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.: 66582

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.
W07183	F13-002	B31VB0	J5G090458-1	M68T31AD	9M68T310	5196021
		B31VB0	J5G090458-1	M68T31AC	9M68T310	5196022
		B31VB0	J5G090458-1	M68T31AA	9M68T310	5196024
		B31VB6	J5G090458-2	M68T41AD	9M68T410	5196021
		B31VB6	J5G090458-2	M68T41AC	9M68T410	5196022
		B31VB6	J5G090458-2	M68T41AA	9M68T410	5196024
		B31VC7	J5G090458-3	M68T51AD	9M68T510	5196021
		B31VC7	J5G090458-3	M68T51AC	9M68T510	5196022
		B31VC7	J5G090458-3	M68T51AA	9M68T510	5196024

TestAmerica
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Certificate of Analysis

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

July 22, 2015

Attention: Scot Fitzgerald

SAF Number	:	F13-002
Date SDG Closed	:	July 8, 2015
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W07183
Data Deliverable	:	15-Day / Summary

CASE NARRATIVE

I. Introduction

On July 8, 2015, three samples were received at TestAmerica (TARL). Upon receipt, the samples were assigned laboratory ID numbers to correspond with the CH2M specific IDs.

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:

Gamma Spectroscopy
Iodine-129 (LL) by method RL-GAM-002
Liquid Scintillation Counting
Technetium-99 by TEVA method RL-LSC-014
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.

QC and sample results are reported in the same units.

V. Comments

Gamma Spectroscopy
Iodine-129 (LL) by method RL-GAM-002:
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Liquid Scintillation Counting
Technetium-99 by TEVA method RL-LSC-014:
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

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.

Reviewed and approved: Erika Jordan 2015.07.22 17:21:17 -07'00'

For Erika Jordan

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.
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	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	F13-002-1204	PAGE 1 OF 1

COLLECTOR: CHRIS FULTON, CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: EVANS, RT	PRICE CODE: 7C AIR QUALITY: ☐
DATA TURNAROUND: 15 Days / 15 Days				
SAMPLING LOCATION: 289TF, 299-W22-90, Valve V03-YE21	PROJECT DESIGNATION: 200W Pump & Treat - Extraction Well Water Sampling		SAF NO.: F13-002	
ICE CHEST NO.: (N/A)	FIELD LOGBOOK NO.: HNF-N- 4919	ACTUAL SAMPLE DEPTH: (N/A)	COA: 303111	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.

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None	None	HCl to pH <2
HOLDING TIME	6 Months	6 Months	6 Months
TYPE OF CONTAINER	G/P	P	P
NO. OF CONTAINER(S)	2	1	1
VOLUME	4L	1L	500mL
SAMPLE ANALYSIS	I129LL_SEP_LEPS_GS_LL: COMMON;	TRITIUM_DIST_LSC: COMMON;	TC99_ETVDSK_LSC: COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B31VB0	WATER	JUL 07 2015	1325	✓	✓	✓

J5G090458
W07183
Due 7-23-15
M68T3

J5G090458

July 22, 2015

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON, CHPRC	DATE/TIME: JUL 07 2015 1440	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: JUL 07 2015 1440
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: JUL 08 2015 0700	RECEIVED BY/STORED IN: K.C. Patterson/CHPRC	DATE/TIME: JUL 08 2015 0700
RELINQUISHED BY/REMOVED FROM: K.C. Patterson/CHPRC	DATE/TIME: JUL 08 2015 0830	RECEIVED BY/STORED IN: J. Friesz, TARL	DATE/TIME: JUL 08 2015 0830
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
** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. TRVL-15-110

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

PRINTED ON 6/19/2015 | FSR ID = FSR1244 | TRVL NUM = TRVL-15-110 | A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F13-002-1210	PAGE 1 OF 1
COLLECTOR CHRIS FULTON CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR EVANS, RT	PRICE CODE 7C AIR QUALITY ☐	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 289TF, 299-W22-91, Valve V03-YE22	PROJECT DESIGNATION 200W Pump & Treat - Extraction Well Water Sampling		SAF NO. F13-002		
ICE CHEST NO. (N/A)	FIELD LOGBOOK NO. HNF-N-491 9	ACTUAL SAMPLE DEPTH (N/A)	COA 303111	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.

