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 _21__ ***Pages***

Report No.: 67539

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.
W07271	X15-048	B32J25	J5J140411-1	M7QK81AA	9M7QK810	5288022
		B32J25	J5J140411-1	M7QK81AC	9M7QK810	5288023
		B32J25	J5J140411-1	M7QK81AD	9M7QK810	5288024
		B32J30	J5J140411-2	M7QK91AA	9M7QK910	5288022
		B32J30	J5J140411-2	M7QK91AC	9M7QK910	5288023
		B32J30	J5J140411-2	M7QK91AD	9M7QK910	5288024
	X16-011	B33BC1	J5J140410-1	M7QK71AA	9M7QK710	5288021
		B33BC1	J5J140410-1	M7QK71AC	9M7QK710	5288022
		B33BC1	J5J140410-1	M7QK71AD	9M7QK710	5288023

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Certificate of Analysis

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

November 5, 2015

Attention: Scot Fitzgerald

SAF Number	:	X16-011, X15-048
Date SDG Closed	:	October 14, 2015
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W07271
Data Deliverable	:	15-Day / Summary

CASE NARRATIVE

I. Introduction

On October 14, 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:

Alpha Spectroscopy
Uranium 234, 235 and 238 by method RL-ALP-015
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

Alpha Spectroscopy
Uranium 234, 235 and 238 by method RL-ALP-015:
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

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:

Whitney M. Ritari

Digitally signed by Whitney Ritari
Date: 2015.11.05 12:45:51 -08'00'

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

C.O.C. # **X15-048-006**

Collector	J.R. Aguilar/CHPRC	**Contact/Requester**	WATERS-HUSTED, K	**Telephone No.**	376-4650
SAF No.	X15-048	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	302869
Project Title	200-BP-5 Treatability Test -Day 1	**Logbook No.**	HNF-N-506 76/ 82	**Ice Chest No.**	N/A
Shipped To (Lab)	TestAmerica Incorporated, Richland	**Method of Shipment**	GOVERNMENT VEHICLE	**Bill of Lading/Air Bill No.**	N/A
Protocol	CERCLA	**Priority:**	**15 Days** **PRIORITY**	**Offsite Property No.**	N/A

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 INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32J25	N	W	10-14-15	0834	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B32J25	N	W	10-14-15	0834	1x500-mL P	TC99_ETVDSK_LSC: COMMON	6 Months	HCl to pH <2
B32J25	N	W	~~0834~~ 10-14-15	0834 β 10-14-15	1x1-L G/P	UISO_PLATE_AEA: COMMON MNQKS	6 Months	HNO3 to pH <2

J5J140411
W09271
Due 10-29-15

J5J140411

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
J.R. Aguilar/CHPRC			OCT 14 2015 0910	E.L. Kauer CHPRC			OCT 14 2015 0910
E.L. Kauer CHPRC			OCT 14 2015 1420	J. Friesz, TARL			OCT 14 2015 1420

Matrix *

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

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X15-048-008**

Collector	J.R. Aguilar/CHPRC	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	X15-048	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302869
Project Title	200-BP-5 Treatability Test -Day 1	Logbook No.	HNF-N-506 76/82	Ice Chest No.	N/A
Shipped To (Lab)	TestAmerica Incorporated, Richland	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	CERCLA	Priority:	15 Days **PRIORITY**	Offsite Property No.	N/A

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 INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32J30	N	W	10-14-15	0834	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B32J30	N	W	10-14-15	0834	1x500-mL P	TC99_ETVDSK_LSC: COMMON	6 Months	HCl to pH <2
B32J30	N	W	10-14-15	0834	1x1-L G/P	UISO_PLATE_AEA: COMMON MNQK9	6 Months	HNO3 to pH <2

JSJ140411

WO7271

Due 10-29-15

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	J.R. Aguilar/CHPRC		OCT 14 2015 0910		E.L. Kauer CHPRC		OCT 14 2015 0910
Relinquished By	E.L. Kauer CHPRC		Date/Time OCT 14 2015 1420	Received By	J. Friesz, TARL		Date/Time OCT 14 2015 1420
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 9/17/2015 FSR ID = FSR6393 A-6004-842 (REV 2)

