

Analytical Data Package Prepared For  
**Fluor Hanford Inc.**

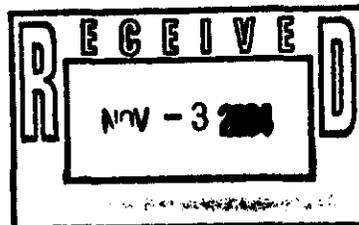
Radiochemical Analysis By  
**STL Richland**

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

Assigned Laboratory Code: STLRL  
 Data Package Contains 59 Pages

Report No.: 27009

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
<u>W04366</u>	F03-025	B193K0	J4H250123-1	GNVH61AE	9GNVH610	4257330
		B193K0	J4H250123-1	GNVH61AJ	9GNVH610	4257332
		B193K0	J4H250123-1	GNVH61AD	9GNVH610	4257335
		B193K0	J4H250123-1	GNVH61AG	9GNVH610	4257338
		B193K0	J4H250123-1	GNVH61AH	9GNVH610	4257340
		B193K0	J4H250123-1	GNVH61AC	9GNVH610	4257343
		B193K0	J4H250123-1	GNVH61AF	9GNVH610	4257346



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## Certificate of Analysis

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

October 26, 2004

Attention: Steve Trent

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SAF Number	:	F03-025
Date SDG Closed	:	September 7 17, 2004
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W04366
Data Deliverable	:	30-Day / Summary

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### AMENDED CASE NARRATIVE

#### I. Introduction

On September 24, 2004, one soil sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was 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>
B193K0	GNVH6	SOIL	8/24/04

#### II. Sample Receipt

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

#### III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

**Alpha Spectroscopy**  
 Thorium-232 by method RICHRC5084  
**Gamma Spectroscopy**  
 Gamma (Ra-226, -228) by method RICHRC5017  
**Gas Proportional Counting**  
 Total Strontium by method RICHRC5006

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**Liquid Scintillation Counting**  
Carbon-14 by method RICHRC5022  
Nickel-63 by method RICHRC5069  
Technecium-99 by method RICHRC5078  
Tritium by method RICHRC5037

#### **IV. Quality Control**

The analytical results for each analysis performed under SDG W04366 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**

##### **Alpha Spectroscopy**

###### **Thorium-232 by method RICHRC5084**

The MDA was not achieved for sample B193K0; the volume analyzed was reduced as determined by screening activities. The MDA was achieved on the blank and LCS and the data are accepted. Except as noted, the LCS, batch blank, sample results and Sample duplicate (B193K0) are within contractual requirements.

##### **Gamma Spectroscopy**

###### **Gamma (Ra-226, -228) by method RICHRC5017**

There was insufficient sample received to analyze a separate duplicate sample fraction, therefore the precision determination was performed by recounting the sample aliquot on a separate detector.

High activities of other nuclides above the energy of interest prohibits achieving the MDA for Ra-226 and Ra-228 due to Compton Scattering caused by matrix effect for sample B193K0 and its duplicate.

The blank Ra-226 result is greater than the CRDL: possibly indigenous to the matrix sand used for the blank.

The Ra-226 and Ra-228 (sample B193K0 and its duplicate) results reported may be possible false positive values. Although the key-line activity is greater than the achieved MDA, the identification of these radionuclides are rejected by abundance criteria.

Am-241, Co-60 and Cs-137 are detected in Samples B193K0 and its duplicate.

Except as noted, the LCS, batch blank, sample results and Sample duplicate (B193K0) are within contractual requirements.

Fluor Hanford, Inc.  
October 26, 2004  
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**Gas Proportional Counting**

**Total Strontium by method RICHRC5006**

The MDA was not achieved for samples B194K0 and its duplicate however the sample results are greater than the CRDL and the data is accepted. Except as noted, the LCS, batch blank, sample results and Sample duplicate (B193K0) are within contractual requirements.

**Liquid Scintillation Counting**

**Carbon-14 by method RICHRC5022**

The LCS, batch blank and sample results are within contractual requirements.

**Nickel-63 by method RICHRC5069**

The MDA was not achieved for samples B193K0: the volume analyzed was reduced due to sample screening activity and the data are accepted. Except as noted, the LCS, batch blank, sample results and Sample duplicate (B193K0) are within contractual requirements.

**Technecium-99 by method RICHRC5078**

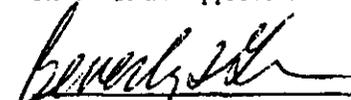
The MDA was not achieved for samples B193K0: the volume analyzed was reduced due to sample screening activity and the data are accepted. Except as noted, the LCS, batch blank, matrix spike (B19MK0), sample results and sample duplicate (B193K0) are within contractual requirements.

**Tritium by method RICHRC5037**

The LCS, batch blank, sample results and Sample duplicate (B193K0) 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-228	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2480	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

### Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship,  $R = \text{constants} * f(x,y,z,\dots)$ . The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties ( $u_i$ ) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty ( $u_c$ ) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value ( $S/\sqrt{n}$ ), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

## Report Definitions

<b>Action Lev</b>	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
<b>Batch</b>	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
<b>Bias</b>	Defined by the equation $(\text{Result}/\text{Expected})-1$ as defined by ANSI N13.30.
<b>COC No</b>	Chain of Custody Number assigned by the Client or STL Richland.
<b>Count Error (#s)</b>	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
<b>Total Uncert (#s) <i>u<sub>c</sub> - Combined Uncertainty.</i></b>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u<sub>c</sub>, the combined uncertainty.</i> The uncertainty is absolute and in the same units as the result.
<b>(#s), Coverage Factor</b>	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
<b>CRDL (RL)</b>	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
<b>Lc</b>	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
<b>Lot-Sample No</b>	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
<b>MDC MDA</b>	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \text{Sqrt}((\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . For LSC methods the batch blank is used as a measure of the background variability.
<b>Primary Detector</b>	The instrument identifier associated with the analysis of the sample aliquot.
<b>Ratio U-234/U-238</b>	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321 C is 1.038.
<b>Rst/MDC</b>	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
<b>Rst/TotUncert</b>	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
<b>Report DB No</b>	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
<b>RER</b>	The equation Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPUd}^2)]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
<b>SDG</b>	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
<b>Sum Rpt Alpha Spec Rst(s)</b>	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
<b>Work Order</b>	The LIMS software assign test specific identifier.
<b>Yield</b>	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

Date: 15-Apr-05

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID

**AMENDED DATA**

Report No. : 27009

SDG No: W04366

Batch	Client Id Work Order	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
<b>4257330 THISO_IE_PRECIP_AEA</b>									
B193K0									
	GNVH61AE	TH-228	7.92E-01 +- 6.20E+00	U	pCi/g	90%	7.74E+00	1.00E+00	
		TH-230	1.65E+00 +- 1.17E+01	U	pCi/g	90%	4.67E+00	1.00E+00	
		TH-232	4.86E-01 +- 3.87E+00	U	pCi/g	90%	5.55E+00	1.00E+00	
	GNVH61AK	TH-228	2.23E+00 +- 1.58E+01	U	pCi/g	88%	6.09E+00	1.00E+00	95.3
		TH-230	1.79E+00 +- 1.26E+01	U	pCi/g	88%	2.42E+00	1.00E+00	8.2
		TH-232	0.00E+00 +- 2.19E+00	U	pCi/g	88%	2.42E+00	1.00E+00	200.0
<b>4257346 GAMMA_GS</b>									
B193K0									
	GNVH61AF	RA-226	5.05E-01 +- 2.26E-01	U	pCi/g		3.59E-01		
		RA-228	8.15E-01 +- 3.02E-01	U	pCi/g		3.26E-01	2.00E-01	
	GNVH61AT	RA-226	4.82E-01 +- 2.96E-01	U	pCi/g		3.28E-01		
		RA-228	6.16E-01 +- 2.81E-01	U	pCi/g		3.22E-01	2.00E-01	
<b>4257343 SRTOT_SEP_PRECIP_GPC</b>									
B193K0									
	GNVH61AC	STRONTIUM	3.82E+03 +- 1.02E+03		pCi/g	83%	6.50E+01		
B193K0 DUP									
	GNVH61AR	STRONTIUM	3.77E+03 +- 1.00E+03		pCi/g	83%	6.23E+01		
<b>4257332 C14_LSC</b>									
B193K0									
	GNVH61AJ	C-14	2.95E-01 +- 8.24E-01	U	pCi/g	100%	1.61E+00	5.00E+01	
	GNVH61AL	C-14	-2.00E-01 +- 8.06E-01	U	pCi/g	100%	1.62E+00	5.00E+01	
<b>4257335 NI63LSC</b>									
B193K0									
	GNVH61AD	NI-63	1.39E+02 +- 6.06E+02	U	pCi/g	86%	1.51E+02	3.00E+01	
	GNVH61AM	NI-63	1.08E+02 +- 5.16E+02	U	pCi/g	85%	1.28E+02	3.00E+01	
<b>4257338 TC99_ETVDSK_LSC</b>									
B193K0									
	GNVH61AG	TC-99	3.97E+00 +- 1.55E+01	U	pCi/g	100%	2.48E+01	1.50E+01	
	GNVH61AP	TC-99	1.69E+00 +- 1.53E+01	U	pCi/g	100%	2.47E+01	1.50E+01	
<b>4257340 908.0_H3_LSC</b>									
B193K0									
	GNVH61AH	H-3	1.87E-01 +- 9.97E-02		pCi/g	100%	7.42E-02	4.00E+02	
	GNVH61AQ	H-3	1.82E-01 +- 9.67E-02		pCi/g	100%	7.13E-02	4.00E+02	
No. of Results: 20									

**REVISED**  
Sat 4/15/05

STL Richland

RPD - Relative Percent Difference.

rptSTLRichSaSummary V4.12 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.

