

NOVEMBER 29 , 2004



STL

STL Richland
2800 George Washington Way
Richland, WA 99352

Tel: 509 375 3131 Fax: 509 375 5590
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November 18, 2004

Windy Fetterly, A.P.P
2430 Stevens Drive, Room 192
Richland, WA 99354

Reference: Contract 615

Dear Ms. Fetterly:

Accompanying this letter are the Data Package(s) for the radiochemical analyses for the following Fluor Sample Delivery Groups:

<u>SDG NUMBER</u>	<u>SAF NUMBER</u>	<u>LOT NUMBER</u>
W04367	S04-081	J4H250224

If you have any questions regarding this data package or require any additional information please contact Bev Giroir at 375-3131.

Receipt of this letter and the packages are acknowledged by:

<u>Windy Fetterly</u>	<u>November 29, 2004</u>	<u>3:35</u>
Name	Date	Time

XC: File

NOVEMBER 29 , 2004

Analytical Data Package Prepared For
Fluor Hanford Inc.

Radiochemical Analysis By
STL Richland

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code: STLRL

Data Package Contains 28 Pages

Report No.: 27279

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W04367	S04-081	S04081-01	J4H250224-1	GNWFV1AA	9GNWFV10	4238550
		S04081-02	J4H250224-2	GNWF91AA	9GNWF910	4238550
		S04081-03	J4H250224-3	GNWGD1AA	9GNWGD10	4238550
		S04081-04	J4H250224-4	GNWGM1AA	9GNWGM10	4238550
		S04081-05	J4H250224-5	GNWG21AA	9GNWG210	4238550
		S04081-07	J4H250224-7	GNWG71AA	9GNWG710	4238550
		S04081-08	J4H250224-8	GNWG81AA	9GNWG810	4238550
		S04081-09	J4H250224-9	GNWG91AA	9GNWG910	4238550



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Certificate of Analysis

Fluor Hanford
 P.O. Box 1000, T6-03
 Richland, WA 99352

November 24, 2004

Attention: John Trechter

SAF Number	:	S04-081
Date SDG Closed	:	August 25, 2004
Number of Samples	:	Nine (9)
Sample Type	:	Other (oil-like)
SDG Number	:	W04367
Data Deliverable	:	30 / 45 Day Summary

CASE NARRATIVE

I. Introduction

On August 20, 2004, nine "other" samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned to lot J4H250224 and assigned the following laboratory ID number to correspond with the Fluor Hanford (FH) specific ID:

<u>FH ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
S04081-01	GNWFV	OTHER	8/20/04
S04081-02	GNWF9	OTHER	8/20/04
S04081-03	GNWGD	OTHER	8/20/04
S04081-04	GNWGM	OTHER	8/20/04
S04081-05	GNWG2	OTHER	8/20/04
S04081-06	GNWG6	OTHER	8/20/04
S04081-07	GNWG7	OTHER	8/20/04
S04081-08	GNWG8	OTHER	8/20/04
S04081-09	GNWG9	OTHER	8/20/04

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

Fluor Hanford
November 24, 2004
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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**
Tritium by method RICHRC5037

IV. Quality Control

The analytical results for each analysis performed under SDG W04367 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
Tritium by method RICHRC5037

The sample matrix of "other", which is noted as being similar to hydraulic fluid, caused the distillation of the samples to be complex. Cryogenic Distillation was used, but at a higher temperature and with added oxygen. Additionally, micro distillations were performed to further clean up the sample distillate without any effectiveness. Additional glassware was procured to complete the analysis which resulted in a longer turn around time.

Quench was observed in samples S04-081-04, 05, and -07 but within the parameters of the calibration curve and the data is accepted. Sample S04-081-06 failed due to matrix effect: the quench was significantly outside of the calibration range. A duplicate analysis was not performed as the final volume of distillate was insufficient. Except as noted, the LCS, batch blank and sample 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:



Beverly I. Giroir
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%. $Lc = (1.645 * \sqrt{2 * (BkgrndCnt / BkgrndCntMin) / SCntMin}) * (ConvFct / (Eff * Yld * Abn * Vol)) * IngrFct$. 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.

