time <i>8.19.13</i>	Received By/Stored In <i>Fed Ex</i>	Date/Time <i>8.19.13</i>					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time					



SBG
501721

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Appendix 5
Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-K-64		DATA PACKAGE: J01921		
VALIDATOR:	ELR	LAB: TAL	DATE: 9/22/13		
			SDG: J01921		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
JIRPO4 JIRPOS JIRPO6					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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 (14) - J cell
MS - antimony (45%) Silicon (14%) - J cell

no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate RPD values acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Duplicate results acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
MS/MSD standards NIST traceable? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
MS/MSD standards expired? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Field duplicate RPD values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Field split RPD values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> N/A
ICP serial dilution %D values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
ICP post digestion spike required?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
ICP post digestion spike values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Standards traceable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Standards expired?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

8. HOLDING TIMES (all levels)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45712-1

Sdg Number: J01921

Method Blank - Batch: 280-188133

Method: 6010B

Preparation: 3050B

Lab Sample ID: MB 280-188133/1-A
 Client Matrix: Solid
 Dilution: 1.0
 Analysis Date: 08/22/2013 1821
 Prep Date: 08/22/2013 0700
 Leach Date: N/A

Analysis Batch: 280-188536
 Prep Batch: 280-188133
 Leach Batch: N/A
 Units: mg/Kg

Instrument ID: MT_025
 Lab File ID: N/A
 Initial Weight/Volume: 1 g
 Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Antimony	0.38	U	0.38	0.60
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	0.22	U	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	0.40	U	0.40	1.0

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45712-1
Sdg Number: J01921

Lab Control Sample - Batch: 280-188133

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 280-188133/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 08/22/2013 1823
Prep Date: 08/22/2013 0700
Leach Date: N/A

Analysis Batch: 280-188536
Prep Batch: 280-188133
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: N/A
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	195.2	98	82 - 116	
Antimony	50.0	47.42	95	82 - 110	
Arsenic	100	98.80	99	85 - 110	
Barium	200	196.6	98	87 - 112	
Beryllium	5.00	4.92	98	84 - 114	
Boron	100	98.62	99	80 - 120	
Cadmium	10.0	10.55	106	87 - 110	
Calcium	5000	4939	99	82 - 114	
Chromium	20.0	19.86	99	84 - 114	
Cobalt	50.0	49.67	99	87 - 110	
Copper	25.0	25.62	102	88 - 110	
Iron	100	101.3	101	87 - 120	
Lead	50.0	49.61	99	86 - 110	
Magnesium	5000	4941	99	90 - 110	
Manganese	50.0	50.05	100	88 - 110	
Molybdenum	100	99.09	99	86 - 110	
Nickel	50.0	49.45	99	87 - 110	
Potassium	5000	5051	101	89 - 110	
Selenium	200	198.9	99	83 - 110	
Silicon	1000	13.59	1	10 - 70	N
Silver	5.00	4.96	99	87 - 114	
Sodium	5000	5016	100	90 - 112	
Vanadium	50.0	50.50	101	88 - 110	
Zinc	50.0	49.56	99	76 - 114	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45712-1
Sdg Number: J01921

Matrix Spike - Batch: 280-188133

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-45712-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 08/22/2013 1832
Prep Date: 08/22/2013 0700
Leach Date: N/A

Analysis Batch: 280-188536
Prep Batch: 280-188133
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: N/A
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	4780	197	6101	671	50 - 200	4
Antimony	0.35 U	49.3	22.02	45	20 - 200	
Arsenic	2.2	98.6	84.75	84	76 - 111	
Barium	57.6	197	233.6	89	52 - 159	
Beryllium	0.20	4.93	4.52	88	72 - 105	
Boron	0.90 U	98.6	85.18	86	80 - 120	
Cadmium	0.39	9.86	9.60	93	40 - 130	
Calcium	4070	4930	9433	109	43 - 165	
Chromium	7.4	19.7	27.07	100	70 - 200	
Cobalt	6.9	49.3	49.85	87	72 - 106	
Copper	14.7	24.7	37.07	91	37 - 187	
Iron	18400	98.6	19550	1159	70 - 200	4
Lead	6.4	49.3	48.14	85	70 - 200	
Magnesium	3630	4930	9076	110	64 - 145	
Manganese	255	49.3	346.6	185	40 - 200	4
Molybdenum	0.38 B	98.6	84.17	85	75 - 103	
Nickel	10.5	49.3	53.61	88	61 - 126	
Potassium	995	4930	5733	96	56 - 172	
Selenium	0.79 U	197	168.1	85	76 - 104	
Silicon	355	986	496.6	14	20 - 200	N
Silver	0.15 U	4.93	4.27	87	75 - 141	
Sodium	171	4930	4692	92	78 - 111	
Vanadium	44.6	49.3	93.50	99	50 - 169	
Zinc	51.9	49.3	94.18	86	70 - 200	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45712-1
Sdg Number: J01921

