

0073610

SAF-RC-092
100-BC Groundwater
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Jeanette Duncan H4-21

KW 8/6/07
Initials/Date

COMMENTS:

SDG J00118

SAF-RC-092

Rad only

Chem only

Rad & Chem

Complete

Partial

Waste Site: 100-C-7 boreholes

RECEIVED
AUG 09 2007
EDMC

Analytical Data Package Prepared For
Washington Closure Hanford



Radiochemical Analysis By

TAL Richland

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

Assigned Laboratory Code: STLRL

Data Package Contains 42 Pages

Report No.: 36231

| SDG No. | Order No. | Client Sample ID (List Order) | Lot-Sa No. | Work Order | Report DB ID | Batch No. |
|---------|-----------|-------------------------------|--------------|------------|--------------|-----------|
| J00118 | RC-092 | J15DY2 | J7G260357-1 | J3M351AA | 9J3M3510 | 7211438 |
| | | J15DY3 | J7G260357-2 | J3M361AA | 9J3M3610 | 7211438 |
| | | J15DY3-A | J7G260357-11 | J3T8D1AA | 9J3T8D10 | 7211440 |
| | | J15DY4 | J7G260357-3 | J3M381AA | 9J3M3810 | 7211438 |
| | | J15DY5 | J7G260357-4 | J3M391AA | 9J3M3910 | 7211438 |
| | | J15DY5-A | J7G260357-12 | J3T78JAA | 9J3T78J10 | 7211440 |
| | | J15DY6 | J7G260357-5 | J3M4A1AA | 9J3M4A10 | 7211438 |
| | | J15DY7 | J7G260357-6 | J3M321AA | 9J3M3210 | 7211438 |
| | | J15DY7-A | J7G260357-9 | J3T781AA | 9J3T7810 | 7211440 |
| | | J15DY8 | J7G260357-7 | J3M331AA | 9J3M3310 | 7211438 |
| | | J15DY9 | J7G260357-8 | J3M341AA | 9J3M3410 | 7211438 |
| | | J15DY9-A | J7G260357-10 | J3T78CAA | 9J3T78C10 | 7211440 |

STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
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Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

August 2, 2007

Attention: Joan Kessner

SAF Number : RC-092
Date SDG Closed : July 26, 2007
Number of Samples : Eight (8)
Sample Type : Water
SDG Number : J00118
Data Deliverable : 7 -Day / Summary

CASE NARRATIVE

I. Introduction

On July 26, 2007, eight 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> |
|----------------|-----------------|---------------|------------------------|
| J15DY2 | J3M35 | WATER | 7/26/07 |
| J15DY3 | J3M36 | WATER | 7/26/07 |
| J15DY4 | J3M38 | WATER | 7/26/07 |
| J15DY5 | J3M39 | WATER | 7/26/07 |
| J15DY6 | J3M4A | WATER | 7/26/07 |
| J15DY7 | J3M32 | WATER | 7/26/07 |
| J15DY8 | J3M33 | WATER | 7/26/07 |
| J15DY9 | J3M34 | WATER | 7/26/07 |

II. Sample Receipt

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

Washington Closure Hanford
August 2, 2007

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:

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:

Hexavalent Chromium Batch 7211438

The client instructed Test America Richland to filter samples J15DY2, J15DY4, J15DY6 and J15DY8. The client provided the filters. Only the filtrate was analyzed for samples J15DY2, J15DY4, J15DY6 and J15DY8.

The client instructed Test America Richland to allow the particulates in samples J15DY3, J15DY5, J15DY7 and J15DY9 to settle and the liquid was to be decanted. The decants for samples J15DY3, J15DY5, J15DY7 and J15DY9 were to be analyzed as water. The sediment was to be analyzed as *other solids*, see hexavalent chromium batch 7211440.

Except as noted, the LCS, batch blank, sample, sample duplicate (J15DY2), matrix spike (J15DY2) and matrix spike duplicate (J15DY2) results are within contractual requirements.

Hexavalent Chromium Batch 7211438

The sediment from samples J15DY3, J15DY5, J15DY7 and J15DY9 were analyzed as other solids. The client instructed Test America Richland to add a -A to the client IDs. The client IDs for the other solid samples are as follows: J15DY3-A, J15DY5-A, J15DY7-A and J15DY9-A.

