

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: 31908

SDG Nbr	ORDER Nbr	CLIENT ID NUMBER	LOT Nbr	WORK ORDER	RPT DB ID	BATCH
W04897	X06-031	B1HY21	J6D060380-1	H2RD31AA	9H2RD310	6097256
		B1HY21	J6D060380-1	H2RD31AC	9H2RD310	6097258

Comments:

Certificate of Analysis

Pacific Northwest National Laboratories
Sigma V Building
Richland, WA 99352

April 13, 2006

Attention: Dot Stewart

SAF Number : X06-031
Date SDG Closed : April 6, 2006
Number of Samples : One (1)
Sample Type : Water
SDG Number : W04897
Data Deliverable : 7-Day / Summary

CASE NARRATIVE

I. Introduction

On April 6, 2006, 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 Pacific Northwest National Laboratories (PGW) specific IDs:

<u>PGW ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
B1HY21	H2RD3	WATER	4/6/06

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:

Liquid Scintillation Counting

Technetium-99 by TEVA method RICH-RC-5065

Laser Induced Phosphorimetry

Total Uranium by method RICH-RC-5058

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

Liquid Scintillation Counting

Technetium-99 by TEVA method RICH-RC-5065:

The LCS, batch blank, samples, sample duplicate (B1HY21), and sample matrix spike (B1HY21) results are within contractual requirements.

Total Uranium

Total Uranium by method RICH-RC-5058:

The sample to which the matrix spike was add had an activity that greatly exceeds the spike activity, resulting in a high recovery of the spike. The LCS, batch blank, samples, sample duplicate (B1HY21), and sample matrix spike (B1HY21) 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, $R = \text{constants} * f(x,y,z,...)$. 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%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgrndCnt} / \text{BkgrndCntMin}) / \text{SCntMin})) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. 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.
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%. $MDC = (4.65 * \text{Sqrt}((\text{BkgrndCnt} / \text{BkgrndCntMin}) / \text{SCntMin}) + 2.71 / \text{SCntMin}) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. For LSC methods the batch blank is used as a measure of the background variability.
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.

4/13/2006 4:01:04 PM

STL Richland Report

Lab Code: STLRL

FormNbr: R FormatType: FEAD Version: 05 Rpt Nbr: 31908 File Name: h:\Reportdb\edd\FeadIV\Rad\W04897.Edd, h:\Reportdb\edd\FeadIV\Rad\31908.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:				
9H2RD310	B1HY21		MW6-SBB-A1	X06-031	W04897					04/06/2006 08:42				
Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
6097256	TC-99	14133-76-7	1.91E+03	pCi/L	2.2E+01	1.2E+02		8.74E+00	100.0	TC99_ETVDSK_LS	1.255E-01	L	04/11/200 00:05	I
6097258	Uranium	7440-61-1	3.88E+02	ug/L	4.6E+01	4.6E+01	N	8.42E-02		UTOT_KPA	2.49E-02	ML	04/12/200 13:26	I

Thursday, April 13, 2006

STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04897.Edd, h:\Reportdb\edd\Fead\Rad\31908.Edd

Lab Sample Id: H2TE01AB

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BLK

Received Date: 04/06/2006

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/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6097256 BLK	TC-99 14133-76-7	-9.37E-01	pCi/L	5.2E+00 3.6E+00	U	8.75E+00	100.0		TC99_ETVDSK	1.281E-01 L	04/11/2006 03:13				D

Thursday, April 13, 2006

STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\I\Rad\W04897.Edd, h:\Reportdb\edd\Fead\I\Rad\31908.Edd

Lab Sample Id: H2TE41AB

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BLK

Received Date: 04/06/2006

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	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/ ML	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6097258 BLK	Uranium 7440-61-1	7.11E-02	ug/L	7.3E-03 7.3E-03	UN	7.97E-02			UTOT_KPA	2.63E-02	04/12/2006 13:20				D

Thursday, April 13, 2006

STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\FeadIV\Rad\W04897.Edd, h:\Reportdb\edd\FeadIV\Rad\31908.Edd

Lab Sample Id: H2TE01CS

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BS

Received Date: 04/06/2006

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	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6097256 BS	TC-99 14133-76-7	4.40E+02	pCi/L	3.2E+01 1.1E+01		8.94E+00	100.0	5.44E+02 80.9	TC99_ETVDSK	1.25E-01 L	04/11/2006 04:16			70 130	D

Thursday, April 13, 2006

STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04897.Edd, h:\Reportdb\edd\Fead\Rad\31908.Edd

Lab Sample Id: H2TE41CS

Sdg/Rept Nbr: W04897

31908

Collection Date: 04/06/2006 08:42

Client Id: NA

Matrix: WATER

WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BS

Received Date: 04/06/2006

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	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
6097258 BS	Uranium 7440-61-1	3.73E+01	ug/L	4.4E+00 4.4E+00	N	8.06E-02		3.73E+01 100.1	UTOT_KPA	2.60E-02 ML	04/12/2006 13:22			70 130	D

Thursday, April 13, 2006

STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\FeadIV\Rad\W04897.Edd, h:\Reportdb\edd\FeadIV\Rad\31908.Edd

Lab Sample Id: H2TE41DS

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: BS

Received Date: 04/06/2006

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	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6097258 BS	Uranium 7440-61-1	3.50E+00	ug/L	3.6E-01 3.6E-01	N	8.15E-02		3.51E+00 99.9	UTOT_KPA	2.57E-02 ML	04/12/2006 13:24			70 130	D

Thursday, April 13, 2006

STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\I\Rad\W04897.Edd, h:\Reportdb\edd\Fead\I\Rad\31908.Edd

Lab Sample Id: H2RD31ER

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: B1HY21

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: DUP

Received Date: 04/06/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X06-031	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
6097256 DUP	TC-99 14133-76-7	1.89E+03 1.91E+03	pCi/L	1.2E+02 2.1E+01		8.19E+00	100.0		TC99_ETVDSK	1.288E-01 L	04/11/2006 02:11	1.3 20.0	0.3 3		D

Thursday, April 13, 2006

STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04897.Edd, h:\Reportdb\edd\Fead\Rad\31908.Edd

Lab Sample Id: H2RD31GR

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: B1HY21

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: DUP

Received Date: 04/06/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X06-031	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	Aliq Size/ ML	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6097258 DUP	Uranium 7440-61-1	3.94E+02 3.88E+02	ug/L	4.6E+01 4.6E+01	N	7.33E-02			UTOT_KPA	2.86E-02	04/12/2006 13:34	1.4 20.0	0.2 3		D

Thursday, April 13, 2006

STL Richland Qc Matrix Spike Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\Fead\Rad\W04897.Edd, h:\Reportdb\edd\Fead\Rad\31908.Edd

Lab Sample Id: H2RD31DW

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: B1HY21

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: MS

Received Date: 04/06/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X06-031	MW6-SBB-A19981								AB	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
6097256 MS	TC-99 14133-76-7	3.01E+03	pCi/L	3.3E+02 3.6E+01		9.18E+00	100.0	3.58E+03 84.2	TC99_ETVDSK	1.259E-01 L	04/11/2006 01:08			60 140	D

Thursday, April 13, 2006

STL Richland Qc Matrix Spike Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\edd\FeadIV\Rad\W04897.Edd, h:\Reportdb\edd\FeadIV\Rad\31908.Edd

Lab Sample Id: H2RD31FW

Sdg/Rept Nbr: W04897 31908

Collection Date: 04/06/2006 08:42

Client Id: B1HY21

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%*:

QC Type: MS

Received Date: 04/06/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X06-031	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
6097258 MS	Uranium 7440-61-1	5.14E+01	ug/L	6.9E+01 6.9E+01	UN	7.91E-02		3.41E+01 150.7	UTOT_KPA	2.65E-02 ML	04/12/2006 13:31			60 140	D

Lot No., Due Date: J6D060380; 04/13/2006
Client, Site: 384868; PGW 615HANFORD HANFORD
QC Batch No., Method Test: 6097256; RTC99 Tc-99 by LSC
SDG, Matrix: W04897; WATER

8.0	Correction Calculation Protocol Used. OK	Yes	No	N/A
8.01	The Appropriate Methods Were Used To Analyze the Samples OK	Yes	No	N/A
8.02	Final Results Are in the Appropriate Activity Units OK	Yes	No	N/A
8.03	Batch Contains the Required QC Appropriate for the Method OK	Yes	No	N/A
8.04	The Correct Tracer and QC Vials Where Used in the Samples Incorrect Tracer/Vial => H2RD31AD TCSG<->TCSE Q:V9	Yes	No	N/A
8.05	Sample was Appropriately Traced Before or After Fractionating the Sample OK	Yes	No	N/A
8.06	At Least the Minimum Sample Volume Was Used OK	Yes	No	N/A
8.07	The Correct Count Geometry was Used. OK	Yes	No	N/A
8.08	The Sample was Counted for the Minimum Count Time or CRDL was Achieved. OK	Yes	No	N/A
8.09	Method Blank is within Control Limits. OK	Yes	No	N/A
8.1	Comments:			
8.11	Matrix Blank is within Control Limits. No Matrix Blanks (MBIks) found in Batch!	Yes	No	N/A
8.12	Method Blank(s) < QAS Limit Value (No B Flag Necessary). OK	Yes	No	N/A
8.13	QAS Specified Duplicate Equation Value within Control Limits. OK (RPD)	Yes	No	N/A
8.14	LCS within Control Limits. OK	Yes	No	N/A
8.15	MLCS within Control Limits. No Matrix Spikes (MLCS) found in Batch!	Yes	No	N/A
8.16	MS within Control Limits. OK	Yes	No	N/A
8.17	Tracer within Control Limits. No Tracers found in Batch!	Yes	No	N/A
8.18	Samples are above Minimum Tracer Yield (No Failed Samples) No Tracers found in Batch!	Yes	No	N/A
8.19	Sample Specific MDC <= CRDL. OK	Yes	No	N/A
8.2	Comments:			
8.21	Result < Lc, Activity Not Detected, U Flag. No Limit Specified!	Yes	No	N/A
8.22	Result < Mdc, Activity Not Detected, U Flag. No Positive Results OK Calc_IDL Not Calculated	Yes	No	N/A
8.23	Result <= Action Level, when Defined. OK; No Action Level Found => TC-99 OK; No Callin Level Found => TC-99	Yes	No	N/A
8.24	Result + 3s >=0, Not Too Negative. OK	Yes	No	N/A
8.25	Counting Spectrum are within FWHM Limits. No FWHM found in Batch Data!	Yes	No	N/A

8.26	Instruments have Current Calibrations.	Yes	No	N/A
8.27	Correct Count Library Used. No Count Library found in Batch Data!	Yes	No	N/A <input checked="" type="checkbox"/>
8.28	Instrument Background within Limits at Time of Counting. (Not Applicable to this version. To be developed in later versions)	Yes	No	N/A
8.29	Instrument Check Source within Limits at the Time of Counting. (Not Applicable to this version. To be developed in later versions)	Yes	No	N/A
8.3	Comments:			
8.31	Results Blank Subtracted as Appropriate. OK	Yes	No	N/A <input checked="" type="checkbox"/>

First Level Review Pam Anderson

Date 4-12-04



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 6097256

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: 4-13-06

Lot No., Due Date: J6D060380; 04/13/2006
 Client, Site: 384868; PGW 615HANFORD HANFORD
 QC Batch No., Method Test: 6097258; RUNAT UNat by KPA
 SDG, Matrix: W04897; WATER

8.0	Correction Calculation Protocol Used. OK	Yes	No	N/A
8.01	The Appropriate Methods Were Used To Analyze the Samples OK	Yes	No	N/A
8.02	Final Results Are in the Appropriate Activity Units OK	Yes	No	N/A
8.03	Batch Contains the Required QC Appropriate for the Method OK	Yes	No	N/A
8.04	The Correct Tracer and QC Vials Where Used in the Samples Incorrect Tracer/Vial => H2TE41AD UNSC<>UNSF Q:V9	Yes	No	N/A
8.05	Sample was Appropriately Traced Before or After Fractionating the Sample OK	Yes	No	N/A
8.06	At Least the Minimum Sample Volume Was Used No Count Analysis Size found in Batch Data!	Yes	No	N/A
8.07	The Correct Count Geometry was Used. No Count Geometry found in Batch Data!	Yes	No	N/A
8.08	The Sample was Counted for the Minimum Count Time or CRDL was Achieved. No Count Duration Field Found in Batch Data!	Yes	No	N/A
8.09	Method Blank is within Control Limits. OK	Yes	No	N/A
8.1	Comments:			
8.11	Matrix Blank is within Control Limits. No Matrix Blanks (MBIs) found in Batch!	Yes	No	N/A
8.12	Method Blank(s) < QAS Limit Value (No B Flag Necessary). OK	Yes	No	N/A
8.13	QAS Specified Duplicate Equation Value within Control Limits. OK (RPD)	Yes	No	N/A
8.14	LCS within Control Limits. OK	Yes	No	N/A
8.15	MLCS within Control Limits. No Matrix Spikes (MLCS) found in Batch!	Yes	No	N/A
8.16	MS within Control Limits. MS Exceeds Control Limit => => H2RD31AF Uranium 151 L:60 140 Q:S1	Yes	No	N/A
8.17	Tracer within Control Limits. No Tracers found in Batch!	Yes	No	N/A
8.18	Samples are above Minimum Tracer Yield (No Failed Samples) No Tracers found in Batch!	Yes	No	N/A
8.19	Sample Specific MDC <= CRDL. OK	Yes	No	N/A
8.2	Comments:			
8.21	Result < Lc, Activity Not Detected, U Flag. No Limit Specified!	Yes	No	N/A
8.22	Result < Mdc, Activity Not Detected, U Flag. Batch Positive Result => H2RD31AC Uranium 3.9E+02 L:8.4E-02	Yes	No	N/A
8.23	Result <= Action Level, when Defined. OK; No Action Level Found => Uranium OK; No Callin Level Found => Uranium	Yes	No	N/A
8.24	Result + 3s >=0, Not Too Negative. OK	Yes	No	N/A
8.25	Counting Spectrum are within FWHM Limits. No FWHM found in Batch Data!	Yes	No	N/A

8.26	Instruments have Current Calibrations.	Yes	No	N/A
8.27	Correct Count Library Used. No Count Library found in Batch Data!	Yes	No	N/A <input checked="" type="checkbox"/>
8.28	Instrument Background within Limits at Time of Counting. (Not Applicable to this version. To be developed in later version)	Yes	No	N/A
8.29	Instrument Check Source within Limits at the Time of Counting. (Not Applicable to this version. To be developed in later version)	Yes	No	N/A
8.3	Comments:			
8.31	Results Blank Subtracted as Appropriate. OK	Yes <input checked="" type="checkbox"/>	No	N/A

First Level Review Pam Anderson

Date 4-13-06



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 6097238

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: See NCM

Second Level Review: [Signature]

Date: 4-13-06

Clouseau Nonconformance Memo



NCM #: 10-07873	Classification: Anomaly
NCM Initiated By: Erika Jordan	Status: GLREVIEW
Date Opened: 04/13/2006	Production Area: Environmental - Sep
Date Closed:	Tests: UNat by KPA
	Lot #'s (Sample #'s): J6D060380 (1), J6D070000 (258),
	QC Batches: 6097258
Nonconformance: Other (describe in detail)	
Subcategory: Other (explanation required)	

Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Erika Jordan	04/13/2006	The sample to which the matrix spike was added had an activity which greatly exceeds the spike activity, resulting in a high recovery of the spike.

Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Erika Jordan	04/13/2006	none

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>
----------------------	--------------------	-----------------

PNNL *J6D060380*
W04897
Due 4/13/06

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X06-031-4**
 Page 1 of 1

Collector DURATEK	Contact/Requester Dot Stewart	Telephone No. 509-376-5056	MSIN	FAX
SAF No. E. PARCHEN X06-031	Sampling Origin Hanford Site	Purchase Order/Charge Code		
Project Title CERCLA 2UP1-RB SPECIAL SAMPLING	<i>DTS-SAWS-H103A</i>	Ice Chest No. <i>SAWS-325</i>	Temp.	
Shipped To (Lab) Severn Trent Incorporated, Richland	Method of Shipment Govt. Vehicle	Bill of Lading/Air Bill No.		
Protocol LTMC	Priority: 7 Days PRIORITY	Offsite Property No.		

POSSIBLE SAMPLE HAZARDS/REMARKS ** **	SPECIAL INSTRUCTIONS TAT 7 days	Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1HY21		W	<i>4/6/06</i>	<i>0842</i>	1x20-mL P	Activity Scan	None
B1HY21		W	↓	↓	1x500-mL P	TC99_ETVDSK_LSC: Tc-99 (1)	HCl to pH <2
B1HY21		W	↓	↓	1x500-mL G/P	UTOT_KPA: Uranium (1)	HNO3 to pH <2

Relinquished By DURATEK D. E. PARCHEN	Print <i>D. E. PARCHEN</i>	Sign <i>D. E. PARCHEN</i>	Date/Time APR 06 2006	Received By <i>S. Welch</i>	Print <i>S. Welch</i>	Sign <i>S. Welch</i>	Date/Time APR 06 2006 14:10	Matrix * S = Soil DS = Drum Solid SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge W = 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	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	



STL

Sample Check-in List

Date/Time Received: 4/6/06 14:10
 Client: PGW SDG #: W04897 NA SAF #: X06-031 NA
 Work Order Number: J6D060380 Chain of Custody # X06-031-4
 Shipping Container ID: SAWS-325 Air Bill # N/A

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: 1
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 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): _____

Sample Custodian: S. Welch Date: 4/6/06 14:10

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

No action necessary; process as is.

Project Manager _____ Date _____

4/7/2006 12:52:18 PM

Sample Preparation/Analysis

Balance Id:1120482733

384868, Pacific Northwest National Laboratory ,
Pacific Northwest National Lab

FP Tc-99 Prp/SepRC5065
S5 Technetium-99 by Liquid Scint
5I CLIENT: HANFORD

P
PRIORITY

Pipet #: _____

Report Due: 04/13/2006 *W04897*

Sep1 DT/Tm Tech: _____

Batch: 6097256 WATER pCi/L
SEQ Batch, Test: None

PM, Quote: HC , 57671

Sep2 DT/Tm Tech: _____

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 H2RD3-1-AA J6D060380-1-SAMP  04/06/2006 08:42			125.50g,in	125.50g		60				
			AmtRec: 20ML,2X500ML #Containers: 3				Scr:	Alpha:	Beta:	
2 H2RD3-1-AD-S J6D060380-1-MS  04/06/2006 08:42			125.90g,in	125.90g	TCSG1572 02/09/06,pd 01/10/06,r	60				
			AmtRec: 20ML,2X500ML #Containers: 3				Scr:	Alpha:	Beta:	
3 H2RD3-1-AE-X J6D060380-1-DUP  04/06/2006 08:42			128.80g,in	128.80g		60				
			AmtRec: 20ML,2X500ML #Containers: 3				Scr:	Alpha:	Beta:	
4 H2TE0-1-AA-B J6D070000-256-BLK  04/06/2006 08:42			128.10g,in	128.10g		60				
			AmtRec: #Containers: 1				Scr:	Alpha:	Beta:	
5 H2TE0-1-AC-C J6D070000-256-LCS  04/06/2006 08:42			125.00g,in	125.00g	TCSE1924 04/04/06,pd 01/10/06,r	60				
			AmtRec: #Containers: 1				Scr:	Alpha:	Beta:	
6 H2TE0-1-AD-B J6D070000-256-BLK  04/06/2006 08:42						60				
			AmtRec: #Containers: 1				Scr:	Alpha:	Beta:	

4/7/2006 12:52:20 PM

Sample Preparation/Analysis

Balance Id: _____

FP Tc-99 Prp/SepRC5065
S5 Technetium-99 by Liquid Scint
5I CLIENT: HANFORD

Pipet #: _____

Report Due: 04/13/2006

Sep1 DT/Tm Tech: _____

Batch: 6097256
SEQ Batch, Test: None

pCi/L

Sep2 DT/Tm Tech: _____

Prep Tech: _____



Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
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Comments: *M22 4/7/06*

All Clients for Batch:

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

H2RD31AA-SAMP Constituent List:

Tc-99 RDL:15 pCi/L LCL:70 UCL:130 RPD:20

H2RD31AD-MS Constituent List:

H2TE01AA-BLK:

Tc-99 RDL:15 pCi/L LCL: UCL: RPD:

H2TE01AC-LCS:

Tc-99 RDL:15 pCi/L LCL:70 UCL:130 RPD:20

H2TE01AD-BLK:

Tc-99 RDL:15 pCi/L LCL: UCL: RPD:

H2RD31AA-SAMP Calc Info:

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

H2RD31AD-MS Calc Info:

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

H2TE01AA-BLK:

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

H2TE01AC-LCS:

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

H2TE01AD-BLK:

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

Approved By _____

Date: _____

ICOC Fraction Transfer/Status Report

ByDate: 4/11/2005, 4/16/2006, Batch: '6097256', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
6097256				
AC	CalcC	WAGNERJ	4/7/2006 10:53:11	
SC		WAGNERJ	InPrep	4/7/2006 10:53:11 AM REVISION 6
SC		wagnerj	IsBatched	4/7/2006 12:42:06 PM ICOC_RADCALC v4.8.20
SC		WAGNERJ	Prep1C	4/7/2006 12:54:33 PM RICH-RC-5016 REVISION 6
SC		AntonsonL	Sep1C	4/10/2006 4:49:20 PM RICH-RC-5078 REVISION 3
SC		DAWKINSO	InCnt1	4/10/2006 5:15:33 PM RICH-RD-0001 REVISION 3
SC		BlackCL	CalcC	4/11/2006 10:09:43 AM RICH-RD-0001 REVISION 3
AC		WAGNERJ	4/7/2006 12:54:33 PM	
AC		AntonsonL	4/10/2006 4:49:20 PM	
AC		DAWKINSO	4/10/2006 5:15:33 PM	
AC		BlackCL	4/11/2006 10:09:43	

AC: Accepting Entry; SC: Status Change

4/7/2006 1:00:35 PM

Sample Preparation/Analysis

Balance Id:1120482733

384868, Pacific Northwest National Laboratory
Pacific Northwest National Lab

DH UNat_Laser PrpRC5015
SS Total Uranium by KPA
5I CLIENT: HANFORD

P

Pipet #: 240

Report Due: 04/13/2006 *W04897*

Sep1 DT/Tm Tech:

Batch: 6097258 WATER ug/L
SEQ Batch, Test: None

PM, Quote: HC , 57671

Sep2 DT/Tm Tech:

PRIORITY

Prep Tech: ,WAGNERJ *J. Scott*

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 H2RD3-1-AC J6D060380-1-SAMP 04/06/2006 08:42	<i>Final Vol</i> 24.90g,in							
2 H2RD3-1-AF-S J6D060380-1-MS 04/06/2006 08:42	26.50g,in		UNSF3055 04/06/06,pd 09/16/04,r					
3 H2RD3-1-AG-X J6D060380-1-DUP 04/06/2006 08:42	28.60g,in							
4 H2TE4-1-AA-B J6D070000-258-BLK 04/06/2006 08:42	26.30g,in							
5 H2TE4-1-AC-C J6D070000-258-LCS 04/06/2006 08:42	26.00g,in		UNSF3056 04/06/06,pd 09/16/04,r					
6 H2TE4-1-AD-C J6D070000-258-LCS 04/06/2006 08:42	25.70g,in		UNSC1118 04/06/06,pd 09/17/04,r					

4/7/2006 1:00:37 PM

Sample Preparation/Analysis

Balance Id:1120482733

DH UNat_Laser PrpRC5015
SS Total Uranium by KPA
5I CLIENT: HANFORD

Pipet #: _____

Report Due: 04/13/2006

Sep1 DT/Tm Tech:

Batch: 6097258 ug/L

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ



Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
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Comments: *PHC 2.2.2.2*

All Clients for Batch:

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

H2RD31AC-SAMP Constituent List:

Uranium RDL:1.44E-01 ug/L LCL: UCL: RPD:

H2RD31AF-MS Constituent List:

H2TE41AA-BLK:

Uranium RDL:1.44E-01 ug/L LCL: UCL: RPD:

H2TE41AC-LCS:

Uranium RDL:0.144343 ug/L LCL:70 UCL:130 RPD:20

H2TE41AD-LCS:

Uranium RDL:0.144343 ug/L LCL:70 UCL:130 RPD:20

H2RD31AC-SAMP Calc Info:

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

H2RD31AF-MS Calc Info:

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

H2TE41AA-BLK:

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

H2TE41AC-LCS:

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

H2TE41AD-LCS:

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

Approved By _____ Date: _____

4/13/2006 10:35:36 AM

ICOC Fraction Transfer/Status Report

ByDate: 4/13/2005, 4/18/2006, Batch: '6097258', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
6097258				
AC		Cnt1C	WAGNERJ 4/7/2006 10:53:17	
SC			WAGNERJ InPrep 4/7/2006 10:53:17 AM	REVISION 4
SC			wagnerj IsBatched 4/7/2006 12:42:06 PM	ICOC_RADCALC v4.8.20
SC			WAGNERJ Prep1C 4/7/2006 1:00:44 PM	RICH-RC-5015 REVISION 4
SC			ScottM InPrep2 4/11/2006 11:04:13 AM	RICH-RC-5015 REVISION 4
SC			ScottM Prep2C 4/12/2006 11:21:25 AM	RICH-RC-5015 REVISION 4
SC			BarbosaH Cnt1C 4/12/2006 1:51:53 PM	RICH-RC-5058 REVISION 7
AC			WAGNERJ 4/7/2006 1:00:44 PM	
AC			ScottM 4/11/2006 11:04:13	
AC			ScottM 4/12/2006 11:21:25	
AC			BarbosaH 4/12/2006 1:51:53 PM	

AC: Accepting Entry; SC: Status Change