

Analytical Data Package Prepared For

# Fluor Hanford

Radiochemical Analysis By

**TestAmerica TARL**

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

*Data Package Contains \_\_\_\_\_ Pages*

**Report Nbr: 38636**

SDG Nbr	ORDER Nbr	CLIENT ID NUMBER	LOT Nbr	WORK ORDER	RPT DB ID	BATCH
<u>W05303B</u>	W08-012	B1RJ96	J8C120215-1	KJE6C1AA	9KJE6C10	8072455

RECEIVED MARCH 27, 2008

0077348

**RECEIVED**  
MAY 21 2008  
EDMC

Comments: \_\_\_\_\_

## Certificate of Analysis

Fluor Hanford  
1200 Jadwin Ave.  
Richland, WA 99352

March 27, 2008

Attention: Steve Trent

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SAF Number	:	W08-012
Date SDG Closed	:	December 27, 2007
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W05303B
Data Deliverable	:	15 Day / Summary

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### CASE NARRATIVE

On March 12, 2008 a request for reanalysis (Order Number: 080312TARL-R4674) of one water sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID numbers to correspond with the Fluor Hanford specific IDs:

<u>PGW ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
B1RJ96	KJE6C (KETFN)	WATER	12/26/07

#### 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:

**Gamma Spectroscopy**  
Gamma Spec (LL) by method RICH-RC-5017

Fluor Hanford  
March 27, 2008

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**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**

Gamma Spec (LL) by method RICH-RC-5017:

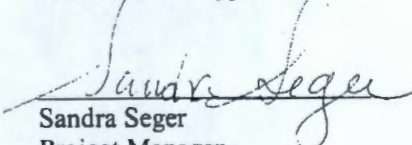
The reanalysis results are within RER acceptance criteria.

There was insufficient volume for a duplicate. Sample B1RJ96 was recounted on a different detector for the duplicate (B1RJ96 DUP).

Except as noted, the LCS, batch blank, samples and sample duplicate (B1RJ96) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

  
Sandra Seger  
Project Manager

## Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 00-02	Gross Alpha (Coprecipitation)	RICH-RC-5021
EPA 903.0	Total Alpha Radium (Ra-226)	RICH-RC-5027
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr-89/90	RICH-RC-5006
ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007

### Uncertainty Estimation

Test America 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,  $R = \text{constants} * f(x,y,z,...)$ . 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 ( $S/\sqrt{n}$ ), 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

<b>Action Lev</b>	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.
<b>Batch</b>	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
<b>Bias</b>	Defined by the equation $(\text{Result}/\text{Expected})-1$ as defined by ANSI N13.30.
<b>COC No</b>	Chain of Custody Number assigned by the Client or STL Richland.
<b>Count Error (#s)</b>	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.
<b>Total Uncert (#s) <i>u<sub>c</sub> - Combined Uncertainty.</i></b>	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, <i>u<sub>c</sub>, the combined uncertainty.</i> The uncertainty is absolute and in the same units as the result.
<b>(#s), Coverage Factor</b>	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
<b>CRDL (RL)</b>	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
<b>Lc</b>	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%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . 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.
<b>Lot-Sample No</b>	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.
<b>MDC MDA</b>	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%. $MDC = (4.65 * \text{Sqrt}((\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . For LSC methods the batch blank is used as a measure of the background variability.
<b>Primary Detector</b>	The instrument identifier associated with the analysis of the sample aliquot.
<b>Ratio U-234/U-238</b>	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.
<b>Rst/MDC</b>	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.
<b>Rst/TotUcert</b>	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.
<b>Report DB No</b>	Sample Identifier used by the report system. The number is based upon the first five digits of the <b>Work Order</b> Number.
<b>RER</b>	The equation Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPUd}^2)]$ 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.
<b>SDG</b>	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
<b>Sum Rpt Alpha Spec Rst(s)</b>	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.
<b>Work Order</b>	The LIMS software assign test specific identifier.
<b>Yield</b>	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