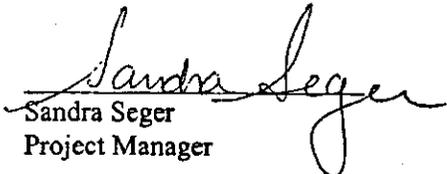
The insoluble matrix spike recovered at 14%, the regular matrix spike recovered at 79% with a PDMS of 94%. The cause is uncertain. The color of the insoluble matrix spike digestate was significantly lighter than normal and this is reflected in the yield. No reanalysis is possible.

Except as noted, the LCS, batch blank, sample, sample duplicate (J15DY9), matrix spike and matrix spike duplicate (J15DY9) results are within contractual requirements.

Washington Closure Hanford
August 2, 2007

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

Reviewed and approved:


Sandra Seger
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.

Sample Results Summary

Date: 06-Aug-07

TAL Richland STLRL

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

Report No. : 36231

SDG No: J00118

| Batch | Client Id Work Order | Parameter | Result +- Uncertainty (2s) | Qual | Units | Tracer Yield | MDC or MDA | CRDL | RPD |
|--------------------|-------------------------|-----------|-----------------------------|------|-------|-----------------|---------------|----------|-----|
| 7211438 | 7196_CR6 | | | | | | | | |
| | J15DY2 | | | | | | | | |
| | J3M351AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| | J15DY2 DUP | | | | | | | | |
| | J3M351AE | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | 0.0 |
| | J15DY3 | | | | | | | | |
| | J3M361AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| | J15DY4 | | | | | | | | |
| | J3M381AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| | J15DY5 | | | | | | | | |
| | J3M391AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| | J15DY6 | | | | | | | | |
| | J3M4A1AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| | J15DY7 | | | | | | | | |
| | J3M321AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| | J15DY8 | | | | | | | | |
| | J3M331AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| | J15DY9 | | | | | | | | |
| | J3M341AA | HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | 2.00E-03 | 2.00E-03 | |
| 7211440 | 7196_CR6 | | | | | | | | |
| | J15DY3-A | | | | | | | | |
| | J3T8D1AA | HEXCHROME | 3.50E-01 +- 0.00E+00 | U | mg/kg | N/A | 3.50E-01 | 2.00E-03 | |
| | J15DY5-A | | | | | | | | |
| | J3T78JAA | HEXCHROME | 2.20E+00 +- 0.00E+00 | | mg/kg | N/A | 3.50E-01 | | |
| | J15DY7-A | | | | | | | | |
| | J3T781AA | HEXCHROME | 3.50E-01 +- 0.00E+00 | U | mg/kg | N/A | 3.50E-01 | 2.00E-03 | |
| | J15DY9-A | | | | | | | | |
| | J3T78CAA | HEXCHROME | 3.50E-01 +- 0.00E+00 | U | mg/kg | N/A | 3.50E-01 | | |
| | J15DY9-A DUP | | | | | | | | |
| | J3T8C1AE | HEXCHROME | 5.67E-01 +- 0.00E+00 | | mg/kg | N/A | 3.50E-01 | 2.00E-03 | |
| No. of Results: 14 | | | | | | | | | |

TAL Richland
rptSTLRchSaSum
mary2 V5.1.3
A2002

RPD - Relative Percent Difference.

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

Date: 06-Aug-07

TAL Richland STLRL

Ordered by Method, Batch No, QC Type..

Report No. : 36231

SDG No.: J00118

| Batch | Work Order | Parameter | Result +- Uncertainty (2s) | Qual | Units | Tracer Yield | LCS Recovery | Bias | MDC MDA |
|----------|---------------------------|--------------------|-----------------------------|------|-------|--------------|--------------|------|----------|
| 7196_CR8 | | | | | | | | | |
| 7211438 | MATRIX SPIKE, J15DY2 MS | J3M351AC HEXCHROME | 2.73E-01 +- 0.00E+00 | | mg/L | N/A | 104% | 0.0 | 2.00E-03 |
| 7211438 | MATRIX SPIKE, J15DY2 MSD | J3M351AD HEXCHROME | 2.73E-01 +- 0.00E+00 | | mg/L | N/A | 104% | 0.0 | 2.00E-03 |
| 7211438 | LCS, | J3VRA1AC HEXCHROME | 5.14E-01 +- 0.00E+00 | | mg/L | N/A | 103% | 0.0 | 2.00E-03 |
| 7211438 | BLANK QC, | J3VRA1AA HEXCHROME | 2.00E-03 +- 0.00E+00 | U | mg/L | N/A | | | 2.00E-03 |
| 7196_CR6 | | | | | | | | | |
| 7211440 | MATRIX SPIKE, J15DY9-A MS | J3T8C1AC HEXCHROME | 1.33E+01 +- 0.00E+00 | | mg/kg | N/A | 80% | -0.2 | 3.50E-01 |
| 7211440 | LCS, | J3VRP1AC HEXCHROME | 1.84E+01 +- 0.00E+00 | | mg/kg | N/A | 92% | -0.1 | 3.50E-01 |
| 7211440 | BLANK QC, | J3VRP1AA HEXCHROME | 3.50E-01 +- 0.00E+00 | U | mg/kg | N/A | | | 3.50E-01 |