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

Date: 27-Oct-04

Report No. : 27009

SDG No.: W04366

Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
<b>THISO_IE_PRECIP_AEA</b>									
4257330 BLANK QC									
	GP4CX1AA	TH-228	-2.63E-03 +/- 3.06E-03	U	pCi/g	52%			5.48E-02
		TH-230	-8.26E-04 +/- 1.86E-03	U	pCi/g	52%			4.16E-02
		TH-232	1.03E-02 +/- 2.07E-02	U	pCi/g	52%			2.80E-02
4257330 LCS									
	GP4CX1AC	TH-230	9.91E-01 +/- 2.28E-01		pCi/g	47%	87%	-0.1	3.29E-02
<b>GAMMA_GS</b>									
4257346 BLANK QC									
	GP4E91AA	RA-226	1.13E-01 +/- 1.18E-01	U	pCi/g				6.32E-02
		RA-226	-1.29E-01 +/- 1.46E-01	U	pCi/g				1.72E-01
4257346 LCS									
	GP4E91AC	CS-137	8.96E-01 +/- 1.43E-01		pCi/g		102%	0.0	7.11E-02
		RA-226	1.56E+00 +/- 2.78E-01		pCi/g		73%	-0.3	1.15E-01
<b>SRTOT_SEP_PRECIP_GPC</b>									
4257343 BLANK QC									
	GP4E51AA	STRONTIUM	-1.27E-02 +/- 4.61E-02	U	pCi/g	80%			1.14E-01
4257343 LCS									
	GP4E51AC	STRONTIUM	1.18E+00 +/- 3.33E-01		pCi/g	83%	105%	0.0	1.05E-01
<b>C14_LSC</b>									
4257332 BLANK QC									
	GP4C41AA	C-14	-5.04E-02 +/- 1.61E-01	U	pCi/g	100%			3.25E-01
4257332 LCS									
	GP4C41AC	C-14	7.26E+00 +/- 4.58E-01		pCi/g	100%	100%	0.0	3.25E-01
<b>NI63LSC</b>									
4257335 BLANK QC									
	GP4DE1AA	NI-63	3.77E+00 +/- 5.56E+00	U	pCi/g	78%			6.61E+00
4257335 LCS									
	GP4DE1AC	NI-63	5.04E+02 +/- 9.09E+01		pCi/g	86%	99%	0.0	6.07E+00
<b>TC99_ETVDSK_LSC</b>									
4257338 MATRIX SPIKE									
	GNVH61AN	TC-99	8.06E+03 +/- 4.96E+02		pCi/g	100%	89%	-0.1	2.47E+01
4257338 BLANK QC									
	GP4DX1AA	TC-99	4.18E-02 +/- 1.55E-01	U	pCi/g	100%			2.49E-01
4257338 LCS									
	GP4DX1AD	TC-99	8.17E+01 +/- 5.03E+00		pCi/g	100%	90%	-0.1	2.51E-01
<b>906.0_H3_LSC</b>									
4257340 BLANK QC									
	GP4D81AA	H-3	9.08E-02 +/- 2.50E-01	U	pCi/g	100%			2.76E-01
4257340 LCS									
	GP4D81AC	H-3	1.43E+00 +/- 5.17E-01		pCi/g	100%	105%	0.0	2.81E-01
No. of Results: 19									

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

Date: 27-Oct-04

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04366

Collection Date: 8/18/2004 11:25:00 AM

Lot-Sample No.: J4H250123-1

Report No.: 27009

Received Date: 8/24/2004 2:50:00 PM

Client Sample ID: B193K0

COC No.:

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Acton Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sn Size	Aliquot Size	Primary Detector
Batch: 4257330	THISO_IE_PRECIP_AEA				Work Order: GNVH61AE		Report DB ID: 9GNVH610					
TH-228	7.92E-01	U	2.87E+00	6.20E+00	7.74E+00	pCi/g	90%	0.1	10/10/04 08:00 a		0.01	ALP113
							2.53E+00	1.00E+00			G	
TH-230	1.65E+00	U	2.66E+00	1.17E+01	4.67E+00	pCi/g	90%	0.35	10/10/04 08:00 a		0.01	ALP113
							1.07E+00	1.00E+00			G	
TH-232	4.86E-01	U	1.91E+00	3.87E+00	5.55E+00	pCi/g	90%	0.09	10/10/04 08:00 a		0.01	ALP113
							1.51E+00	1.00E+00			G	
Batch: 4257332	C14_LSC				Work Order: GNVH61AJ		Report DB ID: 9GNVH610					
C-14	2.95E-01	U	6.75E-01	8.24E-01	1.61E+00	pCi/g	100%	0.18	9/27/04 11:37 p		1.008	LSC3
							7.72E-01	5.00E+01			G	
Batch: 4257335	NI63LSC				Work Order: GNVH61AD		Report DB ID: 9GNVH610					
NI-63	1.39E+02	U	6.61E+01	6.06E+02	1.51E+02	pCi/g	86%	0.93	10/18/04 11:00 p		0.01	LSC4
							7.34E+01	3.00E+01			G	
Batch: 4257338	TC99_ETVDSK_LSC				Work Order: GNVH61AG		Report DB ID: 9GNVH610					
TC-99	3.97E+00	U	1.07E+01	1.55E+01	2.48E+01	pCi/g	100%	0.16	10/21/04 01:03 p		0.05	LSC4
							1.19E+01	1.50E+01			G	
Batch: 4257340	906.0_H3_LSC				Work Order: GNVH61AH		Report DB ID: 9GNVH610					
H-3	1.87E-01		4.02E-02	9.97E-02	7.42E-02	pCi/g	100%	(2.5)	9/24/04 10:46 p		40.0	LSC4
							3.44E-02	4.00E+02			G	
Batch: 4257343	SRTOT_SEP_PRECIP_GPC				Work Order: GNVH61AC		Report DB ID: 9GNVH610					

STL Richland MDC|MDA, Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample 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: 15-Apr-05

Lab Name: STL Richland  
Lot-Sample No.: J4H250123-1  
Client Sample ID: B193K0

SDG: W04366  
Report No.: 27009  
COC No.:

Collection Date: 8/18/2004 11:25:00 AM  
Received Date: 8/24/2004 2:50:00 PM  
Matrix: SOIL

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 Sn Size	Aliquot Size	Primary Detector
STRONTIUM	<b>3.82E+03</b>		1.66E+02	1.02E+03	6.50E+01	pCi/g	83%	(58.7)	10/14/04 07:34 p		0.01	GPC28A
						3.01E+01		(7.5)			G	
Batch: 4257348	GAMMA_GS				Work Order: GNVH61AF			Report DB ID: 9GNVH610				
RA-228	<b>3.85E-01</b>	U	2.26E-01	2.26E-01	3.59E-01	pCi/g		(1.4)	10/12/04 11:46 a		51.5	GER1\$1
								(4.5)			g	
RA-228	<b>3.15E-01</b>	U	3.02E-01	3.02E-01	3.26E-01	pCi/g		(2.5)	10/12/04 11:46 a		51.5	GER1\$1
							2.00E-01	(5.4)			g	

No. of Results: 10      Comments:

**REVISED**  
STL 4/15/05

**AMENDED DATA**

STL Richland      MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
rptSTL.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.  
V4.12 A97

## FORM I

Date: 27-Oct-04

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04366

Collection Date: 8/18/2004 11:25:00 AM

Lot-Sample No.: J4H250123-1

Report No.: 27009

Received Date: 8/24/2004 2:50:00 PM

Client Sample ID: B193K0

COC No.:

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Count 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
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STL Richland  
rptSTLRchSample  
V4.9.4 A97

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.

## FORM II

Date: 27-Oct-04

## DUPLICATE RESULTS

Lab Name: STL Richland  
 Lot-Sample No.: J4H250123-1  
 Client Sample ID: B193K0

SDG: W04366  
 Report No.: 27009  
 COC No.:

Collection Date: 8/18/2004 11:25:00 AM  
 Received Date: 8/24/2004 2:50:00 PM  
 Matrix: SOIL

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 4257330	THISO_IE_PRECIP_AEA					Work Order: GNVH61AK		Report DB ID: GNVH61KR	Orig Sa DB ID: 9GNVH610			
TH-228	2.23E+00	U	3.31E+00	1.58E+01	6.09E+00	pCi/g	88%	0.37	10/10/04 08:00 a		0.01	ALP114
	7.92E-01	U	RPD 95.3			1.00E+00		0.28			G	
TH-230	1.79E+00	U	2.53E+00	1.26E+01	2.42E+00	pCi/g	88%	0.74	10/10/04 08:00 a		0.01	ALP114
	1.65E+00	U	RPD 8.2			1.00E+00		0.28			G	
TH-232	0.00E+00	U	0.00E+00	2.19E+00	2.42E+00	pCi/g	88%	0.	10/10/04 08:00 a		0.01	ALP114
	4.86E-01	U	RPD 200.0			1.00E+00		0.			G	
<i>Alpha Spec Result Sum = 4.0E+00</i>												
Batch: 4257332	C14_LSC					Work Order: GNVH61AL		Report DB ID: GNVH61LR	Orig Sa DB ID: 9GNVH610			
C-14	-2.00E-01	U	6.59E-01	8.06E-01	1.82E+00	pCi/g	100%	-0.12	9/28/04 12:19 a		1.004	LSC3
	2.95E-01	U	RPD 1042.8			5.00E+01		-0.5			G	
<i>Alpha Spec Result Sum = 4.0E+00</i>												
Batch: 4257335	NI63LSC					Work Order: GNVH61AM		Report DB ID: GNVH61MR	Orig Sa DB ID: 9GNVH610			
NI-63	1.08E+02	U	5.60E+01	5.16E+02	1.28E+02	pCi/g	85%	0.84	10/19/04 12:42 a		0.01	LSC4
	1.39E+02	U	RPD 25.8			3.00E+01		0.42			G	
<i>Alpha Spec Result Sum = 4.0E+00</i>												
Batch: 4257338	TC99_ETVDSK_LSC					Work Order: GNVH61AP		Report DB ID: GNVH61PR	Orig Sa DB ID: 9GNVH610			
TC-99	1.69E+00	U	1.06E+01	1.53E+01	2.47E+01	pCi/g	100%	0.07	10/21/04 03:08 p		0.05	LSC4
	3.97E+00	U	RPD 80.8			1.50E+01		0.22			G	
<i>Alpha Spec Result Sum = 4.0E+00</i>												
Batch: 4257340	906.0_H3_LSC					Work Order: GNVH61AQ		Report DB ID: GNVH61QR	Orig Sa DB ID: 9GNVH610			

STL Richland

RPD - Relative Percent Difference.

rp(STLRchDupV4.9  
 .4 A97

MDC|MDA,Le - 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.

## FORM II

Date: 27-Oct-04

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W04366

Collection Date: 8/18/2004 11:25:00 AM

Lot-Sample No.: J4H250123-1

Report No.: 27009

Received Date: 8/24/2004 2:50:00 PM

Client Sample ID: B193K0

COC No.:

Matrix: SOIL

Parameter	Result, Orig Rat	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rat/MDC, Rat/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
H-3	1.82E-01		3.88E-02	9.67E-02	7.13E-02	pCi/g	100%	(2.6)	9/24/04 11:28 p		40.0	LSC4
	1.87E-01		RPD 2.5			4.00E+02		(3.6)			G	
Batch: 4257343	SRTOT_SEP_PRECIP_GPC		Work Order: GNVH61AR		Report DB ID: GNVH61RR		Orig Sa DB ID: 9GNVH610					
STRONTIUM	3.77E+03	U	1.64E+02	2.62E+04	6.23E+01	pCi/g	83%	(60.6)	10/14/04 07:34 p		0.01	GPC28B
	3.82E+03	U	RPD 1.2					0.29			G	
Batch: 4257348	GAMMA_GS		Work Order: GNVH61AT		Report DB ID: GNVH61TR		Orig Sa DB ID: 9GNVH610					
RA-226	4.82E-01	U	2.98E-01	2.98E-01	3.28E-01	pCi/g		(1.5)	10/12/04 11:46 a		47.1	GER4\$1
	5.05E-01	U	RPD 4.6					(3.3)			g	
RA-228	6.16E-01	U	2.81E-01	2.81E-01	3.22E-01	pCi/g		(1.9)	10/12/04 11:46 a		47.1	GER4\$1
	8.15E-01	U	RPD 27.7			2.00E-01		(4.4)			g	

No. of Results: 10    Comments:

STL Richland    RPD - Relative Percent Difference.

rptSTLRchDupV4.9    MDC|MDA,Le - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

.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 II

Date: 15-Apr-05

DUPLICATE RESULTS

Lab Name: STL Richland  
 Lot-Sample No.: J4H250123-1  
 Client Sample ID: B193K0 DUP

SDG: W04366  
 Report No. : 27009  
 COC No. :

Collection Date: 8/18/2004 11:25:00 AM  
 Received Date: 8/24/2004 2:50:00 PM  
 Matrix: SOIL

Parameter	Result, Orig Est	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4257343	SRTOT_SEP_PRECIP_GPC			Work Order: GNVH61AR		Report DB ID: GNVH61RR		Orig Sa DB ID: 9GNVH610				
STRONTIUM	3.77E+03		1.64E+02	1.00E+03	6.23E+01	pCi/g	83%	(60.8)	10/14/04 07:34 p		0.01	GPC28B
	3.82E+03		RPD 1.2					(7.5)			G	

No. of Results: 1    Comments:

**AMENDED DATA**  
**REVISED**  
 8/15/05

STL Richland    RPD - Relative Percent Difference.  
 rptSTLRechDupV4.1    MDC|MDA, Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 2 A97

13A

**FORM II**  
**BLANK RESULTS**

Date: 27-Oct-04

Lab Name: STL Richland  
Matrix: SOIL

SDG: W04366  
Report No.: 27009

Parameter	Result	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Alliquot Size	Primary Detector
Batch: 4257332	C14_LSC				Work Order: GP4C41AA	Report DB ID: GP4C41AB						
C-14	-5.04E-02	U	1.32E-01	1.61E-01	3.25E-01	pCi/g	100%	-0.16	9/27/04 10:12 p		5.0	LSC3
					1.56E-01	5.00E+01		-0.62			G	
Batch: 4257330	THISO_IE_PRECIP_AEA				Work Order: GP4CX1AA	Report DB ID: GP4CX1AB						
TH-228	-2.63E-03	U	3.03E-03	3.06E-03	5.48E-02	pCi/g	52%	-0.05	10/10/04 08:00 a		2.0	ALP116
					1.25E-02	1.00E+00		(-1.7)			G	
TH-230	-8.28E-04	U	1.85E-03	1.66E-03	4.18E-02	pCi/g	52%	-0.02	10/10/04 08:00 a		2.0	ALP116
					6.79E-03	1.00E+00		-1.			G	
TH-232	1.03E-02	U	2.07E-02	2.07E-02	2.80E-02	pCi/g	52%	0.37	10/10/04 08:00 a		2.0	ALP116
					1.00E+00			1.			G	
Batch: 4257335	M63LSC				Work Order: GP4DE1AA	Report DB ID: GP4DE1AB						
NI-63	3.77E+00	U	2.85E+00	5.56E+00	6.61E+00	pCi/g	78%	0.57	10/19/04 02:24 a		0.25	LSC4
					3.22E+00	3.00E+01		(1.4)			G	
Batch: 4257338	TC99_ETVDSK_LSC				Work Order: GP4DX1AA	Report DB ID: GP4DX1AB						
TC-99	4.18E-02	U	1.08E-01	1.55E-01	2.49E-01	pCi/g	100%	0.17	10/21/04 04:10 p		5.0	LSC4
					1.19E-01	2.00E+01		0.54			G	
Batch: 4257340	906.0_H3_LSC				Work Order: GP4D81AA	Report DB ID: GP4D81AB						
H-3	9.08E-02	U	1.17E-01	2.50E-01	2.76E-01	pCi/g	100%	0.33	9/24/04 09:21 p		10.0	LSC4
					1.28E-01	4.00E+02		0.73			G	
Batch: 4257346	GAMMA_GS				Work Order: GP4E91AA	Report DB ID: GP4E91AB						
RA-226	1.13E-01	U	1.18E-01	1.18E-01	6.32E-02	pCi/g		(1.8)	10/12/04 11:45 a		52.0	GER5\$1
								(1.9)			g	

STL Richland MDC|MDA, Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchBlank 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: 27-Oct-04

Lab Name: STL Richland  
Matrix: SOIL

SDG: W04366  
Report No.: 27009

Parameter	Result	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rat/MDC, Rat/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
RA-228	-1.29E-01	U	1.48E-01	1.48E-01	1.72E-01	pCi/g		-0.75	10/12/04 11:45 a		52.0	GER5\$1
						2.00E-01		-(1.8)			9	
Batch: 4257343	SRTOT_SEP_PRECIP_GPC				Work Order: GP4E51AA			Report DB ID: GP4E51A8				
STRONTIUM	-1.27E-02	U	4.60E-02	4.61E-02	1.14E-01	pCi/g	80%	-0.11	10/14/04 07:34 p		6.0	GPC28C
					5.29E-02			-0.55			G	
No. of Results:	10	Comments:										

FORM II  
LCS RESULTS

Date: 27-Oct-04

Lab Name: STL Richland

SDG: W04366

Matrix: SOIL

Report No. : 27009

Parameter	Result	Count Qual 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: 4257332	C14_LSC				Work Order: GP4C41AC		Report DB ID: GP4C41CS					
C-14	7.26E+00	3.00E-01	4.58E-01	3.25E-01	pCi/g	100%	7.25E+00	2.34E-01	100%	9/27/04 10:55 p	5.0	LSC3
						Rec Limits:	70	130	0.0		G	
Batch: 4257330	THISO_IE_PRECIP_AEA				Work Order: GP4CX1AC		Report DB ID: GP4CX1CS					
TH-230	9.91E-01	1.69E-01	2.28E-01	3.29E-02	pCi/g	47%	1.14E+00	3.41E-02	87%	10/10/04 08:00 a	2.0	ALP118
						Rec Limits:	70	130	-0.1		G	
Batch: 4257335	NI63LSC				Work Order: GP4DE1AC		Report DB ID: GP4DE1CS					
NI-63	5.04E+02	8.55E+00	9.09E+01	6.07E+00	pCi/g	86%	5.07E+02	1.70E+01	99%	10/19/04 04:05 a	0.25	LSC4
						Rec Limits:	70	130	0.0		G	
Batch: 4257338	TC99_ETVDSK_LSC				Work Order: GP4DX1AD		Report DB ID: GP4DX1DS					
TC-99	8.17E+01	7.87E-01	5.03E+00	2.51E-01	pCi/g	100%	9.08E+01	1.15E+00	90%	10/21/04 05:12 p	5.0	LSC4
						Rec Limits:	70	130	-0.1		G	
Batch: 4257340	906.0_H3_LSC				Work Order: GP4D81AC		Report DB ID: GP4D81CS					
H-3	1.43E+00	1.83E-01	5.17E-01	2.81E-01	pCi/g	100%	1.36E+00	4.70E-02	105%	9/24/04 10:04 p	10.0	LSC4
						Rec Limits:	70	130	0.0		G	
Batch: 4257346	GAMMA_GS				Work Order: GP4E91AC		Report DB ID: GP4E91CS					
CS-137	8.96E-01	1.43E-01	1.43E-01	7.11E-02	pCi/g		8.81E-01	6.98E-02	102%	10/12/04 11:47 a	26.61	GER7\$1
RA-226	1.56E+00	2.78E-01	2.78E-01	1.15E-01	pCi/g		2.14E+00	3.61E-01	73%	10/12/04 11:47 a	26.61	GER7\$1
						Rec Limits:			-0.3		g	
Batch: 4257343	SRTOT_SEP_PRECIP_GPC				Work Order: GP4E51AC		Report DB ID: GP4E51CS					
STRONTIUM	1.18E+00	1.27E-01	3.33E-01	1.05E-01	pCi/g	83%	1.12E+00	1.38E-02	105%	10/14/04 07:34 p	6.0	GPC28D
						Rec Limits:	20	105	0.0		G	

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

rptSTLRchLcs  
V4.9.4 A97

FORM II  
LCS RESULTS

Date: 27-Oct-04

Lab Name: STL Richland

SDG: W04366

Matrix: SOIL

Report No. : 27009

Parameter	Result	Count 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
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No. of Results: 8      Comments:

FORM II  
MATRIX SPIKE RESULTS

Date: 27-Oct-04

Lab Name: STL Richland

SDG: W04366

Lot-Sample No.: J4H250123-1

Report No.: 27009

Matrix: SOIL

Parameter	SpikeResult, Orig Rat	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rec- overy	Exp- ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 4257338	TC99_ETVDSK_LSC			Work Order: GNVH61AN		Report DB ID: GNVH61NW			Orig Sa DB ID: 9GNVH610				
TC-99	8.06E+03		7.77E+01	4.98E+02	2.47E+01	pCi/g	100%	89.01%	9.05E+03	.15E+00	10/21/04 02:05 p	0.05	LSC4
	3.97E+00	RPD										G	
No. of Results: 1	Comments:												

STL Richland RER - Replicate Error Ratio =  $(S-D)/[\text{sqrt}(\text{sq}(TPUs)+\text{sq}(TPUd))]$  as defined by ICPT BOA.  
 rptSTLRechMs Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 V4.9.4 A97



STL

Data Review/Verification Checklist  
RADIOCHEMISTRY, First Level Review

10/11/2004 11:34:14 AM

Lot No., Due Date: J4H250123; 10/22/2004  
Client, Site: 108302; FLUOR- SOILS Hanford Site  
QC Batch No., Method Test: 4257330; RTHISO Thiso by ALP  
SDG, Matrix: W04366; SOIL

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:

The samples did not meet the RDL due to reduced aliquots.

First Level Review *John Hester*

Date *10-11-4*

Data Review Checklist  
RADIOCHEMISTRY  
Second Level Review

QC Batch Number: 4257330

Review Item	Yes (✓)	No (✓)	N/A (✓)
<b>A. Sample Analysis</b>			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
<b>B. QC Samples</b>			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
<b>C. Other</b>			
1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: MDA not achieved in results & CPDL  
Screening Activity for B determined reduced activity  
data accepted

Second Level Review: [Signature] Date: 10-11-04

# Clouseau Nonconformance Memo



NCM #: <b>10-03852</b> NCM Initiated By: John Norton Date Opened: 10/11/2004 Date Closed:	Classification: <b>Anomaly</b> Status: <b>GLREVIEW</b> Production Area: Environmental - Prep Tests: Thlso by ALP Lot #'s (Sample #'s): J4H250123 (1), J4I130000 (330), QC Batches: 4257330
Nonconformance: MDA not met Subcategory: Data accepted	

**Problem Description / Root Cause**

<u>Name</u>	<u>Date</u>	<u>Description</u>
John Norton	10/11/2004	The samples did not meet the RDL due to reduced aliquots.

**Corrective Action**

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
John Norton	10/11/2004	The aliquots were reduced based on activity detected during screening. The samples can be re-analyzed if needed.

**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>
----------------------	--------------------	-----------------



Data Review Checklist  
RADIOCHEMISTRY  
Second Level Review

QC Batch Number: 4257346

Review Item	Yes (✓)	No (✓)	N/A (✓)
<b>A. Sample Analysis</b>			
1. Are the sample yields within acceptance criteria?			—
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
<b>B. QC Samples</b>			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			—
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			—
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
<b>C. Other</b>			
1. Are all Nonconformances included and noted?	✓		By 10-18-04
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Second Level Review: [Signature] Date: 10-18-04

# Clouseau Nonconformance Memo



NCM #: <b>10-03907</b> NCM Initiated By: <b>Dale O'Connell</b> Date Opened: <b>10/15/2004</b> Date Closed:	Classification: <b>Anomaly</b> Status: <b>PMREVIEW</b> Production Area: <b>Counting</b> Tests: <b>Gamma by GER 10D</b> Lot #'s (Sample #'s): <b>J4H250123 (1), J4I130000 (346),</b> QC Batches: <b>4257346</b>
Nonconformance: <b>QC Result Out of Limits</b> Subcategory: <b>MDA exceeds RDL</b>	

### Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Dale O'Connell	10/15/2004	1. MDA Exceeds RDL. Cause is Matrix Effect: High activity of other radionuclides above the energy of interest are prohibitive to the achieving MDA<RDL, due to Compton Scattering. J4H250123-001: Ra-226,-228 J4H250123-001-X: Ra-226,-228  2. Blank result for Ra-226 > CRDL. Cause: Ra-226 possibly indigenous to the matrix sand used for QC.  3. Possible False Positive: Although key-line activity> MDA, identification of radionuclide rejected by abundance criteria. J4H250123-001: Ra-226,-228 J4H250123-001-X: Ra-226,-228  4. Am-241, Co-60 nad Cs-137 detected in the sample and duplicate.

### Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Dale O'Connell	10/15/2004	Sample activity greater than MDA. MDA achieved on the blank. Blank result rounds to CRDL. Report results with MDAs achieved.

### 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>



STL

Data Review/Verification Checklist  
RADIOCHEMISTRY, First Level Review

10/15/2004 2:46:30 PM

Lot No., Due Date: J4H250123; 10/08/2004  
Client, Site: 108302; FLUOR- SOILS Hanford Site  
QC Batch No., Method Test: 4257343; RSRTOT SrTot by GPC  
SDG, Matrix: W04366; SOIL

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:

Samples did not meet the RDL  
however the activity detected was greater than the IOC.

First Level Review *John Hester* Date 10-15-4



# STL

## Data Review Checklist RADIOCHEMISTRY Second Level Review

QC Batch Number: 4257343

Review Item	Yes (✓)	No (✓)	N/A (✓)
<b>A. Sample Analysis</b>			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
<b>B. QC Samples</b>			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
<b>C. Other</b>			
1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: See NCM

Second Level Review: Gwendolyn Date: 10-18-04

# Clouseau Nonconformance Memo



NCM #: <b>10-03901</b> NCM Initiated By: John Norton Date Opened: 10/15/2004 Date Closed:	Classification: <b>Anomaly</b> Status: <b>GLREVIEW</b> Production Area: <b>Environmental - Nona</b> Tests: <b>None</b> Lot #'s (Sample #'s): <b>J4H250123 (1),</b> QC Batches: <b>None.</b>
Nonconformance: <b>MDA not met</b> Subcategory: <b>Data accepted</b>	

**Problem Description / Root Cause**

<u>Name</u>	<u>Date</u>	<u>Description</u>
John Norton	10/15/2004	Samples did not meet the RDL.

**Corrective Action**

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
John Norton	10/15/2004	The activity detected was greater than the IDC, data accepted.

**Client Notification Summary**

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

**Quality Assurance Verification**

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

**Approval History**

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

Data Review/Verification Checklist  
RADIOCHEMISTRY, First Level Review

9/29/2004 1:24:01 PM

Lot No., Due Date: J4H250123; 10/08/2004  
Client, Site: 108302; FLUOR- SOILS Hanford Site  
QC Batch No., Method Test: 4257332; RC14 C-14 by LSC  
SDG, Matrix: W04366; SOIL

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?  Yes  No  N/A

2.0 QC Batch

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?  Yes  No  N/A

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

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

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

3.0 QC & Samples

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

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

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

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

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

4.0 Raw Data

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

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

4.3 Were Yields entered correctly?  Yes  No  N/A

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

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

5.0 Other

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

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

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

5.4 Was transcription checked?  Yes  No  N/A

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

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

6.0 Comments on any No response:

First Level Review

*Thomas E. [Signature]*

Date

9/29/04



# STL

## Data Review Checklist RADIOCHEMISTRY Second Level Review

OC Batch Number: 4257332

Review Item	Yes (✓)	No (✓)	N/A (✓)
<b>A. Sample Analysis</b>			
1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
<b>B. QC Samples</b>			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
<b>C. Other</b>			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Second Level Review: *[Signature]*

Date: 9-30-07

Lot No., Due Date: J4H250123; 10/08/2004  
 Client, Site: 108302; FLUOR-SOILS Hanford Site  
 QC Batch No., Method Test: 4257335; RNI63 Ni-63 by LSC  
 SDG, Matrix: W04386; SOIL

- |  |                                     |               |
|--|-------------------------------------|---------------|
| <b>1.0 COC</b>   |                                     |               |
| 1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?            | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| <b>2.0 QC Batch</b>  |                                     |               |
| 2.1 Do the Summary/Detailled Reports include a calculated result for each sample listed on the QC Batch Sheet? | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 2.2 Are the QC appropriate for the analysis included in the batch?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?            | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 2.4 Does the Worksheets Include a Tracer Vial label for each sample?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| <b>3.0 QC &amp; Samples</b>  |                                     |               |
| 3.1 Is the blank results, yield, and MDA within contract limits?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 3.2 Is the LCS result, yield, and MDA within contract limits?  | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 3.3 Are the MS/MSD results, yields, and MDA within contract limits?  | Yes                                 | No <b>N/A</b> |
|  | <input checked="" type="checkbox"/> |               |
| 3.4 Are the duplicate result, yields, and MDAs within contract limits?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 3.5 Are the sample yields and MDAs within contract limits?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| <b>4.0 Raw Data</b>  |                                     |               |
| 4.1 Were results calculated in the correct units?  | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 4.2 Were analysis volumes entered correctly?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 4.3 Were Yields entered correctly?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 4.4 Were spectra reviewed/meet contractual requirements?   | Yes                                 | No <b>N/A</b> |
|  | <input checked="" type="checkbox"/> |               |
| 4.5 Were raw counts reviewed for anomalies?  | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| <b>5.0 Other</b>   |                                     |               |
| 5.1 Are all nonconformances included and noted?  | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 5.2 Are all required forms filled out?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 5.3 Was the correct methodology used?  | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 5.4 Was transcription checked?   | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 5.5 Were all calculations checked at a minimum frequency?  | Yes                                 | No <b>N/A</b> |
|  | <input checked="" type="checkbox"/> |               |
| 5.6 Are worksheet entries complete and correct?  | Yes                                 | No N/A        |
|  | <input checked="" type="checkbox"/> |               |
| 6.0 Comments on any No response:<br>The sample did not meet the RDL due to reduced aliquot.                    |                                     |               |

First Level Review

*John Norton*

Date

10-25-4



# STL

## Data Review Checklist RADIOCHEMISTRY Second Level Review

QC Batch Number: 4257335

Review Item	Yes (✓)	No (✓)	N/A (✓)
<b>A. Sample Analysis</b>			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓	✓	
3. Are the correct isotopes reported?	✓		
<b>B. QC Samples</b>			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
<b>C. Other</b>			
1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: See NCM

Second Level Review: [Signature] Date: 10-26-04

# Clouseau Nonconformance Memo



NCM #: <b>10-04004</b> NCM Initiated By: John Norton Date Opened: 10/25/2004 Date Closed:	Classification: <b>Anomaly</b> Status: <b>GLREVIEW</b> Production Area: Environmental - Nona Tests: Ni-63 by LSC Lot #'s (Sample #'s): J4H250123 (1), J4I130000 (335), QC Batches: 4257335
Nonconformance: MDA not met Subcategory: Data accepted	

**Problem Description / Root Cause**

<u>Name</u>	<u>Date</u>	<u>Description</u>
John Norton	10/25/2004	Sample did not meet the RDL due to reduced aliquots.

**Corrective Action**

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
John Norton	10/25/2004	Aliquots were reduced because of high activity detected during sample screening.

**Client Notification Summary**

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

**Quality Assurance Verification**

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

**Approval History**

<u>Date Approved</u>	<u>Approved By</u>	<u>Position</u>
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Lot No., Due Date: J4H250123; 10/08/2004  
 Client, Site: 108302; FLUOR- SOILS Hanford Site  
 QC Batch No., Method Test: 4257338; RTC99 Tc-99 by LSC  
 SDG, Matrix: W04366; SOIL

- |   |                                     |               |
|---|-------------------------------------|---------------|
| <b>1.0 COC</b>  |                                     |               |
| 1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?           | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| <b>2.0 QC Batch</b>   |                                     |               |
| 2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 2.2 Are the QC appropriate for the analysis included in the batch?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?           | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 2.4 Does the Worksheets include a Tracer Vial label for each sample?  | Yes                                 | No <b>N/A</b> |
|   | <input checked="" type="checkbox"/> |               |
| <b>3.0 QC &amp; Samples</b>   |                                     |               |
| 3.1 Is the blank results, yield, and MDA within contract limits?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 3.2 Is the LCS result, yield, and MDA within contract limits?   | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 3.3 Are the MS/MSD results, yields, and MDA within contract limits?   | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 3.4 Are the duplicate result, yields, and MDAs within contract limits?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 3.5 Are the sample yields and MDAs within contract limits?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| <b>4.0 Raw Data</b>   |                                     |               |
| 4.1 Were results calculated in the correct units?   | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 4.2 Were analysis volumes entered correctly?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 4.3 Were Yields entered correctly?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 4.4 Were spectra reviewed/meet contractual requirements?  | Yes                                 | No <b>N/A</b> |
|   | <input checked="" type="checkbox"/> |               |
| 4.5 Were raw counts reviewed for anomalies?   | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| <b>5.0 Other</b>  |                                     |               |
| 5.1 Are all nonconformances included and noted?   | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 5.2 Are all required forms filled out?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 5.3 Was the correct methodology used?   | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 5.4 Was transcription checked?  | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 5.5 Were all calculations checked at a minimum frequency?   | Yes                                 | No <b>N/A</b> |
|   | <input checked="" type="checkbox"/> |               |
| 5.6 Are worksheet entries complete and correct?   | Yes                                 | No N/A        |
|   | <input checked="" type="checkbox"/> |               |
| 6.0 Comments on any No response:<br>The samples did not meet the RDL due to reduced aliquots.                 |                                     |               |

First Level Review John Hottel Date 10-22-4



# STL

## Data Review Checklist RADIOCHEMISTRY Second Level Review

OC Batch Number: 4257338

Review Item	Yes (✓)	No (✓)	N/A (✓)
<b>A. Sample Analysis</b>			
1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓	✓	
3. Are the correct isotopes reported?	✓		
<b>B. QC Samples</b>			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?	✓ <i>10-25-01</i>		✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
<b>C. Other</b>			
1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: See next 3193K0

Second Level Review: *[Signature]* Date: 10-25-01

# Clouseau Nonconformance Memo



NCM #: <b>10-03975</b> NCM Initiated By: John Norton Date Opened: 10/22/2004 Date Closed:	Classification: <b>Anomaly</b> Status: <b>GLREVIEW</b> Production Area: Environmental - Nona Tests: Tc-99 by LSC Lot #'s (Sample #'s): J4H250123 (1), J41130000 (338), QC Batches: 4257338
Nonconformance: MDA not met Subcategory: Inhomogeneity of the Sample	

**Problem Description / Root Cause**

<u>Name</u>	<u>Date</u>	<u>Description</u>
John Norton	10/22/2004	Samples did not meet the RDL.

**Corrective Action**

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
John Norton	10/22/2004	The RDL was not met due to reduced aliquots dictated by the results of sample screening.

**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>
----------------------	--------------------	-----------------

Lot No., Due Date: J4H250123; 10/08/2004  
 Client, Site: 108302; FLUOR- SOILS Hanford Site  
 QC Batch No., Method Test: 4257340; RTRITIUM H-3 by LSC  
 SDG, Matrix: W04366; SOIL

- |                             |   |     |        |
|-----------------------------|---|-----|--------|
| <b>1.0 COC</b>              |   |     |        |
| 1.1                         | Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?           | Yes | No N/A |
|                             |   | ✓   |        |
| <b>2.0 QC Batch</b>         |   |     |        |
| 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 |
|                             |   | ✓   |        |
| <b>3.0 QC &amp; Samples</b> |   |     |        |
| 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 |
|                             |   | ✓   |        |
| <b>4.0 Raw Data</b>         |   |     |        |
| 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 |
|                             |   | ✓   |        |
| <b>5.0 Other</b>            |   |     |        |
| 5.1                         | Are all nonconformances included and noted?   | Yes | No N/A |
|                             |   | ✓   |        |
| 5.2                         | Are all required forms filled out?  | Yes | No N/A |
|                             |   | ✓   |        |
| 5.3                         | Was the correct methodology used?   | Yes | No N/A |
|                             |   | ✓   |        |
| 5.4                         | Was transcription checked?  | Yes | No N/A |
|                             |   | ✓   |        |
| 5.5                         | Were all calculations checked at a minimum frequency?   | Yes | No N/A |
|                             |   | ✓   |        |
| 5.6                         | Are worksheet entries complete and correct?   | Yes | No N/A |
|                             |   | ✓   |        |
| 6.0                         | Comments on any No response:  |     |        |

First Level Review

*Thomas E. [Signature]*

Date

*9/29/04*



# STL

## Data Review Checklist RADIOCHEMISTRY Second Level Review

QC Batch Number: 4257340

Review Item	Yes (✓)	No (✓)	N/A (✓)
<b>A. Sample Analysis</b>			
1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
<b>B. QC Samples</b>			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
<b>C. Other</b>			
1. Are all Nonconformances included and noted?	42573404		42573407
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: Reduced Aeq due to screen info

Second Level Review: \_\_\_\_\_ Date: \_\_\_\_\_

# CHAIN OF CUSTODY

STL RICHLAND

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-025-124	PAGE 1 OF 1	
COLLECTOR Pope/Pfister/Hughes/Wiberg	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ		PRICE CODE SN	DATA TURNAROUND 45 Days / 45 Days		
SAMPLING LOCATION 216-S-20; 35.0N-57.5E 32.5' - 35' 25" - 5" 11" 04	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		AIR QUALITY <input type="checkbox"/>			
ICE CHEST NO. GRP-04-005	FIELD LOGBOOK NO. HNF-N-356 1	COA 119143E510	METHOD OF SHIPMENT Federal Express					Due 10/08/04
SHIPPED TO Severn Trent Incorporated, Richland	OFFSITE PROPERTY NO.		BILL OF LADING/AIR BILL NO.					
MATRIX* A=Air DL=Drum L=Liquids DS=Drum S=Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/REMARKS N/A FLH-Q-50639 W04366 J4H250123 Due 10/29/04	PRESERVATION Cool 4C None	TYPE OF CONTAINER gG gG	NO. OF CONTAINER(S) 1 1	VOLUME 250mL 250mL	SPECIAL HANDLING AND/OR STORAGE N/A		
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B193K0	SOIL	8/18/04	1125	X	X	GNVHL6		
				b/c shows Rept'd 9/13/04				
CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS				
RELINQUISHED BY/REMOVED FROM S.P. Pfeister	DATE/TIME 8-18-04 1200	RECEIVED BY/STORED IN S.P. Pfeister	DATE/TIME 8-18-04 1200	(1)Chromium Hex - 7196; NO2/NO3 - 353.1; Sulfides - 9030; Oil & Grease - 413.1; (2)Nickel-63; Gamma Spec - Radium (Radium-226, Radium-228) Technetium-99; Isotopic Thorium (Thorium-232) Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr;				
RELINQUISHED BY/REMOVED FROM SITE F0306 3-20	DATE/TIME 8/24/04 0920	RECEIVED BY/STORED IN R. Pfeister	DATE/TIME 8/24/04 0920					
RELINQUISHED BY/REMOVED FROM R. Pfeister	DATE/TIME 8/24/04 1450	RECEIVED BY/STORED IN B. Kreutz	DATE/TIME 8/24/04 1450					
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME					
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME					
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME					
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME				
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME				



# STL

## Sample Check-in List

Date/Time Received: 8/24/04 1450

Client: Flour Hanford SDG #: W04366 NA [ ] SAF #: F03-025 NA [ ]

Work Order Number: J4H250123 Chain of Custody # F03-025-124

Shipping Container ID: GRP-04-005 Air Bill # N/A

- Custody Seals on shipping container intact? NA [ ] Yes  No [ ]
- Custody Seals dated and signed? NA [ ] Yes  No [ ]
- Chain of Custody record present? Yes  No [ ]
- Cooler temperature: 6°C NA [ ] 5. Vermiculite/packing materials is NA [ ] Wet  Dry [ ]
- Number of samples in shipping container: 2
- Sample holding times exceeded? NA [ ] Yes [ ] No
- Samples have:
  - tape  hazard labels
  - custody seals  appropriate sample labels
- Samples are:
  - in good condition  leaking
  - broken  have air bubbles
 (Only for samples requiring head space)
- Sample pH taken? NA  pH < 2 [ ] pH > 2 [ ] pH > 9 [ ]
- Sample Location, Sample Collector Listed? \* Yes  No [ ]  
\*For documentation only. No corrective action needed.
- Were any anomalies identified in sample receipt? Yes [ ] No
- Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian:  Date: 8/24/04

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

10/4/2004 2:21:50 PM **Sample Preparation/Analysis** Balance Id:1120373922, III 7411003  
 108302, FLUOR HANFORD IC , Flour 9R Thiso PrpRC5013/RC5019, SepRC5084(5003) Pipet #:  
 Hanford Inc S1 Thorium-228,230,232 by Alpha Spec  
 Report Due: 10/08/2004 SI CLIENT: HANFORD Sep1 DT/Tm Tech:  
 Batch: 4257330 SOIL pCi/g PM, Quote: BG2, 50639 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	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, In/Date
1 GNVH6-1-AE J4H250123-1-SAMP ████████████████████ 08/18/2004 11:25	0.01g.in		THTC7415 10/04/04.pd 08/10/04.r		200			
		AmtRec: 2X250G	#Containers: 2				Scr Rst: Alpha: 3.20E+04 pCi/g Beta: 1.08E+04 pCi/g	
2 GNVH6-1-AK-X J4H250123-1-DUP ████████████████████ 08/18/2004 11:25	0.01g.in		THTC7416 10/04/04.pd 08/10/04.r					
		AmtRec: 2X250G	#Containers: 2				Scr Rst: Alpha: 3.20E+04 pCi/g Beta: 1.08E+04 pCi/g	
3 GP4CX-1-AA-B J4H130000-330-BLK ████████████████████ 08/18/2004 11:25	2.00g.in		THTC7413 10/04/04.pd 08/10/04.r					
		AmtRec:	#Containers: 1				Scr Rst: Alpha: Beta:	
4 GP4CX-1-AC-C J4H130000-330-LCS ████████████████████ 08/18/2004 11:25	2.00g.in		THS10752 09/30/04.pd 08/10/04.r					
		AmtRec:	#Containers: 1				Scr Rst: Alpha: Beta:	

Comments: Samples were traced after aliquot. Samples were counted 3x with con HCL @ 10-40y  
 Blank & spike may be switched w/ 10/8/04

All Clients for Batch:  
 108302, FLUOR HANFORD IC Flour Hanford Inc , BG2, 50639

GNVH61AX-SAMP Constituent List:

Th-228	RDL:1	pCi/g	LCL:	UCL:	RPD:	Th-230	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35
Th-232	RDL:1	pCi/g	LCL:	UCL:	RPD:	Th-234	RDL:	pCi/g	LCL:20	UCL:105	RPD:35

GP4CX1AA-BLK:	Th-228	RDL:1	pCi/g	LCL:	UCL:	RPD:	Th-230	RDL:1	pCi/g	LCL:	UCL:	RPD:
	Th-232	RDL:1	pCi/g <td>LCL: <td>UCL: <td>RPD: <td>Th-234</td> <td>RDL:</td> <td>pCi/g <td>LCL:20</td> <td>UCL:105</td> <td>RPD:35</td> </td></td></td></td>	LCL: <td>UCL: <td>RPD: <td>Th-234</td> <td>RDL:</td> <td>pCi/g <td>LCL:20</td> <td>UCL:105</td> <td>RPD:35</td> </td></td></td>	UCL: <td>RPD: <td>Th-234</td> <td>RDL:</td> <td>pCi/g <td>LCL:20</td> <td>UCL:105</td> <td>RPD:35</td> </td></td>	RPD: <td>Th-234</td> <td>RDL:</td> <td>pCi/g <td>LCL:20</td> <td>UCL:105</td> <td>RPD:35</td> </td>	Th-234	RDL:	pCi/g <td>LCL:20</td> <td>UCL:105</td> <td>RPD:35</td>	LCL:20	UCL:105	RPD:35

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10/11/2004 11:10:42 AM

# Rpt DB Transfer log (Batch Results)

**STL**

SDG or Batch Isotope	Rpt Db Id Method	RTst Oc	LotSample Analysis Date	Client Id Result	Matrix	Received Date	Sample Date	Expected Yield	Volumes
<b>W04366</b>	<b>9GNVH610</b>		<b>J4H2501231</b>	<b>B193K0</b>	<b>SOIL</b>	<b>8/24/2004 2:50:00</b>	<b>8/18/2004 11:25:00 AM</b>		
C-14	5SS3	0	9/27/2004 11:37:28	PM2.951E-01	3.373E-01	4.118E-01	1.611E+00	pCi/g	1.0 1.008E+0
H-3	ATS6	0	9/24/2004 10:46:27	PM1.8688E-01	2.012E-02	4.985E-02	7.416E-02	pCi/g	1.0 4.0E+1
TH-228	9RS1	0	10/10/2004 8:00:20	7.921E-01	1.436E+00	3.098E+00	7.744E+00	pCi/g	0.896 1.0E-2
TH-230	9RS1	0	10/10/2004 8:00:20	1.6464E+00	1.329E+00	5.857E+00	4.668E+00	pCi/g	0.896 1.0E-2
TH-232	9RS1	0	10/10/2004 8:00:20	4.8598E-01	9.534E-01	1.935E+00	5.551E+00	pCi/g	0.896 1.0E-2
<b>W04366</b>	<b>GNVH61KR</b>		<b>J4H2501231</b>	<b>B193K0 DUP</b>	<b>SOIL</b>	<b>8/24/2004 2:50:00</b>	<b>8/18/2004 11:25:00 AM</b>		
TH-228	9RS1	0 R	10/10/2004 8:00:23	2.2345E+00	1.654E+00	7.917E+00	6.091E+00	pCi/g	0.875 1.0E-2
TH-230	9RS1	0 R	10/10/2004 8:00:23	1.7888E+00	1.263E+00	6.318E+00	2.421E+00	pCi/g	0.875 1.0E-2
TH-232	9RS1	0 R	10/10/2004 8:00:23	0.0E+00	0.0E+00	1.094E+00	2.421E+00	pCi/g	0.875 1.0E-2
<b>W04366</b>	<b>GP4CX1AB</b>		<b>J41130000330</b>	<b>INTRA-LAB BLANK</b>	<b>SOIL</b>	<b>8/24/2004 2:50:00</b>	<b>8/18/2004 11:25:00 AM</b>		
TH-228	9RS1	0 B	10/10/2004 8:00:27	-2.6276E-03	1.517E-03	1.53E-03	5.461E-02	pCi/g	0.52 2.0E+0
TH-230	9RS1	0 B	10/10/2004 8:00:27	-8.2616E-04	8.262E-04	8.265E-04	4.157E-02	pCi/g	0.52 2.0E+0
TH-232	9RS1	0 B	10/10/2004 8:00:27	1.0326E-02	1.033E-02	1.036E-02	2.798E-02	pCi/g	0.52 2.0E+0
<b>W04366</b>	<b>GP4CX1CS</b>		<b>J41130000330</b>	<b>INTRA-LAB CHECK</b>	<b>SOIL</b>	<b>8/24/2004 2:50:00</b>	<b>8/18/2004 11:25:00 AM</b>		
TH-230	9RS1	0 S	10/10/2004 8:00:42	9.9135E-01	8.449E-02	1.141E-01	3.287E-02	pCi/g	1.1373E+00 0.47 2.0E+0

4257330, \*\*Samples Inserted | Updated | NotUpdated => 3 | 0 | 1,  
 \*\*Results Inserted | ReTestInserted | Updated | NotInserted => 10 | 0 | 0 | 0.  
 \*\*Diff RptDb | Qims => \*wo:GP4CX1AA=> , mat:SOIL | Solid \*wo:GP4CX1AA=> , mat:SOIL | Solid  
 \*wo:GP4CX1AC=> , mat:SOIL | Solid \*wo:GP4CX1AC=> , mat:SOIL | Solid.

STL RICHLAND

9/24/2004 10:40:32 AM **Sample Preparation/Analysis** Balance Id: 1120421783  
 108302, FLUOR HANFORD IC , Flour AW Gamma PrpRC5017 Pipet #: \_\_\_\_\_  
 Hanford Inc T9 Gamma by HPGE 10 day ingrowth  
 Report Due: 10/08/2004 51 CLIENT: HANFORD Sep1 DT/Tm Tech: \_\_\_\_\_  
 Batch: 4257346 SOIL pCi/g PM, Quote: BG2, 50639 Sep2 DT/Tm Tech: \_\_\_\_\_  
 SEQ Batch, Test: None Prep Tech: ,ScottM

Work Order, Lot, Sample Date	Total Amt /Unk	Total Acidified/Unit	Initial Aliquot Amt/Unk	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
1 GNVH6-1-AF J4H250123-1-SAMP [REDACTED]			51.50g,ln	51.50g			525 1000	61	0426	WJ/12/04
08/18/2004 11:25		AmtRec: 2X250G	#Containers: 2							
2 GNVH6-1-AT-X J4H250123-1-DUP [REDACTED]			47.10g,ln	47.10g				64	0426	
08/18/2004 11:25		AmtRec: 2X250G	#Containers: 2							
3 GP4E9-1-AA-B J41130000-346-BLK [REDACTED]			52.0g					65	0425	
08/18/2004 11:25		AmtRec: 2X250G	#Containers: 1							
4 GP4E9-1-AC-C J41130000-346-LCS [REDACTED]			26.61g		CAL491 01/01/03,pd 01/01/02,1			67	0427	
08/18/2004 11:25		AmtRec: 2X250G	#Containers: 1							

Comments: Geometry 225 10 day ingrowth started 9/24/04 WJR

All Clients for Batch: 108302, FLUOR HANFORD IC Flour Hanford Inc , BG2, 50639

GNVH61AF-SAMP Constituent List:

Co-60	RDL: 5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL: 1.00E-01	pCi/g	LCL: 70	UCL: 130	RPD: 35
Cs-137DA	RDL: 1.00E-01	pCi/g	LCL: 70	UCL: 130	RPD: 35	Eu-152	RDL: 1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-154	RDL: 1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-155	RDL: 1.00E-01	pCi/g	LCL:	UCL:	RPD:
Ra-226	RDL: 1.00E-01	pCi/g	LCL:	UCL:	RPD:	RA-228	RDL: 2.00E-01	pCi/g	LCL:	UCL:	RPD:
RA-228DA	RDL: 2.00E-01	pCi/g	LCL:	UCL:	RPD:						
GP4E91AA-BLK:											
Co-60	RDL: 5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL: 1.00E-01	pCi/g	LCL:	UCL:	RPD:

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9/24/2004 10:40:34 AM

Sample Preparation/Analysis

Balance Id:1120421763

AW Gamma PrpRC5017  
 T9 Gamma by HPGE 10 day ingrowth  
 SI CLIENT: HANFORD

Pipet #: \_\_\_\_\_

Report Due: 10/08/2004

Sep1 DT/Tm Tech:

Batch: 4257346  
 SEQ Batch, Test: None

pCi/g

Sep2 DT/Tm Tech:

Prep Tech: ,ScottM

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, In/Date	
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Ru-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Ru-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Ru-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Ra-226	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	RA-228	RDL:2.00E-01	pCi/g	LCL:	UCL:	RPD:
RA-228DA	RDL:2.00E-01	pCi/g	LCL:	UCL:	RPD:						
GP4E91AC-LCS:											
Cs-137	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	Cs-137DA	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35
20VH61AF-SAMP Calc Info: Uncert Level (#s): 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: N GP4E91AA-BLK: Uncert Level (#s): 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: N GP4E91AC-LCS: Uncert Level (#s): 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: N											

STL RICHLAND

10/15/2004 3:55:29 PM

# ICOC Fraction Transfer/Status Report

ByDate: 10/16/2003, 10/20/2004, Batch: '4257346', User: 'ALL Order By DateTimeAccepting'

Q	Batch	Work Ord	CurStatus	Accepting	Comments
	4257346				
AC		CalcC	ScottM	9/24/2004 10:35:19	
SC			heidelbergt	IsBatched 9/13/2004 12:44:15 PM	ICOC_RADCALC v4.8.05
SC			ScottM	InPrep 9/24/2004 10:35:19 AM	RICH-RC-5045 Revision 1
SC			DAWKINSO	InCnt1 9/24/2004 4:10:36 PM	RICH-RD-0007 REVISION 5
SC			HUGHESJ	CalcC 10/13/2004 7:11:23 AM	RICH-RD-0007 REVISION 5
AC			DAWKINSO	9/24/2004 4:10:36 PM	
AC			HUGHESJ	10/13/2004 7:11:23	

AC: Accepting Entry, SC: Status Change

STL Richland  
Richland Wa.

STL RICHLAND

10/4/2004 2:24:32 PM  
108302, FLUOR HANFORD IC  
Hanford Inc

Sample Preparation/Analysis

Balance Id: 1120373922, 111741003, 02

, Flour CH Sr-Total PrpRC5013, SepRC5006  
TH Total Strontium by GPC  
SI CLIENT: HANFORD

Pipet #: NA

Sep1 DT/Tm Tech: 1D-12-04 8:27 PM

Report Due: 10/08/2004

Sep2 DT/Tm Tech: NA

Batch: 4257343 SOIL pCi/g PM, Quote: BG2, 50639  
SEQ Batch, Test: None

Prep Tech: WAGNERJ

Work Order, Lot, Sample Date Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
1 GNVH6-1-AC J4H250123-1-SAMP [REDACTED] 08/18/2004 11:25		0.01g.in	SRTA12270 09/21/04.pd 06/10/04.r				83.3 50	28A	1459	10/14/04/000
AmtRec: 2X250G #Containers: 2							Scr Rst: Alpha: 3.20E+04 pCi/g Beta: 1.08E+04 pCi/g			
2 GNVH6-1-AR-X J4H250123-1-DUP [REDACTED] 08/18/2004 11:25		0.01g.in	SRTA12271 06/21/04.pd 06/10/04.r				82.8	28B		
AmtRec: 2X250G #Containers: 2							Scr Rst: Alpha: 3.20E+04 pCi/g Beta: 1.08E+04 pCi/g			
3 GP4E5-1-AA-B J41130000-343-BLK [REDACTED] 08/18/2004 11:25		6.00g.in	SRTA12272 09/21/04.pd 06/10/04.r				80.2	28C		
AmtRec: #Containers: 1							Scr Rst: Alpha: Beta:			
4 GP4E5-1-AC-C J41130000-343-LCS [REDACTED] 08/18/2004 11:25		6.00g.in	STSB0891 04/02/04.pd 02/25/04.r				82.6	28D		
AmtRec: #Containers: 1							Scr Rst: Alpha: Beta:			

Comments: Samples were traced after aliquot. 10-4-04

All Clients for Batch:  
108302, FLUOR HANFORD IC Flour Hanford Inc , BG2, 50639

GNVH61AC-SAMP Constituent List:

Sr-90	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35
-------	-------	-------	--------	---------	--------

GP4E51AA-BLK:

Sr-90	RDL:1	pCi/g	LCL:	UCL:	RPD:
-------	-------	-------	------	------	------

GP4E51AC-LCS:

Sr-90	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35
-------	-------	-------	--------	---------	--------

GNVH61AC-SAMP Calc Info:

10/4/2004 2:24:34 PM

Sample Preparation/Analysis

Balance Id: 1120373922

CH Sr>Total PPRCS013, SepRCS006  
 TH Total Strontium by GPC  
 SI CLIENT: HANFORD

Pipet #:

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech: WAGNERJ

Report Due: 10/09/2004  
 Batch: 4257343  
 SEQ Batch Test: None

PCV/g

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Val 2 Prep Date	Dist Size	Pipet Geometry	Count Time Min	Detector Id	Count On/Off (24hr) Circle	CR Analyst, Init/Date
DP4E31AA-BLK1	Decart Level (#): 2	Decay to subc: Y	Blk subc.: N	Sol. Mot.: Y	ODR#: 3					
DP4E31AC-1C81	Decart Level (#): 2	Decay to subc: Y	Blk subc.: N	Sol. Mot.: Y	ODR#: 3					
	Decart Level (#): 2	Decay to subc: Y	Blk subc.: N	Sol. Mot.: Y	ODR#: 3					

10/15/2004 2:45:11 PM

# ICOC Fraction Transfer/Status Report

ByDate: 10/16/2003, 10/20/2004, Batch: '4257343', User: \*ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
<b>4257343</b>				
AC	CalcC	WAGNERJ	10/4/2004 2:04:44 PM	
SC		heidelbergt	IsBatched	9/13/2004 12:44:15 PM
SC		WAGNERJ	InPrep2	10/4/2004 2:04:44 PM
SC		WAGNERJ	Prep2C	10/4/2004 4:28:00 PM
SC		FABREM	InSep1	10/7/2004 6:16:20 AM
SC		FABREM	Sep1C	10/13/2004 7:41:03 AM
SC		HUGHESJ	InCnt1	10/13/2004 8:08:53 AM
SC		BlackCL	CalcC	10/15/2004 8:33:33 AM
AC		WAGNERJ	10/4/2004 4:28:00 PM	ICOC_RADCALC v4.8.05
AC		FABREM	10/7/2004 6:16:20	RICH-RC-5013 REVISION 5
AC		FABREM	10/13/2004 7:41:03	RICH-RC-5013 REVISION 5
AC		HUGHESJ	10/13/2004 8:08:53	RICH-RC-5006 REVISION 5
AC		BlackCL	10/15/2004 8:33:33	RICH-RD-0007 REVISION 5
				RICH-RD-0003 REVISION 4

AC: Accepting Entry; SC: Status Change

STL Richland  
Richland Wa.

9/13/2004 12:44:18 PM **Sample Preparation/Analysis** Balance Id: *PJ 300 #029*  
 108302, FLUOR HANFORD IC , Flour 5S C-14 Prp/SepRC5022 Pipet #: \_\_\_\_\_  
 Hanford Inc S3 Carbon-14 by Liquid Scint  
 Report Due: 10/08/2004 SI CLIENT: HANFORD Sep1 DT/Tm Tech: *9-23-04om*  
 Batch: 4257332 SOIL pCi/g PM, Quote: BG2, 50639 Sep2 DT/Tm Tech: \_\_\_\_\_  
 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, In/Date
1 GNVH6-1-AJ J4H250123-1-SAMP [REDACTED] 08/18/2004 11:25								
		AmtRec: 2X250G	#Containers: 2				Scr Rst: Alpha: 3.20E+04 pCi/g	Beta: 1.08E+04 pCi/g
2 GNVH6-1-AL-X J4H250123-1-DUP [REDACTED] 08/18/2004 11:25								
		AmtRec: 2X250G	#Containers: 2				Scr Rst: Alpha: 3.20E+04 pCi/g	Beta: 1.08E+04 pCi/g
3 GP4C4-1-AA-B J41130000-332-BLK [REDACTED] 08/18/2004 11:25								
		AmtRec:	#Containers: 1				Scr Rst: Alpha:	Beta:
4 GP4C4-1-AC-C J41130000-332-LCS [REDACTED] 08/18/2004 11:25								
		AmtRec:	#Containers: 1				Scr Rst: Alpha:	Beta:
5 GP4C4-1-AD-BN J41130000-332-BLK [REDACTED] 08/18/2004 11:25								
		AmtRec:	#Containers: 1				Scr Rst: Alpha:	Beta:

Comments:

All clients for Batch:  
 108302, FLUOR HANFORD IC Flour Hanford Inc , BG2, 50639

GNVH61AJ-SAMP Constituent List:  
 C-14 RDL:50 pCi/g LCL:70 UCL:130 RPD:35

9/29/2004 1:25:14 PM

# Rpt DB Transfer log (Batch Results)

**STL**

SDG or Batch Isotope	Rpt Db Id Method	RTst Qc	Lot Sample Analysis Date	Client Id Result	Matrix	Received Date	Sample Date	Units	Expected	Yield	Volumes
26867	9GPV6F10		J410901851	GG823 0410465	URINE	9/8/2004 4:00:00 PM	9/8/2004				
SR-89/90	CJTH	0	9/27/2004 6:17:07 PM	1.2722E-01	2.314E-01	2.35E-01	9.699E-01	dpm/ea	0.967	7.485E+2	7.485E+2
26867	GP3PT1AX		J41130000130	INTRA-LAB BLANK	URINE	9/8/2004 4:00:00 PM	9/8/2004				
SR-89/90	CJTH	0 X	9/27/2004 6:17:07 PM	2.0279E-01	2.289E-01	2.338E-01	9.408E-01	dpm/ea	1.0	1.0E+3	1.0E+3
26867	GP3PT1CM		J41130000130	INTRA-LAB CHECK	URINE	9/8/2004 4:00:00 PM	9/8/2004				
SR-89/90	CJTH	0 M	9/27/2004 6:18:00 PM	2.6861E+01	8.53E-01	3.857E+00	1.057E+00	dpm/ea	2.9717E+01	0.987	1.0E+3 1.0E+3

4257130, \*\*Samples Inserted | Updated | NotUpdated => 3 | 0 | 0,  
 \*\*Results Inserted | ReTestInserted | Updated | NotInserted => 3 | 0 | 0 | 0.  
 \*\*Diff RptDb | Qtims => .

STL RICHLAND

10/4/2004 2:22:52 PM **Sample Preparation/Analysis** Balance Id: 1120373922 / 1117411003  
 108302, FLUOR HANFORD IC , Flour AF NI-63 PrpRC5013/5019, SepRC5069 Pipet #: \_\_\_\_\_  
 Hanford Inc S4 Nickel by ICP and Nickel-63 by Liquid Scint  
 Report Due: 10/08/2004 SI CLIENT: HANFORD Sep1 DT/Tm Tech: \_\_\_\_\_  
 Batch: 4257335 SOIL pCi/g PM, Quote: BG2, 50639 Sep2 DT/Tm Tech: \_\_\_\_\_  
 SEQ Batch, Test: None 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	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
1 GNVH6-1-AD J4H250123-1-SAMP [REDACTED]			0.01g.in	0.01g	NITA2031 09/20/04.pd 12/02/02.r					
08/18/2004 11:25			AmtRec: 2X250G	#Containers: 2					Scr Rst: Alpha: 3.20E+04 pCi/g Beta: 1.08E+04 pCi/g	
2 GNVH6-1-AM-X J4H250123-1-DUP [REDACTED]			0.01g.in	0.01g	NITA2032 09/20/04.pd 12/02/02.r					
08/18/2004 11:25			AmtRec: 2X250G	#Containers: 2					Scr Rst: Alpha: 3.20E+04 pCi/g Beta: 1.08E+04 pCi/g	
3 GP4DE-1-AA-B J4I130000-335-BLK [REDACTED]			0.25g.in	0.25g	NITA2033 09/20/04.pd 12/02/02.r					
08/18/2004 11:25			AmtRec:	#Containers: 1					Scr Rst: Alpha: Beta:	
4 GP4DE-1-AC-C J4I130000-335-LCS [REDACTED]			0.25g.in	0.25g	NISA0616 03/31/04.pd 12/02/02.r					
08/18/2004 11:25			AmtRec:	#Containers: 1					Scr Rst: Alpha: Beta:	
5 GP4DE-1-AD-BN J4I130000-335-IBLK [REDACTED]										
08/18/2004 11:25			AmtRec:	#Containers: 1					Scr Rst: Alpha: Beta:	

