

W05065A

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FEB 23 2007

D L STEWART

*21 pages*

Analytical Data Package Prepared For  
**Pacific Northwest National Lab**

Radiochemical Analysis By

**STL Richland STLRL**

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

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

Report Nbr: 34517

SDG Nbr	ORDER Nbr	CLIENT ID NUMBER	LOT Nbr	WORK ORDER	RPT DB ID	BATCH
W05065A	W07-011	B1L6Y9	J7B090137-1	JN6771AA	9JN67710	7040412

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Comments:



**STL Richland**  
 2800 George Washington Way  
 Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590  
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## Certificate of Analysis

Pacific Northwest National Laboratories  
 Sigma V Building  
 Richland, WA 99352

February 21, 2007

Attention: Dot Stewart

---

SAF Number	:	I07-011, G07-011, W07-011
Date SDG Closed	:	January 29, 2007
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W05065A
Data Deliverable	:	15-Day / Summary

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### CASE NARRATIVE

#### I. Introduction

On January 29, 2007 a request for additional analyses of one water sample was received at STL Richland (STLR). Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Pacific Northwest National Laboratories (PGW) specific ID:

<u>PGW ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
B1L6Y9	JJWJD	WATER	11/15/06

#### 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

#### 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:

B1L6Y9 does not meet the CRDL for Cs-137 due to low volume. There was insufficient volume for a duplicate. The sample was recounted on another detector for a replicate. There is a positive hit for CO-60. Except as noted, the LCS, batch blank, samples and sample duplicate (B1L6Y9) 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:



Sherryl A. Adam  
Project Manager

**STL RICHLAND ISSUE RESOLUTION FORM  
FOR CONTRACT 615 WITH BHI/FH/PNNL**

PNNL Tracking Number: 07-019  
SAF No.: W07-011  
Date: January 26, 2007  
SDG: W05065A  
Sample No.(s) B1L6Y9

Submitted By: Sherryl Adam

Submitted To: Dot Stewart (PNNL)

Phone No. 509-375-3131 x164

Phone No. 509-376-5056

Fax No. 509-375-5590

Fax No. 509-372-1704

**ISSUE**

We only received 1L of original sample volume. There is only about 100 mLs of sample volume left. PGW requires 1L to be run for a Gamma LL.

**PROPOSED RESOLUTION**

Run the sample as 100 mL direct Gamma LL and count it for 1000 minutes.

**BHI/FH/PNNL COMMENTS -**

Accept proposed resolution.

Heidi Hampt for Dot Stewart 1/29/07

Signature and date

**Adam, Sherryl**

---

**From:** Hampt, Heidi [heidi.hampt@pnl.gov]  
**Sent:** Monday, January 29, 2007 11:00 AM  
**To:** Adam, Sherryl; Stewart, Dorothy L  
**Cc:** Felmy, Diana  
**Subject:** RE: IRF  
**Attachments:** 07-019.doc

Sherryl,

The response is attached.

Thanks,  
Heidi

---

**From:** Adam, Sherryl [mailto:SAdam@stl-inc.com]  
**Sent:** Friday, January 26, 2007 9:33 AM  
**To:** Stewart, Dorothy L  
**Cc:** Hampt, Heidi; Felmy, Diana  
**Subject:** IRF

Dot,  
Please see the attached IRF. Thank you.

<<IRFW05065A.DOC>>

*Sherryl A. Adam*  
Project Manager  
Severn Trent Laboratories Richland  
(509) 375 - 3131 ext. 164

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### 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 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

### Uncertainty Estimation

STL 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,  $R = \text{constants} * f(x,y,z,\dots)$ . 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 (Result/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%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgrndCnt} / \text{BkgrndCntMin}) / \text{SCntMin})) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . 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%. $MDC = (4.65 * \text{Sqrt}((\text{BkgrndCnt} / \text{BkgrndCntMin}) / \text{SCntMin}) + 2.71 / \text{SCntMin}) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . 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.