Duplicate - Batch: 280-188133

**Method: 6010B
Preparation: 3050B**

Lab Sample ID: 280-45712-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 08/22/2013 1830
Prep Date: 08/22/2013 0700
Leach Date: N/A

Analysis Batch: 280-188536
Prep Batch: 280-188133
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: N/A
Initial Weight/Volume: 1.06 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	4780	4431	8	40	
Antimony	0.35 U	0.37	NC	40	U
Arsenic	2.2	1.89	16	30	
Barium	57.6	50.46	13	30	
Beryllium	0.20	0.184	7	30	B
Boron	0.90 U	0.97	NC	30	U
Cadmium	0.39	0.380	1	30	
Calcium	4070	3776	7	30	
Chromium	7.4	5.66	26	40	
Cobalt	6.9	6.18	11	30	
Copper	14.7	15.22	3	30	
Iron	18400	17350	6	40	
Lead	6.4	5.15	21	40	
Magnesium	3630	3490	4	30	
Manganese	255	233.4	9	40	
Molybdenum	0.38 B	0.26	NC	30	U
Nickel	10.5	8.04	26	30	
Potassium	995	919.6	8	40	
Selenium	0.79 U	0.85	NC	30	U
Silicon	355	321.5	10	40	N
Silver	0.15 U	0.16	NC	30	U
Sodium	171	185.4	8	30	
Vanadium	44.6	42.80	4	30	
Zinc	51.9	48.23	7	40	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45712-1
Sdg Number: J01921

Method Blank - Batch: 280-188530

**Method: 7471A
Preparation: 7471A**

Lab Sample ID: MB 280-188530/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 08/23/2013 1824
Prep Date: 08/23/2013 1230
Leach Date: N/A

Analysis Batch: 280-188829
Prep Batch: 280-188530
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: 130823aa.txt
Initial Weight/Volume: .6 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-188530

**Method: 7471A
Preparation: 7471A**

Lab Sample ID: LCS 280-188530/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 08/23/2013 1826
Prep Date: 08/23/2013 1230
Leach Date: N/A

Analysis Batch: 280-188829
Prep Batch: 280-188530
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: 130823aa.txt
Initial Weight/Volume: .6 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.446	107	87 - 111	

Matrix Spike - Batch: 280-188530

**Method: 7471A
Preparation: 7471A**

Lab Sample ID: 280-45712-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 08/23/2013 1837
Prep Date: 08/23/2013 1230
Leach Date: N/A

Analysis Batch: 280-188829
Prep Batch: 280-188530
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: 130823aa.txt
Initial Weight/Volume: .63 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.014 B	0.415	0.452	106	87 - 111	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-45712-1
Sdg Number: J01921

Duplicate - Batch: 280-188530

Method: 7471A
Preparation: 7471A

Lab Sample ID: 280-45712-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 08/23/2013 1835
Prep Date: 08/23/2013 1230
Leach Date: N/A

Analysis Batch: 280-188829
Prep Batch: 280-188530
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_033
Lab File ID: 130823aa.txt
Initial Weight/Volume: .54 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	0.014 B	0.0146	6	20	B

Date: 23 September 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-64
Subject: Radiochemistry - Data Package No. J01921-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01921 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
J1RP04	8/15/13	Soil	C	See note 1
J1RP05	8/14/13	Soil	C	See note 1
J1RP06	8/15/13	Soil	C	See note 1

1-- Gamma spectroscopy, carbon-14, alpha spectroscopy, total strontium, tritium, & nickel-63.

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

No field duplicates were submitted for analysis.

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. Two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

Completeness

Data package No. J01921 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.

Two 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: J01921	REVIEWER: ELR	Project: 100-K-64	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