No. of Results: 7

TAL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRchQcSummary V5.1.3 A2002 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

Date: 06-Aug-07

SAMPLE RESULTS

Lab Name: TA Richland

SDG: J00118

Collection Date: 7/26/2007 8:38:00 AM

Lot-Sample No.: J7G260357-1

Report No.: 36231

Received Date: 7/29/2007 3:15:00 PM

Client Sample ID: J15DY2

COC No.: RC-092-006

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: 7211438 | 7196_CR6 | | | | Work Order: J3M351AA | | Report DB ID: 9J3M3510 | | | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1

Comments:

FORM I
SAMPLE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland
Lot-Sample No.: J7G260357-2
Client Sample ID: J15DY3

SDG: J00118
Report No.: 36231
COC No.: RC-092-006

Collection Date: 7/26/2007 8:38:00 AM
Received Date: 7/29/2007 3:15:00 PM
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: 7211438 | 7196_CR6 | | | | Work Order: J3M361AA | | Report DB ID: 9J3M3610 | | | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1 Comments:

FORM I
SAMPLE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland
Lot-Sample No.: J7G260357-11
Client Sample ID: J15DY3-A

SDG: J00118
Report No.: 36231
COC No.: RC-092-006

Collection Date: 7/26/2007 8:38:00 AM
Received Date: 7/29/2007 3:15:00 PM
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 |
|----------------|----------|------------|--------------------|--------------------|----------------------|--------------|------------------------|-----------------------|---------------------|---------------|--------------|------------------|
| Batch: 7211440 | 7196_CR6 | | | | Work Order: J3T8D1AA | | Report DB ID: 9J3T8D10 | | | | | |
| HEXCHROME | 3.50E-01 | U | | 0.0E+00 | 3.50E-01 | mg/kg | N/A | (1.) | 7/27/07 | | 2.6 | |
| | | | | | | | 2.00E-03 | N/A | | | G | |

No. of Results: 1 Comments:

FORM I

Date: 06-Aug-07

SAMPLE RESULTS

Lab Name: TA Richland

SDG: J00118

Collection Date: 7/26/2007 9:35:00 AM

Lot-Sample No.: J7G260357-3

Report No.: 36231

Received Date: 7/29/2007 3:15:00 PM

Client Sample ID: J15DY4

COC No.: RC-092-006

Matrix: WATER

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 |
|----------------|-----------------|---------------|-----------------------|-----------------------|------------------------|-----------------|------------------------|--------------------------|------------------------|------------------|-----------------|---------------------|
| Batch: 7211438 | 7196_CR6 | | | Work Order: J3M381AA | | | Report DB ID: 9J3M3810 | | | | | |
| HEXCHROME | 2.00E-03 | | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1 Comments:

FORM I

Date: 06-Aug-07

SAMPLE RESULTS

Lab Name: TA Richland

SDG: J00118

Collection Date: 7/26/2007 9:35:00 AM

Lot-Sample No.: J7G260357-4

Report No.: 36231

Received Date: 7/29/2007 3:15:00 PM

Client Sample ID: J15DY5

COC No.: RC-092-006

Matrix: WATER

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 |
|----------------|----------|---------------|-----------------------|-----------------------|------------------------|-----------------|------------------------|--------------------------|------------------------|------------------|-----------------|---------------------|
| Batch: 7211438 | 7196_CR6 | | | | Work Order: J3M391AA | | Report DB ID: 9J3M3910 | | | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1

Comments:

FORM I
SAMPLE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland
Lot-Sample No.: J7G260357-12
Client Sample ID: J15DY5-A

