0061262

SAF-B02-063
100 K Area - Full Protocol
FINAL DATA PACKAGE

E:MAIL RESULTS TO:

Mark Buckmaster N/A
INITIAL/DATE

Mike Stankovich NA
INITIAL/DATE

COMPLETE COPY OF DATA PACKAGE TO:

Mark Buckmaster X3-16 BS 1/8/04
INITIAL/DATE

Mike Stankovich H9-02 BS
INITIAL/DATE

Jeanette Duncan BS
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE COVER SHEET)

SDG W04215 SAF-B02-063

Rad only Chem only X Rad & Chem

X Complete Partial

Waste Site: 116-K-1

RECEIVED
FEB 05 2004
EDMC

Analytical Data Package Prepared For

Bechtel Hanford

Radiochemical Analysis By

STL Richland

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

Assigned Laboratory Code: STLRL

Data Package Contains 33 *Pages*

Report No.: 24464

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W04215	B02-063	J01576	J3L010178-1	F5RR91AE	9F5RR910	3337292
		J01576	J3L010178-1	F5RR91AC	9F5RR910	3337294
		J01576	J3L010178-1	F5RR91AA	9F5RR910	3337295

RECEIVED
DEC 2003

SEVERN TRENT STL

STL Richland
2800 George Washington Way
Richland, WA 99352

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

December 23, 2003

Attention: Joan Kessner

SAF Number	:	B02-063
Date SDG Closed	:	December 1, 2003
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W04215
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On December 1, 2003, 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 Bechtel Hanford, Inc. (BHI) specific ID:

BHI ID#	STLR ID#	MATRIX	DATE OF RECEIPT
J01576	F5RR9	SOIL	12/1/03

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.

IV. The requested analyses were:

Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Gamma Spectroscopy

Gamma Spec by method RICH-RC-5017
Chemical Analyses
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

The analytical results for each analysis performed under SDG W04215 includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, sample and sample duplicate (J01576) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec (-to include Am-241 and U-238) by method RICH-RC-5017:
The LCS, batch blank, sample and sample duplicate (J01576) results are within contractual requirements.

Chemical Analyses
Hexavalent Chromium by EPA method 7196A:
The sample matrix spike recovery is low (53%) it is suspected that matrix effect of the solid is the cause. The reanalysis duplicate is out of limits due to the inhomogeneity of the matrix. Except as noted, the LCS, batch blank, sample, sample duplicate (J01576) and sample matrix spike (J01576) results are within contractual requirements.

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

Reviewed and approved:

Beverly I. Giroir
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

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

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

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

Report Definitions

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

Sample Results Summary

STL Richland STLRL

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

Date: 23-Dec-03

Report No. : 24464

SDG No: W04215

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
3337292 GAMMA_GS									
J01576									
	F5RR91AE	CO-60	1.08E-01 +- 2.3E-02		pCi/g		1.81E-02	5.00E-02	
		CS-137	1.92E+00 +- 2.3E-01		pCi/g		2.03E-02	1.00E-01	
		EU-152	1.05E+00 +- 1.7E-01		pCi/g		5.17E-02	1.00E-01	
		EU-154	1.55E-01 +- 5.7E-02	U	pCi/g		7.80E-02	1.00E-01	
		EU-155	6.42E-02 +- 3.4E-02	U	pCi/g		5.61E-02	1.00E-01	
J01576 DUP									
	F5RR91AF	CO-60	1.20E-01 +- 3.1E-02		pCi/g		2.65E-02	5.00E-02	
		CS-137	2.45E+00 +- 2.9E-01		pCi/g		2.81E-02	1.00E-01	
		EU-152	1.43E+00 +- 2.2E-01		pCi/g		7.24E-02	1.00E-01	
		EU-154	1.21E-01 +- 5.7E-02	U	pCi/g		1.02E-01	1.00E-01	
		EU-155	-1.48E-03 +- 4.4E-02	U	pCi/g		7.25E-02	1.00E-01	
3337294 SRTOT_SEP_PRECIP_GPC									
J01576									
	F5RR91AC	STRONTIUM	3.86E+00 +- 1.2E+00		pCi/g	80%	7.91E-01		
J01576 DUP									
	F5RR91AG	STRONTIUM	3.85E+00 +- 1.2E+00		pCi/g	85%	7.95E-01		
3337295 7196_CR6									
J01576									
	F5RR91AA	HEXCHROME	3.50E-01 +- 0.0E+00	U	mg/kg	N/A	3.50E-01	3.50E-01	
J01576 DUP									
	F5RR91AJ	HEXCHROME	3.50E-01 +- 0.0E+00	U	mg/kg	N/A	3.50E-01	3.50E-01	0.0

No. of Results: 14

RPD - Relative Percent Difference.

