

1214102

Analytical Data Package Prepared For
Pacific Northwest National Lab

Special 300 Area Sampling

Radiochemical Analysis By

STL Richland STLR

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

Data Package Contains 33 Pages

Report Nbr: 29968



SDG Nbr	ORDER Nbr	CLIENT ID NUMBER	LOT Nbr	WORK ORDER	RPT DB ID	BATCH
W04768	X05-049	0325-3R	J5I200306-1	HK05Q1AA	9HK05Q10	5263451
		0325-3R	J5I200306-1	HK05Q1AC	9HK05Q10	5263452
		0325-3R	J5I200306-1	HK05Q1AD	9HK05Q10	5263453
		326R-3R	J5I200306-2	HK05T1AA	9HK05T10	5263451
		326R-3R	J5I200306-2	HK05T1AC	9HK05T10	5263452
		326R-3R	J5I200306-2	HK05T1AD	9HK05T10	5263453

Comments:

Certificate of Analysis

Pacific Northwest National Laboratories
Sigma V Building
Richland, WA 99352

September 23, 2005

Attention: Dot Stewart

SAF Number : X05-049
Date SDG Closed : September 20, 2005
Number of Samples : Two (2)
Sample Type : Water
SDG Number : W04768
Data Deliverable : 3-day / Priority

CASE NARRATIVE

I. Introduction

On September 120 2005, two water samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Pacific Northwest National Laboratories (PGW) specific IDs:

<u>PGW ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
325-3R	HK05Q	WATER	9/20/05
326R-3R	HK05T	WATER	9/20/05

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:

Gas Proportional Counting

Gross Alpha by method RICH-RC-5014

Gross Beta by method RICH-RC-5014

Gamma Spectroscopy

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

Pacific Northwest National Laboratories
September 23, 2005

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

Gas Proportional Counting

Gross Alpha by method RICH-RC-5014:

The LCS, batch blank, samples and sample duplicate (0325-3R) results are within contractual requirements.

Gross Beta by method RICH-RC-5014:

The LCS, batch blank, samples and sample duplicate (0326R-3R) results are within contractual requirements.

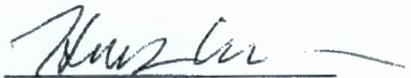
Gamma Spectroscopy

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

The LCS, batch blank, samples and sample duplicate (0325-3R) 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:



Hans Carman
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 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

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 STL Richland.
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.
Total Uncert (#s) <i>u_c Combined Uncertainty.</i>	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_c the combined uncertainty.</i> 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 STL Richland "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%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgmdCnt}/\text{BkgmdCntMin}) / \text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$. 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.
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%. $MDC = (4.65 * \text{Sqrt}((\text{BkgmdCnt}/\text{BkgmdCntMin}) / \text{SCntMin}) + 2.71 / \text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$. For LSC methods the batch blank is used as a measure of the background variability.
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 = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPUd}^2)]$ 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.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland 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.

9/23/2005 3:53:30 PM

STL Richland Report

Lab Code: STLRL

FormNbr: R FormatType: FEAD Version: 05 Rpt Nbr: 29968 File Name: h:\Reportdb\edd\Fead\Rad\W04768.Edd, h:\Reportdb\edd\Fead\Rad\29968.Edd

Lab Sample Id:	Client Id:	Test User	Contract Nbr	SAF Nbr	Sdg Nbr:	QC Type:	Moisture/Solids%:	Distilled Volume	Sample On Date:	Collection Date:				
9HK05Q10	0325-3R		MW6-SBB-A1	X05-049	W04768					09/20/2005 09:45				
Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
5263451	ALPHA	12587-46-1	1.36E+00	pCi/L	8.2E-01	8.7E-01		1.13E+00	100.0	9310_ALPHABETA	1.789E-01	L	09/22/200 14:39	I
5263452	BETA	12587-47-2	6.19E-01	pCi/L	1.4E+00	1.4E+00	U	3.00E+00	100.0	9310_ALPHABETA	1.945E-01	L	09/22/200 14:55	I
5263453	BE-7	13966-02-4	9.67E+00	pCi/L	1.0E+01	1.0E+01	U	2.13E+01		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	CO-60	10198-40-0	-4.20E-01	pCi/L	1.7E+00	1.7E+00	U	3.16E+00		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	CS-134	13967-70-9	-1.43E+00	pCi/L	1.6E+00	1.6E+00	U	2.49E+00		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	CS-137	10045-97-3	9.25E-01	pCi/L	2.9E+00	2.9E+00	U	2.43E+00		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	EU-152	14683-23-9	2.94E-02	pCi/L	3.5E+00	3.5E+00	U	6.42E+00		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	EU-154	15585-10-1	-7.54E-01	pCi/L	4.6E+00	4.6E+00	U	8.75E+00		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	EU-155	14391-16-3	-2.08E+00	pCi/L	3.4E+00	3.4E+00	U	5.75E+00		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	K-40	13966-00-2	1.24E+01	pCi/L	3.2E+01	3.2E+01	U	2.90E+01		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	RU-106	13967-48-1	9.17E+00	pCi/L	1.2E+01	1.2E+01	U	2.43E+01		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I
5263453	SB-125	14234-35-6	-1.03E+00	pCi/L	3.5E+00	3.5E+00	U	6.02E+00		GAMMALL_GS	1.9716E+00	L	09/21/200 19:38	I