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Sample Results Summary

Date: 24-Nov-04

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 27279

SDG No: W04367

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
4238550	906.0_H3_LSC								
	S04081-01								
	GNWV1AA H-3		7.00E+02 +- 2.45E+01		pCi/g	100%	3.55E+00	4.00E+02	
	S04081-02								
	GNWF91AA H-3		2.56E+05 +- 7.84E+03		pCi/g	100%	9.73E+00	4.00E+02	
	S04081-03								
	GNWGD1A H-3		4.14E+02 +- 1.60E+01		pCi/g	100%	3.93E+00	4.00E+02	
	S04081-04								
	GNWGM1A H-3		2.71E+02 +- 1.66E+01		pCi/g	100%	1.30E+01	4.00E+02	
	S04081-05								
	GNWG21AA H-3		1.97E+02 +- 1.93E+01		pCi/g	100%	2.80E+01	4.00E+02	
	S04081-07								
	GNWG71AA H-3		1.30E+02 +- 1.28E+01		pCi/g	100%	1.91E+01	4.00E+02	
	S04081-08								
	GNWG81AA H-3		1.18E+02 +- 1.19E+01		pCi/g	100%	1.69E+01	4.00E+02	
	S04081-09								
	GNWG91AA H-3		1.02E+02 +- 7.53E+00		pCi/g	100%	7.10E+00	4.00E+02	
No. of Results:		8							

STL Richland RPD - Relative Percent Difference.

rptSTLRichSaSum
mary2 V4.9.4 A97

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QC Results Summary
STL Richland STLRL
Ordered by Method, Batch No, QC Type,.

Date: 24-Nov-04

Report No. : 27279

SDG No.: W04367

Batch	Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
906.0_H3_LSC									
4238550	BLANK QC								
	GNXKX1AA	H-3	1.91E-02 +- 1.47E-01	U	pCi/g	100%			3.43E-01
4238550	LCS								
	GNXKX1AC	H-3	1.19E+00 +- 2.18E-01		pCi/g	100%	87%	-0.1	3.49E-01
No. of Results:		2							

STL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRichQcSummary V4.9.4 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-1
Client Sample ID: S04081-01

SDG: W04367
Report No. : 27279
COC No. :

Collection Date: 8/20/2004 9:37:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC											
H-3	7.00E+02		1.19E+01	2.45E+01	3.55E+00	pCi/g	100%	(197.1)	11/20/04 12:20 a		2.6	LSC3
							1.64E+00	4.00E+02			G	

No. of Results: 1 Comments:

NOVEMBER 29, 2004

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
STLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
V4.9.4 A97

FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-2
Client Sample ID: S04081-02

SDG: W04367
Report No. : 27279
COC No. :

Collection Date: 8/20/2004 9:45:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNWF91AA		Report DB ID: 9GNWF910					
H-3	2.56E+05		6.43E+02	7.84E+03	9.73E+00	pCi/g	100%	(26331.9)	11/20/04 12:35 a		1.6	LSC3
							3.78E+00	4.00E+02			G	

No. of Results: 1 Comments:

NOVEMBER 29, 2004

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
STL RchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
V4.9.4 A97

FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-3
Client Sample ID: S04081-03

SDG: W04367
Report No. : 27279
COC No. :

Collection Date: 8/20/2004 9:55:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNWGD1AA		Report DB ID: 9GNWGD10					
H-3	4.14E+02		9.70E+00	1.60E+01	3.93E+00	pCi/g	100%	(105.2)	11/20/04 01:08 a		1.8	LSC3
							1.82E+00	4.00E+02			G	

No. of Results: 1 Comments:

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FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-4
Client Sample ID: S04081-04

SDG: W04367
Report No. : 27279
COC No. :

Collection Date: 8/20/2004 10:05:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNWGM1AA		Report DB ID: 9GNWGM10					
H-3	2.71E+02		1.43E+01	1.66E+01	1.30E+01	pCi/g	100%	(20.8)	11/20/04 01:51 a		1.9	LSC3
						6.01E+00	4.00E+02	(32.7)			G	

No. of Results: 1 Comments:

NOVEMBER 29, 2004

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

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FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-5
Client Sample ID: S04081-05

SDG: W04367
Report No.: 27279
COC No.:

Collection Date: 8/20/2004 10:20:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNWG21AA			Report DB ID: 9GNWG210				
H-3	1.97E+02		1.82E+01	1.93E+01	2.80E+01	pCi/g	100%	(7.)	11/20/04 02:35 a		0.9	LSC3
							1.29E+01	4.00E+02			G	
No. of Results: 1		Comments:										

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FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-7
Client Sample ID: S04081-07

SDG: W04367
Report No. : 27279
COC No. :

Collection Date: 8/20/2004 10:40:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNWG71AA		Report DB ID: 9GNWG710					
H-3	1.30E+02		1.21E+01	1.28E+01	1.91E+01 pCi/g		100%	(6.8)	11/20/04 04:03 a		1.9	LSC3
						8.83E+00	4.00E+02	(20.3)			G	

No. of Results: 1 Comments:

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STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
STLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
V4.9.4 A97

FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-8
Client Sample ID: S04081-08

SDG: W04367
Report No. : 27279
COC No. :

Collection Date: 8/20/2004 10:47:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNWG81AA		Report DB ID: 9GNWG810					
H-3	1.18E+02		1.12E+01	1.19E+01	1.69E+01	pCi/g	100%	(7.)	11/20/04 04:45 a		0.8	LSC3
							7.81E+00	4.00E+02	(19.9)		G	

No. of Results: 1 Comments:

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STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
STLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
V4.9.4 A97

FORM I
SAMPLE RESULTS

Date: 24-Nov-04

Lab Name: STL Richland
Lot-Sample No.: J4H250224-9
Client Sample ID: S04081-09

SDG: W04367
Report No. : 27279
COC No. :

Collection Date: 8/20/2004 10:55:00 AM
Received Date: 8/20/2004 1:50:00 PM
Matrix: OTHER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNWG91AA			Report DB ID: 9GNWG910				
H-3	1.02E+02		6.75E+00	7.53E+00	7.10E+00 pCi/g		100%	(14.3)	11/20/04 05:28 a		0.9	LSC3
							3.28E+00	4.00E+02			G	

No. of Results: 1 Comments:

NOVEMBER 29, 2004

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
STL RchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
V4.9.4 A97

FORM II
BLANK RESULTS

Date: 24-Nov-04

Lab Name: STL Richland

SDG: W04367

Matrix: OTHER

Report No. : 27279

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC				Work Order: GNXKX1AA			Report DB ID: GNXKX1AB				
H-3	1.91E-02	U	1.37E-01	1.47E-01	3.43E-01	pCi/g	100%	0.06	11/19/04 10:54 p		10.0	LSC3
					1.58E-01	4.00E+02		0.26			G	
No. of Results: 1	Comments:											

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FORM II
LCS RESULTS

Date: 24-Nov-04

Lab Name: STL Richland

SDG: W04367

Matrix: OTHER

Report No. : 27279

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 4238550	906.0_H3_LSC												
						Work Order: GNXX1AC							
H-3	1.19E+00		2.06E-01	2.18E-01	3.49E-01	pCi/g	100%	1.37E+00	4.58E-02	87%	11/19/04 11:36 p	10.0	LSC3
							Rec Limits:	70	130	-0.1		G	
No. of Results: 1	Comments:												

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STL Richland
rptSTLRchLcs
V4.9.4 A97
Bias - (Result/Expected)-1 as defined by ANSI N13.30.

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Lot No., Due Date: J4H250224; 09/21/2004
Client, Site: 108302; FLUOR- SOILS Hanford Site
QC Batch No., Method Test: 4238550; RTRITIUM H-3 by LSC
SDG, Matrix: W04367; OIL

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:
NCM 10-04282.

First Level Review [Signature]

Date 11-22-04

SEVERN
TRENT **STL**

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number:

11-23-04
W 4238550

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
Fail Sample 504081-010: Matrix effect (Drench)
Sample 10 correction.

Second Level Review: *[Signature]* Date: 11-23-04

**Clouseau
Nonconformance Memo**

**SEVERN
TRENT
SERVICES**

NCM #: 10-04282 NCM Initiated By: Dale O'Connell Date Opened: 11/22/2004 Date Closed:	Classification: Anomaly Status: GLREVIEW Production Area: Environmental - Nona Tests: H-3 by LSC Lot #'s (Sample #'s): J4H250000 (550), J4H250224 (1,2,3,4,5,6,7,8,9), QC Batches: 4238550
Nonconformance: QC data exceeded criteria Subcategory: Other (explanation required)	

Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Dale O'Connell	11/22/2004	Quench parameter below 100. Cause: matrix effect. GNWGM1AA GNWG21AA GNWG61AA GNWG71AA Duplicate not analyzed. Incorrect IDs on Liquid Scintillation counting Sheet for 2 samples, cause is technician error.

Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Dale O'Connell	11/22/2004	Quench parameter within calibration range for all samples except GNWG61AA. Consider GNWG61AA failed due to matrix effect. MDA<CRDL on remaining samples. Blank result less than CRDL. LCS radiochemical recovery within acceptance limits. Sample identifications corrected in calculation. Report results of remaining samples.

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>

NOVEMBER 29 , 2004

CHAIN OF CUSTODY

STL RICHLAND



FLH
Q-50639

J4H250224
SDG# W04367

Due 9/21/04

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C# 102704

Page 1 of 2

Collector HULSE, K. B.	Contact/Requestor EBY, MARK	Tel. No. 376-8991 MSIN N2-57 FAX
SAF Number S04-081	Sample Origin FFTF RSB	Purchase Order/Charge Code
Project Title Oil Samples for Tritium	Logbook # DTS-5AWS-H77	Ice Chest # GWS-116A Temp.
Shipped To (Lab) STLRL	Method of Shipment Gov. Vehicle	Bill of Lading/Air Bill No. N/A
Protocol RCRA	Data Turnaround 30 Days	Offsite Property No. N/A

Sample No.	Lab. ID	*	Date	Time	No/Type Container	Sample Analysis	Perservative
S04081-01		O	8/20/2004	0937	(1) 20 P	Activity Scan (Lab Specific)	None
S04081-01		O	8/20/2004	0937	(1) 500 P	Tririum-Other	None <i>None Cool to 4°C</i>
S04081-02		O	8/20/2004	0945	(1) 20 P	Activity Scan (Lab Specific)	None
S04081-02		O	8/20/2004	0945	(1) 500 P	Tririum-Other	None
S04081-03		O	8/20/2004	0955	(1) 20 P	Activity Scan (Lab Specific)	None
S04081-03		O	8/20/2004	0955	(1) 500 P	Tririum-Other	None
S04081-04		O	8/20/2004	1005	(1) 20 P	Activity Scan (Lab Specific)	None
S04081-04		O	8/20/2004	1005	(1) 500 P	Tririum-Other	None
S04081-05		O	8/20/2004	1020	(1) 20 P	Activity Scan (Lab Specific)	None
S04081-05		O	8/20/2004	1020	(1) 500 P	Tririum-Other	None
S04081-06		O	8/20/2004	1030	(1) 20 P	Activity Scan (Lab Specific)	None
S04081-06		O	8/20/2004	1030	(1) 500 P	Tririum-Other	None

Handwritten notes and arrows pointing to sample rows:
 → GNWFXY *of 8/25/04*
 → GNWF9
 → GNWGD
 → GNWGM
 → GNWG2
 → GNWGL

POSSIBLE SAMPLE HAZARDS/REMARKS
 List all known wastes. MSDS Yes No

SPECIAL INSTRUCTIONS Hold Time

Relinquished By Print Sign Date/Time KB Hulse <i>KB Hulse</i> 8-20-04	Received By Print Sign Date/Time SA. Rheehear <i>[Signature]</i> AUG 20 2004
Relinquished By Date/Time	Received By Date/Time
Relinquished By Date/Time	Received By Date/Time
Relinquished By Date/Time	Received By Date/Time

- Matrix *
- S = Soil
 - SE = Sediment
 - SO = Solid
 - SL = Sludge
 - W = Water
 - O = Oil
 - A = Air
 - DS = Drum Solids
 - DL = Drum Liquids
 - T = Tissue
 - WI = Wipe
 - L = Liquid
 - V = Vegetation
 - X = Other

FINAL SAMPLE DISPOSITION Disposal Method e.g. Return to customer, per lab procedure, used in process. Disposed By Date/Time

NOVEMBER 29, 2004

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C # 102704

Page 2 of 2

Collector HULSE, K. B.	Contact/Requestor EBY, MARK	Tel. No. 376-8991 MSIN N2-57 FAX
SAF Number S04-081	Sample Origin FTF RSB	Purchase Order/Charge Code
Project Title Oil Samples for Tritium	Logbook # DTS-SAWS-H27	Ice Chest # GINS-116A Temp.
Shipped To (Lab) STLRL	Method of Shipment Gov. Vehicle	Bill of Lading/Air Bill No. N/A
Protocol RCRA	Data Turnaround 30 Days	Offsite Property No. N/A

Sample No.	Lab. ID	*	Date	Time	No/Type Container	Sample Analysis	Perservative
S04081-07		O	8/20/2004	1040	(1) 20 P	Activity Scan (Lab Specific)	None
S04081-07		O	8/20/2004	1040	(1) 500 P	Tritium-Other	NONE
S04081-08		O	8/20/2004	1047	(1) 20 P	Activity Scan (Lab Specific)	NONE
S04081-08		O	8/20/2004	1047	(1) 500 P	Tritium-Other	None
S04081-09		O	8/20/2004	1055	(1) 20 P	Activity Scan (Lab Specific)	NONE
S04081-09		O	8/20/2004	1055	(1) 500 P	Tritium-Other	None

Handwritten notes: GNWG7, GNWG8, GNWG9

W04367

J4H250224

Due 9/21/04

NOVEMBER 29, 2004

POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.		MSDS Yes <input type="checkbox"/> No <input type="checkbox"/>	SPECIAL INSTRUCTIONS	Hold Time
Relinquished By KB Hulse Sign [Signature] Date/Time 13:50	Received By A. Rhinehart Sign [Signature] Date/Time 13:50	Relinquished By KB Hulse Date/Time 8-20-04	Received By [Signature] Date/Time AUG 20 2004	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe 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

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Sample Check-in List

Date/Time Received: 8/20/04 @ 13:50 AR 504-081 ^{OR} 8/20/04
 Client: Duratek SDG #: W04367 NA [] SAF #: 102704 NA []
 Work Order Number: 141250224 Chain of Custody # 102704
 Shipping Container ID: GWS-116A 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: 18
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 []
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: April Rhoads / Richard Date: 8/20/04

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[] No action necessary; process as is.

Project Manager _____ Date _____

STL RICHLAND

8/25/2004 4:39:12 PM

Sample Preparation/Analysis

108302, FLUOR HANFORD IC
Hanford Inc

, Flour

AT H-3 Prp/SepRC5037
S6 Tritium by Liquid Scint
SI CLIENT: HANFORD

Balance Id: _____

Pipet #: _____

Report Due: 09/21/2004

W04307

Sep1 DT/Tm Tech: _____

Sep2 DT/Tm Tech: _____

Batch: 4238550 OIL

pCi/g

PM, Quote: BG2, 50639

Prep Tech: _____

SEQ Batch, Test: None



Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 GNWV-1-AA J4H250224-1-SAMP 08/20/2004 09:37								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:	Beta:		
2 GNWV-1-AC-X J4H250224-1-DUP 08/20/2004 09:37								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:	Beta:		
3 GNWF9-1-AA J4H250224-2-SAMP 08/20/2004 09:45								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:	Beta:		
4 GNWGD-1-AA J4H250224-3-SAMP 08/20/2004 09:55								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:	Beta:		
5 GNWGM-1-AA J4H250224-4-SAMP 08/20/2004 10:05								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:	Beta:		
6 GNWG2-1-AA J4H250224-5-SAMP 08/20/2004 10:20								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:	Beta:		
7 GNWG6-1-AA J4H250224-6-SAMP 08/20/2004 10:30								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:	Beta:		