SDG: J00118
Report No.: 36231
COC No.: RC-092-006

Collection Date: 7/26/2007 9:35:00 AM
Received Date: 7/29/2007 3:15:00 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/TotUncert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|----------|------|--------------------|--------------------|----------------------|--------------|------------------------|------------------------|---------------------|---------------|--------------|------------------|
| Batch: 7211440 | 7196_CR6 | | | | Work Order: J3T78JAA | | Report DB ID: 9J3T8J10 | | | | | |
| HEXCHROME | 2.20E+00 | | | 0.0E+00 | 3.50E-01 | mg/kg | N/A | (6.3) | 7/27/07 | | 0.8 | |
| | | | | | | | | N/A | | | G | |

No. of Results: 1 Comments:

FORM I
SAMPLE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland
Lot-Sample No.: J7G260357-5
Client Sample ID: J15DY6

SDG: J00118
Report No.: 36231
COC No.: RC-092-006

Collection Date: 7/26/2007 12:20:00 PM
Received Date: 7/29/2007 3:15:00 PM
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: 7211438 | 7196_CR6 | | | | Work Order: J3M4A1AA | | Report DB ID: 9J3M4A10 | | | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1 Comments:

FORM I
SAMPLE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland
Lot-Sample No.: J7G260357-6
Client Sample ID: J15DY7

SDG: J00118
Report No. : 36231
COC No. : RC-092-006

Collection Date: 7/26/2007 12:20:00 PM
Received Date: 7/29/2007 3:15:00 PM
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/TotUncert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|----------|------|--------------------|--------------------|----------------------|--------------|----------------|------------------------|---------------------|---------------|--------------|------------------|
| Batch: 7211438 | 7196_CR6 | | | | Work Order: J3M321AA | | | Report DB ID: 9J3M3210 | | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1 Comments:

FORM I

Date: 06-Aug-07

SAMPLE RESULTS

Lab Name: TA Richland

SDG: J00118

Collection Date: 7/26/2007 12:20:00 PM

Lot-Sample No.: J7G260357-9

Report No.: 36231

Received Date: 7/29/2007 3:15:00 PM

Client Sample ID: J15DY7-A

COC No.: RC-092-006

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 |
|----------------|----------|---------------|-----------------------|-----------------------|------------------------|-----------------|------------------------|--------------------------|------------------------|------------------|-----------------|---------------------|
| Batch: 7211440 | 7196_CR6 | | | Work Order: J3T781AA | | | Report DB ID: 9J3T7810 | | | | | |
| HEXCHROME | 3.50E-01 | U | | 0.0E+00 | 3.50E-01 | mg/kg | N/A | (1.) | 7/27/07 | | 2.5 | |
| | | | | | | | 2.00E-03 | N/A | | | G | |

No. of Results: 1

Comments:

FORM I
SAMPLE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland
Lot-Sample No.: J7G260357-7
Client Sample ID: J15DY8

SDG: J00118
Report No. : 36231
COC No. : RC-092-006

Collection Date: 7/26/2007 1:50:00 PM
Received Date: 7/29/2007 3:15:00 PM
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/TotUncert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|----------|------|-----------------------|-----------------------|------------------------|-----------------|------------------------|---------------------------|------------------------|------------------|-----------------|---------------------|
| Batch: 7211438 | 7196_CR6 | | | | Work Order: J3M331AA | | Report DB ID: 9J3M3310 | | | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1 Comments:

FORM I
SAMPLE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland
Lot-Sample No.: J7G260357-8
Client Sample ID: J15DY9

SDG: J00118
Report No.: 36231
COC No.: RC-092-006

Collection Date: 7/26/2007 1:50:00 PM
Received Date: 7/29/2007 3:15:00 PM
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: 7211438 | 7196_CR6 | | | | Work Order: J3M341AA | | Report DB ID: 9J3M3410 | | | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | | 2.00E-03 | N/A | | | ML | |

No. of Results: 1 Comments:

FORM I

Date: 06-Aug-07

SAMPLE RESULTS

Lab Name: TA Richland
 Lot-Sample No.: J7G260357-10
 Client Sample ID: J15DY9-A

SDG: J00118
 Report No.: 36231
 COC No.: RC-092-006

Collection Date: 7/26/2007 1:50:00 PM
 Received Date: 7/29/2007 3:15:00 PM
 Matrix: SOIL

Ordered by Client Sample ID, Batch No.