2/21/2007 8:29:34 AM

## STL Richland Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

Version: 05

Rpt Nbr: 34517

File Name: h:\Reportdb\edd\Fead\Rad\W05065A.Edd, h:\Reportdb\edd\Fead\Rad\34517.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:				
9JN67710	B1L6Y9		MW6-SBB-A1	W07-011	W05065A					11/15/2006 11:10				
Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
7040412	BE-7	13966-02-4	2.56E+02	pCi/L	3.3E+02	3.3E+02	U	5.77E+02		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	CO-60	10198-40-0	1.06E+02	pCi/L	3.6E+01	3.6E+01		2.45E+01		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	CS-134	13967-70-9	-6.38E+00	pCi/L	1.6E+01	1.6E+01	U	2.71E+01		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	CS-137	10045-97-3	-1.03E+01	pCi/L	1.4E+01	1.4E+01	U	2.32E+01		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	EU-152	14683-23-9	-8.31E+00	pCi/L	3.3E+01	3.3E+01	U	5.67E+01		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	EU-154	15585-10-1	-3.76E+01	pCi/L	4.7E+01	4.7E+01	U	7.73E+01		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	EU-155	14391-16-3	-1.56E+01	pCi/L	3.0E+01	3.0E+01	U	5.07E+01		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	K-40	13966-00-2	-5.12E+02	pCi/L	4.6E+02	4.6E+02	U	7.12E+02		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	RU-106	13967-48-1	-1.85E+01	pCi/L	1.4E+02	1.4E+02	U	2.38E+02		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I
7040412	SB-125	14234-35-6	-1.59E+01	pCi/L	3.6E+01	3.6E+01	U	5.94E+01		GAMMALL_GS	9.96E-02	L	02/14/2007 09:40	I

STL Richland

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.

1

Wednesday, February 21, 2007

**STL Richland QC Blank Report**

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\FeadIV\Rad\W05065A.Edd, h:\Reportdb\edd\FeadIV\Rad\34517.E

Lab Sample Id: JN8CR1AB

Sdg/Rept Nbr: W05065A 34517

Collection Date: 11/15/2006 11:10

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: BLK

Received Date: 01/29/2007

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	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
7040412	BE-7	-5.47E+00	pCi/L	1.6E+01	U	2.75E+01			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 13966-02-4			1.6E+01						L	09:41				
7040412	CO-60	-4.73E-02	pCi/L	7.0E-01	U	1.23E+00			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 10198-40-0			7.0E-01						L	09:41				
7040412	CS-134	-6.43E-03	pCi/L	8.1E-01	U	1.39E+00			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 13967-70-9			8.1E-01						L	09:41				
7040412	CS-137	-1.94E-01	pCi/L	7.0E-01	U	1.20E+00			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 10045-97-3			7.0E-01						L	09:41				
7040412	EU-152	-2.03E-01	pCi/L	1.8E+00	U	3.03E+00			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 14683-23-9			1.8E+00						L	09:41				
7040412	EU-154	9.63E-01	pCi/L	2.0E+00	U	3.56E+00			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 15585-10-1			2.0E+00						L	09:41				
7040412	EU-155	4.13E-01	pCi/L	1.4E+00	U	2.35E+00			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 14391-16-3			1.4E+00						L	09:41				
7040412	K-40	-2.11E+01	pCi/L	2.1E+01	U	3.06E+01			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 13966-00-2			2.1E+01						L	09:41				
7040412	RU-106	-1.69E+00	pCi/L	7.2E+00	U	1.21E+01			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 13967-48-1			7.2E+00						L	09:41				
7040412	SB-125	-2.45E-01	pCi/L	1.7E+00	U	2.97E+00			GAMMALL_GS	2.0022E+00	02/14/2007				D
	BLK 14234-35-6			1.7E+00						L	09:41				

Wednesday, February 21, 2007

**STL Richland QC Control Sample Report**

Lab Code: STLR

FormNbr: R      FormatType: FEAD      VersionNbr: 05      File Name: h:\Reportdb\edd\FeadIV\Rad\W05065A.Edd, h:\Reportdb\edd\FeadIV\Rad\34517.E