Lab Sample Id:	Client Id:	Test User	Contract Nbr	SAF Nbr	Sdg Nbr:	QC Type:	Moisture/Solids%:	Distilled Volume	Sample On Date:	Collection Date:				
9HK05T10	326R-3R		MW6-SBB-A1	X05-049	W04768					09/20/2005 11:35				
Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
5263451	ALPHA	12587-46-1	4.13E+00	pCi/L	1.3E+00	1.6E+00		1.10E+00	100.0	9310_ALPHABETA	1.562E-01	L	09/22/200 14:39	I
5263452	BETA	12587-47-2	5.06E+00	pCi/L	1.7E+00	1.9E+00		2.94E+00	100.0	9310_ALPHABETA	1.779E-01	L	09/22/200 14:55	I
5263453	BE-7	13966-02-4	1.24E+01	pCi/L	1.7E+01	1.7E+01	U	3.39E+01		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	CO-60	10198-40-0	-1.63E+00	pCi/L	2.6E+00	2.6E+00	U	4.37E+00		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	CS-134	13967-70-9	1.67E+00	pCi/L	2.7E+00	2.7E+00	U	5.33E+00		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	CS-137	10045-97-3	6.58E-01	pCi/L	2.0E+00	2.0E+00	U	3.87E+00		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	EU-152	14683-23-9	-1.10E+00	pCi/L	6.2E+00	6.2E+00	U	1.08E+01		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	EU-154	15585-10-1	8.81E-01	pCi/L	6.6E+00	6.6E+00	U	1.33E+01		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	EU-155	14391-16-3	2.83E+00	pCi/L	4.8E+00	4.8E+00	U	8.67E+00		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	K-40	13966-00-2	1.07E+01	pCi/L	6.1E+01	6.1E+01	U	8.02E+00		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	RU-106	13967-48-1	-6.31E+00	pCi/L	2.2E+01	2.2E+01	U	3.95E+01		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	I
5263453	SB-125	14234-35-6	1.59E+00	pCi/L	5.7E+00	5.7E+00	U	1.06E+01		GAMMALL_GS	1.9355E+00	L	09/21/200 19:39	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.

Friday, September 23, 2005

STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04768.Edd, h:\Reportdb\edd\Fead\Rad\29968.Edd

Lab Sample Id: HK0731AB

Sdg/Rept Nbr: W04768

29968

Collection Date: 09/20/2005 09:45

Client Id: NA

Matrix: WATER

WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BLK

Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AF	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/ L	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5263451 BLK	ALPHA 12587-46-1	1.46E-01	pCi/L	2.9E-01 2.9E-01	U	6.40E-01	100.0		9310_ALPHAB	1.931E-01	09/22/2005 14:39				D

Friday, September 23, 2005

STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\I\Rad\W04768.Edd, h:\Reportdb\edd\Fead\I\Rad\29968.Edd

Lab Sample Id: HK0751AB

Sdg/Rept Nbr: W04768 29968

Collection Date: 09/20/2005 11:35

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BLK

Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AH	H					
Batch # / Qc Type	Analy/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Allq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5263452 BLK	BETA 12587-47-2	-7.49E-01	pCi/L	9.7E-01 9.5E-01	U	2.29E+00	100.0		9310_ALPHAB	2.138E-01 L	09/22/2005 14:55				D

Friday, September 23, 2005

STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04768.Edd, h:\Reportdb\edd\Fead\Rad\29968.Edd