| Parameter | Result | Count Error (2 s) | Total Uncert(2 s) | MDC MDA, Action Lev | Rpt Unit, Lc | Yield CRDL(RL) | Rst/MDC, Rst/TotUncert | Analysis, Prep Date | Total Sa Size | Allquot Size | Primary Detector |
|----------------|------------|-----------------------|-----------------------|------------------------|-----------------|------------------------|---------------------------|------------------------|------------------|-----------------|---------------------|
| Batch: 7211440 | 7196_CR6 | | | Work Order: J3T78CAA | | Report DB ID: 9J3T8C10 | | | | | |
| HEXCHROME | 3.50E-01 U | | 0.0E+00 | 3.50E-01 | mg/kg | N/A | (1.) N/A | 7/27/07 | | 2.2 G | |

No. of Results: 1 Comments:

FORM II

Date: 06-Aug-07

DUPLICATE RESULTS

Lab Name: TA Richland

SDG: J00118

Collection Date: 7/26/2007 8:38:00 AM

Lot-Sample No.: J7G260357-1

Report No.: 36231

Received Date: 7/29/2007 3:15:00 PM

Client Sample ID: J15DY2 DUP

COC No.: RC-092-006

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/TotUncert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|---------------------|------|-----------------------|-----------------------|------------------------|------------------------|-------|---------------------------|-------------------------|------------------|-----------------|---------------------|
| Batch: 7211438 | 7196_CR6 | | | | Work Order: J3M351AE | Report DB ID: J3M351ER | | | Orig Sa DB ID: 9J3M3510 | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | 2.00E-03 | U | RPD 0.0 | | | 2.00E-03 | | N/A | | | ML | |

No. of Results: 1 Comments:

FORM II
BLANK RESULTS

Date: 06-Aug-07

Lab Name: TA Richland

SDG: J00118

Matrix: SOIL

Report No. : 36231

| 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: 7211440 | 7196_CR6 | | | | Work Order: J3VRP1AA | | Report DB ID: J3VRP1AB | | | | | |
| HEXCHROME | 3.50E-01 | U | | 0.0E+00 | 3.50E-01 | mg/kg | N/A | (1.) | 7/27/07 | | 2.5 | |
| | | | | | | 2.00E-03 | | N/A | | | G | |
| No. of Results: 1 | | | Comments: | | | | | | | | | |

FORM II
BLANK RESULTS

Date: 06-Aug-07

Lab Name: TA Richland

SDG: J00118

Matrix: WATER

Report No. : 36231

| 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: 7211438 | 7196_CR6 | | | | Work Order: J3VRA1AA | | | | Report DB ID: J3VRA1AB | | | |
| HEXCHROME | 2.00E-03 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 1. | 7/27/07 | | 100.0 | |
| | | | | | | 2.00E-03 | | N/A | | | ML | |

No. of Results: 1

Comments:

FORM II
LCS RESULTS

Date: 06-Aug-07

Lab Name: TA Richland

SDG: J00118

Matrix: SOIL

Report No. : 36231

| 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: 7211440 | 7196_CR6 | | | | | | | | | | | | |
| | | | | | | Work Order: J3VRP1AC | | Report DB ID: J3VRP1AS | | | | | |
| HEXCHROME | 1.84E+01 | | | 0.0E+00 | 3.50E-01 | mg/kg | N/A | 2.00E+01 | | 92% | 7/27/07 | 2.5 | |
| | | | | | | | Rec Limits: | 85 | 115 | -0.1 | | G | |
| No. of Results: 1 | Comments: | | | | | | | | | | | | |

FORM II
LCS RESULTS

Date: 06-Aug-07

Lab Name: TA Richland

SDG: J00118

Matrix: WATER

Report No.: 36231

| 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: 7211438 | 7196_CR6 | | | | | Work Order: J3VRA1AC | | Report DB ID: J3VRA1AS | | | | | |
| HEXCHROME | 5.14E-01 | | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 5.00E-01 | | 103% | 7/27/07 | 100.0 | |
| | | | | | | | Rec Limits: | 85 | 115 | 0.0 | | ML | |
| No. of Results: | 1 | Comments: | | | | | | | | | | | |

FORM II
MATRIX SPIKE RESULTS

Date: 06-Aug-07

Lab Name: TA Richland

SDG: J00118

Lot-Sample No.: J7G260357-1, J15DY2 MS

Report No.: 36231

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: 7211438 HEXCHROME | Work Order: J3M351AC 2.73E-01 2.00E-03 | Report DB ID: J3M351CW | Orig Sa DB ID: 9J3M3510 | 0.0E+00 | 2.00E-03 | mg/L | N/A | 103.80% | 2.63E-01 | 7/27/07 | 100.0 ML | 7196_CR6 |
| Batch: 7211438 HEXCHROME | Work Order: J3M351AD 2.73E-01 2.00E-03 | Report DB ID: J3M351DW | Orig Sa DB ID: 9J3M3510 | 0.0E+00 | 2.00E-03 | mg/L | N/A | 103.80% | 2.63E-01 | 7/27/07 | 100.0 ML | 7196_CR6 |