**Lab Sample Id:** JN8CR1CS      **Sdg/Rept Nbr:** W05065A      34517      **Collection Date:** 11/15/2006 11:10  
**Client Id:** NA      **Matrix:** WATER      WATER      **Sample On Date:**  
**Moisture/Solids%\*:**      **QC Type:** BS      **Received Date:** 01/29/2007

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
7040412 BS	CO-60 10198-40-0	3.51E+01	pCi/L	7.1E+00 7.1E+00		1.40E+00		3.87E+01 90.6	GAMMALL_GS	2.0023E+00 L	02/14/2007 09:42			70 130	D
7040412 BS	CS-137 10045-97-3	2.49E+01	pCi/L	3.6E+00 3.6E+00		1.56E+00		2.49E+01 100.2	GAMMALL_GS	2.0023E+00 L	02/14/2007 09:42			70 130	D
7040412 BS	EU-152 14683-23-9	7.24E+01	pCi/L	1.0E+01 1.0E+01		3.45E+00		7.69E+01 94.2	GAMMALL_GS	2.0023E+00 L	02/14/2007 09:42			70 130	D

Wednesday, February 21, 2007

**STL Richland QC Duplicate Report**

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W05065A.Edd, h:\Reportdb\edd\Fead\Rad\34517.E

Lab Sample Id: JN6771CR

Sdg/Rept Nbr: W05065A 34517

Collection Date: 11/15/2006 11:10

Client Id: B1L6Y9

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: DUP

Received Date: 01/29/2007

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
W07-011	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	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
7040412	BE-7	3.71E+01	pCi/L	2.9E+02	U	4.95E+02			GAMMALL_GS	9.96E-02	02/15/2007	149.4	1.1		D
DUP	13966-02-4	2.56E+02		2.9E+02						L	09:07	20.0	3		
7040412	CO-60	1.01E+02	pCi/L	2.9E+01		2.16E+01			GAMMALL_GS	9.96E-02	02/15/2007	5.0	0.2		D
DUP	10198-40-0	1.06E+02		2.9E+01						L	09:07	20.0	3		
7040412	CS-134	-2.71E+00	pCi/L	1.3E+01	U	2.25E+01			GAMMALL_GS	9.96E-02	02/15/2007	0.0	0.4		D
DUP	13967-70-9	-6.38E+00		1.3E+01						L	09:07	20.0	3		
7040412	CS-137	-4.27E+00	pCi/L	1.2E+01	U	2.04E+01			GAMMALL_GS	9.96E-02	02/15/2007	0.0	0.7		D
DUP	10045-97-3	-1.03E+01		1.2E+01						L	09:07	20.0	3		
7040412	EU-152	3.36E+00	pCi/L	3.1E+01	U	5.23E+01			GAMMALL_GS	9.96E-02	02/15/2007	0.0	0.5		D
DUP	14683-23-9	-8.31E+00		3.1E+01						L	09:07	20.0	3		
7040412	EU-154	-1.45E+01	pCi/L	3.3E+01	U	5.66E+01			GAMMALL_GS	9.96E-02	02/15/2007	0.0	1.		D
DUP	15585-10-1	-3.76E+01		3.3E+01						L	09:07	20.0	3		
7040412	EU-155	9.99E+00	pCi/L	2.3E+01	U	3.96E+01			GAMMALL_GS	9.96E-02	02/15/2007	0.0	1.5		D
DUP	14391-16-3	-1.56E+01		2.3E+01						L	09:07	20.0	3		
7040412	K-40	1.54E+02	pCi/L	3.1E+02	U	2.16E+02			GAMMALL_GS	9.96E-02	02/15/2007	0.0	3.1		D
DUP	13966-00-2	-5.12E+02		3.1E+02						L	09:07	20.0	3		
7040412	RU-106	-5.71E+01	pCi/L	1.3E+02	U	2.18E+02			GAMMALL_GS	9.96E-02	02/15/2007	0.0	0.4		D
DUP	13967-48-1	-1.85E+01		1.3E+02						L	09:07	20.0	3		
7040412	SB-125	4.90E+00	pCi/L	3.1E+01	U	5.26E+01			GAMMALL_GS	9.96E-02	02/15/2007	0.0	1.		D
DUP	14234-35-6	-1.59E+01		3.1E+01						L	09:07	20.0	3		