Lab Sample Id: HK0771AB

Sdg/Rept Nbr: W04768 29968

Collection Date: 09/20/2005 09:45

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BLK

Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AJ	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
5263453	BE-7	5.06E+00	pCi/L	1.8E+01	U	3.41E+01			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	13966-02-4			1.8E+01						L	21:38				
5263453	CO-60	1.89E+00	pCi/L	2.8E+00	U	6.08E+00			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	10198-40-0			2.8E+00						L	21:38				
5263453	CS-134	6.34E-01	pCi/L	2.5E+00	U	4.82E+00			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	13967-70-9			2.5E+00						L	21:38				
5263453	CS-137	-5.39E-01	pCi/L	2.3E+00	U	4.11E+00			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	10045-97-3			2.3E+00						L	21:38				
5263453	EU-152	-1.17E+00	pCi/L	5.7E+00	U	1.01E+01			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	14683-23-9			5.7E+00						L	21:38				
5263453	EU-154	1.87E+00	pCi/L	7.6E+00	U	1.52E+01			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	15585-10-1			7.6E+00						L	21:38				
5263453	EU-155	2.65E+00	pCi/L	5.1E+00	U	9.09E+00			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	14391-16-3			5.1E+00						L	21:38				
5263453	K-40	1.78E+00	pCi/L	6.9E+01	U	4.08E+01			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	13966-00-2			6.9E+01						L	21:38				
5263453	RU-106	-1.88E+00	pCi/L	2.1E+01	U	3.76E+01			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	13967-48-1			2.1E+01						L	21:38				
5263453	SB-125	3.29E-01	pCi/L	5.9E+00	U	1.08E+01			GAMMALL_GS	1.9321E+00	09/21/2005				D
BLK	14234-35-6			5.9E+00						L	21:38				

Friday, September 23, 2005

STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04768.Edd, h:\Reportdb\edd\Fead\Rad\29968.Edd

Lab Sample Id: HK0731CS

Sdg/Rept Nbr: W04768 29968

Collection Date: 09/20/2005 09:45

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BS

Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AG	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Allq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5263451 BS	ALPHA 12587-46-1	2.17E+01	pCi/L	5.1E+00 2.1E+00		6.29E-01	100.0	2.36E+01 92.2	9310_ALPHAB	1.984E-01 L	09/22/2005 20:08			70 130	D

Friday, September 23, 2005

STL Richland QC Control Sample Report

Lab Code: STLR

FormNbr: R FormatType: FEAD VersionNbr: 05 File Name: h:\Reportdb\edd\Fead\VRad\W04768.Edd, h:\Reportdb\edd\Fead\VRad\20968.Edd

Lab Sample Id: HK0751CS Sdg/Rept Nbr: W04768 29968 Collection Date: 09/20/2005 11:35
 Client Id: NA Matrix: WATER WATER Sample On Date:
 Moisture/Solids%*: QC Type: BS Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AI	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	To/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Allq Size/ L	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5263452 BS	BETA 12587-47-2	2.02E+01	pCi/L	3.8E+00 2.3E+00		2.57E+00	100.0	2.32E+01 86.8	9310_ALPHAB	1.94E-01 L	09/22/2005 14:55			70 130	D

Friday, September 23, 2005

STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\FeadIV\Rad\W04768.Edd, h:\Reportdb\edd\FeadIV\Rad\29968.Edd

Lab Sample Id: HK0771CS

Sdg/Rept Nbr: W04768 29968

Collection Date: 09/20/2005 09:45

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BS

Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AK	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Allq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5263453 BS	CO-60 10198-40-0	3.96E+01	pCi/L	8.3E+00 8.3E+00		2.26E+00		3.93E+01 100.9	GAMMALL_GS	1.9315E+00 L	09/21/2005 21:38			70 130	D
5263453 BS	CS-137 10045-97-3	2.77E+01	pCi/L	6.4E+00 6.4E+00		3.47E+00		2.62E+01 105.9	GAMMALL_GS	1.9315E+00 L	09/21/2005 21:38			70 130	D
5263453 BS	EU-152 14683-23-9	7.25E+01	pCi/L	1.5E+01 1.5E+01		8.83E+00		7.96E+01 91.1	GAMMALL_GS	1.9315E+00 L	09/21/2005 21:38			70 130	D

Friday, September 23, 2005

STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04768.Edd, h:\Reportdb\edd\Fead\Rad\29968.Edd

Lab Sample Id: HK05Q1ER

Sdg/Rept Nbr: W04768 29968

Collection Date: 09/20/2005 09:45

Client Id: 0325-3R

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: DUP

Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X05-049	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
5263451 DUP	ALPHA 12587-46-1	3.89E-01 1.36E+00	pCi/L	5.3E-01 5.2E-01	U	1.02E+00	100.0		9310_ALPHAB	1.741E-01 L	09/22/2005 14:39	111.3 20.0	2.6 3		D

Friday, September 23, 2005

STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04768.Edd, h:\Reportdb\edd\Fead\Rad\29968.Edd

Lab Sample Id: HK05Q1FR

Sdg/Rept Nbr: W04768

29968

Collection Date: 09/20/2005 09:45

Client Id: 0325-3R

Matrix: WATER

WATER

Sample On Date:

Moisture/Solids%*:

QC Type: DUP

Received Date: 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RType					
X05-049	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
5263453 DUP	BE-7 13966-02-4	3.45E+00 9.67E+00	pCi/L	1.1E+01 1.1E+01	U	2.10E+01			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	94.9 20.0	0.8 3		D
5263453 DUP	CO-60 10198-40-0	6.53E-01 -4.20E-01	pCi/L	1.5E+00 1.5E+00	U	3.24E+00			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	919.1 20.0	1. 3		D
5263453 DUP	CS-134 13967-70-9	1.86E+00 -1.43E+00	pCi/L	1.7E+00 1.7E+00	U	3.62E+00			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	1507.5 20.0	2.8 3		D
5263453 DUP	CS-137 10045-97-3	1.35E-01 9.25E-01	pCi/L	1.6E+00 1.6E+00	U	3.01E+00			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	149.1 20.0	0.7 3		D
5263453 DUP	EU-152 14683-23-9	1.10E+00 2.94E-02	pCi/L	4.2E+00 4.2E+00	U	7.65E+00			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	189.6 20.0	0.4 3		D
5263453 DUP	EU-154 15585-10-1	-1.69E-01 -7.54E-01	pCi/L	4.1E+00 4.1E+00	U	8.05E+00			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	0.0 20.0	0.2 3		D
5263453 DUP	EU-155 14391-16-3	2.08E+00 -2.08E+00	pCi/L	3.5E+00 3.5E+00	U	6.69E+00			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	0.0 20.0	1.7 3		D
5263453 DUP	K-40 13966-00-2	3.44E+00 1.24E+01	pCi/L	2.8E+01 2.8E+01	U	6.00E+01			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	113.1 20.0	0.5 3		D
5263453 DUP	RU-106 13967-48-1	8.31E+00 9.17E+00	pCi/L	1.3E+01 1.3E+01	U	2.62E+01			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	9.9 20.0	0.1 3		D
5263453 DUP	SB-125 14234-35-6	-2.38E-01 -1.03E+00	pCi/L	4.3E+00 4.3E+00	U	7.72E+00			GAMMALL_GS	2.0129E+00 L	09/21/2005 21:37	0.0 20.0	0.3 3		D

Friday, September 23, 2005

STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R FormatType: FEAD VersionNbr: 05 File Name: h:\Reportdb\edd\Fead\VRad\W04768.Edd, h:\Reportdb\edd\Fead\VRad\29968.Edd

Lab Sample Id: HK05T1ER **Sdg/Rept Nbr:** W04768 29968 **Collection Date:** 09/20/2005 11:35
Client Id: 326R-3R **Matrix:** WATER WATER **Sample On Date:**
Moisture/Solids%*: **QC Type:** DUP **Received Date:** 09/20/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X05-049	MW6-SBB-A19981								AE	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Allq Size/ L	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5263452 DUP	BETA 12587-47-2	2.09E+00 5.06E+00	pCi/L	1.6E+00 1.5E+00	U	3.04E+00	100.0		9310_ALPHA	1.73E-01	09/22/2005 14:55	83.2 20.0	2.7 3		D

Data Review/Verification Checklist
 RADIOCHEMISTRY, First Level Review

9/23/2005 10:20:27 AM

Lot No., Due Date: J51200306; 09/23/2005
 Client, Site: 384868; PGW 615HANFORD HANFORD
 QC Batch No., Method Test: 5263453; RGAMMA Gamma by GER
 SDG, Matrix: W04768; WATER

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? 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

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

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

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

3.0 QC & Samples

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

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

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

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

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

4.0 Raw Data

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

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

4.3 Were Yields entered correctly? Yes No N/A

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

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

5.0 Other

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

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

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

5.4 Was transcription checked? Yes No N/A

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

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

6.0 Comments on any No response:

First Level Review

Handwritten signature

Date

9/21/05



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 5263453

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
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. QC Samples			
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?	✓		
C. Other			
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: _____

Second Level Review: *[Signature]*

Date: *[Signature]* 9-23-05
[Signature]

Lot No., Due Date: J51200306; 09/23/2005
 Client, Site: 384868; PGW 615HANFORD HANFORD
 QC Batch No., Method Test: 5263451; RALPHA-A Alpha by GPC-Am
 SDG, Matrix: W04768; 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 Pam Anderson

Date 9/23/05

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 5263451

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
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. QC Samples			
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?	✓		
C. Other			
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: _____

Second Level Review: *[Signature]*

Date: 9-23-05

Lot No., Due Date: J51200306; 09/23/2005
 Client, Site: 384868; PGW 615HANFORD HANFORD
 QC Batch No., Method Test: 5263452; RBETA-SR Beta by GPC-Sr/Y
 SDG, Matrix: W04768; 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 Pam Anderson