Date: 10-Sep-13

TestAmerica Inc TARL

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

Report No. : 56861

11/22/13

SDG No: J01921

Client Id	Batch	Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3232068 C14_LSC										
J1RP04										
	M1NNA1AH	C-14		1.16E-02 +/- 2.1E-01	UJ	pCi/g	100%	4.46E-01	5.00E+01	
J1RP04 DUP										
	M1NNA1AK	C-14		2.29E-01 +/- 2.2E-01	U	pCi/g	100%	4.49E-01	5.00E+01	180.7
J1RP05										
	M1NM91AH	C-14		1.05E-01 +/- 2.1E-01	UJ	pCi/g	100%	4.50E-01	5.00E+01	
J1RP06										
	M1NNC1AH	C-14		1.79E-01 +/- 2.1E-01	UJ	pCi/g	100%	4.47E-01	5.00E+01	
3232071 PUIISO_PLATE_AEA										
J1RP04										
	M1NNA1AE	Pu-238		-1.90E-03 +/- 3.2E-02	UJ	pCi/g	100%	6.85E-02	1.00E+00	
		PU239/40		1.46E-02 +/- 3.2E-02	U	pCi/g	100%	6.38E-02	1.00E+00	
J1RP05										
	M1NM91AE	Pu-238		-2.23E-03 +/- 2.8E-02	UJ	pCi/g	92%	6.38E-02	1.00E+00	
		PU239/40		-1.12E-03 +/- 2.8E-02	U	pCi/g	92%	5.81E-02	1.00E+00	
J1RP05 DUP										
	M1NM91AK	Pu-238		-2.58E-03 +/- 3.2E-02	U	pCi/g	95%	7.38E-02	1.00E+00	-14.6
		PU239/40		-1.94E-03 +/- 3.2E-02	U	pCi/g	95%	6.97E-02	1.00E+00	-53.8
J1RP06										
	M1NNC1AE	Pu-238		-3.41E-03 +/- 2.9E-02	UJ	pCi/g	95%	7.09E-02	1.00E+00	
		PU239/40		2.84E-03 +/- 2.9E-02	U	pCi/g	95%	9.76E-02	1.00E+00	
3232066 GAMMA_GS										
J1RP04										
	M1NNA1AG	CO-60		4.55E-03 +/- 1.8E-02	U	pCi/g		3.20E-02	5.00E-02	
		CS-137		-1.71E-02 +/- 1.7E-02	U	pCi/g		2.67E-02	1.00E-01	
		EU-152		-1.45E-03 +/- 3.4E-02	U	pCi/g		5.81E-02	1.00E-01	
		EU-154		-2.47E-02 +/- 5.6E-02	U	pCi/g		9.51E-02	1.00E-01	
		EU-155		6.49E-02 +/- 3.0E-02	U	pCi/g		5.44E-02	1.00E-01	
		K-40		1.77E+01 +/- 2.1E+00		pCi/g		2.57E-01		
J1RP04 DUP										
	M1NNA1AJ	CO-60		-9.69E-03 +/- 1.6E-02	U	pCi/g		2.71E-02	5.00E-02	-553.6
		CS-137		-7.80E-03 +/- 1.5E-02	U	pCi/g		2.55E-02	1.00E-01	-74.8
		EU-152		-1.12E-02 +/- 3.5E-02	U	pCi/g		5.86E-02	1.00E-01	-153.9
		EU-154		2.23E-02 +/- 5.7E-02	U	pCi/g		1.01E-01	1.00E-01	-3961.5
		EU-155		5.21E-02 +/- 3.1E-02	U	pCi/g		5.44E-02	1.00E-01	21.9
		K-40		1.76E+01 +/- 2.1E+00		pCi/g		2.01E-01		0.9
J1RP05										
	M1NM91AG	CO-60		7.75E-03 +/- 1.3E-02	U	pCi/g		2.51E-02	5.00E-02	

TestAmerica Inc RPD - Relative Percent Difference.
 rptSTLRchSaSummary2 V5.2.24
 A2002 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: 10-Sep-13

Report No. : 56881

✓ 9/22/13

SDG No: J01921

Batch	Client Id Work Order	Parameter	Result ± Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3232068 GAMMA_GS									
J1RP05									
	M1NM91AG	CS-137	6.56E-02 ± 1.9E-02		pCi/g		2.07E-02	1.00E-01	
		EU-152	6.77E-02 ± 4.4E-02	U	pCi/g		5.44E-02	1.00E-01	
		EU-154	2.73E-02 ± 4.5E-02	U	pCi/g		8.36E-02	1.00E-01	
		EU-155	1.92E-02 ± 2.6E-02	U	pCi/g		4.38E-02	1.00E-01	
		K-40	1.16E+01 ± 1.4E+00		pCi/g		1.81E-01		
J1RP06									
	M1NNC1AG	CO-60	1.21E-02 ± 2.7E-02	U	pCi/g		5.00E-02	5.00E-02	
		CS-137	7.26E-02 ± 3.6E-02		pCi/g		5.02E-02	1.00E-01	
		EU-152	4.86E-03 ± 7.2E-02	U	pCi/g		1.21E-01	1.00E-01	
		EU-154	7.68E-03 ± 8.5E-02	U	pCi/g		1.53E-01	1.00E-01	
		EU-155	9.63E-02 ± 7.0E-02	U	pCi/g		1.20E-01	1.00E-01	
		K-40	1.95E+01 ± 2.6E+00		pCi/g		4.51E-01		
3248040 SRTOT_SEP_PRECIP_GPC									
J1RP04									
	M1NNA2AC	STRONTIUM	3.79E-02 ± 7.6E-02	U	pCi/g	86%	1.69E-01		
J1RP05									
	M1NM92AC	STRONTIUM	9.32E-02 ± 8.7E-02	U	pCi/g	90%	1.76E-01		
J1RP06									
	M1NNC2AC	STRONTIUM	1.88E-02 ± 7.7E-02	U	pCi/g	84%	1.78E-01		
J1RP06 DUP									
	M1NNC2AJ	STRONTIUM	4.95E-02 ± 8.7E-02	U	pCi/g	84%	1.93E-01		88.9
3232069 906.0_H3_LSC									
J1RP04									
	M1NNA1AF	H-3	5.29E-03 ± 2.6E-02	U	pCi/g	100%	6.02E-02	4.00E+02	
J1RP05									
	M1NM91AF	H-3	-1.13E-02 ± 3.8E-02	U	pCi/g	100%	8.68E-02	4.00E+02	
J1RP05 DUP									
	M1NM91AJ	H-3	2.88E-02 ± 5.6E-02	U	pCi/g	100%	1.23E-01	4.00E+02	459.2
J1RP06									
	M1NNC1AF	H-3	-1.46E-02 ± 3.9E-02	U	pCi/g	100%	9.29E-02	4.00E+02	
3232070 NI63_LSC									
J1RP04									
	M1NNA1AD	NI-63	5.23E+00 ± 3.7E+00	U	pCi/g	84%	7.37E+00	3.00E+01	
J1RP04 DUP									
	M1NNA1AL	NI-63	4.37E+00 ± 3.5E+00	U	pCi/g	91%	6.69E+00	3.00E+01	17.9
J1RP05									
	M1NM91AD	NI-63	8.27E+00 ± 3.8E+00		pCi/g	85%	7.02E+00	3.00E+01	

TestAmerica Inc RPD - Relative Percent Difference.
 rptSTLRchSaSummary2 V5.2.24 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or
 A2002 not identified by gamma scan software.

Sample Results Summary

Date: 10-Sep-13

TestAmerica Inc TARL

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

Report No. : 56861

SDG No: J01921

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3232070 NI63_LSC									
J1RP06									
	M1NNC1AD	NI-63	4.22E+00 +/- 3.6E+00	U	pCi/g	83%	7.48E+00	3.00E+01	
3232096 7198_CR6									
J1RP04									
	M1NNA1AA	HEXCHROME	1.55E-01 +/- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
J1RP05									
	M1NM91AA	HEXCHROME	4.55E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M1NM91AM	HEXCHROME	8.75E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	63.2
J1RP06									
	M1NNC1AA	HEXCHROME	3.44E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
No. of Results: 52									

✓ 9/22/13

✓ 9/22/13

TestAmerica Inc
rptSTLRchSaSum
mary2 V5.2.24
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

Certificate of Analysis

Washington Hanford Closure
 2620 Fermi Avenue
 Richland, WA 99354

September 10, 2013

Attention: Joan Kessner

SAF Number : RC-238
 Date SDG Closed : August 19, 2013
 Number of Samples : Three (3)
 Sample Type : Soil
 SDG Number : J01921
 Data Deliverable : 15- Day / Summary

CASE NARRATIVE

I. Introduction

On August 19, 2013, three soil samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID:

<u>WCH ID#</u>	<u>TARL ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
JIRP05	M1NM9	SOIL	08/19/13
JIRP04	M1NNA	SOIL	08/19/13
JIRP06	M1NNC	SOIL	08/19/13

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 (J1RP05) results are within contractual requirements.

Gas Proportional Counting

Strontium-90 by method RL-GPC-010:

The original batched failed due to a high LCS recovery. The entire batch was re-analyzed. Except as noted, the LCS, batch blank, samples and sample duplicate (J1RP06) results are within contractual requirements.

Gamma Spectroscopy

Gamma Spec by method RL-GAM-001:

There was insufficient volume for a duplicate. Sample J1RP04 was recounted on a different detector for the duplicate (J1RP04 DUP). Except as noted, the LCS, batch blank, samples and sample duplicate (J1RP04) results are within contractual requirements.

Liquid Scintillation Counting

Tritium by method RL-LSC-005:

The LCS, batch blank, samples and sample duplicate (J1RP05) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:

The LCS, batch blank, samples and sample duplicate (J1RP04) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:

The LCS, batch blank, samples and sample duplicate (J1RP04) results are within contractual requirements.

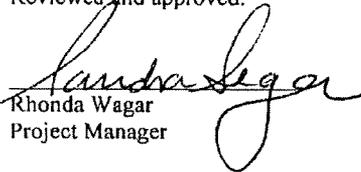
Chemical Analysis

Hexavalent Chromium by EPA method 7196A

The matrix spike recovered low at 63%. The post digestive matrix spike recovered at 75% and the insoluble matrix spike recovered at 86%. This implies a reducing capacity in the sample, but not enough to exhaust the more copious insoluble matrix spike. The sample and sample duplicate (JIRP05) agreement is outside the acceptance limits. This maybe attributed to the inhomogeneity of the matrix. Except as noted; the LCS, batch blank, samples, sample duplicate (JIRP05) and sample matrix spike (JIRP05) 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:

for

Rhonda Wagar
Project Manager

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-238-001	Page 1 of 2							
Collector: <u>8.14.13</u> <u>WHITE EC B. Moeller</u>	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-64 - Statistical Samples (64-1 thru 64-12)	SAF No. RC-238												
Ice Chest No. <u>NA</u>	Field Logbook No. EL-1668	COA DESKSH6520	Method of Shipment Local Delivery											
Shipped To TestAmerica - Richland	Offsite Property No. <u>NA</u>	Bill of Lading/Air Bill No. <u>NA</u>												
POSSIBLE SAMPLE HAZARDS/REMARKS <u>NA</u>				Preservation	Cool 4C	None	None	None						
Special Handling and/or Storage All Test America Cr-VI analyses must be processed at the Richland facility				Type of Container	GP	GP	GP	GP						
<u>J3H190414</u>				No. of Container(s)	1	1	1	1						
<u>301921</u> <u>Due 9.3.13</u>				Volume	250mL	500mL	250mL	250mL						
SAMPLE ANALYSIS				Chromium Hex - 7198 (Hexavalent Chromium)	See Item (2) in Special Instructions	Isclopic Plutonium; Nickel-63; Strontium-89,90 - Total Sr	Carbon-14; Tritium - H3							
Sample No.	Matrix	Sample Date	Sample Time											
<u>J1RPOS</u>	SOIL	<u>8.14.13</u>	<u>0830</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>35997</u>	<u>64-4A</u>	<u>MINMA</u>				
	SOIL													
	SOIL													
	SOIL													
	SOIL													
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS						
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	All Test America CR-VI analyses must be processed at the Richland Facility. The 500 ml GEA samples will be sent to RCF for shipping screen then forwarded on to the rad lab.										
<u>[Signature]</u>	<u>8/14/13 1420</u>	<u>[Signature]</u>	<u>8.14.13 1420</u>	(2) Gamma Spec (Client List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)										
<u>[Signature]</u>	<u>8.14.13 1425</u>	<u>[Signature]</u>	<u>8.14.13 1425</u>	Barcode:  J3H190416										
<u>[Signature]</u>	<u>8.14.13 1440</u>	<u>[Signature]</u>	<u>8.14.13 1440</u>	REVIEWED BY <u>[Signature]</u>										
<u>[Signature]</u>	<u>8.19.13 1040</u>	<u>[Signature]</u>	<u>8.19.13 1040</u>	DATE <u>8.19.13</u>										
<u>[Signature]</u>	<u>8.19.13 1455</u>	<u>[Signature]</u>	<u>8.19.13 1455</u>											
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time											
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time											
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time											

TestAmerica

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Appendix 5
Data Validation Supporting Documentation

APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-K-64		DATA PACKAGE:	J01921	
VALIDATOR:	ELR	LAB:	TAL	DATE:	9/21/13
		SDG:	J01921		
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input checked="" type="checkbox"/> Tritium	XC14	XAL-63	
SAMPLES/MATRIX					
JIRPO4 JIRPO5 JIRPO6					
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 PO-238 LCS - J all