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November 5, 2015

Sample Check-in List

Date/Time Received: 10-14-15 | 1420 Container GM Screen Result: (Airlock) 0 cpm Initials [B]
Sample GM Screen Result (Sample Receiving) 0 cpm Initials [B]

Client: PGW SDG #: WO7271 SAF #: X15-048 NA [ ]

Lot Number: JSJ14044

Chain of Custody # X15-048-006; 008

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: _____ °C NA [B]
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: 2x500mLp; 2xLp; 4x4Lp
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: 10-14-15

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

[DMF] No action necessary; process as is

Project Manager Whitney M Ritan Date 10/15/15

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CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X16-011-003**

Collector	J.R. Aguilar/CHPRC	**Contact/Requester**	WATERS-HUSTED, K	**Telephone No.**	376-4650
SAF No.	X16-011	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	302869
Project Title	200-BP-5 Characterization Sampling	**Logbook No.**	HNF-N-506 76 / 82	**Ice Chest No.**	N/A
Shipped To (Lab)	TestAmerica Incorporated, Richland	**Method of Shipment**	GOVERNMENT VEHICLE	**Bill of Lading/Air Bill No.**	N/A
Protocol	CERCLA	**Priority:**	15 Days **PRIORITY**	**Offsite Property No.**	N/A

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 INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B33BC1	N	W	10-14-15	0808	1x1-L P	906.0_TRITIUM_LSC: COMMON	6 Months	None
B33BC1	N	W	10-14-15	0808	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B33BC1	N	W	10-14-15	0808	1x500-mL P	TC99_ETVDSK_LSC: COMMON MNQKN	6 Months	HCl to pH <2

J5J140410
WO7271
Due 10-29-15

J5J140410

Relinquished By J.R. Aguilar/CHPRC — Print — Sign — Date/Time OCT 14 2015 0910		Received By E.L. Kauer CHPRC — Print — Sign — Date/Time OCT 14 2015 0910	
Relinquished By E.L. Kauer CHPRC — Date/Time OCT 14 2015 1420		Received By J. Friesz, TARL — Date/Time OCT 14 2015 1420	
Relinquished By — Date/Time		Received By — Date/Time	
Relinquished By — Date/Time		Received By — Date/Time	

Matrix *

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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November 5, 2015

Sample Check-in List

Date/Time Received: 10-14-15 / 1420 Container GM Screen Result: (Airlock) 0 cpm Initials[ ]
Sample GM Screen Result (Sample Receiving) 0 cpm Initials[ ]

Client: PGW SDG #: W07271 SAF #: X16-011 NA [ ]

Lot Number: JSJ140410

Chain of Custody # X16-011-003

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: 6.2 °C 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): 1
7. Containers received: 1x500mLp; 1xLp; 2xLp
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: 10-14-15

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

[ ] No action necessary; process as is

Project Manager Date 10/15/15

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Sample Results Summary

Date: 04-Nov-15

TestAmerica Inc TARL

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

Report No. : 67539 **SDG No:** W07271

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5288024 UISO_PLATE_AEA									
B32J25									
	M7QK81AD	U-234	4.22E+01 +- 6.9E+00		pCi/L	89%	3.05E-01	1.00E+00	
		U-235	1.61E+00 +- 5.3E-01		pCi/L	89%	2.04E-01	1.00E+00	
		U-238	4.31E+01 +- 7.0E+00		pCi/L	89%	3.84E-01	1.00E+00	
B32J25 DUP									
	M7QK81AG	U-234	4.17E+01 +- 6.7E+00		pCi/L	98%	2.50E-01	1.00E+00	1.1
		U-235	1.51E+00 +- 4.9E-01		pCi/L	98%	2.15E-01	1.00E+00	6.3
		U-238	4.17E+01 +- 6.7E+00		pCi/L	98%	3.55E-01	1.00E+00	3.2
B32J30									
	M7QK91AD	U-234	4.06E+01 +- 6.6E+00		pCi/L	87%	2.03E-01	1.00E+00	
		U-235	1.79E+00 +- 5.5E-01		pCi/L	87%	1.49E-01	1.00E+00	
		U-238	4.03E+01 +- 6.6E+00		pCi/L	87%	1.56E-01	1.00E+00	
5288022 I129LL_SEP_LEPS_GS									
B32J25									
	M7QK81AA	I129	2.89E+00 +- 9.4E-01		pCi/L	91%	6.34E-01	1.00E+00	
B32J30									
	M7QK91AA	I129	3.34E+00 +- 8.5E-01		pCi/L	78%	5.72E-01	1.00E+00	
B33BC1									
	M7QK71AC	I129	2.62E+00 +- 6.1E-01		pCi/L	95%	4.74E-01	1.00E+00	
B33BC1 DUP									
	M7QK71AG	I129	3.93E+00 +- 8.4E-01		pCi/L	95%	5.58E-01	1.00E+00	39.9
5288021 906.0_H3_LSC									
B33BC1									
	M7QK71AA	H-3	1.23E+04 +- 5.2E+02		pCi/L	100%	2.87E+02	4.00E+02	
B33BC1 DUP									
	M7QK71AF	H-3	1.28E+04 +- 5.4E+02		pCi/L	100%	2.88E+02	4.00E+02	4.2
5288023 TC99_ETVDSK_LSC									
B32J25									
	M7QK81AC	Tc-99	6.23E+03 +- 1.4E+02		pCi/L	100%	9.20E+00	1.50E+01	
B32J30									
	M7QK91AC	Tc-99	6.19E+03 +- 1.4E+02		pCi/L	100%	9.26E+00	1.50E+01	
B33BC1									
	M7QK71AD	Tc-99	6.08E+03 +- 1.4E+02		pCi/L	100%	9.05E+00	1.50E+01	
B33BC1 DUP									
	M7QK71AH	Tc-99	6.11E+03 +- 1.4E+02		pCi/L	100%	9.36E+00	1.50E+01	0.4

No. of Results: 19

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

rptTALRchSaSum mary2 V5.4.1 A2002

QC Results Summary

Date: 04-Nov-15

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 67539 **SDG No.:** W07271

Batch Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
UISO_PLATE_AEA								
5288024 BLANK QC,								
M7QN81AA	U-234	1.49E-01 +- 1.6E-01	U	pCi/L	77%			1.96E-01
	U-235	-5.58E-03 +- 7.0E-02	U	pCi/L	77%			1.42E-01
	U-238	1.44E-01 +- 1.6E-01	U	pCi/L	77%			2.06E-01
5288024 LCS,								
M7QN81AC	U-234	8.69E+00 +- 1.7E+00		pCi/L	94%	102%	0.0	2.93E-01
	U-235	5.44E-01 +- 2.8E-01		pCi/L	94%	139%	0.4	1.71E-01
	U-238	9.23E+00 +- 1.8E+00		pCi/L	94%	103%	0.0	3.33E-01
I129LL_SEP_LEPS_GS								
5288022 BLANK QC,								
M7QN61AA	I129	-2.67E-02 +- 3.4E-01	U	pCi/L	88%			6.13E-01
5288022 LCS,								
M7QN61AC	I129	1.65E+01 +- 2.2E+00		pCi/L	94%	86%	-0.1	8.06E-01
906.0_H3_LSC								
5288021 MATRIX SPIKE, B33BC1								
M7QK71AE	H-3	1.61E+03 +- 7.9E+02		pCi/L	100%	107%	0.1	3.39E+02
5288021 BLANK QC,								
M7QN51AA	H-3	1.76E+02 +- 1.5E+02	U	pCi/L	100%			3.11E+02
5288021 LCS,								
M7QN51AC	H-3	2.85E+03 +- 2.4E+02		pCi/L	100%	102%	0.0	3.05E+02
TC99_ETVDSK_LSC								
5288023 MATRIX SPIKE, B32J25								
M7QK81AF	Tc-99	5.84E+02 +- 2.1E+02		pCi/L	100%	113%	0.1	8.99E+00
5288023 BLANK QC,								
M7QN71AA	Tc-99	3.64E-01 +- 4.2E+00	U	pCi/L	100%			9.04E+00
5288023 LCS,								
M7QN71AC	Tc-99	9.43E+01 +- 7.0E+00		pCi/L	100%	91%	-0.1	9.08E+00

No. of Results: 14

TestAmerica Inc
rptSTLRchQcSummary V5.4.1 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: 04-Nov-15

Lab Name:	**TestAmerica Inc**	**SDG:**	W07271	**Collection Date:**	10/14/2015 8:34:00 AM
Lot-Sample No.:	**J5J140411-1**	**Report No. :**	67539	**Received Date:**	10/14/2015 2:20:00 PM
Client Sample ID:	**B32J25**	**COC No. :**	X15-048-006	**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: 5288022	I129LL_SEP_LEPS_GS			**Work Order:** M7QK81AA			**Report DB ID:** 9M7QK810					
I129	**2.89E+00**		9.4E-01	9.4E-01	6.34E-01	pCi/L	91%	*(4.6)*	10/30/15 12:05 p		2.0102	LEP4$1
						2.88E-01	1.00E+00	*(6.2)*			L	
Batch: 5288023	TC99_ETVDSK_LSC			**Work Order:** M7QK81AC			**Report DB ID:** 9M7QK810					
Tc-99	**6.23E+03**		4.2E+01	1.4E+02	9.20E+00	pCi/L	100%	*(676.6)*	10/20/15 08:37 p		0.1274	LSC3
						4.41E+00	1.50E+01	*(86.4)*			L	
Batch: 5288024	UISO_PLATE_AEA			**Work Order:** M7QK81AD			**Report DB ID:** 9M7QK810					
U-234	**4.22E+01**		2.4E+00	6.9E+00	3.05E-01	pCi/L	89%	*(138.4)*	10/26/15 07:54 p		0.2022	ALP3
						1.20E-01	1.00E+00	*(12.3)*			L	
U-235	**1.61E+00**		4.6E-01	5.3E-01	2.04E-01	pCi/L	89%	*(7.9)*	10/26/15 07:54 p		0.2022	ALP3
						7.01E-02	1.00E+00	*(6.1)*			L	
U-238	**4.31E+01**		2.4E+00	7.0E+00	3.84E-01	pCi/L	89%	*(112.3)*	10/26/15 07:54 p		0.2022	ALP3
						1.60E-01	1.00E+00	*(12.3)*			L	

Ratio U-234/238 = 1.0

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

November 5, 2015

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TestAmerica Inc
rptSTLRchSample
V5.4.1 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: 04-Nov-15

Lab Name:	**TestAmerica Inc**	**SDG:**	W07271	**Collection Date:**	10/14/2015 8:34:00 AM
Lot-Sample No.:	**J5J140411-2**	**Report No. :**	67539	**Received Date:**	10/14/2015 2:20:00 PM
Client Sample ID:	**B32J30**	**COC No. :**	X15-048-008	**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: 5288022	I129LL_SEP_LEPS_GS			**Work Order:** M7QK91AA			**Report DB ID:** 9M7QK910					
I129	**3.34E+00**		8.5E-01	8.5E-01	5.72E-01	pCi/L	78%	*(5.8)*	10/30/15 12:07 p		2.0062	LEP5$1
						2.25E-01	1.00E+00	*(7.8)*			L	
Batch: 5288023	TC99_ETVDSK_LSC			**Work Order:** M7QK91AC			**Report DB ID:** 9M7QK910					
Tc-99	**6.19E+03**		4.2E+01	1.4E+02	9.26E+00	pCi/L	100%	*(668.5)*	10/20/15 10:42 p		0.1269	LSC5
						4.44E+00	1.50E+01	*(86.3)*			L	
Batch: 5288024	UISO_PLATE_AEA			**Work Order:** M7QK91AD			**Report DB ID:** 9M7QK910					
U-234	**4.06E+01**		2.3E+00	6.6E+00	2.03E-01	pCi/L	87%	*(200.)*	10/26/15 07:54 p		0.204	ALP5
						7.05E-02	1.00E+00	*(12.3)*			L	
U-235	**1.79E+00**		4.8E-01	5.5E-01	1.49E-01	pCi/L	87%	*(12.)*	10/26/15 07:54 p		0.204	ALP5
						4.42E-02	1.00E+00	*(6.5)*			L	
U-238	**4.03E+01**		2.3E+00	6.6E+00	1.56E-01	pCi/L	87%	*(257.9)*	10/26/15 07:54 p		0.204	ALP5
						4.77E-02	1.00E+00	*(12.3)*			L	

Ratio U-234/238 = 1.0

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

November 5, 2015

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TestAmerica Inc
rptSTLRchSample
V5.4.1 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: 04-Nov-15

Lab Name:	**TestAmerica Inc**	**SDG:**	W07271	**Collection Date:**	10/14/2015 8:08:00 AM
Lot-Sample No.:	**J5J140410-1**	**Report No. :**	67539	**Received Date:**	10/14/2015 2:20:00 PM
Client Sample ID:	**B33BC1**	**COC No. :**	X16-011-003	**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: 5288021	906.0_H3_LSC			**Work Order:** M7QK71AA			**Report DB ID:** 9M7QK710					
H-3	**1.23E+04**		3.7E+02	5.2E+02	2.87E+02	pCi/L	100%	*(42.9)*	10/21/15 03:25 a		0.00504	LSC8
						1.36E+02	4.00E+02	*(47.4)*			L	
Batch: 5288022	I129LL_SEP_LEPS_GS			**Work Order:** M7QK71AC			**Report DB ID:** 9M7QK710					
I129	**2.62E+00**		6.1E-01	6.1E-01	4.74E-01	pCi/L	95%	*(5.5)*	10/30/15 09:52 a		2.006	LEP48[illegible]
						2.28E-01	1.00E+00	*(8.6)*			L	
Batch: 5288023	TC99_ETVDSK_LSC			**Work Order:** M7QK71AD			**Report DB ID:** 9M7QK710					
Tc-99	**6.08E+03**		4.1E+01	1.4E+02	9.05E+00	pCi/L	100%	*(671.6)*	10/20/15 06:33 p		0.1302	LSC8
						4.34E+00	1.50E+01	*(86.4)*			L	

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

November 5, 2015

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TestAmerica Inc
rptSTLRchSample
V5.4.1 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: 04-Nov-15

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07271	**Collection Date:**	10/14/2015 8:34:00 AM
Lot-Sample No.:	**J5J140411-1**	**Report No. :**	67539	**Received Date:**	10/14/2015 2:20:00 PM
Client Sample ID:	**B32J25 DUP**	**COC No. :**	X15-048-006	**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: 5288024	UISO_PLATE_AEA			**Work Order:** M7QK81AG		**Report DB ID:** M7QK81GR			**Orig Sa DB ID:** 9M7QK810			
U-234	4.17E+01		2.3E+00	6.7E+00	2.50E-01	pCi/L	98%	(166.8)	10/26/15 07:54 p		0.2042	ALP4
	4.22E+01		**RPD**	**1.1**		1.00E+00		(12.4)			L	
U-235	1.51E+00		4.4E-01	4.9E-01	2.15E-01	pCi/L	98%	(7.)	10/26/15 07:54 p		0.2042	ALP4
	1.61E+00		**RPD**	**6.3**		1.00E+00		(6.1)			L	
U-238	4.17E+01		2.3E+00	6.7E+00	3.55E-01	pCi/L	98%	(117.3)	10/26/15 07:54 p		0.2042	ALP4
	4.31E+01		**RPD**	**3.2**		1.00E+00		(12.4)			L	

Ratio U-234/238 = 1.0 ***Alpha Spec Result Sum = 8.5E+01***

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

November 5, 2015

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

rptSTLRchDupV5.4.1 A2002 **MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.**

FORM II

Date: 04-Nov-15

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07271	**Collection Date:**	10/14/2015 8:08:00 AM
Lot-Sample No.:	**J5J140410-1**	**Report No. :**	67539	**Received Date:**	10/14/2015 2:20:00 PM
Client Sample ID:	**B33BC1 DUP**	**COC No. :**	X16-011-003	**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: 5288021	906.0_H3_LSC			**Work Order:**	M7QK71AF	**Report DB ID:**	M7QK71FR		**Orig Sa DB ID:** 9M7QK710			
H-3	1.28E+04		3.8E+02	5.4E+02	2.88E+02	pCi/L	100%	(44.5)	10/21/15 06:09 a		0.00502	LSC8
	1.23E+04		**RPD**	**4.2**		4.00E+02		(48.)			L	
Batch: 5288022	I129LL_SEP_LEPS_GS			**Work Order:**	M7QK71AG	**Report DB ID:**	M7QK71GR		**Orig Sa DB ID:** 9M7QK710			
I129	3.93E+00		8.4E-01	8.4E-01	5.58E-01	pCi/L	95%	(7.)	10/30/15 09:54 a		2.0025	LEP5$1
	2.62E+00		**RPD**	**39.9**		1.00E+00		(9.4)			L	
Batch: 5288023	TC99_ETVDSK_LSC			**Work Order:**	M7QK71AH	**Report DB ID:**	M7QK71HR		**Orig Sa DB ID:** 9M7QK710			
Tc-99	6.11E+03		4.2E+01	1.4E+02	9.36E+00	pCi/L	100%	(652.4)	10/20/15 07:35 p		0.1262	LSC8
	6.08E+03		**RPD**	**0.4**		1.50E+01		(86.2)			L	

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

November 5, 2015

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

rptSTLRchDupV5.4.1 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: 04-Nov-15

Lab Name: TestAmerica Inc
Matrix: WATER

SDG: W07271
Report No. : 67539

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: 5288024	UISO_PLATE_AEA			**Work Order:**	M7QN81AA		**Report DB ID:**	M7QN81AB				
U-234	1.49E-01	U	1.6E-01	1.6E-01	1.96E-01	pCi/L	77%	0.76	10/26/15 07:55 p		0.2003	ALP6
					6.43E-02	1.00E+00		(1.9)			L	
U-235	-5.58E-03	U	7.0E-02	7.0E-02	1.42E-01	pCi/L	77%	-0.04	10/26/15 07:55 p		0.2003	ALP6
					3.88E-02	1.00E+00		-0.16			L	
U-238	1.44E-01	U	1.6E-01	1.6E-01	2.06E-01	pCi/L	77%	0.7	10/26/15 07:55 p		0.2003	ALP6
					6.96E-02	1.00E+00		(1.8)			L	
							Ratio U-234/238 = 1.0					
Batch: 5288021	906.0_H3_LSC			**Work Order:**	M7QN51AA		**Report DB ID:**	M7QN51AB				
H-3	1.76E+02	U	1.3E+02	1.5E+02	3.11E+02	pCi/L	100%	0.57	10/21/15 07:32 a		0.005	LSC8
					1.48E+02	4.00E+02		(2.4)			L	
Batch: 5288022	I129LL_SEP_LEPS_GS			**Work Order:**	M7QN61AA		**Report DB ID:**	M7QN61AB				
I129	-2.67E-02	U	3.4E-01	3.4E-01	6.13E-01	pCi/L	88%	-0.04	10/30/15 05:53 p		2.0125	LEP4$1
					2.73E-01	1.00E+00		-0.16			L	
Batch: 5288023	TC99_ETVDSK_LSC			**Work Order:**	M7QN71AA		**Report DB ID:**	M7QN71AB				
Tc-99	3.64E-01	U	3.7E+00	4.2E+00	9.04E+00	pCi/L	100%	0.04	10/20/15 11:44 p		0.1305	LSC8
					4.33E+00	1.50E+01		0.17			L	

No. of Results: 6 **Comments:**

November 5, 2015

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TestAmerica Inc
rptSTLRchBlank
V5.4.1 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: 04-Nov-15

Lab Name: TestAmerica Inc

SDG: W07271

Matrix: WATER

Report No. : 67539

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: 5288024	UISO_PLATE_AEA			**Work Order:**	M7QN81AC		**Report DB ID:**	M7QN81CS					
U-234	8.69E+00		1.1E+00	1.7E+00	2.93E-01	pCi/L	94%	8.54E+00	4.69E-02	102%	10/26/15 07:55 p	0.2014	ALP11
							Rec Limits:	70	130	0.0		L	
U-235	5.44E-01		2.7E-01	2.8E-01	1.71E-01	pCi/L	94%	3.90E-01	2.14E-03	139%	10/26/15 07:55 p	0.2014	ALP11
							Rec Limits:	70	130	0.4		L	
U-238	9.23E+00		1.1E+00	1.8E+00	3.33E-01	pCi/L	94%	8.95E+00	4.91E-02	103%	10/26/15 07:55 p	0.2014	ALP11
							Rec Limits:	70	130	0.0		L	
Batch: 5288021	906.0_H3_LSC			**Work Order:**	M7QN51AC		**Report DB ID:**	M7QN51CS					
H-3	2.85E+03		2.1E+02	2.4E+02	3.05E+02	pCi/L	100%	2.80E+03	8.40E+01	102%	10/21/15 08:55 a	0.00502	LSC8
							Rec Limits:	70	130	0.0		L	
Batch: 5288022	I129LL_SEP_LEPS_GS			**Work Order:**	M7QN61AC		**Report DB ID:**	M7QN61CS					
I129	1.65E+01		2.2E+00	2.2E+00	8.06E-01	pCi/L	94%	1.91E+01	3.09E-01	86%	10/30/15 05:54 p	2.0039	LEP5$1
							Rec Limits:	70	130	-0.1		L	
Batch: 5288023	TC99_ETVDSK_LSC			**Work Order:**	M7QN71AC		**Report DB ID:**	M7QN71CS					
Tc-99	9.43E+01		6.3E+00	7.0E+00	9.08E+00	pCi/L	100%	1.04E+02	6.14E-01	91%	10/21/15 12:46 a	0.1301	LSC8
							Rec Limits:	70	130	-0.1		L	

No. of Results: 6 **Comments:**

November 5, 2015

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

rptSTLRchLcs
V5.4.1 A2002

FORM II

MATRIX SPIKE RESULTS

Date: 04-Nov-15

Lab Name: TestAmerica Inc **SDG:** W07271

Lot-Sample No.: J5J140410-1, B33BC1 **Report No. :** 67539 **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: 5288021	**Work Order:** M7QK71AE			**Report DB ID:** M7QK71EW			**Orig Sa DB ID:** 9M7QK710					
H-3	1.61E+03		4.3E+02	7.9E+02	3.39E+02	pCi/L	100%	106.96%	1.50E+03	10/21/15 04:47 a	0.0043	906.0_H3_LSC
	1.23E+04								4.51E+01		L	LSC8

Number of Results: 1

Comments:

November 5, 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.

V5.4.1 A2002

FORM II

MATRIX SPIKE RESULTS

Date: 04-Nov-15

Lab Name: TestAmerica Inc **SDG:** W07271

Lot-Sample No.: J5J140411-1, B32J25 **Report No. :** 67539 **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: 5288023	**Work Order:** M7QK81AF			**Report DB ID:** M7QK81FW			**Orig Sa DB ID:** 9M7QK810					
Tc-99	5.84E+02		4.3E+01	2.1E+02	8.99E+00	pCi/L	100%	112.74%	5.18E+02	10/20/15 09:40 p	0.1309	TC99_ETVDSK_LSC
	6.23E+03								2.96E+00		L	LSC8

Number of Results: 1

Comments:

November 5, 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.

V5.4.1 A2002