Date 9-23-05



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 5263452

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
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. QC Samples			
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?	✓		
C. Other			
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: _____

Second Level Review:  Date: 9-23-05

STI - RICHLAND

PNNL	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # X05-049-41
		Page 1 of 1

Collector <i>CS</i>	Contact/Requester DL STEWART	Telephone No. MSIN FAX 509-376-5056
SAF No. X05-049	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title SPECIAL 300 AREA SAMPLING		Ice Chest No. Temp.
Shipped To (Lab) Severn Trent Incorporated, Richland	Method of Shipment Govt Truck	Bill of Lading/Air Bill No.
Protocol CHARACTERIZATION	Priority: 3 Days PRIORITY	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS ** ** <div style="text-align: center; margin-top: 10px;"> <i>W04768</i> <i>J5I200306</i> <i>Doc 09 23 05</i> </div>	SPECIAL INSTRUCTIONS Hold Time This SAF must be grouped into one SDG to facilitate analytical batching, not to exceed rapid turnaround times. Submit invoices & deliverables to DL Stewart, PNNL <div style="text-align: center; margin-top: 10px;"> <i>3 day TAT</i> </div>
---	---

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
0325-3R		W	<i>9/20/05</i>	<i>05:30</i>	1x1000-mL P	9310_ALPHABETA_GPC: Alpha + Beta (2) <i>HK05R</i>	HNO3 to pH <2
0325-3R		W	<i>9/20/05</i>	<i>09:45</i>	1x20-mL P	Activity Scan	None
0325-3R		W	<i>9/20/05</i>	<i>09:30</i>	4x1000-mL G/P	GAMMALL_GS: List-1 (9)	None

Relinquished By <i>J. Duckshorer</i>	Print	Sign <i>J. Duckshorer</i>	Date/Time <i>9-20-05/1:30</i>	Received By <i>Jeff Jensen</i>	Print	Sign <i>[Signature]</i>	Date/Time <i>9/20/05</i>	Matrix * S = Soil DS = Drum Solid SE = Sediment DI = Drum Liquid SO = Solid T = Tissue SI = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)			Disposed By			Date/Time	

PNNL	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # X05-049-46
		Page 1 of 1

Collector CSD	Contact/Requester DL STEWART	Telephone No. MSIN FAX 509-376-5056
SAF No. X05-049	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title SPECIAL 300 AREA SAMPLING		Ice Chest No. Temp.
Shipped To (Lab) Severn Trent Incorporated, Richland	Method of Shipment Govt Truck	Bill of Lading/Air Bill No.
Protocol CHARACTERIZATION	Priority: 3 Days PRIORITY	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS * * * W09768	SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This SAF must be grouped into one SDG to facilitate analytical batching, not to exceed rapid turnaround times. Submit invoices & deliverables to DL Stewart, PNNL <div style="font-size: 2em; text-align: center; margin-top: 10px;">3-day TAT</div>
---	---

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
326R-3R		W	7/20/05	11:35	1x1000-mL P	9310_ALPHABETA_GPC: Alpha + Beta (2) HK05T	HNO3 to pH <2
326R-3R		W	7/20/05	11:35	1x20-mL P	Activity Scan	None
326R-3R		W	7/20/05	11:10	4x1000-mL G/P	GAMMALL_GS: List-1 (9)	None

Relinquished By CJ Buchshener	Received By Jeff Jensen	Matrix *
Print Sign <i>[Signature]</i>	Print Sign <i>[Signature]</i>	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
Date/Time 9-20-05/11:30	Date/Time 09/20/05	
Relinquished By	Received By	
Date/Time	Date/Time	
Relinquished By	Received By	
Date/Time	Date/Time	
Relinquished By	Received By	
Date/Time	Date/Time	
FINAL SAMPLE DISPOSITION	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: 09 20 05 1330

Client: PLW SDG #: W09768 NA SAF #: X05-019 NA

Work Order Number: J5J200306 Chain of Custody # X05-019 A1, 16

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? Yes No
4. Cooler temperature: _____ NA 5. Vermiculite/packing materials is NA Wet Dry
6. Number of samples in shipping container: 12
7. Sample holding times exceeded? NA Yes No
8. Samples have:
 - tape _____ hazard labels
 - _____ custody seals appropriate samples labels
9. Samples are:
 - in good condition _____ leaking
 - _____ broken _____ have air bubbles
 (Only for samples requiring head space)
10. Sample pH taken? NA pH < 2 pH > 2 pH > 9 adjust pH = 7
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): _____

Sample Custodian: [Signature] Date: 09 20 05

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[] No action necessary; process as is.

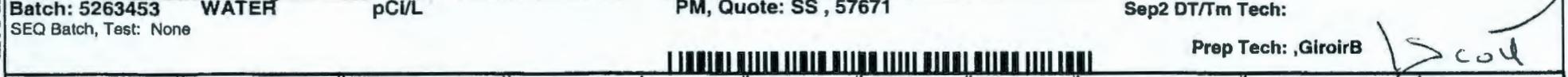
Project Manager _____ Date _____

LS-023, 9/03, Rev. 5

STL RICHLAND

PGW WATER

9/21/2005 5:37:14 AM **Sample Preparation/Analysis** Balance Id:1120482733
 384868, Pacific Northwest National Laboratories, Pacific Northwest National Lab
 AW Gamma PrpRC5017 Pipet #: 229
 TA Gamma by HPGE
 SI CLIENT: HANFORD
 Report Due: 09/23/2005 W04768
 Batch: 5263453 WATER pCi/L PM, Quote: SS, 57671
 SEQ Batch, Test: None
 Sep1 DT/Tm Tech:
 Sep2 DT/Tm Tech:
 Prep Tech: ,GiroirB



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 HK05Q-1-AD J5I200306-1-SAMP 09/20/2005 09:45	1971.60g,in					100	G11	2118		96/105HR
AmtRec: 20ML,5XLP #Containers: 6 Scr Rst: Alpha: Beta:										
2 HK05Q-1-AF-X J5I200306-1-DUP 09/20/2005 09:45	2012.90g,in						G10	2317		
AmtRec: 20ML,5XLP #Containers: 6 Scr Rst: Alpha: Beta:										
3 HK05T-1-AD J5I200306-2-SAMP 09/20/2005 11:35	1935.50g,in						G6	2119		
AmtRec: 20ML,5XLP #Containers: 6 Scr Rst: Alpha: Beta:										
4 HK077-1-AA-B J5I200000-453-BLK 09/20/2005 09:45	1932.10g,in						G6	2318		
AmtRec: #Containers: 1 Scr Rst: Alpha: Beta:										
5 HK077-1-AC-C J5I200000-453-LCS 09/20/2005 09:45	1931.50g,in		QCAG1127 08/22/05,pd 06/08/05,r				G11	2318		
AmtRec: #Containers: 1 Scr Rst: Alpha: Beta:										

Comments:
 pH confirmed @ 2m prep

All Clients for Batch:
 384868, Pacific Northwest National Laboratories Pacific Northwest National Lab, SS, 57671

HK05Q1AD-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:

STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1 ISV - Insufficient Volume for Analysis WO Cnt: 5
 Richland Wa. pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added Prep_SamplePrep v4.8.08

25

STL RICHLAND

9/21/2005 5:37:20 AM

Sample Preparation/Analysis

Balance Id:1120482733

AW Gamma PrpRC5017
TA Gamma by HPGE
SI CLIENT: HANFORD

Pipet #: 229

Report Due: 09/23/2005

Sep1 DT/Tm Tech:

Batch: 5263453
SEQ Batch, Test: None

pCi/L

Sep2 DT/Tm Tech:

Prep Tech: ,GiroirB



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:	
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:
HK0771AA-BLK:											
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:
HK0771AC-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						
HK05Q1AD-SAMP Calc Info:											
Uncert Level (#s): 2		Decay to SaDt: Y		Blk Subt.: N		Sci.Not.: Y		ODRs: B			
HK0771AA-BLK:											
Uncert Level (#s): 2		Decay to SaDt: Y		Blk Subt.: N		Sci.Not.: Y		ODRs: B			
HK0771AC-LCS:											
Uncert Level (#s): 2		Decay to SaDt: Y		Blk Subt.: N		Sci.Not.: Y		ODRs: B			

Approved By _____

Date: _____

9/23/2005 10:19:00 AM

ICOC Fraction Transfer/Status Report

ByDate: 9/23/2004, 9/28/2005, Batch: '5263453', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
5263453				
AC	CalcC	GiroirB	9/21/2005 4:54:27	
SC		wagarr	isBatched 9/20/2005 2:52:16 PM	ICOC_RADCALC v4.8.08
SC		GiroirB	inPrep 9/21/2005 4:54:27 AM	RICH-RC-5017 REVISION 4
SC		GiroirB	Prep1C 9/21/2005 5:54:53 AM	RICH-RC-5017 REVISION 4
SC		DAWKINSO	InCnt1 9/21/2005 5:59:00 PM	RICH-RD-0007 REVISION 5
SC		StringerR	CalcC 9/22/2005 9:54:25 AM	RICH-RD-0007 REVISION 5
AC		GiroirB	9/21/2005 5:54:53	
AC		DAWKINSO	9/21/2005 5:59:00 PM	
AC		StringerR	9/22/2005 9:54:25	

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

9/21/2005 5:37:03 AM

Sample Preparation/Analysis

Balance Id:1120482733

384868, Pacific Northwest National Laboratories , Pacific Northwest National Lab

AZ Gross Alpha PrpRC5014
S7 Gross Alpha by GPC using Am-241 curve
SI CLIENT: HANFORD

Pipet #: _____

Report Due: 09/23/2005

W04768

Sep1 DT/Tm Tech:

Batch: 5263451 WATER pCi/L PM, Quote: SS , 57671
SEQ Batch, Test: None All Tests: 5263451 AZS7, 5263452 BCS8, 5263453 AWTA,

Sep2 DT/Tm Tech:

Prep Tech: ,GiroirB

Scott

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 HK05Q-1-AA J51200306-1-SAMP 09/20/2005 09:45	178.90g,in									
										
AmtRec: 20ML_5XLP #Containers: 6 Scr Rst: Alpha: Beta:										
2 HK05Q-1-AE-X J51200306-1-DUP 09/20/2005 09:45	174.10g,in									
										
AmtRec: 20ML_5XLP #Containers: 6 Scr Rst: Alpha: Beta:										
3 HK05T-1-AA J51200306-2-SAMP 09/20/2005 11:35	156.20g,in									
										
AmtRec: 20ML_5XLP #Containers: 6 Scr Rst: Alpha: Beta:										
4 HK073-1-AA-B J51200000-451-BLK 09/20/2005 09:45	193.10g,in									
										
AmtRec: #Containers: 1 Scr Rst: Alpha: Beta:										
5 HK073-1-AC-C J51200000-451-LCS 09/20/2005 09:45	198.40g,in		ASD3654 08/18/05,pd 03/25/05,r							
										
AmtRec: #Containers: 1 Scr Rst: Alpha: Beta:										

1.5 19.6 100 10g

1531 9/22/05 R

18.0 10b

16.0 10c

0.1 10d

✓ 0.4 ✓ 10e 2058
pc 10d

Comments:

PHADJ

All Clients for Batch:
384868, Pacific Northwest National Laboratories Pacific Northwest National Lab, SS , 57671

HK05Q1AA-SAMP Constituent List:
ALPHA RDL:3 pCi/L LCL: UCL: RPD:

STL RICHLAND

28

STL RICHLAND

9/21/2005 5:37:09 AM

Sample Preparation/Analysis

Balance Id:1120482733

AZ Gross Alpha PrpRC5014
 S7 Gross Alpha by GPC using Am-241 curve
 51 CLIENT: HANFORD

Pipet #: _____

Report Due: 09/23/2005

Sep1 DT/Tm Tech:

Batch: 5263451
 SEQ Batch, Test: None

pCi/L

Sep2 DT/Tm Tech:

Prep Tech: ,GiroirB



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:
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HK0731AA-BLK:
 ALPHA RDL:3 pCi/L LCL: UCL: RPD:
 HK0731AC-LCS:
 Am-241 RDL: pCi/L LCL:70 UCL:130 RPD:20
 HK05Q1AA-SAMP Calc Info:
 Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
 HK0731AA-BLK:
 Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
 HK0731AC-LCS:
 Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____ Date: _____

9/23/2005 2:54:18 PM

ICOC Fraction Transfer/Status Report

ByDate: 9/23/2004, 9/28/2005, Batch: '5263451', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
5263451				
AC	Rev1C	GiroirB	9/21/2005 4:54:13	
SC		wagarr	IsBatched 9/20/2005 2:52:16 PM	ICOC_RADCALC v4.8.08
SC		GiroirB	InPrep 9/21/2005 4:54:13 AM	RICH-RC-5014 REVISION 6
SC		GiroirB	Prep1C 9/21/2005 5:55:07 AM	RICH-RC-5014 REVISION 6
SC		ScottM	Prep2C 9/22/2005 1:21:24 PM	RICH-RC-5014 REVISION 6
SC		StringerR	InCnt1 9/22/2005 1:29:32 PM	RICH-RD-0003 REVISION 4
SC		DAWKINSO	CalcC 9/22/2005 9:48:59 PM	RICH-RD-0003 REVISION 4
SC		AndersonP	Rev1C 9/23/2005 2:51:13 PM	RICH-RC-0002 REVISION 7
AC		GiroirB	9/21/2005 5:55:07	
AC		ScottM	9/22/2005 1:21:24 PM	
AC		StringerR	9/22/2005 1:29:32 PM	
AC		DAWKINSO	9/22/2005 9:48:59 PM	
AC		AndersonP	9/23/2005 2:51:13 PM	

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

STL RICHLAND

9/21/2005 5:37:09 AM

Sample Preparation/Analysis

Balance Id:1120482733

384868, Pacific Northwest National Laboratories ,
Pacific Northwest National Lab

BC Gross Beta PrpRC5014
S8 Gross Beta by GPC using Sr/Y-90 curve
5I CLIENT: HANFORD

Pipet #: 229

Report Due: 09/23/2005 W04768

Sep1 DT/Tm Tech:

Batch: 5263452 WATER pCi/L
SEQ Batch, Test: None

PM, Quote: SS , 57671

Sep2 DT/Tm Tech:

Prep Tech: ,GiroirB Scott

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 HK05Q-1-AC J51200306-1-SAMP 09/20/2005 09:45 AmtRec: 20ML,5XLP #Containers: 6	194.50g,in									
<div style="display: flex; justify-content: space-between; font-size: 1.2em;"> 1.5 25.2 100 26a 1543 9/22/05 R </div>										
2 HK05T-1-AC J51200306-2-SAMP 09/20/2005 11:35 AmtRec: 20ML,5XLP #Containers: 6	177.90g,in									
<div style="display: flex; justify-content: space-between; font-size: 1.2em;"> 18.0 26b </div>										
3 HK05T-1-AE-X J51200306-2-DUP 09/20/2005 11:35 AmtRec: 20ML,5XLP #Containers: 6	173.00g,in									
<div style="display: flex; justify-content: space-between; font-size: 1.2em;"> 18.1 26c </div>										
4 HK075-1-AA-B J51200000-452-BLK 09/20/2005 11:35 AmtRec: #Containers: 1	213.80g,in									
<div style="display: flex; justify-content: space-between; font-size: 1.2em;"> 0.1 26d </div>										
5 HK075-1-AC-C J51200000-452-LCS 09/20/2005 11:35 AmtRec: #Containers: 1 BESB2526 09/09/05,pd 09/21/04,r	194.00g,in									
<div style="display: flex; justify-content: space-between; font-size: 1.2em;"> 0.5 27a </div>										

Comments:
ph verified @ 52m prep

All Clients for Batch:
384868, Pacific Northwest National Laboratories Pacific Northwest National Lab, SS , 57671

HK05Q1AC-SAMP Constituent List:
BETA RDL:4 pCi/L LCL: UCL: RPD:

31

STL RICHLAND

9/21/2005 5:37:14 AM

Sample Preparation/Analysis

Balance Id:1120482733

BC Gross Beta PrpRC5014
 S8 Gross Beta by GPC using Sr/Y-90 curve
 5I CLIENT: HANFORD

Pipet #: _____

Report Due: 09/23/2005

Sep1 DT/Tm Tech: _____

Batch: 5263452
 SEQ Batch, Test: None

pCi/L

Sep2 DT/Tm Tech: _____

Prep Tech: ,GiroirB



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:
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HK0751AA-BLK:

BETA RDL:4 pCi/L LCL: UCL: RPD:
 HK0751AC-LCS:
 Sr-90 RDL: pCi/L LCL:70 UCL:130 RPD:20

HK05Q1AC-SAMP Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
 HK0751AA-BLK:
 Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
 HK0751AC-LCS:
 Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____

Date: _____

9/23/2005 2:54:48 PM

ICOC Fraction Transfer/Status Report

ByDate: 9/23/2004, 9/28/2005, Batch: '5263452', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
5263452				
AC	Rev1C	GiroirB	9/21/2005 4:54:24	
SC		wagarr	IsBatched 9/20/2005 2:52:16 PM	ICOC_RADCALC v4.8.08
SC		GiroirB	InPrep 9/21/2005 4:54:24 AM	RICH-RC-5014 REVISION 6
SC		GiroirB	Prep1C 9/21/2005 5:55:00 AM	RICH-RC-5014 REVISION 6
SC		ScottM	Prep2C 9/22/2005 1:21:34 PM	RICH-RC-5014 REVISION 6
SC		StringerR	InCnt1 9/22/2005 1:29:50 PM	RICH-RD-0003 REVISION 4
SC		DAWKINSO	CalcC 9/22/2005 8:46:33 PM	RICH-RD-0003 REVISION 4
SC		AndersonP	Rev1C 9/23/2005 2:51:21 PM	RICH-RC-0002 REVISION 7
AC		GiroirB	9/21/2005 5:55:00	
AC		ScottM	9/22/2005 1:21:34 PM	
AC		StringerR	9/22/2005 1:29:50 PM	
AC		DAWKINSO	9/22/2005 8:46:33 PM	
AC		AndersonP	9/23/2005 2:51:21 PM	

AC: Accepting Entry; SC: Status Change

STL Richland
Richland Wa.