Analytical Data Package Prepared For

CH2M Hill Plateau Remediation

Radiochemical Analysis By

TestAmerica Inc

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

Assigned Laboratory Code: TARL

Data Package Contains 19 *Pages*

Report No.: 69163

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.
W07533	F16-043	B35VP5	J6G010421-1	M8VJX1AE	9M8VJX10	6187072
		B35VP5	J6G010421-1	M8VJX1AC	9M8VJX10	6187073
		B35VP5	J6G010421-1	M8VJX1AF	9M8VJX10	6187074
		B35VP5	J6G010421-1	M8VJX1AD	9M8VJX10	6187075
		B35VP5	J6G010421-1	M8VJX1AA	9M8VJX10	6187076

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

August 16, 2016

Attention: Scot Fitzgerald

SAF Number	:	F16-043
Date SDG Closed	:	June 30, 2016
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W07533
Data Deliverable	:	15-Day / Summary

CASE NARRATIVE

I. Introduction

On June 30, 2016, one soil sample was received at TestAmerica (TARL). Upon receipt, the sample was assigned laboratory ID numbers to correspond with the CH2M specific IDs.

II. Sample Receipt

The sample was 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:

Gas Proportional Counting
Gross Alpha by method RL-GPC-001
Gross Beta by method RL-GPC-001
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Liquid Scintillation Counting
Tritium by method RL-LSC-005

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.

The analytical results are reported on a dry weight basis.

QC and sample results are reported in the same units.

V. Comments

Gas Proportional Counting

Gross Alpha by method RL-GPC-001:
The MDA exceeds the CRDL. The precipitate weights were within the optimal range and the samples were counted for the routine maximum time. No other analytical or quality issues were noted. Except as noted, the sample results and associated batch QC results are within contractual requirements.

Gross Beta by method RL-GPC-001:
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Strontium-90 by method RL-GPC-010:
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Gamma Spectroscopy

Gamma Spec by method RL-GAM-001:
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Liquid Scintillation Counting

Tritium by method RL-LSC-005:
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

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CH2M Hill Plateau Remediation Company
August 16, 2016

Reviewed and approved:

Digitally signed by Steven Campbell
Date: 2016.08.16 11:17:56 -07'00'

Steven Campbell
Project Manager Assistant

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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.
CSU (#s) ***u_c Combined Standard Uncert.***	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 standard 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|MDL	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.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-043-043	PAGE 1 OF 1
COLLECTOR Juan Aguilar CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8C AIR QUALITY ☐	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION C9403, I-001	PROJECT DESIGNATION 100-NR-2 Drilling - Soil		SAF NO. F16-043		
ICE CHEST NO. N/A	FIELD LOGBOOK NO. HNF-N-645-3 92	ACTUAL SAMPLE DEPTH 32.00'-34.50'	COA 304070	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

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. NA

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	None	None	None	None	
HOLDING TIME	6 Months	6 Months	6 Months	6 Months	
TYPE OF CONTAINER	G/P	G/P	G/P	G	
NO. OF CONTAINER(S)	1	1	1	1	
VOLUME	500mL	~~120~~mL 125	60mL	60mL	
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SRTOT_SEP_PRECIP_GPC: COMMON;	TRITIUM_DIST_LSC: COMMON;	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B35VP5	SOIL	JUN 30 2016	0855	✓	✓	✓	✓

J6G010421
WO#533
Due 7-15-16
MSVSX

J6G010421

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM Juan Aguilar CHPRC	DATE/TIME JUN 30 2016 0945	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME JUN 30 2016 0945
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC	DATE/TIME JUN 30 2016 1415	RECEIVED BY/STORED IN J. Bock, TARH	DATE/TIME JUN 30 2016 1415
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
SPLIT SPOON PARTS B & A WILL BE COMBINED TO ENSURE ADEQUATE SAMPLE MATERIAL FOR ANALYSIS; SAMPLE A AND B PORTION SAMPLES B35VN2, B35VP0, B35VP5
(1) GAMMA_GS: COMMON {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155};
(2) ALPHA_GPC: COMMON {Gross alpha}; BETA_GPC: COMMON {Gross beta};

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

PRINTED ON 6/2/2016 FSR ID = FSR33023 TRVL NUM = TRVL-16-165 A-6003-618 (REV 2)