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 - J all

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

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

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

Comments: _____

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 Field QC

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: 2 am

Appendix 6

Additional Documentation Requested by Client

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

Date: 10-Sep-13

Report No. : 56861

SDG No.: J01921

Batch	Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_LSC									
3232068	BLANK QC,								
	M1NXA1AA	C-14	-1.01E-01 +/- 2.0E-01	U	pCi/g	100%			4.48E-01
3232068	LCS,								
	M1NXA1AC	C-14	6.81E+00 +/- 5.7E-01		pCi/g	100%	94%	-0.1	4.41E-01
PUISO_PLATE_AEA									
3232071	BLANK QC,								
	M1NXE1AA	Pu-238	-1.31E-03 +/- 3.3E-02	U	pCi/g	100%			6.80E-02
		PU239/40	-2.63E-03 +/- 3.3E-02	U	pCi/g	100%			7.50E-02
3232071	LCS,								
	M1NXE1AC	PU239/40	7.15E+00 +/- 1.4E+00		pCi/g	100%	107%	0.1	6.63E-02
GAMMA_GS									
3232068	BLANK QC,								
	M1NW81AA	CO-60	6.12E-03 +/- 1.1E-02	U	pCi/g				2.11E-02
		CS-137	-2.55E-03 +/- 1.1E-02	U	pCi/g				1.90E-02
		EU-152	3.63E-03 +/- 2.9E-02	U	pCi/g				5.01E-02
		EU-154	9.41E-03 +/- 3.3E-02	U	pCi/g				6.15E-02
		EU-155	7.64E-03 +/- 2.7E-02	U	pCi/g				4.78E-02
		K-40	-6.36E-01 +/- 3.4E-01	U	pCi/g				6.93E-01
3232066	LCS,								
	M1NW81AC	CS-137	9.80E-01 +/- 1.4E-01		pCi/g		95%	0.0	2.42E-02
		RA-226	9.30E-01 +/- 1.4E-01		pCi/g		82%	-0.2	4.31E-02
		RA-228	7.02E-01 +/- 1.3E-01		pCi/g		100%	0.0	7.94E-02
		U-238	9.33E-01 +/- 1.3E-01		pCi/g		78%	-0.2	4.40E-02
SRTOT_SEP_PRECIP_GPC									
3248040	BLANK QC,								
	M1T5W1AA	STRONTIUM	-2.65E-02 +/- 5.9E-02	U	pCi/g	100%			1.48E-01
3248040	LCS,								
	M1T5W1AC	STRONTIUM	2.12E+00 +/- 5.3E-01		pCi/g	86%	93%	-0.1	1.75E-01
906.0_H3_LSC									
3232069	BLANK QC,								
	M1NXC1AA	H-3	-1.90E-02 +/- 4.0E-02	U	pCi/g	100%			9.67E-02
3232069	LCS,								
	M1NXC1AC	H-3	4.18E-01 +/- 5.9E-02		pCi/g	100%	92%	-0.1	8.73E-02
NI63_LSC									
3232070	BLANK QC,								
	M1NXD1AA	NI-63	1.05E+00 +/- 3.2E+00	U	pCi/g	90%			6.62E+00
3232070	LCS,								
	M1NXD1AC	NI-63	2.64E+02 +/- 2.2E+01		pCi/g	78%	93%	-0.1	7.43E+00
7196_CR6									
3232096	MATRIX SPIKE, J1RP05								
	M1NM91AL	HEXCHROME	1.95E+01 +/- 0.0E+00		mg/kg	N/A	63%	-0.4	1.55E-01
3232096	LCS,								

TestAmerica Inc Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRchQcSummary V5.2.24 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.
 A2002

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

Date: 10-Sep-13

Report No.: 56861

SDG No.: J01921

Batch	Work Order	Parameter	Result ± Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
	M1N361AC	HEXCHROME	1.83E+01 ± 0.0E+00		mg/kg	N/A	98%	0.0	1.55E-01
	3232096 BLANK QC,								
	M1N361AA	HEXCHROME	1.55E-01 ± 0.0E+00	U	mg/kg	N/A			1.55E-01
No. of Results: 24									

TestAmerica Inc Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRchQcSummary V5.2.24 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or
 A2002 not identified by gamma scan software.

Date: 23 September 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-64
Subject: Wet Chemistry - Data Package No. J01921-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. J01921 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
J1RP04	8/15/13	Soil	C	See note 1
J1RP05	8/14/13	Soil	C	See note 1
J1RP06	8/15/13	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.

Due to a matrix spike recovery outside QC limits (63%), all chromium VI 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

No field duplicates were submitted for analysis.

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 J01921 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 a matrix spike recovery outside QC limits (63%), all chromium VI 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*.

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: J01921	REVIEWER: ELR	Project: 100-K-64	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium VI	J	All	MS recovery

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

Appendix 3
Annotated Laboratory Reports

Sample Results Summary

Date: 10-Sep-13

TestAmerica Inc TARL

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

Report No. : 56861

SDG No: J01921

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3232070	NI63_LSC								
	J1RP06								
	M1NNC1AD	NI-63	4.22E+00 +/- 3.6E+00	U	pCi/g	83%	7.48E+00	3.00E+01	
3232098	7198_CR6								
	J1RP04								
	M1NNA1AA	HEXCHROME	1.55E-01 +/- 0.0E+00	U	J mg/kg	N/A	1.55E-01	1.55E-01	
	J1RP05								
	M1NM91AA	HEXCHROME	4.56E-01 +/- 0.0E+00	J	mg/kg	N/A	1.55E-01	1.55E-01	
	M1NM91AM	HEXCHROME	8.76E-01 +/- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	63.2
	J1RP06								
	M1NNC1AA	HEXCHROME	3.44E-01 +/- 0.0E+00	J	mg/kg	N/A	1.55E-01	1.55E-01	
No. of Results:		52							

9/22/13

TestAmerica Inc rptSTLRchSaSummary2 V5.2.24 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

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

September 10, 2013

Attention: Joan Kessner

SAF Number	:	RC-238
Date SDG Closed	:	August 19, 2013
Number of Samples	:	Three (3)
Sample Type	:	Soil
SDG Number	:	J01921
Data Deliverable	:	15- Day / Summary

CASE NARRATIVE

I. Introduction

On August 19, 2013, three soil samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID:

<u>WCH ID#</u>	<u>TARL ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
JIRP05	MINM9	SOIL	08/19/13
JIRP04	MINNA	SOIL	08/19/13
JIRP06	MINNC	SOIL	08/19/13

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 (J1RP05) results are within contractual requirements.