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: 23-Dec-03

Report No. : 24464

SDG No.: W04215

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
GAMMA_GS								
3337292 BLANK QC								
F5W6X1AA	CO-60	4.58E-03 +- 5.0E-03	U	pCi/g				1.00E-02
	CS-137	-4.36E-03 +- 4.2E-03	U	pCi/g				6.53E-03
	EU-152	-1.83E-03 +- 9.9E-03	U	pCi/g				1.73E-02
	EU-154	2.65E-04 +- 1.1E-02	U	pCi/g				2.14E-02
	EU-155	7.05E-03 +- 1.2E-02	U	pCi/g				2.10E-02
3337292 LCS								
F5W6X1AC	CS-137	2.76E-01 +- 5.4E-02		pCi/g		94%	-0.1	3.17E-02
	K-40	1.87E+01 +- 2.5E+00		pCi/g		95%	0.0	2.33E-01
	RA-226	9.81E-01 +- 1.6E-01		pCi/g		85%	-0.1	4.91E-02
	RA-228	2.34E+00 +- 3.7E-01		pCi/g		125%	0.2	1.18E-01
	U-238DHP	1.30E+00 +- 9.7E-01	U	pCi/g		123%	0.2	1.31E+00
SRTOT_SEP_PRECIP_GPC								
3337294 BLANK QC								
F5W631AA	STRONTIUM	1.08E-02 +- 5.5E-02	U	pCi/g	87%			1.27E-01
3337294 LCS								
F5W631AC	STRONTIUM	1.07E+00 +- 3.1E-01		pCi/g	88%	95%	-0.1	1.22E-01
7196_CR6								
3337295 MATRIX SPIKE								
F5RR91AH	HEXCHROME	2.19E+01 +- 0.0E+00		mg/kg	N/A	54%	-0.5	3.50E-01
3337295 LCS								
F5W661AC	HEXCHROME	4.36E+01 +- 0.0E+00		mg/kg	N/A	107%	0.1	3.50E-01
3337295 BLANK QC								
F5W661AB	HEXCHROME	3.50E-01 +- 0.0E+00	U	mg/kg	N/A			3.50E-01

No. of Results: 15

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

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

FORM I

SAMPLE RESULTS

Date: 23-Dec-03

Lab Name:	**STL Richland**	**SDG:**	W04215	**Collection Date:**	11/25/2003 8:15:00 AM
Lot-Sample No.:	**J3L010178-1**	**Report No. :**	24464	**Received Date:**	12/1/2003 2:20:00 PM
Client Sample ID:	**J01576**	**COC No. :**		**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3337292	GAMMA_GS			**Work Order:** F5RR91AE			**Report DB ID:** 9F5RR910					
CO-60	1.08E-01		2.3E-02	2.3E-02	1.81E-02	pCi/g		*(6.)*	12/8/03 04:43 p		838.0	GER5$1
							5.00E-02	*(9.5)*			g	
CS-137	1.92E+00		2.3E-01	2.3E-01	2.03E-02	pCi/g		*(94.6)*	12/8/03 04:43 p		838.0	GER5$1
							1.00E-01	*(16.5)*			g	
EU-152	1.05E+00		1.7E-01	1.7E-01	5.17E-02	pCi/g		*(20.3)*	12/8/03 04:43 p		838.0	GER5$1
							1.00E-01	*(12.5)*			g	
EU-154	1.55E-01	U	5.7E-02	5.7E-02	7.80E-02	pCi/g		*(2.)*	12/8/03 04:43 p		838.0	GER5$1
							1.00E-01	*(5.5)*			g	
EU-155	6.42E-02	U	3.4E-02	3.4E-02	5.61E-02	pCi/g		*(1.1)*	12/8/03 04:43 p		838.0	GER5$1
							1.00E-01	*(3.8)*			g	
Batch: 3337294	SRTOT_SEP_PRECIP_GPC			**Work Order:** F5RR91AC			**Report DB ID:** 9F5RR910					
STRONTIUM	3.86E+00		6.6E-01	1.2E+00	7.91E-01	pCi/g	80%	*(4.9)*	12/17/03 09:16 a		1.06	GPC26A
						3.67E-01		*(6.3)*			G	
Batch: 3337295	7196_CR6			**Work Order:** F5RR91AA			**Report DB ID:** 9F5RR910					
HEXCHROME	3.50E-01	U		0.0E+00	3.50E-01	mg/kg	N/A	*(1.)*	12/5/03		2.5	
							3.50E-01	*N/A*			G	

No. of Results: 7 **Comments:**

STL Richland
rptSTLRchSample
V4.05 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 I

SAMPLE RESULTS

Date: 23-Dec-03

Lab Name:	STL Richland	**SDG:**	W04215	**Collection Date:**	11/25/2003 8:15:00 AM
Lot-Sample No.:	J3L010178-1	**Report No. :**	24464	**Received Date:**	12/1/2003 2:20:00 PM
Client Sample ID:	J01576	**COC No. :**		**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector

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: 23-Dec-03

DUPLICATE RESULTS

Lab Name:	STL Richland	**SDG:**	W04215	**Collection Date:**	11/25/2003 8:15:00 AM
Lot-Sample No.:	J3L010178-1	**Report No. :**	24464	**Received Date:**	12/1/2003 2:20:00 PM
Client Sample ID:	J01576 DUP	**COC No. :**		**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3337292	GAMMA_GS			**Work Order:** F5RR91AF		**Report DB ID:** F5RR91FR			**Orig Sa DB ID:** 9F5RR910			
CO-60	1.20E-01		3.1E-02	3.1E-02	2.65E-02	pCi/g		(4.5)	12/8/03 08:57 p		838.0	GER6$1
	1.08E-01		**RPD**	**10.8**		5.00E-02		(7.7)			g	
CS-137	2.45E+00		2.9E-01	2.9E-01	2.81E-02	pCi/g		(87.4)	12/8/03 08:57 p		838.0	GER6$1
	1.92E+00		**RPD**	**24.4**		1.00E-01		(16.7)			g	
EU-152	1.43E+00		2.2E-01	2.2E-01	7.24E-02	pCi/g		(19.8)	12/8/03 08:57 p		838.0	GER6$1
	1.05E+00		**RPD**	**30.7**		1.00E-01		(12.8)			g	
EU-154	1.21E-01	U	5.7E-02	5.7E-02	1.02E-01	pCi/g		(1.2)	12/8/03 08:57 p		838.0	GER6$1
	1.55E-01	U	**RPD**	**24.6**		1.00E-01		(4.2)			g	
EU-155	-1.48E-03	U	4.4E-02	4.4E-02	7.25E-02	pCi/g		-0.02	12/8/03 08:57 p		838.0	GER6$1
	6.42E-02	U	**RPD**	**209.5**		1.00E-01		-0.07			g	
Batch: 3337294	SRTOT_SEP_PRECIP_GPC			**Work Order:** F5RR91AG		**Report DB ID:** F5RR91GR			**Orig Sa DB ID:** 9F5RR910			
STRONTIUM	3.85E+00		6.5E-01	1.2E+00	7.95E-01	pCi/g	85%	(4.8)	12/17/03 09:16 a		1.02	GPC26B
	3.86E+00		**RPD**	**0.2**				(6.3)			G	
Batch: 3337295	7196_CR6			**Work Order:** F5RR91AJ		**Report DB ID:** F5RR91JR			**Orig Sa DB ID:** 9F5RR910			
HEXCHROME	3.50E-01	U		0.0E+00	3.50E-01	mg/kg	N/A	(1.)	12/5/03		2.5	
	3.50E-01	U	**RPD**	**0.0**		3.50E-01		N/A			G	

No. of Results: 7 **Comments:**

10

RPD - Relative Percent Difference.
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

BLANK RESULTS

Date: 23-Dec-03

Lab Name: STL Richland

SDG: W04215

Matrix: SOIL

Report No. : 24464

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3337295	7196_CR6			**Work Order:**	F5W661AB		**Report DB ID:**	F5W661AB				
HEXCHROME	3.50E-01	U		0.0E+00	3.50E-01	mg/kg	N/A	(1.)	12/5/03		2.5	
								N/A			G	
Batch: 3337292	GAMMA_GS			**Work Order:**	F5W6X1AA		**Report DB ID:**	F5W6X1AX				
CO-60	4.58E-03	U	5.0E-03	5.0E-03	1.00E-02	pCi/g		0.46	12/8/03 04:44 p		859.27	GER4$1
						5.00E-02		(1.8)			g	
CS-137	-4.36E-03	U	4.2E-03	4.2E-03	6.53E-03	pCi/g		-0.67	12/8/03 04:44 p		859.27	GER4$1
						1.00E-01		-(2.1)			g	
EU-152	-1.83E-03	U	9.9E-03	9.9E-03	1.73E-02	pCi/g		-0.11	12/8/03 04:44 p		859.27	GER4$1
						1.00E-01		-0.37			g	
EU-154	2.65E-04	U	1.1E-02	1.1E-02	2.14E-02	pCi/g		0.01	12/8/03 04:44 p		859.27	GER4$1
						1.00E-01		0.05			g	
EU-155	7.05E-03	U	1.2E-02	1.2E-02	2.10E-02	pCi/g		0.34	12/8/03 04:44 p		859.27	GER4$1
						1.00E-01		(1.2)			g	
Batch: 3337294	SRTOT_SEP_PRECIP_GPC			**Work Order:**	F5W631AA		**Report DB ID:**	F5W631AB				
STRONTIUM	1.08E-02	U	5.4E-02	5.5E-02	1.27E-01	pCi/g	87%	0.09	12/17/03 09:16 a		6.0	GPC26C
					5.88E-02			0.4			G	

No. of Results: 7 **Comments:**

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

LCS RESULTS

Date: 23-Dec-03

Lab Name: STL Richland

Matrix: SOIL

SDG: W04215

Report No. : 24464

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 3337295	7196_CR6			**Work Order:**	F5W661AC		**Report DB ID:**	F5W661AS					
HEXCHROME	4.36E+01			0.0E+00	3.50E-01	mg/kg	N/A	4.08E+01		107%	12/5/03	2.5	
							Rec Limits:	80	120	0.1		G	
Batch: 3337292	GAMMA_GS			**Work Order:**	F5W6X1AC		**Report DB ID:**	F5W6X1CM					
CS-137	2.76E-01		5.4E-02	5.4E-02	3.17E-02	pCi/g		2.93E-01	1.3E-01	94%	12/8/03 08:58 p	457.79	GER4$1
							Rec Limits:	70	130	-0.1		g	
K-40	1.87E+01		2.5E+00	2.5E+00	2.33E-01	pCi/g		1.95E+01	1.9E+00	95%	12/8/03 08:58 p	457.79	GER4$1
							Rec Limits:	70	130	0.0		g	
RA-226	9.81E-01		1.6E-01	1.6E-01	4.91E-02	pCi/g		1.15E+00	5.2E-02	85%	12/8/03 08:58 p	457.79	GER4$1
							Rec Limits:	70	130	-0.1		g	
RA-228	2.34E+00		3.7E-01	3.7E-01	1.18E-01	pCi/g		1.87E+00	9.6E-02	125%	12/8/03 08:58 p	457.79	GER4$1
							Rec Limits:	70	130	0.2		g	
U-238DHP	1.30E+00	U	9.7E-01	9.7E-01	1.31E+00	pCi/g		1.05E+00	5.4E-02	123%	12/8/03 08:58 p	457.79	GER4$1
							Rec Limits:	70	130	0.2		g	
Batch: 3337294	SRTOT_SEP_PRECIP_GPC			**Work Order:**	F5W631AC		**Report DB ID:**	F5W631CS					
STRONTIUM	1.07E+00		1.3E-01	3.1E-01	1.22E-01	pCi/g	88%	1.13E+00	1.4E-02	95%	12/17/03 09:16 a	6.0	GPC26D
							Rec Limits:	20	105	-0.1		G	