STL

Data Review/Verification Checklist  
RADIOCHEMISTRY, First Level Review

2/16/2007 11:40:01 AM

Lot No., Due Date: J7B090137; 02/13/2007  
Client, Site: 384868; PGW 615HANFORD HANFORD  
QC Batch No., Method Test: 7040412; RGAMMA Gamma by GER  
SDG, Matrix: W05065A; WATER

1.0 COC		
1.1	Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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 <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.2	Are the QC appropriate for the analysis included in the batch?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.3	Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.4	Does the Worksheets include a Tracer Vial label for each sample?	Yes No N/A <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
3.0 QC & Samples		
3.1	Is the blank results, yield, and MDA within contract limits?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.2	Is the LCS result, yield, and MDA within contract limits?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.3	Are the MS/MSD results, yields, and MDA within contract limits?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.4	Are the duplicate result, yields, and MDAs within contract limits?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.5	Are the sample yields and MDAs within contract limits?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.0 Raw Data		
4.1	Were results calculated in the correct units?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.2	Were analysis volumes entered correctly?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.3	Were Yields entered correctly?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.4	Were spectra reviewed/meet contractual requirements?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.5	Were raw counts reviewed for anomalies?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.0 Other		
5.1	Are all nonconformances included and noted?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.2	Are all required forms filled out?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.3	Was the correct methodology used?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.4	Was transcription checked?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.5	Were all calculations checked at a minimum frequency?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.6	Are worksheet entries complete and correct?	Yes No N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.0	Comments on any No response: See NCM. 10-09452	

First Level Review Pam Anderson

Date 2-16-07



# STL

Data Review Checklist  
RADIOCHEMISTRY  
Second Level Review

QC Batch Number: 7040412  
W05065A

Review Item	Yes (✓)	No (✓)	N/A (✓)
<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 with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?		✓	
<b>C. Other</b>			
1. Are all Nonconformances 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: See NCM

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Second Level Review: Sheryl A. Adams Date: 2-20-07

# Clouseau Nonconformance Memo



NCM #: <b>10-09452</b> NCM Initiated By: Pam Anderson Date Opened: 02/16/2007 Date Closed:	Classification: <b>Anomaly</b> Status: <b>GLREVIEW</b> Production Area: Environmental - Sep Tests: Gamma by GER Lot #'s (Sample #'s): J7B090000 (412), QC Batches: 7040412
Nonconformance: Other (describe in detail) Subcategory: Other (explanation required)	

### Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Pam Anderson	02/16/2007	There was insufficient sample sent for make a duplicate for this gamma in water sample. The sample was recounted on a different detector to make a duplicate. Due to the insufficient sample the CRDL is not met for Cs 137. There is a positive hit for Co 60.

### Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Pam Anderson	02/16/2007	Note in case narrative.

### Client Notification Summary

<u>Client</u>	<u>Project Manager</u>	<u>Notified</u>	<u>Response</u>	<u>How Notified</u>	<u>Note</u>
			<u>Response</u>		<u>Response Note</u>

### Quality Assurance Verification

<u>Verified By</u>	<u>Due Date</u>	<u>Status</u>	<u>Notes</u>
			This section not yet completed by QA.