Number of Results: 2

Comments:

FORM II

Date: 06-Aug-07

MATRIX SPIKE RESULTS

Lab Name: TA Richland

SDG: J00118

Lot-Sample No.: J7G260357-10, J15DY9-A MS

Report No. : 36231

Matrix: SOIL

| 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: 7211440 | Work Order: J3T8C1AC | Report DB ID: J3T8C1CW | Orig Sa DB ID: 9J3T8C10 | | | | | | | | | |
| HEXCHROME | 1.33E+01 | 0.0E+00 | 3.50E-01 | mg/kg | N/A | 79.73% | 1.66E+01 | 7/27/07 | | | 2.5 | 7196_CR6 |
| | 3.50E-01 | | | | | | | | | | G | |

Number of Results: 1

Comments:

FORM II

Date: 06-Aug-07

MATRIX SPIKE DUPLICATE RESULTS

Lab Name: TA Richland

SDG: J00118

Lot-Sample No.: J7G260357-1, J15DY2 MS

Report No.: 36231

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: 7211438 | 7196_CR6 | | | Work Order: J3M351AC | | Report DB ID: J3M351CW | | Orig Sa DB ID: J3M351DW | | | | | |
| HEXCHROME | 2.73E-01 | | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 103.80% | 2.63E-01 | | 7/27/07 | 100.0 | |
| | 2.73E-01 | RPD | 0.0 | | | | | | | | | ML | |
| Batch: 7211438 | 7196_CR6 | | | Work Order: J3M351AD | | Report DB ID: J3M351DW | | Orig Sa DB ID: J3M351CW | | | | | |
| HEXCHROME | 2.73E-01 | | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 103.80% | 2.63E-01 | | 7/27/07 | 100.0 | |
| | 2.73E-01 | RPD | 0.0 | | | | | | | | | ML | |
| No. of Results: 2 | Comments: | | | | | | | | | | | | |

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 $(\text{Result}/\text{Expected})-1$ 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%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgmdCnt}/\text{BkgmdCntMin})/\text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$. 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. |
| 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%. $MDC = (4.65 * \text{Sqrt}(\text{BkgmdCnt}/\text{BkgmdCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$. For LSC methods the batch blank is used as a measure of the background variability. |
| 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 = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPUd}^2)]$ 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. |
| SDG | Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt. |
| Sum Rpt Alpha Spec Rst(s) | The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units. |
| Work Order | The LIMS software assign test specific identifier. |
| Yield | The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method. |



STL

Richland Laboratory
Data Review Check List
Hexavalent Chromium

| Batch Number(s): 7211438 | | | | |
|--|---------|--------|---------|----------------------------------|
| Lab Sample Numbers or | | | | |
| Method/Test/Parameter: Cr+6 in Water / RICH-WC-5003 | | | | |
| Review Item | Yes (✓) | No (✓) | N/A (✓) | 2 nd 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? | | | ✓ | / |



STL

Richland Laboratory
Data Review Check List
Hexavalent Chromium

| Batch Number(s): 7211440 | | | | |
|--|---------|--------|---------|----------------------------------|
| Lab Sample Numbers or SDG: J00116 | | | | |
| Method/Test/Parameter: Cr+6 in SOLID / RICH-WC-5003, Rev 7 | | | | |
| Review Item | Yes (✓) | No (✓) | N/A (✓) | 2 nd 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? | | | ✓ | ✓ |

**Clouseau
Nonconformance Memo**

STL

| | |
|---|---|
| NCM #: 10-10501 | Classification: Anomaly |
| NCM Initiated By: Steven Wheland | Status: GLREVIEW |
| Date Opened: 07/30/2007 | Production Area: Classical Chemistry |
| Date Closed: | Tests: 7196A |
| | Lot #'s (Sample #'s): J7G260357 (10,11,12,9), J7G300000 (440), |
| | QC Batches: 7211440, |
| Nonconformance: Other (describe in detail) | |
| Subcategory: Other (explanation required) | |

Problem Description / Root Cause

| <u>Name</u> | <u>Date</u> | <u>Description</u> |
|----------------|-------------|---|
| Steven Wheland | 07/30/2007 | Insoluble MS recovered at 14% Regular MS recovered at 79% with a PDMS of 94%. Uncertain what happened. The color of the insoluble MS digestate was significantly lighter than normal and this is reflected in the yield. No reanalysis is possible. |

Corrective Action

| <u>Name</u> | <u>Date</u> | <u>Corrective Action</u> |
|----------------|-------------|--------------------------|
| Steven Wheland | 07/30/2007 | report the results. |

Client Notification Summary

| <u>Client</u> | <u>Project Manager</u> | <u>Notified</u> | <u>Response</u> | <u>How Notified</u> | <u>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 RICHLAND AMENDED

J76260357

J00118

Due 08-10-07

| | | | | | | | |
|---|--|---|--|-----------------------------------|--|---|-------------|
| Washington Closure Hanford | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | RC-092-006 | Page 1 of 2 |
| Collector C. Martinez, K Singleton <i>O Connolly</i> | | Company Contact C. Martinez | | Telephone No. 509-551-2816 | | Project Coordinator KESSNER, JH | |
| Project Designation 100-BC Groundwater | | Sampling Location 100-C-7 boreholes | | SAF No. RC-092 | | Price Code <i>7B</i> Data Turnaround <i>15 days</i> | |
| Ice Chest No. <i>Saws-49</i> | | Field Logbook No. EL-1585-9 | | COA 0100C7M000 | | Method of Shipment <i>NA Gout Vehicle</i> <i>PAS 7/26/07</i> | |
| Shipped To Severn Trent Incorporated, Richland | | Offsite Property No. <i>N/A</i> | | Bill of Lading/Air Bill No. NA | | | |

| | | | | | | | | | |
|--|---------------------|---------|--|--|--|--|--|--|--|
| POSSIBLE SAMPLE HAZARDS/REMARKS <i>None</i> Special Handling and/or Storage <i>Cool, 4 degrees centigrade</i> | Preservation | Cool 4C | | | | | | | |
| | Type of Container | G/P | | | | | | | |
| | No. of Container(s) | 1 | | | | | | | |
| | Volume | 500mL | | | | | | | |

| | | | | | | | | | | | | | |
|------------------------|--|--|--|------------------------|--|--|--|--|--|--|--|--|--|
| SAMPLE ANALYSIS | | | | Chromium Hex - 7196 | | | | | | | | | |
|------------------------|--|--|--|------------------------|--|--|--|--|--|--|--|--|--|

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|------------|----------|-------------|-------------|---|----------------------------------|--|--|-------|--|--|--|--|--|
| J15DY2 | WATER | 7-26-07 | 0838 | ✓ | <i>Please Filter this sample</i> | | | J3M35 | | | | | |
| J15DY3 | WATER | 7-26-07 | 0838 | ✓ | | | | J3M36 | | | | | |
| J15DY4 | WATER | 7-26-07 | 0935 | ✓ | <i>Please Filter this sample</i> | | | J3M38 | | | | | |
| J15DY5 | WATER | 7-26-07 | 0935 | ✓ | | | | J3M39 | | | | | |
| J15DY6 | WATER | 7-26-07 | 1220 | ✓ | <i>Please Filter this sample</i> | | | J3M4A | | | | | |

| | | | | | | | | | | | | |
|---|----------------------------------|--|----------------------------------|-----------------------------|--|--|--|--|--|--|--|--|
| CHAIN OF POSSESSION | | | | SPECIAL INSTRUCTIONS | | | | | | | | Matrix * S=Soil SE=Soilment SO=Solid SL=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tar WJ=Wipe L=Liquid V=Vegetation X=Other |
| Relinquished By/Removed From <i>KM Singleton</i> | Date/Time <i>7-26-07 1415</i> | Received By/Stored In <i>David St. John</i> | Date/Time <i>7/26/07 1415</i> | | | | | | | | | |
| Relinquished By/Removed From <i>David St. John</i> | Date/Time <i>7/26/07 1515</i> | Received By/Stored In <i>L SLANE</i> | Date/Time <i>7/26/07 1515</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 | | | | | | | | | |