3/27/2008 9:35:26 AM

## TestAmerica Report

Lab Code: TARL

FormNbr: R    FormatType: FEAD    Version: 05    Rpt Nbr: 38636    File Name: h:\Reportdb\edd\Fead\Rad\W05303B.Edd, h:\Reportdb\edd\Fead\Rad\38636.E

Lab Sample Id:	Client Id:	Test User	Contract Nbr	SAF Nbr	Sdg Nbr:	QC Type:	Moisture/Solids%*:	Distilled Volume	Sample On Date:	Collection Date:				
9KJE6C10	B1RJ96		MW6-SBB-A1	W08-012	W05303B					12/26/2007 12:38				
Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
8072455	BE-7	13966-02-4	1.32E+01	pCi/L	2.3E+01	2.3E+01	U	4.22E+01		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	CO-60	10198-40-0	9.11E-01	pCi/L	1.4E+00	1.4E+00	U	2.72E+00		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	CS-134	13967-70-9	-9.65E-01	pCi/L	1.3E+00	1.3E+00	U	2.07E+00		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	CS-137	10045-97-3	1.42E+00	pCi/L	1.4E+00	1.4E+00	U	2.63E+00		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	EU-152	14683-23-9	-1.39E+00	pCi/L	2.9E+00	2.9E+00	U	4.79E+00		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	EU-154	15585-10-1	-6.33E-01	pCi/L	3.4E+00	3.4E+00	U	6.25E+00		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	EU-155	14391-16-3	-1.97E-01	pCi/L	2.4E+00	2.4E+00	U	4.22E+00		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	K-40	13966-00-2	-1.69E+01	pCi/L	2.7E+01	2.7E+01	U	5.17E+01		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	RU-106	13967-48-1	-1.27E+00	pCi/L	1.2E+01	1.2E+01	U	2.06E+01		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I
8072455	SB-125	14234-35-6	-2.83E+00	pCi/L	3.0E+00	3.0E+00	U	4.85E+00		GAMMALL_GS	1.8665E+00	L	03/17/2008 17:50	I

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TestAmerica

rptFeadRadSummaryEdd v3.48

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).

B Qual- Analyte was found in the associated laboratory blank above the MDC.

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Thursday, March 27, 2008

## TestAmerica QC Blank Report

Lab Code: TARL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W05303B.Edd, h:\Reportdb\edd\Fead\Rad\38636.E

Lab Sample Id: KJF1V1AB

Sdg/Rept Nbr: W05303B 38636

Collection Date: 12/26/2007 12:38

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: BLK

Received Date: 03/12/2008

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AC	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qual	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
8072455 BLK	BE-7 13966-02-4	5.84E+00	pCi/L	3.5E+01 3.5E+01	U	6.27E+01			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	CO-60 10198-40-0	1.27E+00	pCi/L	2.0E+00 2.0E+00	U	4.01E+00			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	CS-134 13967-70-9	2.65E-01	pCi/L	1.9E+00 1.9E+00	U	3.49E+00			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	CS-137 10045-97-3	2.55E-01	pCi/L	1.7E+00 1.7E+00	U	3.14E+00			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	EU-152 14683-23-9	-1.60E+00	pCi/L	4.2E+00 4.2E+00	U	7.17E+00			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
7 8072455 BLK	EU-154 15585-10-1	-3.03E+00	pCi/L	4.6E+00 4.6E+00	U	7.52E+00			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	EU-155 14391-16-3	-1.50E-01	pCi/L	3.0E+00 3.0E+00	U	5.22E+00			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	K-40 13966-00-2	-3.55E+01	pCi/L	4.2E+01 4.2E+01	U	8.29E+01			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	RU-106 13967-48-1	1.26E+01	pCi/L	1.8E+01 1.8E+01	U	3.45E+01			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D
8072455 BLK	SB-125 14234-35-6	-1.70E+00	pCi/L	4.6E+00 4.6E+00	U	7.77E+00			GAMMALL_GS	2.0003E+00 L	03/17/2008 22:33				D

TestAmerica  
rptFeadRadEdd v3.68

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).

