Analytical Data Package Prepared For

CH2M Hill Plateau Remediation

Radiochemical Analysis By

TestAmerica Inc TARL

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

Data Package Contains 38 *Pages*

Report Nbr: 62079

SDG Nbr	ORDER Nbr	CLIENT ID NUMBER	LOT Nbr	WORK ORDER	RPT DB ID	BATCH
W06836	F14-003	B2X8R2	J4H060432-1	M4KEF1AA	9M4KEF10	4218121
		B2X8R1	J4H060432-2	M4KEG1AA	9M4KEG10	4224061
		B2X8R1	J4H060432-2	M4KEG1AC	9M4KEG10	4224059
		B2X8R1	J4H060432-2	M4KEG1AD	9M4KEG10	4224060

Comments:

September 4, 2014

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – R3-60
Richland, WA 99352

September 4, 2014

Attention: Scot Fitzgerald

SAF Number	:	F14-003
Date SDG Closed	:	August 6, 2014
Number of Samples	:	Two (2)
Sample Type	:	Water
SDG Number	:	W06836
Data Deliverable	:	30-Day / Summary

CASE NARRATIVE

I. Introduction

On August 6, 2014, two water samples were received at TestAmerica (TARL). Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the CH2M specific IDs:

CH2M ID#	TARL ID#	DATE OF RECEIPT	MATRIX
B2X8R2	M4KEF	8/6/14	WATER
B2X8R1	M4KEG	8/6/14	WATER

II. Sample Receipt

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

During the monthly phone call on November 13, 2013 TARL was notified that all groundwater samples received will continue to have a 30 day turnaround time regardless if the chain of custodies have a turn around time that is greater than 30 days.

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:

Gamma Spectroscopy
Iodine-129 (LL) by method RL-GAM-002
Liquid Scintillation Counting
Technetium-99 by method RL-LSC-013
Tritium by method RL-LSC-005
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

Gamma Spectroscopy
Iodine-129 (LL) by method RL-GAM-002:
The LCS, batch blank, samples and sample duplicate (B2X8R1) results are within contractual requirements.

Liquid Scintillation Counting
Technetium-99 by method RL-LSC-013:
The LCS, batch blank, samples, sample duplicate (B2X8R1) and sample matrix spike (B2X8R1) results are within contractual requirements.

Tritium by method RL-LSC-005:
The LCS, batch blank, samples and sample duplicate (B2X8R1) results are within contractual requirements.

Chemical Analysis
Hexavalent Chromium by EPA method 7196A
The LCS, batch blank, samples, sample duplicate (B2X8R2) sample matrix spike (B2X8R2) and matrix spike duplicate (B2X8R2) 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:

Whitney Ritari

Whitney Ritari
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.

TestAmerica Inc Report

Lab Code: TARL

FormNbr: R FormatType: FEAD Version: 05 Rpt Nbr: 62079 File Name: h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id:	Client Id:	Test User	Contract Nbr	SAF Nbr	Sdg Nbr:	QC Type:	Moisture/ Solids%*:	Distilled Volume	Sample On Date:	Collection Date:
9M4KEG10	B2X8R1	F14-003	MW6-SBB-A1	F14-003	W06836					08/06/2014 11:50

Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
4224060	I-129	15046-84-1	2.04E-02	pCi/L	1.5E-01	1.5E-01	U	2.74E-01	94.9	I129LL_SEP_LEPS	3.7825E+00	L	09/02/2014 12:57	I
4224059	Tc-99	14133-76-7	8.53E+01	pCi/L	6.5E+00	1.0E+01		1.01E+01	100.0	TC99_SEP_LSC	1.256E-01	L	08/22/2014 10:14	I
4224061	H-3	10028-17-8	9.69E+02	pCi/L	1.7E+02	1.9E+02		3.29E+02	100.0	TRITIUM_DIST_LS	5.029E-03	L	08/14/2014 09:34	I

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc QC Blank Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id: M4LV31AB **Sdg/Rept Nbr:** W06836 62079 **Collection Date:** 08/06/2014 11:50

Client Id: NA **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** BLK **Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AF	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224059	Tc-99	6.03E+00	pCi/L	5.5E+00	U	9.38E+00	100.0		TC99_SEP_LS	1.277E-01	08/22/2014				D
BLK	14133-76-7			4.1E+00						L	13:21				

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc QC Blank Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id: M4LWA1AB **Sdg/Rept Nbr:** W06836 62079 **Collection Date:** 08/06/2014 11:50

Client Id: NA **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** BLK **Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AH	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224060	I-129	1.57E-01	pCi/L	1.9E-01	U	3.10E-01	81.6		I129LL_SEP_L	3.5449E+00	09/02/2014				D
BLK	15046-84-1			1.9E-01						L	18:08				