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None	None	HCl to pH <2
HOLDING TIME	6 Months	6 Months	6 Months
TYPE OF CONTAINER	G/P	P	P
NO. OF CONTAINER(S)	2	1	1
VOLUME	4L	1L	500mL
SAMPLE ANALYSIS	I129LL_SEP_LEPS_GS_LL: COMMON;	TRITIUM_DIST_LSC: COMMON;	TC99_ETVDSK_LSC: COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B31VB6	WATER	JUL 07 2015	1405	✓	✓	✓

J56090458
W07183
Due 7-23-15
M68T4

July 22, 2015

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM CHRIS FULTON CHPRC	DATE/TIME JUL 07 2015 1440	RECEIVED BY/STORED IN SSU-1	DATE/TIME JUL 07 2015 1440	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. TRVL-15-110
RELINQUISHED BY/REMOVED FROM SSU-1	DATE/TIME JUL 08 2015 0700	RECEIVED BY/STORED IN K.C. Patterson/CHPRC	DATE/TIME JUL 08 2015 0700	
RELINQUISHED BY/REMOVED FROM K.C. Patterson/CHPRC	DATE/TIME JUL 08 2015 0830	RECEIVED BY/STORED IN J. Friesz, TARL	DATE/TIME JUL 08 2015 0830	
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 6/19/2015 FSR ID = FSR1240 TRVL NUM = TRVL-15-110 A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F13-002-1221	PAGE 1 OF 1
COLLECTOR: CHRIS FULTON, CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: EVANS, RT	PRICE CODE: 7C	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: 289TF, 299-W22-92, Valve V03-YE23	PROJECT DESIGNATION: 200W Pump & Treat - Extraction Well Water Sampling		SAF NO.: F13-002	AIR QUALITY: ☐	
ICE CHEST NO.: (N/A)	FIELD LOGBOOK NO.: 491 9	ACTUAL SAMPLE DEPTH: (N/A)	COA: 303111	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.

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None	None	HCl to pH <2
HOLDING TIME	6 Months	6 Months	6 Months
TYPE OF CONTAINER	G/P	P	P
NO. OF CONTAINER(S)	2	1	1
VOLUME	4L	1L	500mL
SAMPLE ANALYSIS	I129LL_SEP_LEPS_GS_LL: COMMON;	TRITIUM_DIST_LSC: COMMON;	TC99_ETVDSK_LSC: COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B31VC7	WATER	JUL 07 2015	1338	✓	✓	✓

JS6090458
W0N183
Due 7-23-15

M68T5

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON, CHPRC	DATE/TIME: JUL 07 2015 1440	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: JUL 07 2015 1440
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: JUL 08 2015 0700	RECEIVED BY/STORED IN: K.C. Patterson/CHPRC	DATE/TIME: JUL 08 2015 0700
RELINQUISHED BY/REMOVED FROM: K.C. Patterson/CHPRC	DATE/TIME: JUL 08 2015 0830	RECEIVED BY/STORED IN: J. Thesz, TARL	DATE/TIME: JUL 08 2015 0836
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
** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. TRVL-15-110

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

PRINTED ON 6/19/2015 FSR ID = FSR1242 TRVL NUM = TRVL-15-110 A-6003-618 (REV 2)

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July 22, 2015

Sample Check-in List

Date/Time Received: 7/8/15 0830 Container GM Screen Result: (Airlock) 40 cpm Initials[ ]
Sample GM Screen Result (Sample Receiving) 0 cpm Initials[ ]

Client: FLH SDG #: WO7183 SAF #: F13-002 NA [ ]

Lot Number: JS6090458

Chain of Custody # F13-002-1204, 1210, 1221

Shipping Container ID or Air Bill Number : NA [ ]

Samples received inside shipping container/cooler/box Yes [ ] 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 [ ]
2. Custody Seals dated and signed? Yes [ ] No [ ] No Custody Seal [ ]
3. Cooler temperature: 7.5 °C ON ICE NA [ ]
4. Vermiculite/packing materials is NA [ ] Wet [ ] Dry [ ]

