SAF-RC-207
Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites – In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 5/10/12
INITIAL/DATE

COMMENTS:

SDG J01498 SAF-RC-207

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-C-7:1 (ACL Stockpile Footprints)

Analytical Data Package Prepared For

Washington Closure Hanford

Radiochemical Analysis By

TestAmerica

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: TARL

Data Package Contains 27 *Pages*

Report No.: 51600

Results in this report relate only to the sample(s) analyzed.

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
J01498	RC-207	J1NMX8	J2E080478-1	MTFRL1AA	9MTFRL10	2129164
		J1NMX9	J2E080478-2	MTFRM1AA	9MTFRM10	2129164
		J1NN00	J2E080478-3	MTFRP1AA	9MTFRP10	2129164
		J1NN01	J2E080478-4	MTFRQ1AA	9MTFRQ10	2129164
		J1NP61	J2E080478-5	MTFRR1AA	9MTFRR10	2129164
		J1NP62	J2E080478-6	MTFRW1AA	9MTFRW10	2129164
		J1NP63	J2E080478-7	MTFR01AA	9MTFR010	2129164
		J1NP64	J2E080478-8	MTFR11AA	9MTFR110	2129164

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

TestAmerica Laboratories, Inc.

May 10, 2012

Attention: Joan Kessner

SAF Number	:	RC-207
Date SDG Closed	:	May 8, 2012
Number of Samples	:	Eight (8)
Sample Type	:	Soil
SDG Number	:	J01498
Data Deliverable	:	24– Hour / Summary

CASE NARRATIVE

I. Introduction

On May 8, 2012, eight soil samples were received at TestAmerica for radiochemical and chemical 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
J1NMX8	MTFRL	SOIL	5/08/12
J1NMX9	MTFRM	SOIL	5/08/12
J1NN00	MTFRP	SOIL	5/08/12
J1NN01	MTFRQ	SOIL	5/08/12
J1NP61	MTFRR	SOIL	5/08/12
J1NP62	MTFRW	SOIL	5/08/12
J1NP63	MTFR0	SOIL	5/08/12
J1NP64	MTFR1	SOIL	5/08/12

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:

Chemical Analysis
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

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

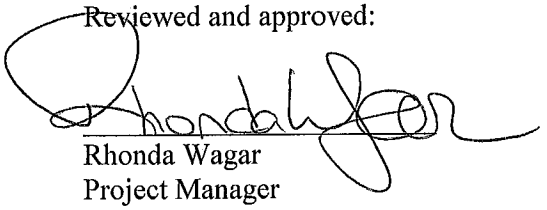
QC and sample results are reported in the same units.

V. Comments

Chemical Analysis
Hexavalent Chromium by EPA method 7196A
The LCS, batch blank, samples, sample duplicate (J1NMX8) and sample matrix spike (J1NMX8) 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

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**TestAmerica Richland's SOP No.**
EPA 901.1	Cs-134, I-131	RL-GAM-001
EPA 900.0	Alpha & Beta	RL-GPC-001
EPA 00-02	Gross Alpha (Coprecipitation)	RL-GPC-002
EPA 903.0	Total Alpha Radium (Ra-226)	RL-RA-002
EPA 903.1	Ra-226	RL-RA-001
EPA 904.0	Ra-228	RL-RA-001
EPA 905.0	Sr-89/90	RL-GPC-003
ASTM D5174	Uranium	RL-KPA-003
EPA 906.0	Tritium	RL-LSC-005

Results in this report relate only to the sample(s) analyzed.

Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/?n), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or TestAmerica.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) ***u_c - Combined Uncertainty.***	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, ***u_c the combined uncertainty.*** The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

Date: 09-May-12

TestAmerica TARL

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

Report No. : 51600 **SDG No:** J01498

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
2129164	7196_CR6								
	J1NMX8								
	MTFRL1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	MTFRL1AD	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	3.50E-01	0.0
	J1NMX9								
	MTFRM1AA	HEXCHROME	1.84E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1NN00								
	MTFRP1AA	HEXCHROME	2.06E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1NN01								
	MTFRQ1AA	HEXCHROME	2.70E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1NP61								
	MTFRR1AA	HEXCHROME	1.86E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1NP62								
	MTFRW1AA	HEXCHROME	2.06E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1NP63								
	MTFR01AA	HEXCHROME	2.50E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1NP64								
	MTFR11AA	HEXCHROME	2.01E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 9

TestAmerica

rptSTLRchSaSummary2 V5.2.20 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.

QC Results Summary

TestAmerica TARL

Ordered by Method, Batch No, QC Type,.

Date: 09-May-12

Report No. : 51600

SDG No.: J01498

Batch / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
7196_CR6								
2129164 MATRIX SPIKE, J1NMX8								
MTFRL1AC	HEXCHROME	8.64E+00 +- 0.0E+00		mg/kg	N/A	85%	-0.2	1.55E-01
2129164 LCS,								
MTFR61AC	HEXCHROME	1.89E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
2129164 BLANK QC,								
MTFR61AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 3

TestAmerica

rptSTLRchQcSummary V5.2.20 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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name: TestAmerica | **SDG:** J01498 | **Collection Date:** 5/8/2012 7:50:00 AM

Lot-Sample No.: J2E080478-1 | **Report No. :** 51600 | **Received Date:** 5/8/2012 4:12:00 PM

Client Sample ID: J1NMX8 | **COC No. :** RC-207-072 | **Matrix:** SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFRL1AA			**Report DB ID:** 9MTFRL10					
HEXCHROME	1.55E-01	U		0.0E+00	1.55E-01	mg/kg	N/A	*1.*	5/8/12 06:00 p		2.5626	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name:	TestAmerica	**SDG:**	J01498	**Collection Date:**	5/8/2012 7:55:00 AM
Lot-Sample No.:	J2E080478-2	**Report No. :**	51600	**Received Date:**	5/8/2012 4:12:00 PM
Client Sample ID:	J1NMX9	**COC No. :**	RC-207-072	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFRM1AA			**Report DB ID:** 9MTFRM10					
HEXCHROME	**1.84E-01**			0.0E+00	1.55E-01	mg/kg	N/A	*(1.2)*	5/8/12 06:00 p		2.5869	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name:	TestAmerica	**SDG:**	J01498	**Collection Date:**	5/8/2012 8:00:00 AM
Lot-Sample No.:	J2E080478-3	**Report No. :**	51600	**Received Date:**	5/8/2012 4:12:00 PM
Client Sample ID:	J1NN00	**COC No. :**	RC-207-072	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:**	MTFRP1AA		**Report DB ID:**	9MTFRP10				
HEXCHROME	**2.06E-01**			0.0E+00	1.55E-01	mg/kg	N/A	*(1.3)*	5/8/12 06:00 p		2.5668	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name: TestAmerica | **SDG:** J01498 | **Collection Date:** 5/8/2012 8:05:00 AM

Lot-Sample No.: J2E080478-4 | **Report No. :** 51600 | **Received Date:** 5/8/2012 4:12:00 PM

Client Sample ID: J1NN01 | **COC No. :** RC-207-072 | **Matrix:** SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFRQ1AA			**Report DB ID:** 9MTFRQ10					
HEXCHROME	**2.70E-01**			0.0E+00	1.55E-01	mg/kg	N/A	*(1.7)*	5/8/12 06:00 p		2.519	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name: TestAmerica | **SDG:** J01498 | **Collection Date:** 5/8/2012 8:10:00 AM

Lot-Sample No.: J2E080478-5 | **Report No. :** 51600 | **Received Date:** 5/8/2012 4:12:00 PM