B Qual- Analyte was found in the associated laboratory blank above the MDC.

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Thursday, March 27, 2008

## TestAmerica QC Control Sample Report

Lab Code: TARL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\VRad\W05303B.Edd, h:\Reportdb\edd\Fead\VRad\38636.E

Lab Sample Id: KJF1V1CS

Sdg/Rept Nbr: W05303B 38636

Collection Date: 12/26/2007 12:38

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: BS

Received Date: 03/12/2008

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AD	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
8072455 BS	CO-60 10198-40-0	4.28E+01	pCi/L	7.6E+00 7.6E+00		3.44E+00		3.78E+01 113.0	GAMMALL_GS	2.0005E+00 L	03/17/2008 22:34			70 130	D
8072455 BS	CS-137 10045-97-3	6.01E+01	pCi/L	9.5E+00 9.5E+00		4.23E+00		5.00E+01 120.3	GAMMALL_GS	2.0005E+00 L	03/17/2008 22:34			70 130	D
8072455 BS	EU-152 14683-23-9	8.26E+01	pCi/L	1.7E+01 1.7E+01	U	2.04E+01		7.67E+01 107.7	GAMMALL_GS	2.0005E+00 L	03/17/2008 22:34			70 130	D
8072455 BS	SB-125 14234-35-6	2.21E-01	pCi/L	6.5E+00 6.5E+00	U	1.12E+01			GAMMALL_GS	2.0005E+00 L	03/17/2008 22:34				D

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TestAmerica  
rptFeadRadEdd v3.68

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

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Thursday, March 27, 2008

### TestAmerica QC Duplicate Report

Lab Code: TARL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\VRad\W05303B.Edd, h:\Reportdb\edd\Fead\VRad\38636.E

Lab Sample Id: KJE6C1CR

Sdg/Rept Nbr: W05303B 38636

Collection Date: 12/26/2007 12:38

Client Id: B1RJ96

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: DUP

Received Date: 03/12/2008

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
W08-012	MW6-SBB-A19981								AB	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qual	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Allq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
8072455 DUP	BE-7 13966-02-4	2.01E+01 1.32E+01	pCi/L	3.6E+01 3.6E+01	U	6.41E+01			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	41.2 20.0	0.3 3		D
8072455 DUP	CO-60 10198-40-0	1.25E+00 9.11E-01	pCi/L	1.8E+00 1.8E+00	U	3.43E+00			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	31.0 20.0	0.3 3		D
8072455 DUP	CS-134 13967-70-9	1.79E-01 -9.65E-01	pCi/L	2.0E+00 2.0E+00	U	3.55E+00			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	0.0 20.0	0.8 3		D
8072455 DUP	CS-137 10045-97-3	3.24E-01 1.42E+00	pCi/L	1.6E+00 1.6E+00	U	2.82E+00			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	125.6 20.0	1. 3		D
8072455 DUP	EU-152 14683-23-9	-1.12E+00 -1.39E+00	pCi/L	4.7E+00 4.7E+00	U	7.90E+00			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	0.0 20.0	0.1 3		D
8072455 DUP	EU-154 15585-10-1	6.97E-01 -6.33E-01	pCi/L	5.2E+00 5.2E+00	U	9.52E+00			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	4155.6 20.0	0.4 3		D
8072455 DUP	EU-155 14391-16-3	-1.95E+00 -1.97E-01	pCi/L	5.1E+00 5.1E+00	U	8.33E+00			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	0.0 20.0	0.5 3		D
8072455 DUP	K-40 13966-00-2	-9.16E+01 -1.69E+01	pCi/L	5.4E+01 5.4E+01	U	1.05E+02			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	0.0 20.0	2. 3		D
8072455 DUP	RU-106 13967-48-1	-1.16E+01 -1.27E+00	pCi/L	1.6E+01 1.6E+01	U	2.62E+01			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	0.0 20.0	0.9 3		D
8072455 DUP	SB-125 14234-35-6	1.28E+00 -2.83E+00	pCi/L	4.5E+00 4.5E+00	U	7.95E+00			GAMMALL_GS	1.8665E+00 L	03/17/2008 22:31	0.0 20.0	1.3 3		D