### Approval History

<u>Date Approved</u>	<u>Approved By</u>	<u>Position</u>
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W05065A

01/24/2007

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

Severn Trent Incorporated,  
2800 George Washington  
Richland, WA 99354

JTB 090137  
JN677  
Due 02-13-07

Battelle PNNL Order Number: 070124STLRL-R3671

Sample Delivery Group: W05065

Special Instructions None

Samples(s)

Lab Sample ID	PNNL Sample	Action	TAT	METHOD_NAME:
9JJWJD10	B1L6Y9	Reanalysis	15/15	GAMMALL_GS

Deliver Report Results to: Dorothy L. Stewart, K6-96  
c/o Secretary  
3110 Port of Benton Blvd.  
Richland, WA 99352

old lot #  
J6K160315

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

**Adam, Sherryl**

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**From:** Hampt, Heidi [heidi.hampt@pnf.gov]  
**Sent:** Wednesday, January 24, 2007 4:00 PM  
**To:** Adam, Sherryl  
**Cc:** Stewart, Dorothy L  
**Subject:** Request for Recheck, Recount, or Reanalysis Order

**Attachments:** 070124STLRLR3671.rtf



070124STLRLR3671  
.rtf (3 KB)

<<070124STLRLR3671.rtf>>

See Attached

W05065A

PNNL <i>V6K160315</i> <i>W05065</i> <i>Dec 12 29-06</i>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>		C.O.C. # <b>W07-011-212</b>
Collector: <i>Hanford</i> R. T. SICKLE		Contact/Requester Dot Stewart		Telephone No. 509-376-5056 MSIN FAX
SAF No. W07-011		Sampling Origin Hanford Site		Purchase Order/Charge Code
Project Title RCRA, NOVEMBER 2006		<i>HNF-N-506-2</i>		Ice Chest No. <i>ROSS</i> Temp.
Shipped To (Lab) Severn Trent Incorporated, Richland		Method of Shipment Govt. Vehicle		Bill of Lading/Air Bill No.
Protocol RCRA		Priority: 45 Days		Offsite Property No.
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)			<b>SPECIAL INSTRUCTIONS</b> Hold Time All Labs except WSCF: Batch all PNNL samples submitted under A, G, I, S, and W 07 SAFs into one SDG, not to exceed SDG closure of 14 days. WSCF: Batch all PNNL GW samples submitted into one SDG, daily closure.	
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1L6Y9		W	<i>11-15-06</i>	<i>1110</i>	1x20-mL P ✓	Activity Scan	None
B1L6Y9		W			1x250-mL P	TC99_ETVDSK_LSC: Tc-99 (1)	HCl to pH <2
B1L6Y9		W			1x75-mL G/P ✓	UTOT_KPA: Uranium (1)	HNO3 to pH <2
B1L6Y9		W			1x1000-mL G/P	GAMMALL_GS: List-1 (9)	HNO3 to pH <2
B1L6Y9		W			1x125-mL P ✓	906.0_H3_LSC: Tritium (1)	None
<i>JJWJD</i>							

Relinquished By: <i>R. T. SICKLE</i> Date/Time: <i>NOV 15 2006</i>	Received By: <i>DAVID HARBINSO</i> Date/Time: <i>NOV 15 2006</i>	Matrix * S = Soil DS = Drum Solid SE = Sediment DI = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By	Received By	
Relinquished By	Received By	
Relinquished By	Received By	
<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By Date/Time



# STL

### Sample Check-in List

Date/Time Received: 11/15/06 1500

Client: PNNL

SDG #: W05065 NA  SAF #: W07-011 NA

Work Order Number: JK160315

Chain of Custody # W060967  
W0701217

Shipping Container ID: RUSS

Air Bill # N/A W07011260  
W07011142

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  S: Vermiculite/packing materials is NA  Wet  Dry
6. Number of samples in shipping container: 20
7. Sample holding times exceeded? NA  Yes  No
8. Samples have:
  - tape
  - custody seals
  - hazard labels
  - appropriate samples labels
9. Samples are:
  - in good condition
  - broken
  - leaking
  - have air bubbles
  - (Only for samples requiring head space)
10. Sample pH taken? NA  pH < 2  pH > 2  adjusted pH
11. Sample Location, Sample Collector Listed? \* Yes  No   
\*For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes  No
13. Description of anomalies (include sample numbers): N/A Yes  No

Sample Custodian: [Signature]

Date: 11/15/06 15:00

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on \_\_\_\_\_ by \_\_\_\_\_ Person contacted \_\_\_\_\_

No action necessary; process as is.