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes [ ] No [ ]
6. Number of samples received (Each sample may contain multiple bottles): 3
7. Containers received: 3x500mLp, 3x4p, ~~8~~ 6x4Lp BN 9-15
8. Sample holding times exceeded? NA [ ] Yes [ ] No [ ]
9. Samples have: ____tape ____hazard labels ____custody seals ____appropriate sample labels
10. Matrix: ____A (FLT, Wipe, Solid, Soil) ____I (Water) ____S (Air, Niosh 7400) ____T (Biological, Ni-63)
11. Samples:
____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 [ ] 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 [ ]
14. Description of anomalies (include sample numbers): NA [ ]
15. Sample Location, Sample Collector Listed on COC? * Yes [ ] No [ ]
*For documentation only. No corrective action needed.
16. Additional Information: N/A

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

Sample Check-in List completed by Sample Custodian:
Signature: Date: 7/8/15

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

No action necessary; process as is

Project Manager Whitney M Pitconi Date 7/13/15

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Sample Results Summary

Date: 22-Jul-15

TestAmerica Inc TARL

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

Report No. : 66582 **SDG No:** W07183

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5196022 I129LL_SEP_LEPS_GS									
B31VB0									
	M68T31AC	I129	2.64E-01 +- 2.8E-01	U	pCi/L	93%	5.64E-01	1.00E+00	
B31VB0 DUP									
	M68T31AF	I129	5.34E-02 +- 2.6E-01	U	pCi/L	87%	5.04E-01	1.00E+00	132.6
B31VB6									
	M68T41AC	I129	1.85E-01 +- 3.8E-01	U	pCi/L	90%	7.07E-01	1.00E+00	
B31VC7									
	M68T51AC	I129	7.75E-01 +- 5.1E-01		pCi/L	86%	4.68E-01	1.00E+00	
5196021 TC99_ETVDSK_LSC									
B31VB0									
	M68T31AD	Tc-99	7.96E+02 +- 2.3E+01		pCi/L	100%	1.00E+01	1.50E+01	
B31VB6									
	M68T41AD	Tc-99	3.58E+03 +- 8.2E+01		pCi/L	100%	1.01E+01	1.50E+01	
B31VB6 DUP									
	M68T41AE	Tc-99	3.55E+03 +- 8.2E+01		pCi/L	100%	1.00E+01	1.50E+01	0.6
B31VC7									
	M68T51AD	Tc-99	3.30E+03 +- 7.6E+01		pCi/L	100%	9.97E+00	1.50E+01	
5196024 TRITIUM_DIST_LSC									
B31VB0									
	M68T31AA	H-3	1.23E+03 +- 1.8E+02		pCi/L	100%	2.83E+02	4.00E+02	
B31VB0 DUP									
	M68T31AH	H-3	1.31E+03 +- 1.8E+02		pCi/L	100%	2.83E+02	4.00E+02	6.8
B31VB6									
	M68T41AA	H-3	6.78E+03 +- 3.7E+02		pCi/L	100%	2.87E+02	4.00E+02	
B31VC7									
	M68T51AA	H-3	6.84E+03 +- 3.7E+02		pCi/L	100%	2.90E+02	4.00E+02	

No. of Results: 12

TestAmerica Inc

rptTALRchSaSummary2 V5.3.8 A2002

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: 22-Jul-15

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 66582

SDG No.: W07183

Batch Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
I129LL_SEP_LEPS_GS								
5196022 BLANK QC,								
M691C1AA	I129	-1.98E-01 +- 3.5E-01	U	pCi/L	83%			5.86E-01
5196022 LCS,								
M691C1AC	I129	1.87E+01 +- 2.5E+00		pCi/L	93%	97%	0.0	8.00E-01
TC99_ETVDSK_LSC								
5196021 MATRIX SPIKE, B31VB0								
M68T31AE	Tc-99	4.17E+02 +- 4.0E+01		pCi/L	100%	80%	-0.2	9.86E+00
5196021 BLANK QC,								
M690T1AA	Tc-99	-1.45E+00 +- 4.6E+00	U	pCi/L	100%			1.01E+01
5196021 LCS,								
M690T1AC	Tc-99	8.90E+01 +- 7.1E+00		pCi/L	100%	85%	-0.2	9.93E+00
TRITIUM_DIST_LSC								
5196024 MATRIX SPIKE, B31VB0								
M68T31AG	H-3	1.21E+03 +- 3.0E+02		pCi/L	100%	87%	-0.1	3.27E+02
5196024 BLANK QC,								
M691E1AA	H-3	5.56E+01 +- 1.4E+02	U	pCi/L	100%			2.97E+02
5196024 LCS,								
M691E1AC	H-3	3.00E+03 +- 2.5E+02		pCi/L	100%	108%	0.1	2.98E+02

No. of Results: 8

TestAmerica Inc

rptSTLRchQcSummary V5.3.8 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: 22-Jul-15

Lab Name:	**TestAmerica Inc**	**SDG:**	W07183	**Collection Date:**	7/7/2015 1:25:00 PM
Lot-Sample No.:	**J5G090458-1**	**Report No. :**	66582	**Received Date:**	7/8/2015 8:30:00 AM
Client Sample ID:	**B31VB0**	**COC No. :**	F13-002-1204	**Matrix:**	WATER

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: 5196021	TC99_ETVDSK_LSC			**Work Order:** M68T31AD			**Report DB ID:** 9M68T310					
Tc-99	**7.96E+02**		1.6E+01	2.3E+01	1.00E+01	pCi/L	100%	*(79.3)*	7/18/15 05:20 a		0.1265	LSC9
						4.82E+00	1.50E+01	*(68.7)*			L	
Batch: 5196022	I129LL_SEP_LEPS_GS			**Work Order:** M68T31AC			**Report DB ID:** 9M68T310					
I129	**2.64E-01**	U	2.8E-01	2.8E-01	5.64E-01	pCi/L	93%	*0.47*	7/21/15 08:08 a		2.0145	LEP4$1
						2.63E-01	1.00E+00	*(1.9)*			L	
Batch: 5196024	TRITIUM_DIST_LSC			**Work Order:** M68T31AA			**Report DB ID:** 9M68T310					
H-3	**1.23E+03**		1.6E+02	1.8E+02	2.83E+02	pCi/L	100%	*(4.3)*	7/18/15 04:29 p		0.00501	LSC8
						1.34E+02	4.00E+02	*(13.6)*			L	

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

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TestAmerica Inc
rptSTLRchSample
V5.3.8 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: 22-Jul-15

Lab Name:	**TestAmerica Inc**	**SDG:**	W07183	**Collection Date:**	7/7/2015 2:05:00 PM
Lot-Sample No.:	**J5G090458-2**	**Report No. :**	66582	**Received Date:**	7/8/2015 8:30:00 AM
Client Sample ID:	**B31VB6**	**COC No. :**	F13-002-1210	**Matrix:**	WATER

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: 5196021	TC99_ETVDSK_LSC			**Work Order:** M68T41AD			**Report DB ID:** 9M68T410					
Tc-99	**3.58E+03**		3.2E+01	8.2E+01	1.01E+01	pCi/L	100%	*(355.)*	7/18/15 07:24 a		0.1268	LSC9
						4.84E+00	1.50E+01	*(86.8)*			L	
Batch: 5196022	I129LL_SEP_LEPS_GS			**Work Order:** M68T41AC			**Report DB ID:** 9M68T410					
I129	**1.85E-01**	U	3.8E-01	3.8E-01	7.07E-01	pCi/L	90%	*0.26*	7/21/15 09:52 a		2.0257	LEP4$1
						3.20E-01	1.00E+00	*0.98*			L	
Batch: 5196024	TRITIUM_DIST_LSC			**Work Order:** M68T41AA			**Report DB ID:** 9M68T410					
H-3	**6.78E+03**		2.9E+02	3.7E+02	2.87E+02	pCi/L	100%	*(23.6)*	7/18/15 08:35 p		0.00503	LSC8
						1.36E+02	4.00E+02	*(37.1)*			L	