Client Sample ID: J1NP61 | **COC No. :** RC-207-074 | **Matrix:** SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFRR1AA			**Report DB ID:** 9MTFRR10					
HEXCHROME	**1.86E-01**			0.0E+00	1.55E-01	mg/kg	N/A	*(1.2)*	5/8/12 06:00 p		2.5002	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name:	TestAmerica	**SDG:**	J01498	**Collection Date:**	5/8/2012 9:05:00 AM
Lot-Sample No.:	J2E080478-6	**Report No. :**	51600	**Received Date:**	5/8/2012 4:12:00 PM
Client Sample ID:	J1NP62	**COC No. :**	RC-207-074	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFRW1AA			**Report DB ID:** 9MTFRW10					
HEXCHROME	**2.06E-01**			0.0E+00	1.55E-01	mg/kg	N/A	*(1.3)*	5/8/12 06:00 p		2.5189	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name: TestAmerica | **SDG:** J01498 | **Collection Date:** 5/8/2012 9:10:00 AM

Lot-Sample No.: J2E080478-7 | **Report No. :** 51600 | **Received Date:** 5/8/2012 4:12:00 PM

Client Sample ID: J1NP63 | **COC No. :** RC-207-074 | **Matrix:** SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFR01AA			**Report DB ID:** 9MTFR010					
HEXCHROME	**2.50E-01**			0.0E+00	1.55E-01	mg/kg	N/A	*(1.6)*	5/8/12 06:00 p		2.497	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM I

SAMPLE RESULTS

Date: 09-May-12

Lab Name: TestAmerica | **SDG:** J01498 | **Collection Date:** 5/8/2012 9:15:00 AM

Lot-Sample No.: J2E080478-8 | **Report No. :** 51600 | **Received Date:** 5/8/2012 4:12:00 PM

Client Sample ID: J1NP64 | **COC No. :** RC-207-074 | **Matrix:** SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFR11AA			**Report DB ID:** 9MTFR110					
HEXCHROME	2.01E-01			0.0E+00	1.55E-01	mg/kg	N/A	*(1.3)*	5/8/12 06:00 p		2.5368	
							1.55E-01	*N/A*			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

FORM II

Date: 09-May-12

DUPLICATE RESULTS

Lab Name: TestAmerica **SDG:** J01498 **Collection Date:** 5/8/2012 7:50:00 AM

Lot-Sample No.: J2E080478-1 **Report No. :** 51600 **Received Date:** 5/8/2012 4:12:00 PM

Client Sample ID: J1NMX8 **COC No. :** RC-207-072 **Matrix:** SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:** MTFRL1AD		**Report DB ID:** MTFRL1ER			**Orig Sa DB ID:** 9MTFRL10			
HEXCHROME	1.55E-01	U		0.0E+00	1.55E-01	mg/kg	N/A	1.	5/8/12 06:00 p		2.5003	
	1.55E-01	U	**RPD**	**0.0**		3.50E-01		N/A			g	

No. of Results: 1 **Comments:**

RPD - Relative Percent Difference.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

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.

FORM II

BLANK RESULTS

Date: 09-May-12

Lab Name: TestAmerica **SDG:** J01498

Matrix: SOIL **Report No. :** 51600

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:**	MTFR61AA	**Report DB ID:**	MTFR61AB					
HEXCHROME	1.55E-01	U		0.0E+00	1.55E-01	mg/kg	N/A	1.	5/8/12 06:00 p		2.5	
						1.55E-01		N/A			g	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

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.