Lot No., Due Date: J8C120215; 03/27/2008  
 Client, Site: 384868; PGW 615HANFORD HANFORD  
 QC Batch No., Method Test: 8072455; RGAMMA Gamma by GER  
 SDG, Matrix: W05303B; WATER

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? Yes No N/A

✓ Yes No N/A

2.0 QC Batch

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? Yes No N/A

✓ Yes No N/A

2.2 Are the QC appropriate for the analysis included in the batch? Yes No N/A

✓ Yes No N/A

2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? Yes No N/A

✓ Yes No N/A

2.4 Does the Worksheets include a Tracer Vial label for each sample? Yes No N/A

✓ Yes No N/A

3.0 QC & Samples

3.1 Is the blank results, yield, and MDA within contract limits? Yes No N/A

✓ Yes No N/A

3.2 Is the LCS result, yield, and MDA within contract limits? Yes No N/A

✓ Yes No N/A

3.3 Are the MS/MSD results, yields, and MDA within contract limits? Yes No N/A

✓ Yes No N/A

3.4 Are the duplicate result, yields, and MDAs within contract limits? Yes No N/A

✓ Yes No N/A

3.5 Are the sample yields and MDAs within contract limits? Yes No N/A

✓ Yes No N/A

4.0 Raw Data

4.1 Were results calculated in the correct units? Yes No N/A

✓ Yes No N/A

4.2 Were analysis volumes entered correctly? Yes No N/A

✓ Yes No N/A

4.3 Were Yields entered correctly? Yes No N/A

✓ Yes No N/A

4.4 Were spectra reviewed/meet contractual requirements? Yes No N/A

✓ Yes No N/A

4.5 Were raw counts reviewed for anomalies? Yes No N/A

✓ Yes No N/A

5.0 Other

5.1 Are all nonconformances included and noted? Yes No N/A

✓ Yes No N/A

5.2 Are all required forms filled out? Yes No N/A

✓ Yes No N/A

5.3 Was the correct methodology used? Yes No N/A

✓ Yes No N/A

5.4 Was transcription checked? Yes No N/A

✓ Yes No N/A

5.5 Were all calculations checked at a minimum frequency? Yes No N/A

✓ Yes No N/A

5.6 Are worksheet entries complete and correct? Yes No N/A

✓ Yes No N/A

6.0 Comments on any No response:

First Level Review Joan Anderson

Date 3/25/08

## Data Review Checklist RADIOCHEMISTRY Second Level Review

Batch Number: 8072455

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

Comments on any "No" response: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Second Level Review: Erika Jada Date: 3/26/18

SKS 3/12/08

W05303A B

Received 3/12/08

Due 3/27/08

03/12/2008

**RECHECK, RECOUNT, OR REANALYSIS ORDER  
CONTRACT NO MW6-SBB-A19981**

**TestAmerica Incorporated,  
2800 George Washington Way  
Richland, WA 99354**

J8C120215  
KJEGC

Battelle PNNL Order Number: 080312TARL-R4674

Sample Delivery Group: W05303

Special Instructions None

Samples(s)

Lab Sample ID	PNNL Sample	Action	TAT	METHOD_NAME:
9KETFN10	B1RJ96	Reanalysis	15/15	GAMMALL_GS

Deliver Report Results to: Fluor Hanford, Inc.  
1200 Jadwin Ave.  
Richland, WA 99352  
C/O Mr. Steve Trent

The report results must reference the Battelle PNNL-order number, SDG number, and the Battelle PNNL sample identification number shown above.