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

July 22, 2015

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TestAmerica Inc
rptSTLRchSample
V5.3.8 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: 22-Jul-15

Lab Name:	**TestAmerica Inc**	**SDG:**	W07183	**Collection Date:**	7/7/2015 1:38:00 PM
Lot-Sample No.:	**J5G090458-3**	**Report No. :**	66582	**Received Date:**	7/8/2015 8:30:00 AM
Client Sample ID:	**B31VC7**	**COC No. :**	F13-002-1221	**Matrix:**	WATER

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: 5196021	TC99_ETVDSK_LSC			**Work Order:** M68T51AD			**Report DB ID:** 9M68T510					
Tc-99	**3.30E+03**		3.1E+01	7.6E+01	9.97E+00	pCi/L	100%	*(331.2)*	7/18/15 09:28 a		0.1281	LSC9
						4.79E+00	1.50E+01	*(86.4)*			L	
Batch: 5196022	I129LL_SEP_LEPS_GS			**Work Order:** M68T51AC			**Report DB ID:** 9M68T510					
I129	**7.75E-01**		5.1E-01	5.1E-01	4.68E-01	pCi/L	86%	*(1.7)*	7/21/15 09:52 a		2.029	LEP5$1
						2.05E-01	1.00E+00	*(3.)*			L	
Batch: 5196024	TRITIUM_DIST_LSC			**Work Order:** M68T51AA			**Report DB ID:** 9M68T510					
H-3	**6.84E+03**		2.9E+02	3.7E+02	2.90E+02	pCi/L	100%	*(23.6)*	7/18/15 09:57 p		0.00501	LSC8
						1.38E+02	4.00E+02	*(37.1)*			L	

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

July 22, 2015

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TestAmerica Inc
rptSTLRchSample
V5.3.8 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: 22-Jul-15

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07183	**Collection Date:**	7/7/2015 1:25:00 PM
Lot-Sample No.:	**J5G090458-1**	**Report No. :**	66582	**Received Date:**	7/8/2015 8:30:00 AM
Client Sample ID:	**B31VB0 DUP**	**COC No. :**	F13-002-1204	**Matrix:**	WATER

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: 5196022	I129LL_SEP_LEPS_GS			**Work Order:** M68T31AF		**Report DB ID:** M68T31FR			**Orig Sa DB ID:** 9M68T310			
I129	5.34E-02	U	2.6E-01	2.6E-01	5.04E-01	pCi/L	87%	0.11	7/21/15 08:09 a		2.0053	LEP5$1
	2.64E-01	U	**RPD**	**132.6**		1.00E+00		0.41			L	
Batch: 5196024	TRITIUM_DIST_LSC			**Work Order:** M68T31AH		**Report DB ID:** M68T31HR			**Orig Sa DB ID:** 9M68T310			
H-3	1.31E+03		1.6E+02	1.8E+02	2.83E+02	pCi/L	100%	(4.6)	7/18/15 07:13 p		0.00501	LSC8
	1.23E+03		**RPD**	**6.8**		4.00E+02		(14.3)			L	

No. of Results: 2 **Comments:**

July 22, 2015

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TestAmerica Inc

rptSTLRchDupV5.3.8 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: 22-Jul-15

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07183	**Collection Date:**	7/7/2015 2:05:00 PM
Lot-Sample No.:	**J5G090458-2**	**Report No. :**	66582	**Received Date:**	7/8/2015 8:30:00 AM
Client Sample ID:	**B31VB6 DUP**	**COC No. :**	F13-002-1210	**Matrix:**	WATER

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: 5196021	TC99_ETVDSK_LSC			**Work Order:** M68T41AE		**Report DB ID:** M68T41ER			**Orig Sa DB ID:** 9M68T410			
Tc-99	3.55E+03		3.2E+01	8.2E+01	1.00E+01	pCi/L	100%	(354.7)	7/18/15 08:26 a		0.1276	LSC9
	3.58E+03		**RPD**	**0.6**		1.50E+01		(86.8)			L	

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

July 22, 2015

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TestAmerica Inc **RPD - Relative Percent Difference.**

rptSTLRchDupV5.3.8 A2002 **MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.**

FORM II

BLANK RESULTS

Date: 22-Jul-15

Lab Name: TestAmerica Inc

Matrix: WATER

SDG: W07183

Report No. : 66582

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: 5196024	TRITIUM_DIST_LSC			**Work Order:**	M691E1AA		**Report DB ID:**	M691E1AB				
H-3	5.56E+01	U	1.2E+02	1.4E+02	2.97E+02	pCi/L	100%	0.19	7/18/15 11:19 p		0.00504	LSC8
					1.41E+02	4.00E+02		0.81			L	
Batch: 5196022	I129LL_SEP_LEPS_GS			**Work Order:**	M691C1AA		**Report DB ID:**	M691C1AB				
I129	-1.98E-01	U	3.5E-01	3.5E-01	5.86E-01	pCi/L	83%	-0.34	7/21/15 11:47 a		2.0009	LEP4$1
					2.44E-01	1.00E+00		-(1.1)			L	
Batch: 5196021	TC99_ETVDSK_LSC			**Work Order:**	M690T1AA		**Report DB ID:**	M690T1AB				
Tc-99	-1.45E+00	U	4.1E+00	4.6E+00	1.01E+01	pCi/L	100%	-0.14	7/18/15 10:29 a		0.1264	LSC9
					4.86E+00	1.50E+01		-0.63			L	

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

July 22, 2015

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TestAmerica Inc
rptSTLRchBlank
V5.3.8 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

LCS RESULTS

Date: 22-Jul-15

Lab Name: TestAmerica Inc

SDG: W07183

Matrix: WATER

Report No. : 66582

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: 5196024	TRITIUM_DIST_LSC			**Work Order:**	M691E1AC		**Report DB ID:**	M691E1CS					
H-3	3.00E+03		2.2E+02	2.5E+02	2.98E+02	pCi/L	100%	2.78E+03	8.34E+01	108%	7/19/15 12:41 a	0.00501	LSC8
							Rec Limits:	70	130	0.1		L	
Batch: 5196022	I129LL_SEP_LEPS_GS			**Work Order:**	M691C1AC		**Report DB ID:**	M691C1CS					
I129	1.87E+01		2.5E+00	2.5E+00	8.00E-01	pCi/L	93%	1.93E+01	2.08E-01	97%	7/21/15 11:48 a	2.0011	LEP5$1
							Rec Limits:	70	130	0.0		L	
Batch: 5196021	TC99_ETVDSK_LSC			**Work Order:**	M690T1AC		**Report DB ID:**	M690T1CS					
Tc-99	8.90E+01		6.5E+00	7.1E+00	9.93E+00	pCi/L	100%	1.05E+02	1.09E+00	85%	7/18/15 11:31 a	0.1285	LSC9
							Rec Limits:	70	130	-0.2		L	

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

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

rptSTLRchLcs
V5.3.8 A2002

FORM II

MATRIX SPIKE RESULTS

Date: 22-Jul-15

Lab Name: TestAmerica Inc **SDG:** W07183

Lot-Sample No.: J5G090458-1, B31VB0 **Report No. :** 66582 **Matrix:** WATER

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: 5196021	**Work Order:**	M68T31AE		**Report DB ID:**	M68T31EW		**Orig Sa DB ID:**	9M68T310				
Tc-99	4.17E+02		1.9E+01	4.0E+01	9.86E+00	pCi/L	100%	79.92%	5.21E+02	7/18/15 06:22 a	0.1297	TC99_ETVDSK_LSC
	7.96E+02								5.37E+00		L	LSC9
Batch: 5196024	**Work Order:**	M68T31AG		**Report DB ID:**	M68T31GW		**Orig Sa DB ID:**	9M68T310				
H-3	1.21E+03		2.2E+02	3.0E+02	3.27E+02	pCi/L	100%	87.50%	1.39E+03	7/18/15 05:51 p	0.00435	TRITIUM_DIST_LSC
	1.23E+03								4.16E+01		L	LSC8

Number of Results: 2

Comments:

July 22, 2015

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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.

V5.3.8 A2002