Gas Proportional Counting

Strontium-90 by method RL-GPC-010:

The original batched failed due to a high LCS recovery. The entire batch was re-analyzed. Except as noted, the LCS, batch blank, samples and sample duplicate (J1RP06) results are within contractual requirements.

Gamma Spectroscopy

Gamma Spec by method RL-GAM-001:

There was insufficient volume for a duplicate. Sample J1RP04 was recounted on a different detector for the duplicate (J1RP04 DUP). Except as noted, the LCS, batch blank, samples and sample duplicate (J1RP04) results are within contractual requirements.

Liquid Scintillation Counting

Tritium by method RL-LSC-005:

The LCS, batch blank, samples and sample duplicate (J1RP05) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:

The LCS, batch blank, samples and sample duplicate (J1RP04) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:

The LCS, batch blank, samples and sample duplicate (J1RP04) results are within contractual requirements.

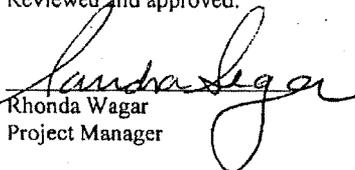
Chemical Analysis

Hexavalent Chromium by EPA method 7196A

The matrix spike recovered low at 63%. The post digestive matrix spike recovered at 75% and the insoluble matrix spike recovered at 86%. This implies a reducing capacity in the sample, but not enough to exhaust the more copious insoluble matrix spike. The sample and sample duplicate (JIRP05) agreement is outside the acceptance limits. This maybe attributed to the inhomogeneity of the matrix. Except as noted; the LCS, batch blank, samples, sample duplicate (JIRP05) and sample matrix spike (JIRP05) 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:

for 
Rhonda Wagar
Project Manager

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-238-001		Page 1 of 2	
Collector <i>at B.H. 13</i> <i>JANITE EC B. Mosler</i>		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8C	
Project Designation 100K Shoreline Characterization		Sampling Location 100-K-64- Statistical Samples (64-1 thru 64-12)		SAF No. RC-238		Data Turnaround 15 Days			
Ice Chest No. <i>NA</i>		Field Logbook No. EL-1868		COA DESKSH6520		Method of Shipment Local Delivery			
Shipped To TestAmerica - Richland		Offsite Property No. <i>NA</i>		Bill of Lading/Air Bill No. <i>NA</i>					
POSSIBLE SAMPLE HAZARDS/REMARKS <i>NA</i>				Preservation	Cool 4C	None	None	None	
Special Handling and/or Storage <i>All Test America Cr-VI analysis must be processed at the Richland facility</i>				Type of Container	GP	GP	GP	GP	
<i>J3H190414</i>				No. of Container(s)	1	1	1	1	
<i>JO1921</i> <i>Due 9.3.13</i>				Volume	250mL	500mL	250mL	250mL	
SAMPLE ANALYSIS				Chromium Hex - 7198 (Hexavalent Chromium)	See item (2) in Special Instructions	Isotopic Plutonium; Nickel-63; Strontium- 89,90 - Total Sr	Carbon-14; Tritium - H3	<i>RCF</i>	
Sample No.	Matrix	Sample Date	Sample Time						
<i>J1R P05</i>	SOIL	<i>8.14.13</i>	<i>0830</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>35997</i>	<i>64-4A MINM9</i>
	SOIL								
	SOIL								
	SOIL								
	SOIL								
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		All Test America CR-VI analyses must be processed at the Richland Facility. The 500 ml GEA samples will be sent to RCF for shipping screen then forwarded on to the rad lab.	
<i>[Signature]</i>		<i>8/14/13 1420</i>		<i>[Signature]</i>		<i>8-14-13 1420</i>			
<i>[Signature]</i>		<i>8-14-13 1425</i>		<i>[Signature]</i>		<i>8-14-13 1425</i>		(2) Gemma Spec (Client List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)	
<i>[Signature]</i>		<i>8-14-13 1440</i>		<i>[Signature]</i>		<i>8-14-13 1440</i>			
<i>[Signature]</i>		<i>8-19-13 1040</i>		<i>[Signature]</i>		<i>8-19-13 1040</i>			
<i>[Signature]</i>		<i>8-19-13 1455</i>		<i>[Signature]</i>		<i>8-19-13 1455</i>			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time			