No. of Results: 7 **Comments:**

12

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

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

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J3L010178
Client ID: BHZ
Due Date: 12/23/03
QC Batch Number: 3337752
Method Test Parameter: TA-8
Matrix: Soil
SDG Number: WU4215

Review Item	Yes (√)	No (√)	N/A (√)
A. COC 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓	✓	
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?			✓
C. QC & Samples 1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data 1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?	✓		
5. Were raw counts reviewed for anomalies?			✓
E. Other 1. Are all Nonconformances included and noted? 10-01405	✓		
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. Are worksheet entries complete and correct?	✓		

Comments on any "No" response:

First Level Review: [signature] Date: 12-10-03

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 3337292

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

Comments on any "No" response: _____

Second Level Review: [signature] Date: 12/17/03

Clouseau
Nonconformance Memo

SEVERN TRENT SERVICES

NCM #: **10-01405**
NCM Initiated By: Dale O'Connell
Date Opened: 12/10/2003
Date Closed:

Classification: **Anomaly**
Status: **PMREVIEW**
Production Area: Environmental - Prep
Tests: Gamma by GER
Lot #'s (Sample #'s): J3L010178 (1), J3L030000 (292),
QC Batches: 3337292

Nonconformance: Insufficient sample volume for QC
Subcategory: Other (explanation required)

Problem Description / Root Cause

Name	Date	Description
Dale O'Connell	12/10/2003	Insufficient sample to generate a duplicate. Possible False Positive: Although key-line activity> MDA, identification of radionuclide rejected by abundance criterIA. J3L010178-001: Eu-154,-155 J3L010178-001-X: Eu-154

Corrective Action

Name	Date	Corrective Action
Dale O'Connell	12/10/2003	Precision determination achieved by recounting sample on a different detector. Report results.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J3W10178
Client ID: BHI
Due Date: 12/23/03
QC Batch Number: 3337294
Method Test Parameter: TH TSR
Matrix: SOIL
SDG Number: WW4215

Review Item	Yes (√)	No (√)	N/A (√)
A. COC 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?	✓		
C. QC & Samples 1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		✓
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data 1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?	✓		
4. Were spectra reviewed/meet contractual requirements?			✓
5. Were raw counts reviewed for anomalies?	✓		
E. Other 1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response:

First Level Review: Pam Anderson Date: 12/8/03

LS-038A, Rev. 9, 8/02

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 3337294

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

Comments on any "No" response: _____

Second Level Review: Beverly [illegible] Date: 12-22-03

SEVERN TRENT STL

Richland Laboratory
Data Review Check List
METALS

Work Order Number(s): WOC4215 Batch#3337695
Lab Sample Numbers or SDG: F5KR9 RICHWOC5005-REV.6
Method/Test/Parameter: HEXAVALENT Chromium (other solid)

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration				
1. Performed at required frequency with required number of levels?	✓			✓
2. Correlation coefficient within QC limits?	✓			✓
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			✓
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			✓
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			✓
C. Sample Analysis				
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?		✓		✓
2. Were all sample holding times met?	✓			✓
D. QC Samples				
1. All results for the preparation blank below limits?	✓			✓
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?		✓		✓
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	✓			✓
4. Analytical spikes within QC limits where applicable?		✓		✓
5. ICP only: One serial dilution performed per SDG?			✓	✓
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	✓
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	✓

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
E. Other				
1. Are all nonconformances included and noted? 10-01414	✓			✓
2. Is the correct date and time of analysis shown?	✓			✓
3. Did the analyst sign and date the front page of the analytical run?	✓			✓
4. Correct methodology used?	✓			✓
5. Transcriptions checked?	✓			✓
6. Calculations checked at minimum frequency?	✓			✓
7. Units checked?	✓			✓

Comments on any "No" response:

MS was below QC limits. — 12-5-03 NW

Analyst: N. Wilens Date: 12-5-03

Second-Level Review: [illegible] Date: 12-5-03

Clouseau
Nonconformance Memo

SEVERN TRENT SERVICES

NCM #: **10-01414**
NCM Initiated By: Dale O'Connell
Date Opened: 12/11/2003
Date Closed:

Classification: **Anomaly**
Status: **PMREVIEW**
Production Area: Classical Chemistry
Tests: 7196A
Lot #'s (Sample #'s): J3L010178 (1), J3L030000 (295), J3L050000 (437),
QC Batches: 3337295, 3339437

Nonconformance: QC data exceeded criteria
Subcategory: MS/MSD accuracy and/or precision out of control

Problem Description / Root Cause

Name	Date	Description
Dale O'Connell	12/11/2003	Soluble matrix spike out of limits, recovery low. Cause: Matrix Effect. RPD out of limits on rerun. Cause : Nonhomogeneity of sample.