## Seger, Sandra

---

**From:** Hampt, Heidi [Heidi\_Hampt@RL.gov]  
**Sent:** Wednesday, March 12, 2008 9:32 AM  
**To:** Jordan, Erika; Seger, Sandra  
**Cc:** Trent, Stephen J; Ayres, Doris E  
**Subject:** Request for Recheck, Recount, or Reanalysis Order

**Attachments:** 080312TARLR4674.rtf



080312TARLR4674.  
rtf (3 KB)

See Attached



## Sample Check-in List

Date/Time Received: 12.26.07 1510

Client: PCW SDG#: 605303 NA  SAF#: 608-012 NA

Work Order Number: ✓ 72260150 Chain of Custody # 608-012-83

Shipping Container ID: \_\_\_\_\_ Air Bill # \_\_\_\_\_

1. Custody Seals on shipping container intact? NA  Yes  No
2. Custody Seals dated and signed? NA  Yes  No
3. Chain of Custody record present? NA  Yes  No
4. Cooler Temperature: \_\_\_\_\_ NA  5. Vermiculite/packing materials is NA  Wet  Dry
6. Number of samples in shipping container: 1
7. Sample holding times exceeded? NA  Yes  No
8. Samples have:
 

_____ Tape	_____ Hazard Labels
_____ Custody Seals	<u>✓</u> Appropriate Sample Labels
9. Samples are:
 

_____ In Good Condition	_____ Leaking
_____ Broken	_____ Have Air Bubbles

(Only for samples requiring no head space.)
10. Sample pH taken? NA  pH < 2  pH > 2  pH > 9
11. Sample Location, Sample Collector Listed? \*  
\*For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes  No
13. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian: D. Smith Date: 12.26.07

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on \_\_\_\_\_ by \_\_\_\_\_ Person Contacted \_\_\_\_\_

No action necessary; process as is.

Project Manager \_\_\_\_\_ Date \_\_\_\_\_

TESTAMERICA

3/14/2008 8:54:36 AM

Sample Preparation/Analysis

Balance Id:1120482733

384868, Pacific Northwest National Laboratory  
Pacific Northwest National Lab

AW Gamma PrpRC5017  
TA Gamma by HPGE  
5I CLIENT: HANFORD

Pipet #:

AnalyDueDate: 03/27/2008 *W05303B*

**PRIORITY**

Sep1 DT/Tm Tech:

Batch: 8072455 WATER pCi/L  
SEQ Batch, Test: None

PM, Quote: SS , 57671

Sep2 DT/Tm Tech:

Prep Tech: HarrisD | *Boo & G.*

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 KJE6C-1-AA J8C120215-1-SAMP 12/26/2007 12:38	1866.50g,in						<i>G11</i>	<i>2109</i>	<i>3/17/08</i>	
<i>100 nls 200</i>										
<i>100 nls 200</i>										
<i>G11</i>										
<i>2109</i>										
<i>3/17/08</i>										
<i>Scr: Alpha: Beta:</i>										
2 KJE6C-1-AC-X J8C120215-1-DUP 12/26/2007 12:38							<i>G13</i>	<i>0151</i>		
<i>Scr: Alpha: Beta:</i>										
3 KJF1V-1-AA-B J8C120000-455-BLK 12/26/2007 12:38	2000.30g,in						<i>G15</i>	<i>0153</i>		
<i>Scr: Alpha: Beta:</i>										
4 KJF1V-1-AC-C J8C120000-455-LCS 12/26/2007 12:38	2000.50g,in		QCAG1453 02/18/08,pd 06/11/05				<i>G14</i>	<i>0154</i>		
<i>Scr: Alpha: Beta:</i>										

Comments: KJE6C-SAMP "Comments: ISV for dup. DLH 3/14/08" *Please count on a diff. detector 3-17-08*

*PHC2.0 Out 3/14/08*

All Clients for Batch:

384868, Pacific Northwest National Laboratory Pacific Northwest National Lab, SS , 57671

KJE6C1AA-SAMP Constituent List:

Co-60	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:	Cs-134	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:
Cs-137	RDL:6.00E+00	pCi/L	LCL:70	UCL:130	RPD:20	Cs-137DA	RDL:6.00E+00	pCi/L	LCL:70	UCL:130	RPD:20
Eu-154	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:	Eu-155	RDL:.00E+00	pCi/L	LCL:	UCL:	RPD:
K-40	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:	Sb-125	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:

KJF1V1AA-BLK:

TAL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1  
Richland Wa. pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added

ISV - Insufficient Volume for Analysis

WO Cnt: 4  
Prep\_SamplePrep v4.8.32

TESTAMERICA

3/14/2008 8:54:37 AM

**Sample Preparation/Analysis**

Balance Id:1120482733

AW Gamma PrpRC5017  
 TA Gamma by HPGE  
 5I CLIENT: HANFORD

Pipet #:

AnalyDueDate: 03/27/2008

Sep1 DT/Tm Tech:

Batch: 8072455

pCi/L

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,HarrisD



Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
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Co-60	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:	Cs-134	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:
Cs-137	RDL:6.00E+00	pCi/L	LCL:	UCL:	RPD:	Cs-137DA	RDL:6.00E+00	pCi/L	LCL:	UCL:	RPD:
Eu-154	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:	Eu-155	RDL:.00E+00	pCi/L	LCL:	UCL:	RPD:
K-40	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:	Sb-125	RDL:0.00E+00	pCi/L	LCL:	UCL:	RPD:

KJF1V1AC-LCS:

Cs-137	RDL:15	pCi/L	LCL:70	UCL:130	RPD:20	Cs-137DA	RDL:15	pCi/L	LCL:70	UCL:130	RPD:20
K-40	RDL:6	pCi/L	LCL:70	UCL:130	RPD:20	Ra-226	RDL:--	pCi/L	LCL:70	UCL:130	RPD:20
RA-228	RDL:--	pCi/L	LCL:70	UCL:130	RPD:20	RA-228DA	RDL:--	pCi/L	LCL:70	UCL:130	RPD:20
U-238	RDL:--	pCi/L	LCL:70	UCL:130	RPD:20						

KJE6C1AA-SAMP Calc Info:

Uncert Level (#s): 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: B

KJF1V1AA-BLK:

Uncert Level (#s): 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: B

KJF1V1AC-LCS:

Uncert Level (#s): 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: B

Approved By \_\_\_\_\_

Date: \_\_\_\_\_

17

3/25/2008 3:56:42 PM

# ICOC Fraction Transfer/Status Report

ByDate: 3/26/2007, 3/30/2008, Batch: '8072455', User: \*ALL Order By DateTimeAccepting

Q	Batch	Work Ord	CurStatus	Accepting	Comments
	8072455				
AC		Rev1C	HarrisD	3/14/2008 8:48:35	
SC			wagarr	IsBatched 3/12/2008 3:36:53 PM	ICOC_RADCALC v4.8.32
SC			HarrisD	InPrep 3/14/2008 8:48:35 AM	RICH-RC-5017 Revision 6
SC			HarrisD	Prep1C 3/14/2008 8:54:41 AM	RICH-RC-5017 REVISION 6
SC			BockJ	InPrep2 3/17/2008 8:19:16 AM	RICH-RC-5017 REVISION 6
SC			BockJ	Prep2C 3/17/2008 5:13:59 PM	RICH-RC-5017 REVISION 6
SC			DAWKINSO	InCnt1 3/17/2008 5:52:19 PM	RICH-RD-0007 REVISION 6
SC			BlackCL	CalcC 3/18/2008 6:36:38 AM	RICH-RD-0007 REVISION 6
SC			antonsonl	Rev1C 3/25/2008 3:56:33 PM	RICH-RC-0002 REV 8
AC			HarrisD	3/14/2008 8:54:41	
AC			BockJ	3/17/2008 8:19:16	
AC			BockJ	3/17/2008 5:13:59 PM	
AC			DAWKINSO	3/17/2008 5:52:19 PM	
AC			BlackCL	3/18/2008 6:36:38	
AC			antonsonl	3/25/2008 3:56:33 PM	

AC: Accepting Entry; SC: Status Change

TAL Richland

Richland Wa.