FORM II

LCS RESULTS

Date: 09-May-12

Lab Name: TestAmerica **SDG:** J01498

Matrix: SOIL **Report No. :** 51600

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 2129164	7196_CR6			**Work Order:**	MTFR61AC		**Report DB ID:**	MTFR61AS					
HEXCHROME	1.89E+01			0.0E+00	1.55E-01	mg/kg	N/A	2.00E+01		94%	5/8/12 06:00 p	2.5	
							Rec Limits:	80	120	-0.1		g	

No. of Results: 1 **Comments:**

FORM II

MATRIX SPIKE RESULTS

Date: 09-May-12

Lab Name: TestAmerica **SDG:** J01498

Lot-Sample No.: J2E080478-1, J1NMX8 **Report No. :** 51600 **Matrix:** SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2129164	**Work Order:** MTFRL1AC			**Report DB ID:** MTFRL1CW			**Orig Sa DB ID:** 9MTFRL10					
HEXCHROME	8.64E+00			0.0E+00	1.55E-01	mg/kg	N/A	84.65%	1.02E+01	5/8/12 06:00 p	2.5104	7196_CR6
	1.55E-01										g	

Number of Results: 1

Comments:

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

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

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Richland Laboratory
Data Review Check List
Hexavalent Chromium

Batch Number(s):	2129164	Lab Sample Numbers or SDG:	J01498

Method/Test/Parameter: Cr+6 ☐ RL-WC-003(Aqueous) ☒ RL-WC-004(Solid)

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 1. Performed at required frequency with required number of levels?	✓			✓
2. Correlation coefficient greater than 0.97?	✓			✓
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within 10% of expected?	✓			✓
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			✓
B. Continuing Calibration 1. CCV analyzed at required frequency and all parameters within 10% of expected?	✓			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			✓
C. Sample Analysis 1. Were any samples with concentrations above the linear range diluted and reanalyzed?			✓	✓
2. Were all sample holding times met?	✓			✓
D. QC Samples 1. All results for the preparation blank below limits?	✓			✓
2. LCS percent recovery within 85-115%	✓			✓
3. $PbCrO_4$ percent recovery within 85-115%?	✓			✓
4. Sample and Duplicate within 20% (aqueous) or 35% (solid) RPD?	✓			✓
5. MS or MS/MSD recoveries within 85-115% (aqueous) or 75-125% (solid)?	✓			✓
6. On MS failure, PDMS within 85-115%?			✓	✓
E. Other 1. Are all nonconformances included and noted?			✓	✓
2. Is the correct date and time of analysis shown?	✓			✓
3. Did the analyst sign and date the front page of the analytical run?	✓			✓
4. Correct methodology used?	✓			✓
5. Transcriptions checked?	✓			✓
6. Calculations checked at minimum frequency?	✓			✓
7. Units checked?	✓			✓

Comments on any "No" response or list NCM number:

Analyst H. Rahaus Date 5/9/12 2nd Review [signature] Date 5/9/12

CG-231 Rev 0, 2/12

TestAmerica Laboratories, Inc.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-207-072	Page 1 of 1
Collector: A. Dunnum	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ Quick Turn; Data Turnaround: ~~21 Days~~ 4.30.12
Project Designation: Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - I	Sampling Location: 100-C-7:1(ACL Footprints)		SAF No.: RC-207	
Ice Chest No.: N/A	Field Logbook No.: EL-1655-05	COA: R00C712600	Method of Shipment: Hand deliver	
Shipped To: TestAmerica Incorporated, Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

None SDG# J01498

Special Handling and/or Storage

Cool, 4 degrees Centigrade

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
SAMPLE ANALYSIS	Chromium Hex - 7196 - Quick Turn										
Sample No. / Matrix * / Sample Date / Sample Time											
~~J1NMX7~~ SOIL K.f. 5.8.12											
J1NMX8 MTFRL SOIL 05/08/12 0750	X										
J1NMX9 MTFRM SOIL 05/08/12 0755	X										
J1NN00 MTFRP SOIL 05/08/12 0800	X										
J1NN01 MTFRQ SOIL 05/08/12 0805	X										

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
[signature] 5-8-12 0920	B. Fahlberg, B. Fahlberg 5-8-12 0920	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
R. Fahlberg, R. Fahlberg 5-8-12 1600	Regina Bingham 5-8-12 1600	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
[signature] WCH 5-8-12 1612	Courier TAVE courier/courier 5-8-12 1612	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	