Corrective Action

Name	Date	Corrective Action
Dale O'Connell	12/11/2003	Soluble matrix spike out of limits on rerun, confirming matrix effect. Report results of original batch, 3337295.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

CHAIN OF CUSTODY

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-063-026	Page 1 of 1
Collector: Fahlberg	Company Contact: M Stankovich; Telephone No.: 531-7620	Project Coordinator: KESSNER, JH	Price Code: 8B; Data Turnaround: 21 Days
Project Designation: 100 K Area - Full Protocol	Sampling Location: 116-K-1 ~~Shallow~~ Deep Zone WO 11/17/03	SAF No.: B02-063	Air Quality ☐
Ice Chest No.: FRC-01-011	Field Logbook No.: EL 1572-1; COA: R116K12600	Method of Shipment: Government Vehicle Hand Delivery	
Shipped To: Severn Trent Incorporated, Richland	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive

< 2,000 pCi/gm

Special Handling and/or Storage

Cool 4c

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	P	aG							
No. of Container(s)	1	1	1	1							
Volume	60mL	60mL	1000mL	60mL							
	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	Strontium-89,90 -- Total Sr, ~~Nickel-63, Carbon-14~~							

SDG W04215 MW 12-23

SAMPLE ANALYSIS J3L010178

Sample No.	Matrix *	Sample Date	Sample Time										
J01576 F5RR9	SOIL	11-25-03	0815	X	X	X	X						

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R Fahlberg R Fahlberg	11-25-03 1330	IB 3728	11-25-03 1330
3728 Ref IB	12/01/03 0900	David St. John	12/01/03 0900
David St. John ERC	12/01/03 1420	[illegible] Ehrlichmann	12/01/03 1420

SPECIAL INSTRUCTIONS RF 11-19-03

(1) ICP Metals - 6010A (Supertrace) {~~Arsenic~~, Chromium, ~~Lead~~, ~~Mercury~~ - 7471 - (CV)
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

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DATA SHEET

SDG	7574	Client/Case	Hanford		SDG H2322
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R308142-04	Client sample id	J00WN8		
Dept sample id	7574-004	Location/Matrix	116-K-1		SOLID
Received	08/28/03	Collected/Weight	08/27/03 09:55	1003 g	
% solids	99.9	Custody/SAF No	B02-062-15	B02-062	

TEST	CAS NO	RESULT pCi/g	2σ ERR (CC	MDA g	RDL pCi/g	QUALIFIERS	TEST
Total Strontium	SR-RAD	10.6	0.55	0.22	1.0		SR
Cobalt 60	10198-40-0	31.8	0.[illegible]	0.26	0.050		GAM
Cesium 137	10045-97-3	437	1.2	0.52	0.10		GAM
[illegible] 152	14683-23-9	.162	1	[illegible]	0.10		GAM
Europium 154	15585-10-1	25.1	0.96	0.86	0.10		GAM
Europium 155	14391-16-3	1.00	0.[illegible]	0.96	0.10		GAM
Americium 241	14596-10-2	5.42	0.[illegible]	.51			GAM

100 K Area - Quick Turn

373-9745

Lab Id	[illegible]
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/12/03

SEVERN TRENT STL

Sample Check-in List

Date/Time Received: 12/01/03 @ 14:20 CR

Client: BHI SDG #: W04215 NA [ ] SAF #: B02-063 NA [ ]

Work Order Number: JBL010178 Chain of Custody # B02-063-0216

Shipping Container ID: ERC-01-011 Air Bill # N/A

1. Custody Seals on shipping container intact? NA [ ] Yes [X] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [X] No [ ]
3. Chain of Custody record present? Yes [X] No [ ]
4. Cooler temperature: 4°C NA [ ] 5. Vermiculite/packing materials is NA [ ] Wet [ ] Dry [X]
6. Number of samples in shipping container: 3
7. Sample holding times exceeded? NA [X] Yes [ ] No [ ]
8. Samples have:
   ___ tape
   X custody seals
   X hazard labels
   X appropriate samples labels
9. Samples are:
   X in good condition
   ___ broken
   ___ leaking
   ___ have air bubbles
   (Only for samples requiring head space)
10. Sample pH taken? NA [X] pH<2 [ ] pH>2 [ ] pH>9 [ ]
11. Sample Location, Sample Collector Listed? * Yes [ ] No [X]
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [X]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: April Rhodes / Phillips Date: 12/01/03

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

LS-023, 9/03, Rev. 5

12/8/2003 9:42:39 AM

Sample Preparation/Analysis

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

PRIORITY

Balance Id:1120421763
Pipet #: NA
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech: ,SCHERRT

Report Due: 12/23/2003 1004215

Batch: 3337292 SOIL pCi/g PM, Quote: BG2, 27038

SEQ Batch, Test: None All Tests: 3337292 AXTA, 3337294 CHTH, 3337295 DWEA, 3337296 88OV, 3339437 DWEA,

Work Order, Lot, Sample DateTime	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 F5RR9-1-AE J3L010178-1-SAMP		838.0g,in				SMA	200	45	2003	12/8 1302D
11/25/2003 08:15		AmtRec: 2X60G,LP	#Containers: 3					Scr Rst:	Alpha: 7.19E+02 pCi/g	Beta: 2.92E+02 pCi/g
2 F5RR9-1-AF-X J3L010178-1-DUP		838.0g,in						G4 12/8 0302D	12/9 0017	
11/25/2003 08:15		AmtRec: 2X60G,LP	#Containers: 3					Scr Rst:	Alpha: 7.19E+02 pCi/g	Beta: 2.92E+02 pCi/g
3 F5W6X-1-AA-B J3L030000-292-BLK		859.27g,in	CAL 827					G4	2004	12/8/0302D
11/25/2003 08:15		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:
4 F5W6X-1-AC-C J3L030000-292-LCS		457.79g,in	CAL816					G4 12/8/2003	12/9 0018	
1/1/02 ~~11/25/2003 08:15~~ JH 12/8/03		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:

Comments: NOT ENOUGH sample recount DUP on different detector. JH 12/8/03

JH 12-8-03

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

F5RR91AE-SAMP Constituent List:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	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:

F5W6X1AA-BLK:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:

12/3/2003 10:28:28 AM

Sample Preparation/Analysis

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

Report Due: 12/23/2003

Batch: 3337292 pCi/g

SEQ Batch, Test: None

Balance Id:

Pipet #:

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech:

Work Order, Lot, Sample DateTime	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
Eu-154	RDL:1.00E-01 pCi/g	LCL:	UCL:	RPD:	Eu-155	RDL:1.00E-01 pCi/g	LCL:	UCL:	RPD:	
F5W6X1AC-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	
K-40	RDL:-- pCi/g	LCL:70	UCL:130	RPD:35	Ra-226	RDL:0.1 pCi/g	LCL:70	UCL:130	RPD:35	
RA-228	RDL:0.2 pCi/g	LCL:70	UCL:130	RPD:35	RA-228DA	RDL:0.2 pCi/g	LCL:70	UCL:130	RPD:35	
U-238	RDL: pCi/g	LCL:70	UCL:130	RPD:35						

F5RR91AE-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

F5W6X1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

F5W6X1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

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12/10/03 12:52:42 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/10/03, 12/11/03, Batch: '3337292', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3337292						
AC		**CalcC**	**SCHERRT**	12/8/03 8:59:38 AM		
SC			wagarr	IsBatched	12/3/03 10:28:18 AM	ICOC_RADCALC v4.708
SC			SCHERRT	InPrep	12/8/03 8:59:38 AM	RICH-RC-5013 Revision 4
SC			SCHERRT	InPrep	12/8/03 9:00:19 AM	RICH-RC-5017 REVISION 3
SC			SCHERRT	Prep1C	12/8/03 9:50:49 AM	RICH-RC-5013 REVISION 4
SC			BlackCL	InCnt1	12/8/03 10:25:53 AM	RICH-RD-0007 REVISION 4
SC			HUGHESJ	CalcC	12/9/03 10:34:42 AM	RICH-RD-0007 REVISION 3
AC			**SCHERRT**	12/8/03 9:00:19 AM		
AC			**SCHERRT**	12/8/03 9:50:49 AM		
AC			**BlackCL**	12/8/03 10:25:53 AM		
AC			**HUGHESJ**	12/9/03 10:34:42 AM		

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AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Grp Rec Cnt: 5

ICOCFractions v4.708

12/9/03 10:23:01 AM

Sample Preparation/Analysis

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

CH Sr-Total PrpRC5013, SepRC5006
TH Total Strontium by GPC
5I CLIENT: HANFORD

PRIORITY

Balance Id:1120373922 #62

Pipet #: NA

Report Due: 12/23/2003 W04215

Sep1 DT/Tm Tech: 12-16-03 4:10 PM

Batch: 3337294 SOIL pCi/g PM, Quote: BG2, 27038

Sep2 DT/Tm Tech: NA

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit (5)	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry (mg)	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
1 F5RR9-1-AC J3L010178-1-SAMP		1.06g,in	SRTA10256 08/07/03 05/29/03,r			80.0	50	26A	0941	12/17/03
11/25/2003 08:15	(1g)	AmtRec: 2X60G,LP	#Containers: 3				Scr Rst:	Alpha: 7.19E+02 pCi/g		Beta: 2.92E+02 pCi/g
2 F5RR9-1-AG-X J3L010178-1-DUP		1.02g,in	SRTA10257 08/07/03 05/29/03,r			85.4		26B		
11/25/2003 08:15	(1g)	AmtRec: 2X60G,LP	#Containers: 3				Scr Rst:	Alpha: 7.19E+02 pCi/g		Beta: 2.92E+02 pCi/g
3 F5W63-1-AA-B J3L030000-294-BLK		6.0g,in	SRTA10258 08/07/03 05/29/03,r			87.1		26C		
11/25/2003 08:15		AmtRec:	#Containers: 1				Scr Rst:	Alpha:		Beta:
4 F5W63-1-AC-C J3L030000-294-LCS		6.0g,in	STSB0816 11/13/03 09/11/03,r			88.3		26D		
11/25/2003 08:15		AmtRec:	#Containers: 1				Scr Rst:	Alpha:		Beta:

Comments: Reduced aliquots targeted in parenthesis. 12-9-03

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

F5RR91AC-SAMP Constituent List:

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

F5W631AA-BLK:

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

F5W631AC-LCS:

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

F5RR91AC-SAMP Calc Info:

12/9/03 10:23:02 AM

Sample Preparation/Analysis

CH Sr-Total PrpRC5013, SepRC5006
TH Total Strontium by GPC
5I CLIENT: HANFORD

PRIORITY

Balance Id:1120373922

Pipet #: _____

Report Due: 12/23/2003

Sep1 DT/Tm Tech:

Batch: 3337294 pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample DateTime	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
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B										
F5W631AA-BLK:										
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B										
F5W631AC-LCS:										
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B										