TestAmerica

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Appendix 5
Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-K-64		DATA PACKAGE: J01921		
VALIDATOR:	ELR	LAB: TAI	DATE: 9/22/13		
			SDG: J01921		
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					
JIRPO4 JIRPOS JIRPOL					
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
Spike standards NIST traceable? (Levels D, E)..... Yes No N/A
Spike standards expired? (Levels D, E)..... Yes No N/A
LCS/BSS samples analyzed?..... Yes No N/A
LCS/BSS results acceptable?..... Yes No N/A
Standards traceable? (Levels D, E)..... Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable?..... Yes No N/A

Comments: MS-6390-Jay

no PATS

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

Date: 10-Sep-13

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 56861

SDG No.: J01921

Batch	Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_LSC									
3232068	BLANK QC,								
	M1NXA1AA	C-14	-1.01E-01 +- 2.0E-01	U	pCi/g	100%			4.48E-01
3232068	LCS,								
	M1NXA1AC	C-14	6.81E+00 +- 5.7E-01		pCi/g	100%	94%	-0.1	4.41E-01
PUISO_PLATE_AEA									
3232071	BLANK QC,								
	M1NXE1AA	Pu-238	-1.31E-03 +- 3.3E-02	U	pCi/g	100%			6.60E-02
		PU239/40	-2.63E-03 +- 3.3E-02	U	pCi/g	100%			7.50E-02
3232071	LCS,								
	M1NXE1AC	PU239/40	7.15E+00 +- 1.4E+00		pCi/g	100%	107%	0.1	6.63E-02
GAMMA_GS									
3232066	BLANK QC,								
	M1NW81AA	CO-60	6.12E-03 +- 1.1E-02	U	pCi/g				2.11E-02
		CS-137	-2.55E-03 +- 1.1E-02	U	pCi/g				1.90E-02
		EU-152	3.63E-03 +- 2.9E-02	U	pCi/g				5.01E-02
		EU-154	9.41E-03 +- 3.3E-02	U	pCi/g				6.15E-02
		EU-155	7.64E-03 +- 2.7E-02	U	pCi/g				4.78E-02
		K-40	-6.38E-01 +- 3.4E-01	U	pCi/g				6.93E-01
3232066	LCS,								
	M1NW81AC	CS-137	9.80E-01 +- 1.4E-01		pCi/g		95%	0.0	2.42E-02
		RA-226	9.30E-01 +- 1.4E-01		pCi/g		82%	-0.2	4.31E-02
		RA-228	7.02E-01 +- 1.3E-01		pCi/g		100%	0.0	7.94E-02
		U-238	9.33E-01 +- 1.3E-01		pCi/g		78%	-0.2	4.40E-02
SRTOT_SEP_PRECIP_GPC									
3248040	BLANK QC,								
	M1T5W1AA	STRONTIUM	-2.65E-02 +- 5.9E-02	U	pCi/g	100%			1.48E-01
3248040	LCS,								
	M1T5W1AC	STRONTIUM	2.12E+00 +- 5.3E-01		pCi/g	86%	93%	-0.1	1.75E-01
906.0_H3_LSC									
3232069	BLANK QC,								
	M1NXC1AA	H-3	-1.90E-02 +- 4.0E-02	U	pCi/g	100%			9.67E-02
3232069	LCS,								
	M1NXC1AC	H-3	4.18E-01 +- 5.9E-02		pCi/g	100%	92%	-0.1	8.73E-02
NI63_LSC									
3232070	BLANK QC,								
	M1NXD1AA	NI-63	1.05E+00 +- 3.2E+00	U	pCi/g	90%			6.62E+00
3232070	LCS,								
	M1NXD1AC	NI-63	2.64E+02 +- 2.2E+01		pCi/g	78%	93%	-0.1	7.43E+00
7196_CR6									
3232096	MATRIX SPIKE, J1RP05								
	M1NM91AL	HEXCHROME	1.95E+01 +- 0.0E+00		mg/kg	N/A	63%	-0.4	1.55E-01
3232096	LCS,								

TestAmerica Inc Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRchQcSummary V5.2.24 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.
 A2002

QC Results Summary

Date: 10-Sep-13

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 56861

SDG No.: J01921

Batch	Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
	M1N381AC	HEXCHROME	1.83E+01 +/- 0.0E+00		mg/kg	N/A	96%	0.0	1.55E-01
	3232096 BLANK QC,								
	M1N381AA	HEXCHROME	1.55E-01 +/- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 24

TestAmerica Inc
rptSTLRchQcSummary V5.2.24
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.