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

Date \_\_\_\_\_

STL RICHLAND

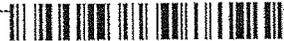
2/12/2007 9:40:16 AM Balance Id: 1120482733

384868, Pacific Northwest National Laboratory AW Gamma PrpRC5017  
 Pacific Northwest National Lab TA Gamma by HPGE  
**Sample Preparation/Analysis** PRIORITY

AnalyDueDate: 02/13/2007 *W05065A* 5I CLIENT: HANFORD

Batch: 7040412 WATER pCi/L PM, Quote: SA, 57671

SEQ Batch, Test: None Sep1 DT/Tm Tech:  
Sep2 DT/Tm Tech:  
Prep Tech: BockJ / APA

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 JN677-1-AA J7B090137-1-SAMP 11/15/2006 11:10	99.60g,in										
											
			AmtRec: 200ML	#Containers: 1			64	0220		2/14/07 R	
									Scr:	Alpha:	Beta:
2 JN677-1-AC-X J7B090137-1-DUP 11/15/2006 11:10											
											
			AmtRec: 200ML	#Containers: 1			68	0147		2/15/07 ~	
									Scr:	Alpha:	Beta:
3 JN8CR-1-AA-B J7B090000-412-BLK 11/15/2006 11:10	2002.20g,in										
											
			AmtRec:	#Containers: 1			65	0221		2/14/07 R	
									Scr:	Alpha:	Beta:
4 JN8CR-1-AC-C J7B090000-412-LCS 11/15/2006 11:10	2002.30g,in		QCAG1333 01/23/07.pd 03/07/05.r								
											
			AmtRec:	#Containers: 1			66	0222		2/14/07 R	
									Scr:	Alpha:	Beta:

Comments: JN677-SAMP "Comments. No DUP. poured up due to insufficient sample amount. Recount on diff. detector. JB 02/12/07"

*PH < 2.0 JB 2-12-07*

All Clients for Batch:  
 384868, Pacific Northwest National Laboratory Pacific Northwest National Lab, SA, 57671

JN6771AA-SAMP Constituent List:

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

JN8CR1AA-BLK:

61

2/16/2007 11:19:26 AM

# ICOC Fraction Transfer/Status Report

ByDate: 2/16/2006, 2/21/2007, Batch: '7040412', User: \*ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
7040412				
AC		CalcC	BockJ 2/12/2007 7:48:56	
SC		wagarr	IsBatched 2/9/2007 2:43:10 PM	ICOC_RADCALC v4.8.26
SC		BockJ	InPrep 2/12/2007 7:48:56 AM	RICH-RC-5016 Revision 6
SC		BockJ	Prep1C 2/12/2007 9:40:22 AM	RICH-RC-5017 REVISION 5
SC		AshworthA	InPrep2 2/12/2007 10:11:49 AM	RICH-RC-5017 REVISION 4
SC		AshworthA	Prep2C 2/13/2007 10:14:46 AM	RICH-RC-5017 REVISION 4
SC		BlackCL	CalcC 2/13/2007 10:24:45 AM	RICH-RD-0007 REVISION 5
SC		StringerR	CalcC 2/16/2007 9:23:59 AM	RICH-RD-0007 REVISION 5
AC		BockJ	2/12/2007 9:40:22	
AC		AshworthA	2/12/2007 10:11:49	
AC		AshworthA	2/13/2007 10:14:46	
AC		BlackCL	2/13/2007 10:24:45	
AC		StringerR	2/16/2007 9:23:59	

AC: Accepting Entry; SC: Status Change

STL Richland  
Richland Wa.