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12/18/03 4:28:29 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/18/03, 12/19/03, Batch: '3337294', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3337294						
AC		**CalcC**	**SCHERRT**	12/8/03 9:00:10 AM		
SC			wagarr	IsBatched	12/3/03 10:28:18 AM	ICOC_RADCALC v4.708
SC			SCHERRT	InPrep	12/8/03 9:00:10 AM	RICH-RC-5013 REVISION 4
SC			SCHERRT	Prep1C	12/8/03 9:50:43 AM	RICH-RC-5013 REVISION 4
SC			WAGNERJ	InPrep2	12/9/03 10:20:10 AM	RICH-RC-5013 REVISION 4
SC			WAGNERJ	Prep2C	12/10/03 10:47:04 AM	RICH-RC-5013 REVISION 4
SC			FABREM	InSep1	12/10/03 3:24:00 PM	RICH-RC-5006 REVISION 5
SC			FABREM	Sep1C	12/16/03 5:46:54 PM	RICH-RC-5006 REVISION 5
SC			BlackCL	InCnt1	12/16/03 6:29:36 PM	RICH-RD-0003 REVISION 3
SC			BlackCL	CalcC	12/17/03 11:05:01 AM	RICH-RD-0003 REVISION 3
AC			**SCHERRT**	12/8/03 9:50:43 AM		
AC			**WAGNERJ**	12/9/03 10:20:10 AM		
AC			**WAGNERJ**	12/10/03 10:47:04		
AC			**FABREM**	12/10/03 3:24:00 PM		
AC			**FABREM**	12/16/03 5:46:54 PM		
AC			**BlackCL**	12/16/03 6:29:36 PM		
AC			**BlackCL**	12/17/03 11:05:01		

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AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Grp Rec Cnt: 8

ICOCFractions v4.708

12/3/2003 10:28:29 AM

Sample Preparation/Analysis

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

PRIORITY

Report Due: 12/23/2003 W04215

Batch: 3337295 SOIL mg/kg PM, Quote: BG2, 27038

SEQ Batch, Test: None

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Work Order, Lot, Sample DateTime	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 F5RR9-1-AA J3L010178-1-SAMP										
11/25/2003 08:15		AmtRec: 2X60G,LP	#Containers: 3				Scr Rst:		Alpha:	Beta:
2 F5RR9-1-AH-S J3L010178-1-MS										
11/25/2003 08:15		AmtRec: 2X60G,LP	#Containers: 3				Scr Rst:		Alpha:	Beta:
3 F5RR9-1-AJ-X J3L010178-1-DUP										
11/25/2003 08:15		AmtRec: 2X60G,LP	#Containers: 3				Scr Rst:		Alpha:	Beta:
4 F5RR9-1-AK-S J3L010178-1-MS										
11/25/2003 08:15		AmtRec: 2X60G,LP	#Containers: 3				Scr Rst:		Alpha:	Beta:
5 F5W66-1-AA-B J3L030000-295-BLK										
11/25/2003 08:15		AmtRec:	#Containers: 1				Scr Rst:		Alpha:	Beta:
6 F5W66-1-AC-C J3L030000-295-LCS										
11/25/2003 08:15		AmtRec:	#Containers: 1				Scr Rst:		Alpha:	Beta:

12/3/2003 10:28:29 AM

Sample Preparation/Analysis

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Balance Id:

Pipet #:

Report Due: 12/23/2003

Sep1 DT/Tm Tech:

Batch: 3337295 mg/kg

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample DateTime	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

Comments:

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

F5RR91AA-SAMP Constituent List:
HEXCHROME RDL:0.35 mg/kg LCL:80 UCL:120 RPD:20
F5RR91AH-MS Constituent List:
HEXCHROME RDL:0.35 mg/kg LCL:75 UCL:125 RPD:20
F5RR91AK-MS:
HEXCHROME RDL:0.35 mg/kg LCL:75 UCL:125 RPD:20
F5W661AA-BLK:
HEXCHROME RDL:0.35 mg/kg LCL: UCL: RPD:
F5W661AC-LCS:
HEXCHROME RDL:0.35 mg/kg LCL:80 UCL:120 RPD:20

F5RR91AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
F5RR91AH-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
F5RR91AK-MS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
F5W661AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
F5W661AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

12/5/03 1:09:14 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/5/03, 12/6/03, Batch: '3337295', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3337295						
AC		**InCnt1**	**WiensN**	12/5/03 7:25:46 AM		
SC			wagarr	IsBatched	12/3/03 10:28:18 AM	ICOC_RADCALC v4.708
SC			WiensN	InCnt1	12/5/03 7:25:46 AM	RICHWC5005 REV.6

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AC: Accepting Entry; SC: Status Change

SEVERN TRENT STL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 100K AREA

B02-063

Lot #: F3L020261
SDG #: W04215

Joan Kessner

Bechtel Hanford, Inc.
3350 George Washington Way
MSIN HO-25
Richland, WA 99352

SEVERN TRENT LABORATORIES, INC.

MARTI WARD
Project Manager

December 9, 2003

DEC

SEVERN TRENT STL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

December 9, 2003

STL LOT NUMBER: **F3L020261**
SDG: **W04215**

Joan Kessner
Bechtel Hanford, Inc.
3350 George Washington Way
MSIN HO-25
Richland, WA 99352

Dear Joan Kessner,

This report contains the analytical results for the sample received under chain of custody by Severn Trent Laboratories (STL) on December 2, 2003. This sample is associated with your B02-063 SAF.