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

TestAmerica Inc QC Blank Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id:	M4LWD1AB	**Sdg/Rept Nbr:**	W06836	62079	**Collection Date:** 08/06/2014 11:50
Client Id:	NA	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	BLK		**Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AJ	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224061	H-3	5.46E+01	pCi/L	1.6E+02	U	3.43E+02	100.0		TRITIUM_DIST	5.001E-03	08/14/2014				D
BLK	10028-17-8			1.4E+02						L	12:20				

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc QC Control Sample Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id: M4LV31CS **Sdg/Rept Nbr:** W06836 62079 **Collection Date:** 08/06/2014 11:50

Client Id: NA **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** BS **Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AG	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224059	Tc-99	4.95E+02	pCi/L	3.2E+01		9.39E+00	100.0	5.31E+02	TC99_SEP_LS	1.285E-01	08/22/2014			70	D
BS	14133-76-7			1.2E+01				93.3		L	14:23			130	

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

TestAmerica Inc QC Control Sample Report

Lab Code: TARL

FormNbr: R FormatType: FEAD VersionNbr: 05 File Name: h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id:	M4LWA1CS	**Sdg/Rept Nbr:**	W06836	62079	**Collection Date:** 08/06/2014 11:50
Client Id:	NA	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	BS		**Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AI	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224060	I-129	9.96E+00	pCi/L	1.3E+00		3.45E-01	91.4	1.10E+01	I129LL_SEP_L	3.5927E+00	09/03/2014			70	D
BS	15046-84-1			1.3E+00				90.6		L	08:22			130	

September 4, 2014

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J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc QC Control Sample Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id: M4LWD1CS **Sdg/Rept Nbr:** W06836 62079 **Collection Date:** 08/06/2014 11:50

Client Id: NA **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** BS **Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AK	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224061	H-3	2.69E+03	pCi/L	2.6E+02		3.42E+02	100.0	2.69E+03	TRITIUM_DIST	5.032E-03	08/14/2014			70	D
BS	10028-17-8			2.3E+02				100.2		L	13:43			130	

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc QC Duplicate Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id:	M4KEG1FR	**Sdg/Rept Nbr:**	W06836	62079	**Collection Date:** 08/06/2014 11:50
Client Id:	B2X8R1	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	**DUP**		**Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
F14-003	MW6-SBB-A19981								AC	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224059	Tc-99	7.93E+01	pCi/L	9.4E+00		9.40E+00	100.0		TC99_SEP_LS	1.278E-01	08/22/2014	7.4	0.9		D
DUP	14133-76-7	8.53E+01		6.1E+00						L	12:19	20.0	3		

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc QC Duplicate Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id:	M4KEG1GR	**Sdg/Rept Nbr:**	W06836	62079	**Collection Date:** 08/06/2014 11:50
Client Id:	B2X8R1	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	DUP		**Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
F14-003	MW6-SBB-A19981								AD	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224060	I-129	-1.22E-01	pCi/L	1.6E-01	U	2.59E-01	91.9		I129LL_SEP_L	3.7884E+00	09/02/2014	0.0	1.3		D
DUP	15046-84-1	2.04E-02		1.6E-01						L	16:24	20.0	3		

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc QC Duplicate Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id: M4KEG1HR **Sdg/Rept Nbr:** W06836 62079 **Collection Date:** 08/06/2014 11:50

Client Id: B2X8R1 **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** DUP **Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
F14-003	MW6-SBB-A19981								AE	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224061	H-3	1.16E+03	pCi/L	2.0E+02		3.33E+02	100.0		TRITIUM_DIST	5.01E-03	08/14/2014	18.4	1.4		D
DUP	10028-17-8	9.69E+02		1.8E+02						L	10:57	20.0	3		

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Thursday, September 04, 2014

TestAmerica Inc Qc Matrix Spike Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W06836.Edd, h:\Reportdb\edd\FeadIV\Rad\62079.Ed

Lab Sample Id: M4KEG1EW **Sdg/Rept Nbr:** W06836 62079 **Collection Date:** 08/06/2014 11:50

Client Id: B2X8R1 **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** MS **Received Date:** 08/06/2014

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
F14-003	MW6-SBB-A19981								AB	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
4224059	Tc-99	3.31E+03	pCi/L	1.8E+02		9.40E+00	100.0	3.60E+03	TC99_SEP_LS	1.276E-01	08/22/2014			70	D
MS	14133-76-7			3.1E+01				92.0		L	11:16			130	

September 4, 2014

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

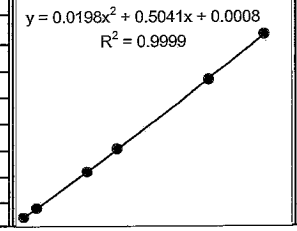
TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Hexavalent Chromium - Water

Analyst:	I. Salifu/K. Boyles
Start Date:	8/6/2014
Start Time:	19:30
End Date:	8/6/2014
End Time	20:51
Analyst Signature:	
Date:	08/06/14

Calibration Curve Information

	Amount (mL)	Conc.(mg/L)	ABS.
Blank	0.000	0.000	0.000
Std. 1	0.100	0.050	0.098
Std. 2	0.500	0.250	0.485
Std. 3	0.750	0.375	0.715
Std. 4	1.500	0.750	1.417
Std 5	2.000	1.000	1.844
Standard Volume (mL):			100.000
Date of Curve:			8/6/2014



R Squared	0.9999
2nd°Coeff (a)	0.0198
1st°Coeff (b)	0.5041
Constant (c)	0.0008
Intercept	-0.0016
MDL (mg/L)	0.008

BATCH #	4218121
SDG #	W06836
Matrix	Water
SOP Information	RL-WC-003 Revision 6
Instrument Information	
Instrument:	Hach DR2010
Wavelength:	540

	Calibration Information:	ICV/CCV Information:	LCS Information:	Matrix Spike Information:
Dilution ID #	Cr-14-00303	Cr-14-00304	Cr-14-00303	Cr-14-00303
Prep Date:	08/06/14	08/06/14	08/06/14	08/06/14
Concentration (mg/L)	50	50	50	50
Expiration Date:	08/07/14	08/07/14	08/07/14	08/07/14
Pipettor(s)	201,282,286	286	286	282
Volume Used (mL)		1.000	1.00	1.50
Final Volume (mL)		100.000	100.00	100.00
Expected Value (mg/L)		0.500	0.500	0.750

Sample ID	Client ID	Type	Final Volume (mL)	Sample ABS.	Color Blank ABS.	Corrected ABS.	Dilution Factor	Curve Conc. (mg/L)	Expected (mg/L)	% Rec. / RPD	Final Reported Conc. (mg/L)	Qualifier
n/a	n/a	ICV	100.000	0.946		0.946	1	0.4954	0.5000	99.08%	0.495	
n/a	n/a	ICB	100.000	0.002		0.002	1	0.0018			<MDL	U
n/a	n/a	CCV	100.000	0.921		0.921	1	0.4819	0.5000	96.37%	0.482	
n/a	n/a	CCB	100.000	0.001		0.001	1	0.0013			<MDL	U
M4KEJ1AA	n/a	BLK	100.000	0.003		0.003	1	0.0023			<MDL	U
M4KEJ1AC	n/a	LCS	100.000	0.964		0.964	1	0.5052	0.5000	101.03%	0.505	
M4KEF1AA	B2X8R2'	Sample	100.000	0.055		0.055	1	0.0286			0.029	
M4KEF1AC	B2X8R2'	MS*	100.000	1.556		1.556	1	0.8331	0.7500	107.27%	0.805	
M4KEF1AD	B2X8R2'	MSD*	100.000	1.552		1.552	1	0.8309	0.7500	106.97%	0.802	
M4KEF1AE	B2X8R2 DUP'	Duplicate	100.000	0.068		0.068	1	0.0352		~~20.66%~~ 18.8	0.035	
			100.000				1					
			100.000				1			SKS 9-4-14		
			100.000				1					
			100.000				1					
n/a	n/a	CCV	100.000	0.915		0.915	1	0.4786	0.5000	95.73%	0.479	
n/a	n/a	CCB	100.000	0.001		0.001	1	0.0013			<MDL	U

*If the parent sample is above the MDL, the Final Reported Conc. (mg/L) for the MS and MSD is corrected for the parent sample.

September 4, 2014

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist
RADIOCHEMISTRY, First Level Review

September 4, 2014

9/4/2014 9:11:53 AM

Lot No., Due Date: J4H060432; 09/05/2014
Client, Site: 108302; FLH HANFORD
QC Batch No., Method Test: 4224060; RGAMLEPS Gamma by LEPS
SDG, Matrix: W06836; WATER

		Yes	No	N/A
1.0 COC				
1.1	Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	✓		
2.0 QC Batch				
2.1	Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2.2	Are the QC appropriate for the analysis included in the batch?	✓		
2.3	Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	✓		
2.4	Does the Worksheets include a Tracer Vial label for each sample?	✓		
3.0 QC & Samples				
3.1	Is the blank results, yield, and MDA within contract limits?	✓		
3.2	Is the LCS result, yield, and MDA within contract limits?	✓		
3.3	Are the MS/MSD results, yields, and MDA within contract limits?			✓
3.4	Are the duplicate result, yields, and MDAs within contract limits?	✓		
3.5	Are the sample yields and MDAs within contract limits?	✓		
4.0 Raw Data				
4.1	Were results calculated in the correct units?	✓		
4.2	Were analysis volumes entered correctly?	✓		
4.3	Were Yields entered correctly?	✓		
4.4	Were spectra reviewed/meet contractual requirements?	✓		
4.5	Were raw counts reviewed for anomalies?	✓		
5.0 Other				
5.1	Are all nonconformances included and noted?			✓
5.2	Are all required forms filled out?	✓		
5.3	Was the correct methodology used?	✓		
5.4	Was transcription checked?	✓		
5.5	Were all calculations checked at a minimum frequency?			✓
5.6	Are worksheet entries complete and correct?	✓		

6.0 Comments on any No response:

First Level Lisa Gustafson Date 9/4/14

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

Batch Number: 4224060

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Nonconformances (NCM) included and noted?			✓
2. Was the correct methodology used?	✓		
3. Were units checked?	✓		

Comments on any "No" response:

γ I-129 .5pCi/L

Second Level Review: [signature] Date: 9/4/14

DR-001, Rev. 01, 10/30/2013

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

September 4, 2014

RADIOCHEMISTRY, First Level Review

8/26/2014 3:53:17 PM

Lot No., Due Date: J4H060432; 09/05/2014
Client, Site: 108302; FLH HANFORD
QC Batch No., Method Test: 4224059; RTC99 Tc-99 by LSC
SDG, Matrix: W06836; WATER

1.0 COC			
1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yes ✓	No	N/A
2.0 QC Batch			
2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	Yes ✓	No	N/A
2.2 Are the QC appropriate for the analysis included in the batch?	Yes ✓	No	N/A
2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes ✓	No	N/A
2.4 Does the Worksheets include a Tracer Vial label for each sample?	Yes	No	N/A ✓
3.0 QC & Samples			
3.1 Is the blank results, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.2 Is the LCS result, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.3 Are the MS/MSD results, yields, and MDA within contract limits?	Yes ✓	No	N/A
3.4 Are the duplicate result, yields, and MDAs within contract limits?	Yes ✓	No	N/A
3.5 Are the sample yields and MDAs within contract limits?	Yes ✓	No	N/A
4.0 Raw Data			
4.1 Were results calculated in the correct units?	Yes ✓	No	N/A
4.2 Were analysis volumes entered correctly?	Yes ✓	No	N/A
4.3 Were Yields entered correctly?	Yes	No	N/A ✓
4.4 Were spectra reviewed/meet contractual requirements?	Yes	No	N/A ✓
4.5 Were raw counts reviewed for anomalies?	Yes ✓	No	N/A
5.0 Other			
5.1 Are all nonconformances included and noted?	Yes	No	N/A ✓
5.2 Are all required forms filled out?	Yes ✓	No	N/A
5.3 Was the correct methodology used?	Yes ✓	No	N/A
5.4 Was transcription checked?	Yes ✓	No	N/A
5.5 Were all calculations checked at a minimum frequency?	Yes	No	N/A ✓
5.6 Are worksheet entries complete and correct?	Yes ✓	No	N/A

6.0 Comments on any No response:

First Level [signature] **Date** 8/26/2014

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

Batch Number: 4224059

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?	✓		
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Nonconformances (NCM) included and noted?			✓
2. Was the correct methodology used?	✓		
3. Were units checked?	✓		

Comments on any "No" response:

Tc99 15pci/L

Second Level Review: [signature] Date: 8/27/14

DR-001, Rev. 01, 10/30/2013

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

September 4, 2014

RADIOCHEMISTRY, First Level Review

8/25/2014 5:49:36 PM

Lot No., Due Date: J4H060432; 09/05/2014
Client, Site: 108302; FLH HANFORD
QC Batch No., Method Test: 4224061; RTRITIUM H-3 by LSC
SDG, Matrix: W06836; WATER

1.0 COC			
1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yes ✓	No	N/A
2.0 QC Batch			
2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	Yes ✓	No	N/A
2.2 Are the QC appropriate for the analysis included in the batch?	Yes ✓	No	N/A
2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes ✓	No	N/A
2.4 Does the Worksheets include a Tracer Vial label for each sample?	Yes	No	N/A ✓
3.0 QC & Samples			
3.1 Is the blank results, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.2 Is the LCS result, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.3 Are the MS/MSD results, yields, and MDA within contract limits?	Yes	No	N/A ✓
3.4 Are the duplicate result, yields, and MDAs within contract limits?	Yes ✓	No	N/A
3.5 Are the sample yields and MDAs within contract limits?	Yes ✓	No	N/A
4.0 Raw Data			
4.1 Were results calculated in the correct units?	Yes ✓	No	N/A
4.2 Were analysis volumes entered correctly?	Yes ✓	No	N/A
4.3 Were Yields entered correctly?	Yes	No	N/A ✓
4.4 Were spectra reviewed/meet contractual requirements?	Yes	No	N/A ✓
4.5 Were raw counts reviewed for anomalies?	Yes ✓	No	N/A
5.0 Other			
5.1 Are all nonconformances included and noted?	Yes	No	N/A ✓
5.2 Are all required forms filled out?	Yes ✓	No	N/A
5.3 Was the correct methodology used?	Yes ✓	No	N/A
5.4 Was transcription checked?	Yes ✓	No	N/A
5.5 Were all calculations checked at a minimum frequency?	Yes	No	N/A ✓
5.6 Are worksheet entries complete and correct?	Yes ✓	No	N/A

6.0 Comments on any No response:

First Level Bardigel **Date** 8/25/2014

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

Batch Number: 4224061

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Nonconformances (NCM) included and noted?			✓
2. Was the correct methodology used?	✓		
3. Were units checked?	✓		

Comments on any "No" response:

H3 400pCi/L

Second Level Review: [signature] Date: 8/26/14

DR-001, Rev. 01, 10/30/2013

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

September 4, 2014

Richland Laboratory
Data Review Check List
Hexavalent Chromium

Batch Number(s):	4218121	Lab Sample Numbers or SDG:	W06836

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 75-125%?			✓	✓
4. Sample and Duplicate within 20% (aqueous) or 35% (solid) RPD?	✓	✓ SKS 9-4-14		✓
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: ~~NCM-10-28237~~ SKS 9-4-14

Analyst [signature] Date 8-18-14 2nd Review [signature] Date 9/12/14

CG-231 Rev 1 5/12

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F14-003-274	PAGE 1 OF 1
COLLECTOR R Crow	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H AIR QUALITY ☐	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8920, I-005	PROJECT DESIGNATION FY2014 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F14-003		
ICE CHEST NO. N/A	FIELD LOGBOOK NO. HNF-N-507-28-41	ACTUAL SAMPLE DEPTH 326.8'	COA 302938ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. SEE PTR		BILL OF LADING/AIR BILL NO. SEE PTR		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	7196_CR6: COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2X8R2	WATER	8-6-14	1150	✓

J4H060432
W06836
Due 9-5-14
MYKEF

J4H060432

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM R Crow R Crow	DATE/TIME 8-6-14 1300	RECEIVED BY/STORED IN L.D. Wall CHPRC L.D. Wall	DATE/TIME 8-6-14 1300
RELINQUISHED BY/REMOVED FROM L.D. Wall CHPRC L.D. Wall	DATE/TIME AUG 0 6 2014 1515	RECEIVED BY/STORED IN J. Boch TARL J. Boch	DATE/TIME AUG 0 6 2014 1515
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
TRVL-14-118

TRVL 14 - 118

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/25/2014

A-6003-618 (REV 2)

September 4, 2014

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F14-003-273	PAGE 1 OF 1
COLLECTOR R Crow	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H AIR QUALITY ☐	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8920, I-005	PROJECT DESIGNATION FY2014 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F14-003		
ICE CHEST NO. N/A	FIELD LOGBOOK NO. HNF-N-507-28-41	ACTUAL SAMPLE DEPTH 326.8	COA 302938ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. SEE PTR		BILL OF LADING/AIR BILL NO. SEE PTR		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	None	None	HCl to pH <2
HOLDING TIME	6 Months	6 Months	6 Months
TYPE OF CONTAINER	P	G/P	G/P
NO. OF CONTAINER(S)	1	2	3
VOLUME	1L	4L	1L
SAMPLE ANALYSIS	TRITIUM_DIST_LSC: COMMON;	I129LL_SEP_LEPS_GS: COMMON;	TC99_SEP_LSC: COMMON {Technetium-99};

J4H060432
W06836

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2X8R1	WATER	8-6-14	1150	✓	✓	✓

M4KEG

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-14-118
R Crow R Crow	8-6-14 1300	L.D. Wall CHPRC L.D. Wall	8-6-14 1300	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
L.D. Wall CHPRC L.D. Wall	AUG 0 6 2014 1515	J Bock Bock TAU	AUG 0 6 2014 1515	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL- 14- 118
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/25/2014

A-6003-618 (REV 2)

September 4, 2014

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Check-in List

September 4, 2014

Date/Time Received: 8-6-14 / 1515 Container GM Screen Result: (Airlock) 60 cpm Initials [B]
Sample GM Screen Result (Sample Receiving) 60 cpm Initials [B]

Client: FLH SDG #: WO 68356 SAF #: F14-003 NA [ ]

Lot Number: J4H060432

Chain of Custody # F14-003-274; 273

Shipping Container ID or Air Bill Number: Hand de Liv NA [BS]

Samples received inside shipping container/cooler/box Yes [B] 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 [B]
2. Custody Seals dated and signed? Yes [ ] No [ ] No Custody Seal [B]
3. Cooler temperature: 3.1 °C NA [ ]
4. Vermiculite/packing materials is NA [B] Wet [ ] Dry [ ]

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes [B] No [ ]
6. Number of samples received (Each sample may contain multiple bottles): 2
7. Containers received: 1x500mLAG, 4xLp; 2xLp
8. Sample holding times exceeded? NA [ ] Yes [ ] No [B]
9. Samples have: ____tape ____hazard labels [B] custody seals [B] appropriate sample labels
10. Matrix: ____A (FLT, Wipe, Solid, Soil) [B] I (Water) ____S (Air, Niosh 7400) ____T (Biological, Ni-63)
11. Samples:
    [B] are in good condition ____are leaking ____are broken
    ____have air bubbles (Only for samples requiring no head space) ____Other ____
12. Sample pH appropriate for analysis requested Yes [B] No [ ] NA [ ]
    (If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO_3 added and pH after addition on table)
13. Were any anomalies identified in sample receipt? Yes [ ] No [B]
14. Description of anomalies (include sample numbers): NA [B] ____
15. Sample Location, Sample Collector Listed on COC? * Yes [B] No [ ]
    *For documentation only. No corrective action needed.
16. Additional Information: N/A

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

Sample Check-in List completed by Sample Custodian:
Signature: [signature] Date: 8-6-14

Client Notification needed? Yes [ ] No [BS] Date: ____
By: ____
Person contacted: ____

[BS] No action necessary; process as is

Project Manager [signature] Date 8-7-14

9/2/2014 12:30:59 PM

Sample Preparation/Analysis

Balance Id:1120482733,B425712682

108302, CH2M Hill Plateau Remediation DOE RL
, Waste Management Federal Servi

BN I-129 Prp/Sep GAM002
TB Gamma by LEPD
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 09/05/2014

Sep1 DT/Tm Tech:

Batch: 4224060 **WATER** **pCi/L** **PM, Quote: SS , 29754**

Sep2 DT/Tm Tech:

SEQ Batch, Test: None All Tests: 4218121 88EA, 4224059 AMS5, 4224060 BNTB, 4224061 ARS6,

Prep Tech: PeoplesK,ReynaV

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 M4KEG-1-AD J4H060432-2-SAMP 08/06/2014 11:50			3782.50g,in AmtRec: 4XLP;2X4LP	3782.50g	ITA14306 08/12/14 #Containers: 6			35.10mg	100min Scr:	L5 Alpha: 4.91E-04 uCi/Sa	1437	9/2/14 JB Beta: -1.34E-03 uCi/Sa	
2 M4KEG-1-AG-X J4H060432-2-DUP 08/06/2014 11:50			3788.40g,in AmtRec: 4XLP;2X4LP	3788.40g	ITA14307 08/12/14 #Containers: 6			34.00mg	Scr:	L5 Alpha: 4.91E-04 uCi/Sa	1504	9/2/14 JB Beta: -1.34E-03 uCi/Sa	
3 M4LWA-1-AA-B J4H120000-60-BLK 08/22/2014 09:27 pd			3544.90g,in AmtRec:	3544.90g	ITA14309 08/12/14 #Containers: 1			30.20mg	Scr:	L5 Alpha:	1947	9/2/14 JB Beta:	
4 M4LWA-1-AC-C J4H120000-60-LCS 08/22/2014 09:29 pd			3592.70g,in AmtRec:	3592.70g	ISD1732 08/18/14 #Containers: 1			34.40mg	Scr:	L4 Alpha:	1002	9/3/14 JB Beta:	

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8/12/2014 3:13:09 PM

Sample Preparation/Analysis

Balance Id:,,

0, ,

BN I-129 Prp/Sep GAM002
TB Gamma by LEPD
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 09/05/2014

Sep1 DT/Tm Tech:

Batch: 4224060 pCi/L

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:

Comments:

```
All Clients for Batch:
    108302, CH2M Hill Plateau Remediation DOE RL       Waste Management Federal Servi,  SS , 29754

M4KEG1AD-SAMP Constituent List:
  I-129        RDL:5.00E-01    pCi/L     LCL:        UCL:        RPD:
M4LWA1AA-BLK:
M4LWA1AC-LCS:
M4KEG1AD-SAMP Calc Info:
    Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
M4LWA1AA-BLK:
    Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
M4LWA1AC-LCS:
    Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
```

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September 4, 2014

ICOC Fraction Transfer/Status Report

September 4, 2014

ByDate: 9/4/2013, 9/9/2014, Batch: '4224060', User: *ALL Order By DateTimeAccepting

Q	Batch	Work Ord	CurStatus	Accepting			SOPs,Reagents,Comments
4224060							
AC			**Rev1C**	**ReynaV**	8/22/2014 9:21:57		
SC				ReynaV	InPrep	8/22/2014 9:21:57 AM	RL-GAM-002 REVISION 4
SC				NeyensA	InPrep	9/2/2014 8:47:03 AM	RL-GAM-002 REVISION 4
SC				NeyensAR	IsBatched	9/2/2014 8:47:39 AM	ICOC_RADCALC v4.9.0
SC				BullJ	InCnt1	9/2/2014 12:55:37 PM	RL-CI-007 REVISION 3
SC				BullJ	CalcC	9/3/2014 1:56:37 PM	RL-CI-007 REVISION 3
SC				AntonsonL	Rev1C	9/4/2014 8:58:46 AM	RL-DR-001 Rev 5
AC				**NeyensA**	9/2/2014 8:47:03 AM		
AC				**BullJ**	9/2/2014 12:55:37 PM		
AC				**BullJ**	9/3/2014 1:56:37 PM		
AC				**AntonsonL**	9/4/2014 8:58:46 AM		

AC: Accepting Entry; SC: Status Change

8/14/2014 2:41:12 PM

Sample Preparation/Analysis

Balance Id:1120482733,,

108302, CH2M Hill Plateau Remediation DOE RL
, Waste Management Federal Servi

AM Tc-99 Prp/Sep LSC013
S5 Technetium-99 by Liquid Scint
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 09/05/2014

Sep1 DT/Tm Tech:

Batch: 4224059 **WATER** **pCi/L** **PM, Quote: SS , 29754**

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: PeoplesK

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 M4KEG-1-AC J4H060432-2-SAMP 08/06/2014 11:50			125.60g,in AmtRec: 4XLP;2X4LP	125.60g	#Containers: 6					Scr:	Alpha: 4.91E-04 uCi/Sa		Beta: -1.34E-03 uCi/Sa
2 M4KEG-1-AE-S J4H060432-2-MS 08/06/2014 11:50			127.60g,in AmtRec: 4XLP;2X4LP	127.60g	TCSG3505 07/17/14,pd 07/01/05,r #Containers: 6					Scr:	Alpha: 4.91E-04 uCi/Sa		Beta: -1.34E-03 uCi/Sa
3 M4KEG-1-AF-X J4H060432-2-DUP 08/06/2014 11:50			127.80g,in AmtRec: 4XLP;2X4LP	127.80g	#Containers: 6					Scr:	Alpha: 4.91E-04 uCi/Sa		Beta: -1.34E-03 uCi/Sa
4 M4LV3-1-AA-B J4H120000-59-BLK 08/14/2014 14:39 pd			127.70g,in AmtRec:	127.70g	#Containers: 1					Scr:	Alpha:		Beta:
5 M4LV3-1-AC-C J4H120000-59-LCS 08/14/2014 14:39 pd			128.50g,in AmtRec:	128.50g	TCSE2901 07/17/14,pd 07/01/05,r #Containers: 1					Scr:	Alpha:		Beta:
6 M4LV3-1-AD-BN J4H120000-59-IBLK 08/12/2014 15:13 pd			AmtRec:		#Containers: 1					Scr:	Alpha:		Beta:

60

September 4, 2014

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Sample Preparation/Analysis

AM Tc-99 Prp/Sep LSC013
S5 Technetium-99 by Liquid Scint
5I CLIENT: HANFORD

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

AnalyDueDate: 09/05/2014

Batch: 4224059 **pCi/L**
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:

Comments: M4LV3-BLK "Comments S-14-00059",,,P-14-00580

All Clients for Batch:
108302, CH2M Hill Plateau Remediation DOE RL Waste Management Federal Servi, SS , 29754

M4KEG1AC-SAMP Constituent List:
Tc-99 RDL:15 pCi/L LCL: UCL: RPD:
M4KEG1AE-MS Constituent List:

M4LV31AA-BLK:
Tc-99 RDL:15 pCi/L LCL: UCL: RPD:
M4LV31AC-LCS:
Tc-99 RDL:15 pCi/L LCL:70 UCL:130 RPD:20
M4LV31AD-IBLK:
Tc-99 RDL:15 pCi/L LCL: UCL: RPD:

M4KEG1AC-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4KEG1AE-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4LV31AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4LV31AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4LV31AD-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

September 4, 2014

ICOC Fraction Transfer/Status Report

September 4, 2014

ByDate: 8/26/2013, 8/31/2014, Batch: '4224059', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			SOPs,Reagents,Comments
4224059						
AC		**Rev1C**	**BourneD**	8/21/2014 1:48:28 PM		
SC			carneyam	IsBatched	8/20/2014 10:42:47 AM	ICOC_RADCALC v4.9.0
SC			BourneD	Sep2C	8/21/2014 1:48:28 PM	RL-LSC-013 REVISION 4
SC			BullJ	InCnt1	8/21/2014 1:55:29 PM	RL-CI-005 REVISION 3
SC			BullJ	CalcC	8/25/2014 1:54:43 PM	RL-CI-005 REVISION 3
SC			nagels	Rev1C	8/26/2014 3:48:17 PM	RL-DR-001 Rev 5
AC			**BullJ**	8/21/2014 1:55:29 PM		
AC			**BullJ**	8/25/2014 1:54:43 PM		
AC			**nagels**	8/26/2014 3:48:17 PM		

AC: Accepting Entry; SC: Status Change

4 (1)

8/12/2014 3:13:09 PM

Sample Preparation/Analysis

Balance Id:,,

108302, CH2M Hill Plateau Remediation DOE RL
, Waste Management Federal Servi

AR H-3 Prp/Sep LSC005
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 09/05/2014

Sep1 DT/Tm Tech:

Batch: 4224061 WATER pCi/L PM, Quote: SS , 29754

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

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 M4KEG-1-AA

J4H060432-2-SAMP

08/06/2014 11:50 AmtRec: 4XLP;2X4LP #Containers: 6 Scr: Alpha: 4.91E-04 uCi/Sa Beta: -1.34E-03 uCi/Sa

2 M4KEG-1-AH-X

J4H060432-2-DUP

08/06/2014 11:50 AmtRec: 4XLP;2X4LP #Containers: 6 Scr: Alpha: 4.91E-04 uCi/Sa Beta: -1.34E-03 uCi/Sa

3 M4LWD-1-AA-B

J4H120000-61-BLK

08/12/2014 15:13 pd AmtRec: #Containers: 1 Scr: Alpha: Beta:

4 M4LWD-1-AC-C

J4H120000-61-LCS

08/12/2014 15:13 pd AmtRec: #Containers: 1 Scr: Alpha: Beta:

5 M4LWD-1-AD-BN

J4H120000-61-IBLK

08/12/2014 15:13 pd AmtRec: #Containers: 1 Scr: Alpha: Beta:

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September 4, 2014

8/12/2014 3:13:10 PM

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Sample Preparation/Analysis

AR H-3 Prp/Sep LSC005
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

Balance Id:,,

Pipet #: _____

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech:

AnalyDueDate: 09/05/2014

Batch: 4224061 pCi/L
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:

Comments:

All Clients for Batch:
108302, CH2M Hill Plateau Remediation DOE RL Waste Management Federal Servi, SS , 29754

M4KEG1AA-SAMP Constituent List:
H-3 RDL:400 pCi/L LCL:70 UCL:130 RPD:20
M4LWD1AA-BLK:
M4LWD1AC-LCS:
M4LWD1AD-IBLK:

M4KEG1AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4LWD1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4LWD1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4LWD1AD-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

September 4, 2014

September 4, 2014

ICOC Fraction Transfer/Status Report

ByDate: 8/25/2013, 8/30/2014, Batch: '4224061', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			SOPs,Reagents,Comments
4224061						
AC		**Rev1C**	**WilkinsonA**	8/13/2014 11:26:36		
SC			WilkinsonA	Sep1C	8/13/2014 11:26:36 AM	RL-LSC-005 REVISION 4
SC			BullJ	InCnt1	8/13/2014 12:07:58 PM	RL-CI-005 REVISION 3
SC			nagels	Rev1C	8/25/2014 5:49:01 PM	RL-DR-001 Rev 5
AC			**BullJ**	8/13/2014 12:07:58		
AC			**nagels**	8/25/2014 5:49:01 PM		

AC: Accepting Entry; SC: Status Change

8/6/2014 8:03:27 PM

Sample Preparation/Analysis

Balance Id:,,

108302, CH2M Hill Plateau Remediation DOE RL
, Waste Management Federal Servi

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
01 STANDARD TEST SET

Pipet #: _____

AnalyDueDate: 09/05/2014

Sep1 DT/Tm Tech:

Batch: 4218121 WATER ug/L **PM, Quote: SS , 29754**

SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 M4KEF-1-AA								
J4H060432-1-SAMP								
08/06/2014 11:50		AmtRec: 1X500MLAG	#Containers: 1			Scr:	Alpha:	Beta:
2 M4KEF-1-AC-S								
J4H060432-1-MS								
08/06/2014 11:50		AmtRec: 1X500MLAG	#Containers: 1			Scr:	Alpha:	Beta:
3 M4KEF-1-AD-D								
J4H060432-1-MSD								
08/06/2014 11:50		AmtRec: 1X500MLAG	#Containers: 1			Scr:	Alpha:	Beta:
4 M4KEF-1-AE-X								
J4H060432-1-DUP								
08/06/2014 11:50		AmtRec: 1X500MLAG	#Containers: 1			Scr:	Alpha:	Beta:
5 M4KEJ-1-AA-B								
J4H060000-121-BLK								
08/06/2014 20:03 pd		AmtRec:	#Containers: 1			Scr:	Alpha:	Beta:
6 M4KEJ-1-AC-C								
J4H060000-121-LCS								
08/06/2014 20:03 pd		AmtRec:	#Containers: 1			Scr:	Alpha:	Beta:

September 4, 2014

8/6/2014 8:03:28 PM

Sample Preparation/Analysis

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
01 STANDARD TEST SET

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

AnalyDueDate: 09/05/2014

Batch: 4218121 ug/L
SEQ Batch, Test: None

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

Comments:

All Clients for Batch:
108302, CH2M Hill Plateau Remediation DOE RL Waste Management Federal Servi, SS , 29754

M4KEF1AA-SAMP Constituent List:

M4KEF1AC-MS Constituent List:

M4KEF1AD-MSD:

M4KEJ1AA-BLK:

M4KEJ1AC-LCS:

M4KEF1AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4KEF1AC-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4KEF1AD-MSD:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4KEJ1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M4KEJ1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

September 4, 2014