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Comments: Samples were traced after aliquot.  $\phi$  to 4.04

All Clients for Batch:  
 108302, FLUOR HANFORD IC Flour Hanford Inc , BG2, 50639

ENVH61AD-SAMP Constituent List:  
 NI-63 RDL:30 pCi/g LCL:70 UCL:130 RFD:35

STL Richard Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1 WO Cnt: 5  
 Richard Wa. pd - Prep Dt, r - Reference Dt, ec - Enrichment Cell, ct - Cocktail Added Prep\_SamplePrep v4.8.06

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STL RICHLAND

10/4/2004 2:22:55 PM

Sample Preparation/Analysis

Balance Id:

AF Ni-63 PrpRC5013/5019, SepRC5069  
 S4 Nickel by ICP and Nickel-63 by Liquid Scint  
 SI CLIENT: HANFORD

Pipet #: \_\_\_\_\_

Report Due: 10/08/2004

Sep1 DT/Tm Tech:

Batch: 4257335

pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

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	QC Vial 2 Prep Date	Count s Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
SP4DE1AA-BLK: Ni-63	RDL:30	pCi/g	LCL:	UCL:	RPD:					
SP4DE1AC-LCS: Ni-63	RDL:30	pCi/g	LCL:70	UCL:130	RPD:35					
SP4DE1AD-ISLK: Ni-63	RDL:30	pCi/g	LCL:	UCL:	RPD:					
ZMVH61AD-SAMP Calc Info:										
Uncert Level (#s): 2		Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					
SP4DE1AA-BLK: Uncert Level (#s): 2		Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					
SP4DE1AC-LCS: Uncert Level (#s): 2		Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					
SP4DE1AD-ISLK: Uncert Level (#s): 2		Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					

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10/25/2004 4:39:04 PM

# ICOC Fraction Transfer/Status Report

ByDate: 10/26/2003, 10/30/2004, Batch: '4257335', User: \*ALL Order By DateTimeAccepting

Q	Batch	Work Ord	CurStatus	Accepting	Comments
<b>4257335</b>					
AC		CalcC	WAGNERJ	10/4/2004 2:04:50 PM	
SC			heldelberg	IsBatched	9/13/2004 12:44:15 PM
SC			WAGNERJ	InPrep2	10/4/2004 2:04:50 PM
SC			WAGNERJ	Prep2C	10/5/2004 1:33:02 PM
SC			WAGNERJ	InSep1	10/5/2004 1:33:38 PM
SC			WAGNERJ	Sep1C	10/18/2004 2:12:53 PM
SC			DAWKINSO	InCnt1	10/18/2004 2:44:27 PM
SC			HARRIESE	TraceC	10/24/2004 12:42:48 PM
SC			HARRIESE	InTrace	10/24/2004 12:43:03 PM
SC			BlackCL	CalcC	10/24/2004 1:24:16 PM
AC			WAGNERJ	10/5/2004 1:33:02 PM	ICOC_RADCALC v4.8.05
AC			WAGNERJ	10/5/2004 1:33:36 PM	RICH-RC-5013 REVISION 5
AC			WAGNERJ	10/18/2004 2:12:53	RICH-RC-5013 REVISION 5
AC			DAWKINSO	10/18/2004 2:44:27	RICH-RC-5069 REVISION 5
AC			HARRIESE	10/24/2004 12:42:48	RICH-RC-5069 REVISION 5
AC			HARRIESE	10/24/2004 12:43:03	RICH-RD-0001 REVISION 3
AC			BlackCL	10/24/2004 1:24:16	BHI-MT-0001 REVISION 1
					BHI-MT-0001 REVISION 1
					RICH-RD-0001 REVISION 3

AC: Accepting Entry, SC: Status Change

STL Richland  
Richland Wa.

09/13/2004 12:44:19 PM

Sample Preparation/Analysis

Balance Id:

108302, FLUOR HANFORD IC  
Hanford Inc

Four AN Tc-99 Prp/Sep/RCS013/5078  
S5 Technetium-99 by Liquid Scint

Pipet #:

Report Due: 10/08/2004

SI CLIENT: HANFORD

Sep1 DTTM Tech:

Batch: 4257338 SOIL

PCIG

PM, Quote: BG2, 50639

Sep2 DTTM Tech:

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 Inv/Date
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1 QNVN6-1-AG

J4H250123-1-SAAP

08/18/2004 11:25

AmtPac: 2X2503

#Containers: 2

Scr Rat: Alpha: 3.20E+04 PCIG

Beta: 1.08E+04 PCIG

2 QNVN6-1-AN-S

J4H250123-1-MS

08/18/2004 11:25

AmtPac: 2X2503

#Containers: 2

Scr Rat: Alpha: 3.20E+04 PCIG

Beta: 1.08E+04 PCIG

3 QNVN6-1-AP-X

J4H250123-1-DUP

08/18/2004 11:25

AmtPac: 2X2503

#Containers: 2

Scr Rat: Alpha: 3.20E+04 PCIG

Beta: 1.08E+04 PCIG

4 GP4DX-1-AA-B

J4130000-338-BLK

08/18/2004 11:25

AmtPac:

#Containers: 1

Scr Rat: Alpha:

Beta:

5 GP4DX-1-AC-BN

J4130000-338-IBLK

08/18/2004 11:25

AmtPac:

#Containers: 1

Scr Rat: Alpha:

Beta:

6 GP4DX-1-AD-C

J4130000-338-LCS

08/18/2004 11:25

AmtPac:

#Containers: 1

Scr Rat: Alpha:

Beta:

9/13/2004 12:44:19 PM

Sample Preparation/Analysis

Balance Id:

AN Tc-99 Prp/SepRC5013/5078  
S5 Technetium-99 by Liquid Scint  
SI CLIENT: HANFORD

Pipet #:

Report Due: 10/08/2004

Sep1 DT/Tm Tech:

Batch: 4257338  
SEQ Batch, Test: None

pCi/g

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
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Comments: Sample Size decreased due to increased radiation level per P. Anderson and J. Wagner. A. Finch

All Clients for Batch:  
108302, FLOOR HANFORD IC Flour Hanford Inc , BQ2, 50639

09VH61AG-SAMP Constituent List:  
Tc-99 RDL:15 pCi/g LCL:70 UCL:130 RPD:35  
09VH61AN-MS Constituent List:

0P4DX1AA-BLK:  
Tc-99 RDL:15 pCi/g LCL: UCL: RPD:  
0P4DX1AC-IBLK:  
Tc-99 RDL:15 pCi/g LCL: UCL: RPD:  
0P4DX1AD-LCS:  
Tc-99 RDL:15 pCi/g LCL:70 UCL:130 RPD:35

09VH61AG-SAMP Calc Info:  
Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Mot.: Y ODRs: B  
09VH61AN-MS Calc Info:  
Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Mot.: Y ODRs: B  
0P4DX1AA-BLK:  
Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Mot.: Y ODRs: B  
0P4DX1AC-IBLK:  
Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Mot.: Y ODRs: B  
0P4DX1AD-LCS:  
Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Mot.: Y ODRs: B

STL RICHLAND

STL

10/22/2004 2:12:29 PM

# ICOC Fraction Transfer/Status Report

ByDate: 10/23/2003, 10/27/2004, Batch: '4257338', User: 'ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
4257338				
AC	Rev1C	DAWKINSO	10/20/2004 4:28:34	
SC		heidelbergt	IsBatched 9/13/2004 12:44:15 PM	ICOC_RADCALC v4.8.05
SC		DAWKINSO	InCnt1 10/20/2004 4:28:34 PM	RICH-RD-0001 REVISION 3
SC		DAWKINSO	CalcC 10/21/2004 10:18:48 PM	RICH-RD-0001 REVISION 3
SC		NortonJ	Rev1C 10/22/2004 2:11:57 PM	RICH-RC-0002 REVISION 6
AC		DAWKINSO	10/21/2004 10:16:48	
AC		NortonJ	10/22/2004 2:11:57	Revision 6

AC: Accepting Entry, SC: Status Change

STL Richland  
Richland Wa.



9/13/2004 12:44:19 PM

### Sample Preparation/Analysis

Balance Id: *PB 5001-S #028*

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

Pipet #:

Report Due: 10/08/2004

Sep1 DT/Tm Tech: *9-23-04 dmw*

Batch: 4257340  
SEQ Batch, Test: None

pCi/g

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
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SP4D81AA-BLK:									
H-3	RDL:400	pCi/g	LCL:	UCL:	RPD:				
SP4D81AC-LCS:									
H-3	RDL:400	pCi/g	LCL:70	UCL:130	RPD:35				
SP4D81AD-BLK:									
H-3	RDL:400	pCi/g	LCL:	UCL:	RPD:				
DNVNG1AH-SAMP Calc Info:									
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N	Sci.Mot.:	Y	ODRs:	0
SP4D81AA-BLK:									
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N	Sci.Mot.:	Y	ODRs:	0
SP4D81AC-LCS:									
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N	Sci.Mot.:	Y	ODRs:	0
SP4D81AD-BLK:									
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N	Sci.Mot.:	Y	ODRs:	0

STL RICHLAND

01

9/29/2004 1:23:14 PM

# ICOC Fraction Transfer/Status Report

ByDate: 9/30/2003, 10/4/2004, Batch: '4257332', User: \*ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
<b>4257332</b>				
AC		CalcC	McDowellD 9/23/2004 11:49:08	
SC		heidelbergt	IsBatched 9/13/2004 12:44:15 PM	ICOC_RADCALC v4.8.05
SC		McDowellD	InSep1 9/23/2004 11:49:08 AM	RICH-RC-5022 REVISION 3
SC		McDowellD	Sep1C 9/27/2004 1:47:36 PM	RICH-RC-5022 REVISION 3
SC		DAWKINSO	InCnt1 9/27/2004 4:01:12 PM	RICH-RD-0001 REVISION 3
SC		BlackCL	CalcC 9/28/2004 3:48:36 AM	RICH-RD-0001 REVISION 3
AC		McDowellD	9/27/2004 1:47:36 PM	
AC		DAWKINSO	9/27/2004 4:01:12 PM	
AC		BlackCL	9/28/2004 3:48:36	

AC: Accepting Entry; SC: Status Change

STL Richland  
Richland Wa.