All applicable quality control procedures met method-specified acceptance criteria.

This report shall not be reproduced except in full, without the written approval of the laboratory. This report is incomplete without the Case Narrative. Results are reported "as received" (i.e. wet weight) unless otherwise noted.

If you have any questions, please feel free to call me at (314) 298-8566.

Sincerely,

Marti Ward
Project Manager

cc: Project File

SAMPLE SUMMARY

F3L020261

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
F5VGT	001	J01576	11/25/03	08:15

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F3L020261

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

METALS

BECHTEL HANFORD, INC.

Client Sample ID: J01576

TOTAL Metals

Lot-Sample #...: F3L020261-001 Matrix.....: SOLID
Date Sampled...: 11/25/03 Date Received..: 12/02/03
% Moisture.....: 2.8

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 3337182						
Chromium	13.0 J	1.0	mg/kg	SW846 6010B	12/03-12/04/03	F5VGT1AD
		Dilution Factor: 1		MDL.....: 0.058		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F3L020261 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F3L030000-182 **Prep Batch #...:** 3337182						
Chromium	**0.14 B**	**1.0**	**mg/kg**	**SW846 6010B**	**12/03-12/04/03**	**F5WM71AA**
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F3L020261 **Matrix.....:** SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F3L030000-182 **Prep Batch #...:** 3337182							
Chromium	167	178	mg/kg	107	SW846 6010B	12/03-12/04/03	F5WM71AC

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F3L020261 **Matrix.....:** SOLID
Date Sampled...: 11/25/03 **Date Received..:** 12/02/03

MS Lot-Sample #: F3L020261-001 **Prep Batch #...:** 3337182
% Moisture.....: 2.8

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium									
	13.0	20.6	37.8	mg/kg	120		SW846 6010B	12/03-12/04/03	F5VGT1AE
_	13.0	20.6	35.7	mg/kg	110	5.6	SW846 6010B	12/03-12/04/03	F5VGT1AF

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

CUK#7706

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B02-063-026	Page 1 of 1
Collector: Fahlberg	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH	Price Code: 8B
Project Designation: 100 K Area - Full Protocol	Sampling Location: 116-K-1 ~~Shallow~~ Deep Zone WO 11/17/03		SAF No.: B02-063	Air Quality ☐
Ice Chest No.: ERC-96-072	Field Logbook No.: EL 1572-1	COA: R116K12600	Method of Shipment: Government Vehicle	
Shipped To: St. Louis Severn Trent Incorporated, ~~Richland~~	Offsite Property No.: A042061		Bill of Lading/Air Bill No.: SEE OSPC	

Date Turnaround: ~~21~~ 7 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive

< 2,000 pCi/gm

Special Handling and/or Storage

Cool 4c

W04215

SAMPLE ANALYSIS

Preservation				None	Cool 4C	None	None					
Type of Container				sG	sG	P	sG					
No. of Container(s)				1	1	1	1					
Volume				60mL	60mL	1000mL	60mL					
				See item (1) in Special Instructions.	Chromium Hex - 7196 DTS 12/1/03	See item (2) in Special Instructions. DTS 12/1/03	Strontium-89,90 - Total Sr, Nickel-63, Carbon-14 DTS 12/1/03					
Sample No.	Matrix *	Sample Date	Sample Time									
J01576	SOIL	11-25-03	0815	X	X	X	X		LOG			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
K Fahlberg / R Fahlberg	11-25-03 1330	IB 3728	11-25-03 1330
3728 Ref IB	12/01/03 0800	David St. John	12/01/03 0800
David St. John	12/01/03 0800	FED EX	

SPECIAL INSTRUCTIONS

RSP 11-19-03

(1) ICP Metals - 6010A (Superfund) (Arsenic, Chromium, Lead), Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

LABORATORY COPY

Matrix *: S=Soil, SE=Sediment, SD=Solid, SL=Sludge, W=Water, O=Oil, A=Air, OS=Other Solids, OL=Other Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By: KMCCaw	Title: Sample Control	Date/Time: 12/2/03 0900
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

SEVERN TRENT **STL**

Y

Lot No.: F3L020261
W04215

Condition Upon Receipt Form
St. Louis Laboratory

Client: Richland

Date: 12/2/03 Time: 0900

Quote No:

Initiated by: KM

Shipper/No: FedEx see below

COC/RFA Numbers: see below

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	(Y) N	Sample received in undamaged condition.	5.	(Y) N	Sample volume sufficient for analysis.
2.	(Y) N	Sample received within 4°C ± 2°C*	6.	(Y) N	Sample received with Chain of Custody
		Record temperature: 2°C, 4°C	7.	(Y) N	Chain of Custody matches sample IDs on containers
3.	(Y) N N/A	Sample received with proper pH**.	8.	(Y) N	Custody seal received intact and tamper evident on cooler
4.	(Y) N	Sample received in proper containers.	9.	(Y) N	Custody seal received intact and tamper evident on bottles

* Temperature Variance Does Not Affect the Following Analyses:

** For DOE-AL (Pantex, LANL, Sandia, Tinet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes:

Shipper #	COC#
7910 7755 1054	B02-063-026 ✓
7910 7771 0299	S04-011-17,19,21,27,29,31,33,185
	I04-006-21,23,28,29,36,44,48,49,52,56,60

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is".
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: KMclaw Date: 12/2/03

Project Management Review: MWard Date: 12/4/03

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM