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: 29523

SDG Nbr	ORDER Nbr	CLIENT ID NUMBER	LOT Nbr	WORK ORDER	RPT DB ID	BATCH
W04617B	S05-004	B1CJB1	J5G180166-1	HFPNT1AA	9HFPNT10	5200541
		B1CJB1	J5G180166-1	HFPNT1AC	9HFPNT10	5200537

Comments:

Certificate of Analysis
RECHECK, RECOUNT, OR REANALYSIS ORDER
ORDER NUMBER 050718STLRL-R3047

Certificate of Analysis

Pacific Northwest National Laboratories
Sigma V Building
Richland, WA 99352

July 27, 2005

Attention: Dot Stewart

SAF Number	:	S05-004
Date SDG Closed	:	July 18, 2005
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W04617B
Data Deliverable	:	45-Day Summary

CASE NARRATIVE

I. Introduction

On July 18, 2005, a request for reanalysis 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:

PGW ID#	STLR ID#	MATRIX	DATE OF RECEIPT
B1CJB1	HFPNT	WATER	4/20/05

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 Beta by method RICH-RC-5014
Liquid Scintillation Counting
Technetium-99 by method RICH-RC-5065

IV. Quality Control

The analytical results for each analysis performed under SDG W04617B 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 Beta by method RICH-RC-5014:
The reanalysis results are not within RER acceptance criteria. Except as noted, the LCS, batch blank, sample and sample duplicate (B1CJB1) results are within contractual requirements.

Liquid Scintillation Counting

Technetium-99 by method RICH-RC-5065:
The reanalysis results are not within RER acceptance criteria. Except as noted, the LCS, batch blank, sample and sample duplicate (B1CJB1) and sample matrix spike (B1CJB1) results are within contractual requirements.

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

Reviewed and approved:

Sandra Leger

Hans Carman
for 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 = 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/vn), 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) ***u_c - Combined Uncertainty.***	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, *u_c the combined uncertainty*. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or 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 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by 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.

STL Richland Report

Lab Code: STLRL

FormNbr: R FormatType: FEAD Version: 05 Rpt Nbr: 29523 File Name: h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.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:
9HFPNT10	B1CJB1		MW6-SBB-A1	S05-004	W04617B					04/20/2005 12:06

Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
5200541	BETA	12587-47-2	3.68E+01	pCi/L	2.7E+00	6.8E+00		2.66E+00	100.0	9310_ALPHABETA	1.32E-01	L	07/25/200 18:27	I
5200537	TC-99	14133-76-7	4.62E+01	pCi/L	5.9E+00	9.0E+00		1.09E+01	100.0	TC99_ETVDSK_LS	1.211E-01	L	07/23/200 02:22	I

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.

STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.E

Lab Sample Id:	HFTDT1AB	**Sdg/Rept Nbr:**	W04617B	29523	**Collection Date:** 04/20/2005 12:06
Client Id:	NA	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	BLK		**Received Date:** 07/18/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	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/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5200537	TC-99	2.88E+00	pCi/L	6.5E+00	U	1.08E+01	100.0		TC99_ETVDSK	1.22E-01	07/23/2005				D
BLK	14133-76-7			4.6E+00						L	05:28				

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.

STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.E

Lab Sample Id:	HFTDV1AB	**Sdg/Rept Nbr:**	W04617B	29523	**Collection Date:** 04/20/2005 12:06
Client Id:	NA	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	BLK		**Received Date:** 07/18/2005

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	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5200541	BETA	-2.89E-01	pCi/L	8.6E-01	U	1.79E+00	100.0		9310_ALPHAB	1.971E-01	07/25/2005				D
BLK	12587-47-2			8.6E-01						L	18:27				

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.

STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.E

Lab Sample Id: HFTDT1CS **Sdg/Rept Nbr:** W04617B 29523 **Collection Date:** 04/20/2005 12:06

Client Id: NA **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** BS **Received Date:** 07/18/2005

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/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
5200537	TC-99	4.92E+02	pCi/L	3.5E+01		1.07E+01	100.0	5.53E+02	TC99_ETVDSK	1.231E-01	07/23/2005			70	D
BS	14133-76-7			1.3E+01				88.9		L	06:31			130	

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.

STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.E

Lab Sample Id: HFTDV1CS **Sdg/Rept Nbr:** W04617B 29523 **Collection Date:** 04/20/2005 12:06

Client Id: NA **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** BS **Received Date:** 07/18/2005

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	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
5200541	BETA	2.33E+01	pCi/L	3.9E+00		1.73E+00	100.0	2.24E+01	9310_ALPHAB	2.042E-01	07/25/2005			70	D
BS	12587-47-2			1.7E+00				104.1		L	18:27			130	

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.

STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.E

Lab Sample Id:	HFPNT1ER	**Sdg/Rept Nbr:**	W04617B	29523	**Collection Date:** 04/20/2005 12:06
Client Id:	B1CJB1	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	DUP		**Received Date:** 07/18/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
S05-004	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
5200537	TC-99	4.88E+01	pCi/L	8.8E+00		1.03E+01	100.0		TC99_ETVDSK	1.283E-01	07/23/2005	5.4	0.4		D
DUP	14133-76-7	4.62E+01		5.7E+00						L	04:26	20.0	3		

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.

STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.E

Lab Sample Id:	HFPNT1FR	**Sdg/Rept Nbr:**	W04617B	29523	**Collection Date:** 04/20/2005 12:06
Client Id:	B1CJB1	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	DUP		**Received Date:** 07/18/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
S05-004	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
5200541	BETA	3.91E+01	pCi/L	6.7E+00		2.73E+00	100.0		9310_ALPHAB	1.311E-01	07/25/2005	6.3	0.5		D
DUP	12587-47-2	3.68E+01		2.8E+00						L	18:27	20.0	3		

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.

STL Richland Qc Matrix Spike Report

Lab Code: STLRL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W04617B.Edd, h:\Reportdb\edd\FeadIV\Rad\29523.E

Lab Sample Id:	HFPNT1DW	**Sdg/Rept Nbr:**	W04617B	29523	**Collection Date:** 04/20/2005 12:06
Client Id:	B1CJB1	**Matrix:**	WATER	WATER	**Sample On Date:**
Moisture/Solids%*:		**QC Type:**	MS		**Received Date:** 07/18/2005

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
S05-004	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
5200537	TC-99	2.93E+03	pCi/L	1.8E+02		1.06E+01	100.0	3.64E+03	TC99_ETVDSK	1.247E-01	07/23/2005			60	D
MS	14133-76-7			3.1E+01				80.5		L	03:24			140	

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.

SEVERN TRENT STL

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

7/27/2005 10:10:20 AM

Lot No., Due Date: J5G180166; 08/02/2005

Client, Site: 384868; PGW 615HANFORD HANFORD

QC Batch No., Method Test: 5200541; RBETA-SR Beta by GPC-Sr/Y

SDG, Matrix: W04617B; WATER

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

6.0 Comments on any No response:

First Level Review Pam Anderson **Date** 7-27-05

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 5200541

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: Jodi Ca Date: 7/27/05

SEVERN TRENT STL

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

7/26/2005 8:05:11 AM

Lot No., Due Date: J5G180166; 08/02/2005

Client, Site: 384868; PGW 615HANFORD HANFORD

QC Batch No., Method Test: 5200537; RTC99 Tc-99 by LSC

SDG, Matrix: W04617B; WATER

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

6.0 Comments on any No response:

First Level Review Pam Anderson **Date** 7.26.05

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 5200537

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: Jodie C. Date: 7/27/05

07/18/2005
RECHECK, RECOUNT, OR REANALYSIS ORDER
CONTRACT NO MW6-SBB-

Severn Trent Incorporated,
2800 George Washington Way
Richland, WA 99354

Battelle PNNL Order Number: 050718STLRL-R3047

Sample Delivery Group: W04617

Special Instructions None

Samples(s)

Lab Sample ID	PNNL Sample	Action	TAT	METHOD_NAME:
9G8VAT10	B1CJB1	Reanalysis	15/15	9310_ALPHABETA_ Beta
9G8VAT10	B1CJB1	Reanalysis	15/15	TC99_ETVDSK_LSC

J5D210189
04 20 05 1500
" 1206
LP
500 P
505-004-81

B R076
SDG W04617 A
J5G180166
Due 08 02 05
HFPNT

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

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

7/21/2005 1:04:38 PM

Sample Preparation/Analysis

Balance Id:1120482733

384868, Pacific Northwest National Labortories , 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: 08/02/2005 W04617B

Sep1 DT/Tm Tech:

Batch: 5200541 **WATER** **pCi/L** **PM, Quote: SS , 57671**

SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech: ,GiroirB Scott

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 HFPNT-1-AA J5G180166-1-SAMP 04/20/2005 12:06	132.00g,in AmtRec: 500P,LP	#Containers: 2	N/B w/ as original W04617	1.5	27.4	200	31B Scr Rst:	2022 Alpha:	7/25/05 OP Beta:	
2 HFPNT-1-AF-X J5G180166-1-DUP 04/20/2005 12:06	131.10g,in AmtRec: 500P,LP	#Containers: 2			29.8		31D Scr Rst:	Alpha:	Beta:	
3 HFTDV-1-AA-B J5G190000-541-BLK 04/20/2005 12:06	197.10g,in AmtRec:	#Containers: 1			0.2		31C ~~31A~~ 7/25/05 OP Scr Rst:	Alpha:	Beta:	
4 HFTDV-1-AC-C J5G190000-541-LCS 04/20/2005 12:06	204.20g,in AmtRec:	BESB2464 06/24/05,pd 09/21/04,r #Containers: 1			0.4		31A ~~31B~~ 7/25/05 OP Scr Rst:	Alpha:	Beta:	

Comments:

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

HFPNT1AA-SAMP Constituent List:

BETA	RDL:4.00E+00	pCi/L	LCL:	UCL:	RPD:

HFTDV1AA-BLK:

BETA	RDL:4.00E+00	pCi/L	LCL:	UCL:	RPD:

HFTDV1AC-LCS:

Sr-90	RDL:	pCi/L	LCL:70	UCL:130	RPD:20

HFPNT1AA-SAMP Calc Info:

7/27/2005 8:34:31 AM

ICOC Fraction Transfer/Status Report

ByDate: 7/27/2004, 8/1/2005, Batch: '5200541', User: *ALL Order By DateTimeAccepting

Q	Batch	Work Ord	CurStatus	Accepting			Comments
5200541							
AC			**CalcC**	**GiroirB**	7/21/2005 12:51:18		
SC				wagarr	IsBatched	7/19/2005 3:12:31 PM	ICOC_RADCALC v4.8.08
SC				GiroirB	InPrep	7/21/2005 12:51:18 PM	RICH-RC-5014 REVISION 6
SC				GiroirB	Prep1C	7/21/2005 1:18:47 PM	RICH-RC-5014 REVISION 6
SC				ScottM	Prep1C	7/25/2005 3:35:04 PM	RICH-RC-5014 REVISION 6
SC				DAWKINSO	InCnt1	7/25/2005 4:33:24 PM	RICH-RD-0003 REVISION 4
SC				DAWKINSO	InCnt1	7/25/2005 9:25:55 PM	RICH-RD-0003 REVISION 4
SC				BlackCL	CalcC	7/26/2005 8:41:22 AM	RICH-RD-0003 REVISION 4
AC				**GiroirB**	7/21/2005 1:18:47 PM		
AC				**ScottM**	7/25/2005 3:35:04 PM		
AC				**DAWKINSO**	7/25/2005 4:33:24 PM		
AC				**DAWKINSO**	7/25/2005 9:25:55 PM		
AC				**BlackCL**	7/26/2005 8:41:22		

AC: Accepting Entry; SC: Status Change

7/21/2005 1:22:04 PM

Sample Preparation/Analysis

Balance Id:1120482733

384868, Pacific Northwest National Labortories ,
Pacific Northwest National Lab

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

Pipet #: _____

Report Due: 08/02/2005 WO#46178

Batch: 5200537 **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	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 HFPNT-1-AC J5G180166-1-SAMP 04/20/2005 12:06			121.10g,in AmtRec: 500P,LP	121.10g #Containers: 2				Scr Rst:	Alpha:	Beta:
2 HFPNT-1-AD-S J5G180166-1-MS 04/20/2005 12:06			124.70g,in AmtRec: 500P,LP	124.70g #Containers: 2	TCSG1172 07/11/05,pd 02/15/05,r			Scr Rst:	Alpha:	Beta:
3 HFPNT-1-AE-X J5G180166-1-DUP 04/20/2005 12:06			128.30g,in AmtRec: 500P,LP	128.30g #Containers: 2				Scr Rst:	Alpha:	Beta:
4 HFTDT-1-AA-B J5G190000-537-BLK 04/20/2005 12:06			122.00g,in AmtRec:	122.00g #Containers: 1				Scr Rst:	Alpha:	Beta:
5 HFTDT-1-AC-C J5G190000-537-LCS 04/20/2005 12:06			123.10g,in AmtRec:	123.10g #Containers: 1	TCSE1722 04/19/05,pd 03/10/05,r			Scr Rst:	Alpha:	Beta:
6 HFTDT-1-AD-BN J5G190000-537-IBLK 04/20/2005 12:06			AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:

Sample Preparation/Analysis

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

Report Due: 08/02/2005

Batch: 5200537 **pCi/L**
SEQ Batch, Test: None

Balance Id:
Pipet #: _____
Sep1 DT/Tm Tech:
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:

Comments: HFPNT-SAMP "Comments: W04617B, beta reanal, aliquot ~= to original aliqot in W04617 and use unat container for tc reanal. Bg"

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

HFPNT1AC-SAMP Constituent List:
Tc-99 RDL:15 pCi/L LCL:70 UCL:130 RPD:20
HFPNT1AD-MS Constituent List:

HFTDT1AA-BLK:
Tc-99 RDL:15 pCi/L LCL: UCL: RPD:
HFTDT1AC-LCS:
Tc-99 RDL:15 pCi/L LCL:70 UCL:130 RPD:20
HFTDT1AD-IBLK:
Tc-99 RDL:15 pCi/L LCL: UCL: RPD:

HFPNT1AC-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
HFPNT1AD-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
HFTDT1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
HFTDT1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
HFTDT1AD-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____ Date: _____

7/25/2005 5:20:05 PM

ICOC Fraction Transfer/Status Report

ByDate: 7/25/2004, 7/30/2005, Batch: '5200537', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
5200537						
AC		**CalcC**	**GiroirB**	7/21/2005 12:51:11		
SC			wagarr	IsBatched	7/19/2005 3:12:31 PM	ICOC_RADCALC v4.8.08
SC			GiroirB	InPrep	7/21/2005 12:51:11 PM	RICH-RC-5016 REVISION 5
SC			GiroirB	Prep1C	7/21/2005 1:18:51 PM	RICH-RC-5016 REVISION 5
SC			FinchA	Sep1C	7/22/2005 4:06:33 PM	RICH-RC-5065 REVISION 5
SC			BlackCL	InCnt1	7/22/2005 4:36:04 PM	RICH-RD-0001 REVISION 3
SC			BlackCL	CalcC	7/25/2005 8:32:40 AM	RICH-RD-0001 REVISION 3
AC			**GiroirB**	7/21/2005 1:18:51 PM		
AC			**FinchA**	7/22/2005 4:06:33 PM		
AC			**BlackCL**	7/22/2005 4:36:04 PM		
AC			**BlackCL**	7/25/2005 8:32:40		

AC: Accepting Entry; SC: Status Change