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STL RICHLAND

8/25/2004 4:39:12 PM

Sample Preparation/Analysis

108302, FLUOR HANFORD IC
Hanford Inc

, Flour

AT H-3 Prp/SepRC5037
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

Balance Id: _____

Pipet #: _____

Report Due: 09/21/2004

Sep1 DT/Tm Tech: _____

Batch: 4238550 OIL
SEQ Batch, Test: None

pCi/g

PM, Quote: BG2, 50639

Sep2 DT/Tm Tech: _____

Prep Tech: _____

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
8 GNWG7-1-AA J4H250224-7-SAMP  08/20/2004 10:40								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:		Beta:	
9 GNWG8-1-AA J4H250224-8-SAMP  08/20/2004 10:47								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:		Beta:	
10 GNWG9-1-AA J4H250224-9-SAMP  08/20/2004 10:55								
AmtRec: 20MLP,500P #Containers: 2			Scr Rst:		Alpha:		Beta:	
11 GNXKX-1-AA-B J4H250000-550-BLK  08/20/2004 09:37								
AmtRec: #Containers: 1			Scr Rst:		Alpha:		Beta:	
12 GNXKX-1-AC-C J4H250000-550-LCS  08/20/2004 09:37								
AmtRec: #Containers: 1			Scr Rst:		Alpha:		Beta:	
13 GNXKX-1-AD-BN J4H250000-550-IBLK  08/20/2004 09:37								
AmtRec: #Containers: 1			Scr Rst:		Alpha:		Beta:	
14 GNXKX-1-AE-BN J4H250000-550-IBLK  08/20/2004 09:37								
AmtRec: #Containers: 1			Scr Rst:		Alpha:		Beta:	

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NOVEMBER 29, 2004

STL RICHLAND

8/25/2004 4:39:13 PM

Sample Preparation/Analysis

AT H-3 Prp/SepRC5037
 S6 Tritium by Liquid Scint
 SI CLIENT: HANFORD

Balance Id: _____

Pipet #: _____

Report Due: 09/21/2004

Sep1 DT/Tm Tech: _____

Sep2 DT/Tm Tech: _____

Batch: 4238550

pCi/g

SEQ Batch, Test: None

Prep Tech: _____



Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
--------------------------------------	-------------------	-----------------------------	------------------------	------------------------	-------------------	----------------	---------------------------------	--------------------------

Comments:

All Clients for Batch:
 108302, FLUOR HANFORD IC

Flour Hanford Inc , BQ2, 50639

GNWV1AA-SAMP Constituent List:

Sample ID	Constituent	RDL	Unit	LCL	UCL	RPD
GNWV1AA-SAMP	H-3	400	pCi/g			
GNXXK1AA-BLK:	H-3	400	pCi/g			
GNXXK1AC-LCS:	H-3	400	pCi/g			
GNXXK1AD-IBLK:	H-3	400	pCi/g			
GNXXK1AE-IBLK:	H-3	400	pCi/g			

Sample ID	Calc Info	Uncert Level (#s)	Decay to SaDt	Blk Subt.	Sci.Not.	ODRs
GNWV1AA-SAMP	Calc Info	2	Y	N	Y	B
GNXXK1AA-BLK:	Calc Info	2	Y	N	Y	B
GNXXK1AC-LCS:	Calc Info	2	Y	N	Y	B
GNXXK1AD-IBLK:	Calc Info	2	Y	N	Y	B
GNXXK1AE-IBLK:	Calc Info	2	Y	N	Y	B

NOVEMBER 29, 2004

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11/22/2004 3:21:36 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/23/2003, 11/27/2004, Batch: '4238550', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
4238550				
AC	CalcC	McDowellID	11/19/2004 3:00:49	
SC		wagarr	IsBatched	8/25/2004 4:38:43 PM
SC		McDowellID	Sep1C	11/19/2004 3:00:49 PM
SC		BlackCL	CalcC	11/20/2004 9:15:47 AM
AC		BlackCL	11/20/2004 9:15:47	
				ICOC_RADCALC v4.8.05
				RICH-RC-5037 REVISION 3
				RICH-RD-0001 REVISION 3

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.