



Analytical Data Package Prepared For  
**Washington Closure Hanford**



Radiochemical Analysis By

**STL Richland**

*2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.*

Assigned Laboratory Code: STLRL

Data Package Contains 21 Pages

Report No.: 31215

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
J00054	RC-048	J111W7	J6A240186-4	HV6GD1AA	9HV6GD10	6024364
		J111X2	J6A240186-1	HV6F81AA	9HV6F810	6024364
		J111Y1	J6A240186-2	HV6F91AA	9HV6F910	6024364
		J111Y2	J6A240186-3	HV6GC1AA	9HV6GC10	6024364

# Certificate of Analysis

Washington Closure Hanford  
3190 George Washington Way  
Richland, WA 99354

January 31, 2005

Attention: Joan Kessner

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SAF Number : RC-048  
Date SDG Closed : January 23, 2006  
Number of Samples : Four (4)  
Sample Type : Water  
SDG Number : J00054  
Data Deliverable : 45-Day / Summary

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## CASE NARRATIVE

### I. Introduction

On January 23, 2006, four water samples were received at STL Richland (STLR) for chemistry analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

<u>WCH ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
J111X2	HV6F8	WATER	01/23/06
J111Y1	HV6F9	WATER	01/23/06
J111Y2	HV6GC	WATER	01/23/06
J111W7	HV6GD	WATER	01/23/06

### II. Sample Receipt

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

### III. Analytical Results/Methodology

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

Washington Closure Hanford  
January 31, 2006

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**Chemical Analysis**  
Hexavalent Chromium by EPA method 7196A

**IV. Quality Control**

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

QC and sample results are reported in the same units.

**V. Comments**

**Chemical Analysis**

Hexavalent Chromium by EPA method 7196A:

The sample J111Y2 was not analyzed with in hold time due to a late delivery to the lab. The sample hold time was missed by 26 minutes. The LCS, batch blank, sample, sample matrix spike (J111X2), matrix spike duplicate (J111X2) and sample duplicate (J111X2) results are within contractual requirements.

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

Reviewed and approved:



Hans Carman  
Project Manager

### Drinking Water Method Cross References

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

### Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship,  $R = \text{constants} * f(x,y,z,\dots)$ . 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) <math>u_c</math> - Combined Uncertainty.</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, $u_c$ the combined uncertainty. 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 4321C 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/TotUcert</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: 27-Jan-06

**STL Richland STLRL**

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

Report No. : 31215

SDG No: J00054

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
6024364	7196_CR6								
	J111W7								
	HV6GD1AA	HEXCHROME	2.00E-03 +/- 0.0E+00	U	mg/L	N/A	2.00E-03	2.00E-03	
	J111X2								
	HV6F81AA	HEXCHROME	2.00E-03 +/- 0.0E+00	U	mg/L	N/A	2.00E-03	2.00E-03	
	HV6F81AE	HEXCHROME	2.00E-03 +/- 0.0E+00	U	mg/L	N/A	2.00E-03	2.00E-03	0.0
	J111Y1								
	HV6F91AA	HEXCHROME	2.00E-03 +/- 0.0E+00	U	mg/L	N/A	2.00E-03	2.00E-03	
	J111Y2								
	HV6GC1AA	HEXCHROME	2.00E-03 +/- 0.0E+00	U	mg/L	N/A	2.00E-03	2.00E-03	

No. of Results: 5

STL Richland

RPD - Relative Percent Difference.

rptSTLRchSaSummary2 V4.14.4 A97

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

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

Date: 27-Jan-06

Report No. : 31215

SDG No.: J00054

Batch	Work Order	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
7196_CR6									
6024364	MATRIX SPIKE								
	HV6F81AC	HEXCHROME	5.52E-01 +- 0.0E+00		mg/L	N/A	105%	0.0	2.00E-03
	HV6F81AD	HEXCHROME	5.57E-01 +- 0.0E+00		mg/L	N/A	106%	0.1	2.00E-03
6024364	LCS								
	HV61K1AC	HEXCHROME	5.30E-01 +- 0.0E+00		mg/L	N/A	106%	0.1	2.00E-03
6024364	BLANK QC								
	HV61K1AA	HEXCHROME	2.00E-03 +- 0.0E+00	U	mg/L	N/A			2.00E-03
<b>No. of Results: 4</b>									

STL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 rptSTLRchQcSummary V4.14.4 A97 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

**FORM I**  
**SAMPLE RESULTS**

Date: 27-Jan-06

Lab Name: STL Richland

SDG: J00054

Collection Date: 1/23/2006 2:30:00 PM

Lot-Sample No.: J6A240186-4

Report No.: 31215

Received Date: 1/23/2006 10:00:00 AM

Client Sample ID: J111W7

COC No.: RC-048-202

Matrix: WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6024364	7196_CR6				Work Order: HV6GD1AA		Report DB ID: 9HV6GD10					
HEXCHROME	2.00E-03	U		0.0E+00	2.00E-03	mg/L	N/A	1.	1/24/06		100.0	
							2.00E-03	N/A			ML	

No. of Results: 1

Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 27-Jan-06

Lab Name: STL Richland

SDG: J00054

Collection Date: 1/23/2006 12:45:00 PM

Lot-Sample No.: J6A240186-1

Report No.: 31215

Received Date: 1/23/2006 10:00:00 AM

Client Sample ID: J111X2

COC No.: RC-048-203

Matrix: WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6024364	7196_CR6				Work Order: HV6F81AA		Report DB ID: 9HV6F810					
HEXCHROME	2.00E-03	U		0.0E+00	2.00E-03	mg/L	N/A	1.	1/24/06		100.0	
							2.00E-03	N/A			ML	

No. of Results: 1

Comments:

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 not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.  
 V4.14.4 A97

**FORM I**  
**SAMPLE RESULTS**

Date: 27-Jan-06

Lab Name: STL Richland  
Lot-Sample No.: J6A240186-2  
Client Sample ID: J111Y1

SDG: J00054  
Report No.: 31215  
COC No.: RC-048-214

Collection Date: 1/23/2006 2:00:00 PM  
Received Date: 1/23/2006 10:00:00 AM  
Matrix: WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6024364	7196_CR6				Work Order: HV6F91AA		Report DB ID: 9HV6F910					
HEXCHROME	<b>2.00E-03</b>	U		0.0E+00	2.00E-03	mg/L	N/A	1.	1/24/06		100.0	
							2.00E-03	N/A			ML	

No. of Results: 1      Comments:

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 not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.  
V4.14.4 A97

## FORM I

Date: 27-Jan-06

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: J00054

Collection Date: 1/23/2006 12:00:00 PM

Lot-Sample No.: J6A240186-3

Report No.: 31215

Received Date: 1/23/2006 10:00:00 AM

Client Sample ID: J111Y2

COC No.: RC-048-215

Matrix: WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6024364	7196_CR6				Work Order: HV6GC1AA		Report DB ID: 9HV6GC10					
HEXCHROME	2.00E-03	U		0.0E+00	2.00E-03	mg/L	N/A	1.	1/24/06		100.0	
							2.00E-03	N/A			ML	

No. of Results: 1

Comments:

## FORM II

Date: 27-Jan-06

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: J00054

Collection Date: 1/23/2006 12:45:00 PM

Lot-Sample No.: J6A240186-1

Report No. : 31215

Received Date: 1/23/2006 10:00:00 AM

Client Sample ID: J111X2

COC No. : RC-048-203

Matrix: WATER

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	Aliquot Size	Primary Detector
Batch: 6024364	7196_CR6				Work Order: HV6F81AE			Report DB ID: HV6F81ER		Orig Sa DB ID: 9HV6F810		
HEXCHROME	2.00E-03	U		0.0E+00	2.00E-03	mg/L	N/A	1.	1/24/06		50.0	
	2.00E-03	U		RPD 0.0		2.00E-03		N/A			ML	

No. of Results: 1    Comments:

STL Richland

RPD - Relative Percent Difference.

rptSTLRchDupV4.1  
4.4 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 not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II  
BLANK RESULTS

Date: 27-Jan-06

Lab Name: STL Richland

SDG: J00054

Matrix: WATER

Report No. : 31215

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6024364	7196_CR6				Work Order: HV61K1AA		Report DB ID: HV61K1AB					
HEXCHROME	2.00E-03	U		0.0E+00	2.00E-03	mg/L	N/A	1.	1/24/06		100.0	
						2.00E-03		N/A			ML	
No. of Results:	1	Comments:										

FORM II  
LCS RESULTS

Date: 27-Jan-06

Lab Name: STL Richland

SDG: J00054

Matrix: WATER

Report No. : 31215

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
Batch: 6024364	7196_CR6			Work Order: HV61K1AC		Report DB ID: HV61K1AS							
HEXCHROME	5.30E-01			0.0E+00	2.00E-03	mg/L	N/A	5.00E-01		106%	1/24/06	100.0	
							Rec Limits:	85	115	0.1		ML	
No. of Results:	1	Comments:											

STL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
rptSTLRchLcs  
V4.14.4 A97

## FORM II

Date: 27-Jan-06

## MATRIX SPIKE RESULTS

Lab Name: STL Richland

SDG: J00054

Lot-Sample No.: J6A240186-1

Report No.: 31215

Matrix: WATER

Parameter	SpikeResult, Orig Rst	Count Qual Error ( 2 s)	Total Uncert( 2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rec- overy	Exp- ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6024364	Work Order: HV6F81AC	Report DB ID: HV6F81CW	Orig Sa DB ID: 9HV6F810									
HEXCHROME	5.52E-01 2.00E-03	0.0E+00	2.00E-03	mg/L	N/A	104.94%	5.26E-01	1/24/06	50.0 ML	7196_CR6		
Batch: 6024364	Work Order: HV6F81AD	Report DB ID: HV6F81DW	Orig Sa DB ID: HV6F81CW									
HEXCHROME	5.57E-01 5.52E-01	0.0E+00	2.00E-03	mg/L	N/A	105.89%	5.26E-01	1/24/06	50.0 ML	7196_CR6		

Number of Results: 2

Comments:

STL Richland RER - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.  
 rptSTLRchMs Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 V4.14.4 A97

## FORM II

Date: 27-Jan-06

## MATRIX SPIKE DUPLICATE RESULTS

Lab Name: STL Richland

SDG: J00054

Lot-Sample No.: J6A240186-1

Report No. : 31215

Matrix: WATER

Parameter	SpikeResult, Orig Rst	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: 6024364	7196_CR6			Work Order: HV6F81AC		Report DB ID: HV6F81CW		Orig Sa DB ID: HV6F81DW					
HEXCHROME	5.52E-01			0.0E+00	2.00E-03	mg/L	N/A	104.94%	5.26E-01		1/24/06	50.0	
	5.57E-01	<b>RPD</b>	0.9									ML	
Batch: 6024364	7196_CR6			Work Order: HV6F81AD		Report DB ID: HV6F81DW		Orig Sa DB ID: HV6F81CW					
HEXCHROME	5.57E-01			0.0E+00	2.00E-03	mg/L	N/A	105.89%	5.26E-01		1/24/06	50.0	
	5.52E-01	<b>RPD</b>	0.9									ML	
No. of Results: 2	Comments:												

STL Richland RER - Replicate Error Ratio =  $(S-D)/[\text{sqrt}(\text{sq}(\text{TPUs})+\text{sq}(\text{TPUd}))]$  as defined by ICPT BOA.  
 rptSTLRchMsDup2 Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 V4.14.4 A97

Work Order Number(s): HV6F8, HV6F9, HV6CC, HV6GD				
Lab Sample Numbers or SDG:				
Method/Test/Parameter: Cr+6 in Water / RICH-WC-5003, Rev 7				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>A. Initial Calibration</b>	✓			✓
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>B. Continuing Calibration</b>	✓			✓
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			✓
<b>C. Sample Analysis</b>	✓			✓
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?	✓			✓
2. Were all sample holding times met?		✓		✓
<b>D. QC Samples</b>	✓			✓
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 (✓)	2 <sup>nd</sup> Level Review (✓)
<b>E. Other</b>			✓	
1. Are all nonconformances included and noted?				✓
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:

Holding time was missed for sample HV6GC due to late delivery by client. See NCM

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Analyst: Steven E. Michael

Date: 1/24/06

Second-Level Review: [Signature]

Date: ~~1-31-06~~ HV6  
1-31-06

# Clouseau Nonconformance Memo

**SEVERN**  
**TRENT**  
SERVICES

NCM #: <b>10-07418</b> NCM Initiated By: Steven Wheland Date Opened: 01/24/2006 Date Closed:	Classification: <b>Deficiency</b> Status: <b>GLREVIEW</b> Production Area: <b>Classical Chemistry</b> Tests: <b>7196A</b> Lot #'s (Sample #'s): <b>J6A240186 (3),</b> QC Batches: <b>6024364</b>
Nonconformance: Holding time violation Subcategory: Other (explanation required)	

**Problem Description / Root Cause**

<u>Name</u>	<u>Date</u>	<u>Description</u>
Steven Wheland	01/24/2006	Sample was delivered to lab too late to meet holding time. It was completed 26 minutes after the sampling time. Requirement is that the sample be analyzed within 24 hours. This was 24 hours 26 minutes.

**Corrective Action**

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Steven Wheland	01/24/2006	report data

**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>

BHI 27023

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-048-203		Page 1 of 1		
Collector TILLER, B <i>Bernhard</i>		Company Contact JOAN KESSNER		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code <b>7N</b> Data Turnaround		
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa		Sampling Location REF-13, PORE WATER		SAF No. RC-048		Air Quality <input type="checkbox"/>		<b>45 Days</b>		
Ice Chest No.		Field Logbook No. EL-1597		COA BESRAS6520		Method of Shipment GROUND TRANSPORT				
Shipped To Severn Trent Incorporated, Richland		Offsite Property No.		Bill of Lading/Air Bill No. SEE OSPC						
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> POTENTIAL RADIOACTIVE < DOT LIMITS  Special Handling and/or Storage COOL 4C <i>J60054</i> <i>J6A290186</i> <i>Due 03 10 06</i>				Preservation Cool 4C  Type of Container G/P  No. of Container(s) 1  Volume 250mL						
<b>SAMPLE ANALYSIS</b>				Chromium Hex - 7196						
Sample No.	Matrix *	Sample Date	Sample Time							
J111X2	<i>HV6 F8</i>	<i>1-23-06</i>	<i>1245</i>	<i>X</i>						
<b>CHAIN OF POSSESSION</b>				<b>Sign/Print Names</b>				<b>SPECIAL INSTRUCTIONS</b>		<b>Matrix *</b>
Relinquished By/Removed From <i>James E. Bernhard</i>		Date/Time <i>1-23-06</i>		Received By/Stored In <i>EAS</i>		Date/Time <i>1-23-06</i>		<i>9.5"u</i>		S=Soil SE=Sediment SO=Solid SL=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wb=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From <i>EAS</i>		Date/Time <i>1-24-06 1000</i>		Received By/Stored In <i>Jeff Jensen</i>		Date/Time <i>012406 1000</i>				
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		

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-048-214		Page 1 of 1	
Collector TILLER, B <i>Burnard</i>				Company Contact JOAN KESSNER		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code <b>7N</b>		Data Turnaround <b>45 Days</b>	
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa				Sampling Location REF-12, SURFACE WATER		SAF No. RC-048		Air Quality <input type="checkbox"/>					
Ice Chest No.				Field Logbook No. EL-1597		COA BESRAS6520		Method of Shipment GROUND TRANSPORT					
Shipped To Severn Trent Incorporated, Richland				Offsite Property No.		Bill of Lading/Air Bill No. SEE OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS POTENTIAL RADIOACTIVE < DOT LIMITS  Special Handling and/or Storage <i>50054</i> COOL4C				Preservation		Cool 4C							
				Type of Container		G/P							
				No. of Container(s)		1							
				Volume		250mL							
SAMPLE ANALYSIS				Chromium Hex - 7196									
Sample No.	Matrix *	Sample Date	Sample Time										
J111Y1	HV6F9	1-23-06	1400	X									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From <i>James E. Baskel</i>		Date/Time 1-23-06		Received By/Stored In <i>EAS Locked Storage</i>		Date/Time 1-23-06		60°C				S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wt=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From <i>EAS LOCKED STORAGE</i>		Date/Time 1-24-06		Received By/Stored In <i>Jeff Jensen</i>		Date/Time 012906 1000							
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							
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						

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-048-215		Page 1 of 1				
Collector TILLER, B <i>Berhard</i>				Company Contact IOAN KESSNER		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code <b>7N</b>		Data Turnaround <b>45 Days</b>			
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa				Sampling Location REF-13 SURFACE WATER			SAF No. RC-048		Air Quality <input type="checkbox"/>						
Ice Chest No.				Field Logbook No. EL-1597		COA BESRAS6520		Method of Shipment GROUND TRANSPORT							
Shipped To Severn Trent Incorporated, Richland				Offsite Property No.			Bill of Lading/Air Bill No. SEE OSPC								
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> POTENTIAL RADIOACTIVE < DOT LIMITS  Special Handling and/or Storage <i>J0005A</i> COOL AC				Preservation		Cool 4C									
				Type of Container		G/P									
				No. of Container(s)		1									
				Volume		250mL									
<b>SAMPLE ANALYSIS</b>				Chromium Hex - 7196											
Sample No.	Matrix *	Sample Date	Sample Time												
J111Y2	<i>HV6GC</i>	1-23-06	1200	X											
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		6.0 cc  Matrix * S=Soil SB=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other							
<i>James E. Beaulieu</i>		1-23-06		<i>EAS Locked Storage</i>		1-23-06									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
<i>EAS Locked Storage</i>		1-23-06/1000		<i>Jeff Jensen</i>		012306 1000									
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									
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							

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-048-202	Page 1 of 1
Collector TILLER, B <i>Bearhead</i>		Company Contact JOAN KESSNER		Telephone No. 375-4688		Project Coordinator KESSNER, JH	
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa		Sampling Location REF-12, PORE WATER		SAF No. RC-048		Price Code <b>7N</b> Data Turnaround <b>45 Days</b>	
Ice Chest No.		Field Logbook No. EL-1597		COA BESRAS6520		Method of Shipment GROUND TRANSPORT	
Shipped To Severn Trent Incorporated, Richland		Offsite Property No.		Bill of Lading/Air Bill No. SEE OSPC			
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> POTENTIAL RADIOACTIVE < DOT LIMITS  Special Handling and/or Storage <i>5000SA</i> COOLAC		Preservation Cool AC  Type of Container G/P  No. of Container(s) 1  Volume 250mL		Chromium Hex - 7196			
<b>SAMPLE ANALYSIS</b>							
Sample No.	Matrix *	Sample Date	Sample Time				
J111W7	<i>HY6GD</i>	<i>1-23-06</i>	<i>1430</i>	<i>X</i>			
<b>CHAIN OF POSSESSION</b>				<b>SPECIAL INSTRUCTIONS</b>			
Relinquished By/Removed From <i>James E. Bearhead</i>		Date/Time <i>1-23-06 1700</i>		Received By/Stored In <i>AS Locked Storage</i>		Date/Time <i>1-23-06</i>	
Relinquished By/Removed From <i>EAS LOW MED STORAGE</i>		Date/Time <i>01-24-06 1000</i>		Received By/Stored In <i>Jeff Jensen</i>		Date/Time <i>01-24-06 1000</i>	
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	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time	
<b>LABORATORY SECTION</b>		Received By		Title		Date/Time	
<b>FINAL SAMPLE DISPOSITION</b>		Disposal Method		Disposed By		Date/Time	

**Sample Check-in List**

Date/Time Received: 01 29 06 1000

Client: BHS SDG #: J00059 NA  SAF #: RC-048 NA

Work Order Number: JGA290116 Chain of Custody # RC-048 - 203, 214, 215, 202

Shipping Container ID: NA Air Bill # \_\_\_\_\_

1. Custody Seals on shipping container intact? NA  Yes  No
2. Custody Seals dated and signed? NA  Yes  No
3. Chain of Custody record present? Yes  No
4. Cooler temperature: 4.5 - 6.0 NA  5. Vermiculite/packing materials is NA  Wet  Dry
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? NA  Yes  No
8. Samples have:
  - \_\_\_\_\_ tape \_\_\_\_\_ hazard labels
  - custody seals  appropriate samples labels
9. Samples are:
  - in good condition \_\_\_\_\_ leaking
  - \_\_\_\_\_ broken \_\_\_\_\_ have air bubbles
 (Only for samples requiring head space)
10. Sample pH taken? NA  pH<2  pH>2  adjusted pH
11. Sample Location, Sample Collector Listed? \* Yes  No   
\*For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes  No
13. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian: JMA Date: 01 29 06

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

1/24/2006 1:26:05 PM

**Sample Preparation/Analysis**

Balance Id: \_\_\_\_\_

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION

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

EA Chromium, Hexavalent (7196A)

SI CLIENT: HANFORD

Sep1 DT/Tm Tech: \_\_\_\_\_

Report Due: 03/10/2006

Sep2 DT/Tm Tech: \_\_\_\_\_

Batch: 6024364

mg/L

Prep Tech: \_\_\_\_\_

SEQ Batch, Test: None

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
<b>8 HV61K-1-AA-B</b>								
J6A240000-364-BLK								
								
01/23/2006 12:45		AmtRec:	#Containers: 1			Scr:	Alpha:	Beta:
<b>9 HV61K-1-AC-C</b>								
J6A240000-364-LCS								
								
01/23/2006 12:45		AmtRec:	#Containers: 1			Scr:	Alpha:	Beta:

**Comments:**

All Clients for Batch:  
 127642, Bechtel Hanford, Inc.                      Bechtel Hanford, Inc.                      , HC , 27023

<b>HV6F81AA-SAMP Constituent List:</b>					
HEXCHROME	RDL:0.002	mg/L	LCL:85	UCL:115	RPD:20
<b>HV6F81AC-MS Constituent List:</b>					
HEXCHROME	RDL:0.002	mg/L	LCL:85	UCL:115	RPD:20
<b>HV6F81AD-MSD:</b>					
HEXCHROME	RDL:0.002	mg/L	LCL:85	UCL:115	RPD:20
<b>HV61K1AA-BLK:</b>					
HEXCHROME	RDL:0.002	mg/L	LCL:	UCL:	RPD:
<b>HV61K1AC-LCS:</b>					
HEXCHROME	RDL:0.002	mg/L	LCL:85	UCL:115	RPD:20
<b>HV6F81AA-SAMP Calc Info:</b>					
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N    Sci.Not.: Y    ODRs: B
<b>HV6F81AC-MS Calc Info:</b>					
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N    Sci.Not.: Y    ODRs: B
<b>HV6F81AD-MSD:</b>					
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N    Sci.Not.: Y    ODRs: B
<b>HV61K1AA-BLK:</b>					
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N    Sci.Not.: Y    ODRs: B
<b>HV61K1AC-LCS:</b>					
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.:	N    Sci.Not.: Y    ODRs: B

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