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8/16/2016

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Sample Check-in List

Date/Time Received: 6-30-16 / 1415 Container GM Screen Result: (Airlock) 0 cpm Initials [B]
Sample GM Screen Result (Sample Receiving) 0 cpm Initials [B]

Client: FLH SDG #: WON533 SAF #: F16-043 NA [ ]

Lot Number: J6K010421

Chain of Custody # F16-043-043

Shipping Container ID or Air Bill Number : _____ NA [B]

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: 14.6°C IC 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): 4 1 B 6-30-16
7. Containers received: 1x125 mL Ab; 2 x 60mL Ab; 1 x 500mL Ab
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. [B] Client/Courier unpack cooler.

Sample Check-in List completed by Sample Custodian:
Signature: [signature] Date: 6-30-16

Client Notification needed? Yes [ ] No [B] Date: _____
By: _____
Person contacted: _____

[B] No action necessary; process as is

Project Manager [signature] Date 7/5/16

Sample Results Summary

TestAmerica Inc TARL

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

Date: 16-Aug-16

Report No. : 69163

SDG No: W07533

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)		Qual	Units	Tracer Yield	MDL	CRDL	RPD
6187075 GAMMA_GS										
B35VP5										
	M8VJX1AD	CO-60	5.40E-04	+- 4.7E-03	U	pCi/g		8.15E-03	1.00E-01	
		CS-137	-3.73E-03	+- 4.3E-03	U	pCi/g		6.99E-03	1.00E-01	
		EU-152	-1.31E-02	+- 1.4E-02	U	pCi/g		1.83E-02	1.00E-01	
		EU-154	2.14E-02	+- 1.5E-02	U	pCi/g		2.70E-02	1.00E-01	
		EU-155	2.59E-02	+- 1.4E-02	U	pCi/g		2.35E-02	1.00E-01	
B35XB3 DUP										
	M8VKG1AH	CO-60	1.96E-03	+- 5.5E-03	U	pCi/g		9.57E-03	1.00E-01	1011.5
		CS-137	-2.37E-03	+- 4.9E-03	U	pCi/g		7.98E-03	1.00E-01	-111.2
		EU-152	-1.89E-03	+- 1.0E-02	U	pCi/g		1.75E-02	1.00E-01	349.3
		EU-154	-4.37E-03	+- 1.8E-02	U	pCi/g		3.03E-02	1.00E-01	-43.4
		EU-155	2.79E-02	+- 1.1E-02	U	pCi/g		1.77E-02	1.00E-01	92.6
6187072 9310_ALPHABETA_GPC										
B35VP5										
	M8VJX1AE	Alpha	3.99E+00	+- 4.2E+00	U	pCi/g	100%	6.49E+00	5.00E+00	
B35X99 DUP										
	M8VKF1AG	Alpha	3.53E+00	+- 4.8E+00	U	pCi/g	100%	7.81E+00	5.00E+00	42.6
6187074 9310_ALPHABETA_GPC										
B35VP5										
	M8VJX1AF	Beta	1.26E+01	+- 2.3E+00		pCi/g	100%	2.06E+00	1.00E+01	
B35X99 DUP										
	M8VKF1AH	Beta	1.18E+01	+- 2.3E+00		pCi/g	100%	2.16E+00	1.00E+01	25.4
6187076 SRTOT_SEP_PRECIP_GPC										
B35VP5										
	M8VJX1AA	STRONTIUM	4.93E-02	+- 9.2E-02	U	pCi/g	81%	1.52E-01	2.00E+00	
6214056 SRTOT_SEP_PRECIP_GPC										
B35X99 DUP										
	M8VKF1AJ	STRONTIUM	-7.74E-02	+- 1.1E-01	U	pCi/g	88%	2.14E-01	2.00E+00	-5530.2
6187073 TRITIUM_DIST_LSC										
B35VP5										
	M8VJX1AC	H-3	4.02E-02	+- 1.5E-01	U	pCi/g	100%	3.44E-01	3.00E+01	
B35VP5 DUP										
	M8VJX1AG	H-3	9.13E-02	+- 2.8E-01	U	pCi/g	100%	6.22E-01	3.00E+01	77.7

No. of Results: 18

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

QC Results Summary

Date: 16-Aug-16

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 69163

SDG No.: W07533

Batch Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
GAMMA_GS								
6187075 BLANK QC,								
M8VX61AA	CO-60	8.23E-04 +- 3.3E-03	U	pCi/g				6.05E-03
	CS-137	1.15E-03 +- 3.2E-03	U	pCi/g				5.66E-03
	EU-152	5.98E-04 +- 7.5E-03	U	pCi/g				1.26E-02
	EU-154	-2.94E-03 +- 1.0E-02	U	pCi/g				1.70E-02
	EU-155	2.80E-03 +- 5.3E-03	U	pCi/g				9.37E-03
6187075 LCS,								
M8VX61AC	CS-137	9.67E-01 +- 1.3E-01		pCi/g		101%	0.0	1.02E-02
9310_ALPHABETA_GPC								
6187072 BLANK QC,								
M8VX31AA	Alpha	4.94E-01 +- 1.7E+00	U	pCi/g	100%			3.00E+00
6187072 LCS,								
M8VX31AC	Alpha	9.32E+01 +- 2.4E+01		pCi/g	100%	104%	0.0	3.23E+00
9310_ALPHABETA_GPC								
6187074 BLANK QC,								
M8VX51AA	Beta	-2.08E-01 +- 9.0E-01	U	pCi/g	100%			1.57E+00
6187074 LCS,								
M8VX51AC	Beta	6.92E+01 +- 9.0E+00		pCi/g	100%	102%	0.0	1.61E+00
SRTOT_SEP_PRECIP_GPC								
6187076 BLANK QC,								
M8VX71AA	STRONTIUM	9.49E-02 +- 9.8E-02	U	pCi/g	83%			1.55E-01
6187076 LCS,								
M8VX71AC	STRONTIUM	4.12E+00 +- 9.6E-01		pCi/g	82%	119%	0.2	1.26E-01
TRITIUM_DIST_LSC								
6187073 MATRIX SPIKE, B35XB3								
M8VKG1AG	H-3	4.64E+00 +- 4.6E-01		pCi/g	100%	99%	0.0	3.41E-01
6187073 BLANK QC,								
M8VX41AA	H-3	9.65E-03 +- 9.6E-02	U	pCi/g	100%			2.18E-01
6187073 LCS,								
M8VX41AC	H-3	1.02E+00 +- 1.6E-01		pCi/g	100%	113%	0.1	2.20E-01

No. of Results: 15

TestAmerica Inc

rptSTLRchQcSummary V5.6 A2002

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

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 16-Aug-16

Lab Name:	**TestAmerica Inc**	**SDG:**	W07533	**Collection Date:**	6/30/2016 8:55:00 AM
Lot-Sample No.:	**J6G010421-1**	**Report No. :**	69163	**Received Date:**	6/30/2016 2:15:00 PM
Client Sample ID:	**B35VP5**	**COC No. :**	F16-043-043	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	CSU (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: 6187072	9310_ALPHABETA_GPC			**Work Order:** M8VJX1AE			**Report DB ID:** 9M8VJX10					
Alpha	**3.99E+00**	U	4.0E+00	4.2E+00	6.49E+00	pCi/g	100%	*0.61*	7/28/16 10:07 a		0.0499	GPC24A
						2.93E+00	5.00E+00	*(1.9)*			g	
Batch: 6187073	TRITIUM_DIST_LSC			**Work Order:** M8VJX1AC			**Report DB ID:** 9M8VJX10					
H-3	**4.02E-02**	U	1.4E-01	1.5E-01	3.44E-01	pCi/g	100%	*0.12*	7/16/16 01:38 p		21.0	LSC9
						1.56E-01	3.00E+01	*0.52*			g	
Batch: 6187074	9310_ALPHABETA_GPC			**Work Order:** M8VJX1AF			**Report DB ID:** 9M8VJX10					
Beta	**1.26E+01**		1.7E+00	2.3E+00	2.06E+00	pCi/g	100%	*(6.1)*	7/27/16 06:41 p		0.1998	GPC26A
						9.89E-01	1.00E+01	*(10.9)*			g	
Batch: 6187075	GAMMA_GS			**Work Order:** M8VJX1AD			**Report DB ID:** 9M8VJX10					
CO-60	**5.40E-04**	U	4.7E-03	4.7E-03	8.15E-03	pCi/g		*0.07*	7/27/16 08:41 a		462.3	GER11$1
							1.00E-01	*0.23*			g	
CS-137	**-3.73E-03**	U	4.3E-03	4.3E-03	6.99E-03	pCi/g		*-0.53*	7/27/16 08:41 a		462.3	GER11$1
							1.00E-01	*-(1.7)*			g	
EU-152	**-1.31E-02**	U	1.4E-02	1.4E-02	1.83E-02	pCi/g		*-0.72*	7/27/16 08:41 a		462.3	GER11$1
							1.00E-01	*-(1.8)*			g	
EU-154	**2.14E-02**	U	1.5E-02	1.5E-02	2.70E-02	pCi/g		*0.79*	7/27/16 08:41 a		462.3	GER11$1
							1.00E-01	*(2.8)*			g	
EU-155	**2.59E-02**	U	1.4E-02	1.4E-02	2.35E-02	pCi/g		*(1.1)*	7/27/16 08:41 a		462.3	GER11$1
							1.00E-01	*(3.7)*			g	
Batch: 6187076	SRTOT_SEP_PRECIP_GPC			**Work Order:** M8VJX1AA			**Report DB ID:** 9M8VJX10					

8/16/2016

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TestAmerica Inc
rptSTLRchSample
V5.6 A2002

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, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 16-Aug-16

Lab Name:	**TestAmerica Inc**	**SDG:**	W07533	**Collection Date:**	6/30/2016 8:55:00 AM
Lot-Sample No.:	**J6G010421-1**	**Report No. :**	69163	**Received Date:**	6/30/2016 2:15:00 PM
Client Sample ID:	**B35VP5**	**COC No. :**	F16-043-043	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	CSU (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
STRONTIUM	**4.93E-02**	U	9.1E-02	9.2E-02	1.52E-01	pCi/g	81%	*0.33*	7/27/16 12:59 p		1.98	GPC32A
						7.27E-02	2.00E+00	*(1.1)*			g	

No. of Results: 9 **Comments:**

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TestAmerica Inc

rptSTLRchSample
V5.6 A2002

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, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

FORM II

Date: 16-Aug-16

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07533	**Collection Date:**	6/30/2016 8:55:00 AM
Lot-Sample No.:	**J6G010421-1**	**Report No. :**	69163	**Received Date:**	6/30/2016 2:15:00 PM
Client Sample ID:	**B35VP5 DUP**	**COC No. :**	F16-043-043	**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6187073	TRITIUM_DIST_LSC			**Work Order:** M8VJX1AG		**Report DB ID:** M8VJX1GR			**Orig Sa DB ID:** 9M8VJX10			
H-3	9.13E-02	U	2.5E-01	2.8E-01	6.22E-01	pCi/g	100%	0.15	7/16/16 01:59 p		19.9	LSC9
	4.02E-02	U	**RPD**	**77.7**		3.00E+01		0.65			g	

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

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TestAmerica Inc

rptSTLRchDupV5.6 A2002

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, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

FORM II

Date: 16-Aug-16

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07534	**Collection Date:**	6/30/2016 12:20:00 PM
Lot-Sample No.:	**J6G010425-1**	**Report No. :**	69163	**Received Date:**	7/1/2016 9:30:00 AM
Client Sample ID:	**B35X99 DUP**	**COC No. :**	F16-043-047	**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6187072	9310_ALPHABETA_GPC			**Work Order:**	M8VKF1AG	**Report DB ID:**	M8VKF1GR		**Orig Sa DB ID:** 9M8VKF10			
Alpha	3.53E+00	U	4.7E+00	4.8E+00	7.81E+00	pCi/g	100%	0.45	7/28/16 10:07 a		0.0496	GPC24C
	5.45E+00	U	**RPD**	**42.6**		5.00E+00		(1.5)			g	
Batch: 6187074	9310_ALPHABETA_GPC			**Work Order:**	M8VKF1AH	**Report DB ID:**	M8VKF1HR		**Orig Sa DB ID:** 9M8VKF10			
Beta	1.18E+01		1.7E+00	2.3E+00	2.16E+00	pCi/g	100%	(5.5)	7/27/16 06:41 p		0.1998	GPC26C
	1.52E+01		**RPD**	**25.4**		1.00E+01		(10.2)			g	
Batch: 6214056	SRTOT_SEP_PRECIP_GPC			**Work Order:**	M8VKF1AJ	**Report DB ID:**	M8VKF1JR		**Orig Sa DB ID:** 9M8VKF10			
STRONTIUM	-7.74E-02	U	1.1E-01	1.1E-01	2.14E-01	pCi/g	88%	-0.36	8/15/16 09:27 p		2.15	GPC32A
	7.20E-02	U	**RPD**	**-5530.2**		2.00E+00		-(1.4)			g	

No. of Results: 3 **Comments:**

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FORM II

Date: 16-Aug-16

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07534	**Collection Date:**	6/30/2016 2:25:00 PM
Lot-Sample No.:	**J6G010425-2**	**Report No. :**	69163	**Received Date:**	7/1/2016 9:30:00 AM
Client Sample ID:	**B35XB3 DUP**	**COC No. :**	F16-043-051	**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6187075	GAMMA_GS			**Work Order:**	M8VKG1AH	**Report DB ID:**	M8VKG1HR		**Orig Sa DB ID:** 9M8VKG10			
CO-60	1.96E-03	U	5.5E-03	5.5E-03	9.57E-03	pCi/g		0.21	7/28/16 08:39 a		419.7	GER18$1
	-1.32E-03	U	**RPD**	**1011.5**		1.00E-01		0.71			g	
CS-137	-2.37E-03	U	4.9E-03	4.9E-03	7.98E-03	pCi/g		-0.3	7/28/16 08:39 a		419.7	GER18$1
	-8.32E-03	U	**RPD**	**-111.2**		1.00E-01		-0.98			g	
EU-152	-1.89E-03	U	1.0E-02	1.0E-02	1.75E-02	pCi/g		-0.11	7/28/16 08:39 a		419.7	GER18$1
	6.95E-03	U	**RPD**	**349.3**		1.00E-01		-0.36			g	
EU-154	-4.37E-03	U	1.8E-02	1.8E-02	3.03E-02	pCi/g		-0.14	7/28/16 08:39 a		419.7	GER18$1
	-6.80E-03	U	**RPD**	**-43.4**		1.00E-01		-0.49			g	
EU-155	2.79E-02	U	1.1E-02	1.1E-02	1.77E-02	pCi/g		(1.6)	7/28/16 08:39 a		419.7	GER18$1
	1.02E-02	U	**RPD**	**92.6**		1.00E-01		(5.2)			g	

No. of Results: 5 **Comments:**

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TestAmerica Inc

rptSTLRchDupV5.6 A2002

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, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 16-Aug-16

Lab Name: TestAmerica Inc

Matrix: SOIL

SDG: W07533

Report No. : 69163

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6187073	TRITIUM_DIST_LSC			**Work Order:**	M8VX41AA		**Report DB ID:**	M8VX41AB				
H-3	9.65E-03	U	8.5E-02	9.6E-02	2.18E-01	pCi/g	100%	0.04	7/16/16 03:26 p		31.1	LSC9
					9.88E-02	3.00E+01		0.2			g	
Batch: 6187075	GAMMA_GS			**Work Order:**	M8VX61AA		**Report DB ID:**	M8VX61AB				
CO-60	8.23E-04	U	3.3E-03	3.3E-03	6.05E-03	pCi/g		0.14	7/27/16 08:46 a		348.0	GER18$1
						1.00E-01		0.49			g	
CS-137	1.15E-03	U	3.2E-03	3.2E-03	5.66E-03	pCi/g		0.2	7/27/16 08:46 a		348.0	GER18$1
						1.00E-01		0.71			g	
EU-152	5.98E-04	U	7.5E-03	7.5E-03	1.26E-02	pCi/g		0.05	7/27/16 08:46 a		348.0	GER18$1
						1.00E-01		0.16			g	
EU-154	-2.94E-03	U	1.0E-02	1.0E-02	1.70E-02	pCi/g		-0.17	7/27/16 08:46 a		348.0	GER18$1
						1.00E-01		-0.59			g	
EU-155	2.80E-03	U	5.3E-03	5.3E-03	9.37E-03	pCi/g		0.3	7/27/16 08:46 a		348.0	GER18$1
						1.00E-01		(1.)			g	
Batch: 6187072	9310_ALPHABETA_GPC			**Work Order:**	M8VX31AA		**Report DB ID:**	M8VX31AB				
Alpha	4.94E-01	U	1.7E+00	1.7E+00	3.00E+00	pCi/g	100%	0.16	7/28/16 02:27 p		0.05	GPC23A
					1.35E+00	5.00E+00		0.58			g	
Batch: 6187074	9310_ALPHABETA_GPC			**Work Order:**	M8VX51AA		**Report DB ID:**	M8VX51AB				
Beta	-2.08E-01	U	9.0E-01	9.0E-01	1.57E+00	pCi/g	100%	-0.13	7/27/16 06:41 p		0.2	GPC27A
					7.49E-01	1.00E+01		-0.46			g	
Batch: 6187076	SRTOT_SEP_PRECIP_GPC			**Work Order:**	M8VX71AA		**Report DB ID:**	M8VX71AB				
STRONTIUM	9.49E-02	U	9.5E-02	9.8E-02	1.55E-01	pCi/g	83%	0.61	7/27/16 12:59 p		2.01	GPC32D
					7.44E-02	2.00E+00		(1.9)			g	

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, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 16-Aug-16

Lab Name: TestAmerica Inc

SDG: W07533

Matrix: SOIL

Report No. : 69163

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector

No. of Results: 9 **Comments:**

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

rptSTLRchBlank
V5.6 A2002

FORM II

LCS RESULTS

Date: 16-Aug-16

Lab Name: TestAmerica Inc

SDG: W07533

Matrix: SOIL

Report No. : 69163

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 6187073	TRITIUM_DIST_LSC			**Work Order:**	M8VX41AC		**Report DB ID:**	M8VX41CS					
H-3	1.02E+00		1.5E-01	1.6E-01	2.20E-01	pCi/g	100%	9.06E-01	2.72E-02	113%	7/16/16 03:47 p	30.2	LSC9
							Rec Limits:	80	120	0.1		g	
Batch: 6187075	GAMMA_GS			**Work Order:**	M8VX61AC		**Report DB ID:**	M8VX61CS					
CS-137	9.67E-01		1.3E-01	1.3E-01	1.02E-02	pCi/g		9.60E-01	9.90E-03	101%	7/27/16 08:47 a	350.1	GER19$1
							Rec Limits:	80	120	0.0		g	
Batch: 6187072	9310_ALPHABETA_GPC			**Work Order:**	M8VX31AC		**Report DB ID:**	M8VX31CS					
Alpha	9.32E+01		6.8E+00	2.4E+01	3.23E+00	pCi/g	100%	9.01E+01	9.10E-01	104%	7/28/16 02:27 p	0.05	GPC23D
							Rec Limits:	80	120	0.0		g	
Batch: 6187074	9310_ALPHABETA_GPC			**Work Order:**	M8VX51AC		**Report DB ID:**	M8VX51CS					
Beta	6.92E+01		2.8E+00	9.0E+00	1.61E+00	pCi/g	100%	6.76E+01	4.80E-01	102%	7/27/16 06:41 p	0.2	GPC27B
							Rec Limits:	80	120	0.0		g	
Batch: 6187076	SRTOT_SEP_PRECIP_GPC			**Work Order:**	M8VX71AC		**Report DB ID:**	M8VX71CS					
STRONTIUM	4.12E+00		2.0E-01	9.6E-01	1.26E-01	pCi/g	82%	3.47E+00	2.46E-02	119%	7/28/16 09:54 a	2.02	GPC31A
							Rec Limits:	80	120	0.2		g	

No. of Results: 5 **Comments:**

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

rptSTLRchLcs
V5.6 A2002

FORM II

MATRIX SPIKE RESULTS

Date: 16-Aug-16

Lab Name: TestAmerica Inc **SDG:** W07534

Lot-Sample No.: J6G010425-2, B35XB3 **Report No. :** 69163 **Matrix:** SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	CSU (2 s)	MDC|MDA	Rpt Unit	Yield	Rec-overy	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6187073	**Work Order:** M8VKG1AG			**Report DB ID:** M8VKG1GW			**Orig Sa DB ID:** 9M8VKG10					
H-3	4.64E+00		3.7E-01	4.6E-01	3.41E-01	pCi/g	100%	99.29%	4.67E+00	7/16/16 03:04 p	20.5	TRITIUM_DIST_LSC
	5.88E-01								1.40E-01		g	LSC9

Number of Results: 1

Comments:

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

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

V5.6 A2002