SPECIAL INSTRUCTIONS

SDG# J01498
Lot# J2E080478
Due 5.9.12

REVIEWED BY AJ
DATE 5-8-12

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

21

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-207-074	Page 1 of 1
Collector A. Dunnum	**Company Contact** Joan Kessner	**Telephone No.** 509-375-4688	**Project Coordinator** KESSNER, JH	**Price Code** ~~8L~~ QuickTurn **Data Turnaround** ~~21 Days~~ KS 3/29/12
Project Designation Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - I	**Sampling Location** 100-C-7:1(ACL Stockpile Footprints)		**SAF No.** RC-207	
Ice Chest No. N/A	**Field Logbook No.** EL-1655-05	**COA** R00C712600	**Method of Shipment** Hand deliver	
Shipped To TestAmerica Incorporated, Richland	**Offsite Property No.** N/A		**Bill of Lading/Air Bill No.** N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool, 4 degrees Centigrade

Preservation	Cool 4C									
Type of Container	G/P									
No. of Container(s)	1									
Volume	125mL									
SAMPLE ANALYSIS	Chromium Hex - 7196 - Quick Turn									

Sample No.	Matrix *	Sample Date	Sample Time								
J1NP61 MTFRP	SOIL	05/08/12	0810	X							
J1NP62 MTFRW	SOIL	05/08/12	0905	X							
J1NP63 MTFRO	SOIL	05/08/12	0910	X							
J1NP64 MTFR1	SOIL	05/08/12	0915	X							
~~J1NP65~~	~~SOIL~~	05/08/12									

CHAIN OF POSSESSION	Sign/Print Names			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	
[illegible] 5-8-12	0920	B Fahlberg B Fahlberg	5-8-12	0920
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	
B Fahlberg R Fahlberg	5-8-12 1608	Bingham	5-8-12	1600
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	
BCH	5-8-12 1612	Cameron Krayer TAL	5-8-12	1612
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	

SPECIAL INSTRUCTIONS

SDG# J01498
Lot# J2E080478
Due 5.9.12

REVIEWED BY AJ
DATE 5-8-12

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

TestAmerica Laboratories, Inc.

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Sample Check-in List

Date/Time Received: 5.8.12 1612 Container GM Screen Result: (Airlock) .08 Initials CK
Sample GM Screen Result (Sample Receiving) .03 Initials CK

Client: WCH SDG #: JO1498 NA [ ] SAF #: RC-207 NA [ ]

Lot Number: J2E080478

Chain of Custody # RC-207-072

Shipping Container ID: hand delivery NA DW Air Bill Number: _____ NA CK

Samples received inside shipping container/cooler/box Yes [CK] Continue with 1 through 4. Initial appropriate response.

No [ ] Go to 5, add comment to #16.

1. Custody Seals on shipping container intact? Yes [ ] No [ ] No Custody Seal [CK]
2. Custody Seals dated and signed? Yes [ ] No [ ] No Custody Seal [CK]
3. Cooler temperature: 7 °C on ice NA [CK]
4. Vermiculite/packing materials is NA [ ] Wet [ ] Dry [CK]

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes [CK] No [ ]
6. Number of samples received (Each sample may contain multiple bottles): 8
7. Containers received: 8 X 125P

8. Sample holding times exceeded? NA [ ] Yes [ ] No [CK]
9. Samples have:
   ___ tape
   CK custody seals
   ___ hazard labels
   CK appropriate sample labels
10. Matrix:
    CK A (FLT, Wipe, Solid, Soil)
    ___ S (Air, Niosh 7400)
    ___ I (Water)
    ___ T (Biological, Ni-63)
11. Samples:
    CK are in good condition
    ___ are broken
    ___ Other
    ___ are leaking
    ___ have air bubbles (Only for samples requiring no head space)
12. Sample pH appropriate for analysis requested Yes [ ] No [ ] NA [CK]
    (If acidification is necessary, then document sample ID, initial pH, amount of HNO_3 added and pH after addition on table overleaf)
    RPL ID # of preservative used : N/A
13. Were any anomalies identified in sample receipt? Yes [ ] No [CK]
14. Description of anomalies (include sample numbers): NA [CK]

LS-023, Rev. 15, 07/11 See over for additional information.

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15. Sample Location, Sample Collector Listed on COC? * Yes [✓] No [ ]
*For documentation only. No corrective action needed.

16. Additional Information: _____

[ ] Client/Courier denied temperature check. [✓] Client/Courier unpack cooler.

Sample Custodian: _____ Date: 5.8.12

Client Informed on _____ by _____ Person contacted _____

[✓] No action necessary; process as is

Project Manager _____ Date 5/9/12

SAMPLE ID	Initial pH	Acid Amt	Final pH	SAMPLE ID	Initial pH	Acid Amt	Final pH

TA-UK 5.8.12

TA-UK 5.8.12

J2 E080478

RW 5/9/12

See over for additional information.

5/8/2012 5:13:39 PM

Sample Preparation/Analysis

127642, Washington Closure Hanford LLC , Bechtel Hanford, Inc.

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

AnalyDueDate: 05/09/2012

Batch: 2129164 **SOIL** **mg/kg**
SEQ Batch, Test: None All Tests: 2129164 DWEA,

PM, Quote: RW2, 27038

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

1 MTFRL-1-AA

J2E080478-1-SAMP

05/08/2012 07:50 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

2 MTFRL-1-AC-S

J2E080478-1-MS

05/08/2012 07:50 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

3 MTFRL-1-AD-X

J2E080478-1-DUP

05/08/2012 07:50 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

4 MTFRM-1-AA

J2E080478-2-SAMP

05/08/2012 07:55 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

5 MTFRP-1-AA

J2E080478-3-SAMP

05/08/2012 08:00 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

6 MTFRQ-1-AA

J2E080478-4-SAMP

05/08/2012 08:05 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

7 MTFRR-1-AA

J2E080478-5-SAMP

05/08/2012 08:10 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

TestAmerica Laboratories, Inc.

5/8/2012 5:13:39 PM

Sample Preparation/Analysis

Balance Id:

127642, Washington Closure Hanford LLC , Bechtel Hanford, Inc.

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 05/09/2012

Sep1 DT/Tm Tech:

Batch: 2129164 **SOIL** **mg/kg** **PM, Quote: RW2, 27038**

SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech:

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

8 MTFRW-1-AA

J2E080478-6-SAMP

05/08/2012 09:05 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

9 MTFR0-1-AA

J2E080478-7-SAMP

05/08/2012 09:10 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

10 MTFR1-1-AA

J2E080478-8-SAMP

05/08/2012 09:15 AmtRec: 1X125P #Containers: 1 Scr: Alpha: Beta:

11 MTFR6-1-AA-B

J2E080000-164-BLK

05/08/2012 17:13 pd AmtRec: #Containers: 1 Scr: Alpha: Beta:

12 MTFR6-1-AC-C

J2E080000-164-LCS

05/08/2012 17:13 pd AmtRec: #Containers: 1 Scr: Alpha: Beta:

Comments:

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

MTFRL1AA-SAMP Constituent List:

TestAmerica Laboratories, Inc.

Sample Preparation/Analysis

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Balance Id:
Pipet #: _____
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

AnalyDueDate: 05/09/2012

Batch: 2129164 **mg/kg**
SEQ Batch, Test: None

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

MTFRL1AC-MS Constituent List:

MTFR61AA-BLK:

MTFR61AC-LCS:

MTFRL1AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
MTFRL1AC-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
MTFR61AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
MTFR61AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

TestAmerica Laboratories, Inc.