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

STL RICHLAND AMENDED

J76260357

J00118

Due 08-10-07

| | | | | | | | |
|--|--|--|--|-----------------------------------|--|--|-------------|
| Washington Closure Hanford | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | RC-092-006 | Page 2 of 2 |
| Collector C. Martinez, K Singleton <i>O. Connolly</i> | | Company Contact C. Martinez | | Telephone No. 509-551-2816 | | Project Coordinator KESSNER, JH | |
| Project Designation 100-BC Groundwater | | Sampling Location 100-C-7 boreholes | | SAF No. RC-092 | | Price Code <i>7B</i> Data Turnaround <i>15 days</i> | |
| Ice Chest No. <i>SAWS-49</i> | | Field Logbook No. EL-1585-9 | | COA 0100C7M000 | | Method of Shipment NA <i>Govt vehicle</i> <i>DAS 7/26/07</i> | |
| Shipped To Severn Trent Incorporated, Richland | | Offsite Property No. <i>N/A</i> | | Bill of Lading/Air Bill No. NA | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|---------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| POSSIBLE SAMPLE HAZARDS/REMARKS <i>None</i> Special Handling and/or Storage <i>Cool, 4 degrees centigrade</i> | Preservation | Cool 4C | | | | | | | | | | | | | | | | | | | |
| | Type of Container | G/P | | | | | | | | | | | | | | | | | | | |
| | No. of Container(s) | 1 | | | | | | | | | | | | | | | | | | | |
| | Volume | 500mL | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|------------------------|--|--|--|---------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| SAMPLE ANALYSIS | | | | Chromium Hex - 7196 | | | | | | | | | | | | | | | | | |
|------------------------|--|--|--|---------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | | | | | | | | | | |
|------------|----------|-------------|-------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|
| J15DY7 | WATER | 7-26-07 | 1220 | ✓ | | | | | | | | | | | | | | | | | | J3M3 2 |
| J15DY8 | WATER | 7-26-07 | 1350 | ✓ | | | | | | | | | | | | | | | | | | J3M3 3 |
| J15DY9 | WATER | 7-26-07 | 1350 | ✓ | | | | | | | | | | | | | | | | | | J3M3 4 |
| J15F00 | WATER | | | | | | | | | | | | | | | | | | | | | |
| J15F01 | WATER | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|--------------|--|-----------------------------|--|-----------------------|--|--------------|--|--|--|--|--|--|--|-----------------|--|--|--|--|--|--|
| CHAIN OF POSSESSION | | | | SPECIAL INSTRUCTIONS | | | | | | | | | | | | Matrix * | | | | | | |
| Relinquished By/Removed From | | Date/Time | | Sign/Print Names | | Received By/Stored In | | Date/Time | | | | | | | | | | | | | | <ul style="list-style-type: none"> S=Soil SE=Settlement SO=Solid Sl=Sludge W=Water O=Oil A=Air D5=Drum Solids DL=Drum Liquids T=Tissue Wt=Wipe L=Liquid V=Vegetation X=Other |
| <i>KM Singleton</i> | | 7-26-07 1415 | | <i>Dan B St...</i> | | <i>Dan B St...</i> | | 7/26/07 1415 | | | | | | | | | | | | | | |
| <i>JAW...</i> | | 7/26/07 1515 | | <i>LJ LANE</i> | | <i>LJ LANE</i> | | 72607 1515 | | | | | | | | | | | | | | |
| 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: 72607 1515

Client: WCH3 SDG #: J00118 NA SAF #: RC-092 NA

Work Order Number: J76260357 Chain of Custody # RC092 006

Shipping Container ID: _____ 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: _____ NA 5. Vermiculite/packing materials is NA Wet Dry
- 6. Number of samples in shipping container: 88 (1-500MLPEA)
- 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? CHROM NA pH<2 pH>2 pH>9
- 11. Sample Location, Sample Collector Listed? * Yes No
*For documentation only. No corrective action needed.
- 12. Were any anomalies identified in sample receipt? Yes No
- 13. Description of anomalies (include sample numbers): _____

Sample Custodian: RJR Date: 72607

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|------------------|--------------------|-----------|-----------------|
| | | | |
| | | | |
| | | | |

Client Informed on _____ by _____ Person contacted _____

[] No action necessary; process as is.

Project Manager _____ Date _____

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Sample Preparation/Analysis

Balance Id:

27642, Washington Closure Hanford
Bechtel Hanford, Inc.

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)

Pipet #:

AnalyDueDate: 08/10/2007

SI CLIENT: HANFORD

Sep1 DT/Tm Tech:

Batch: 7211438 WATER mg/L PM, Quote: SS , 27023

Sep2 DT/Tm Tech:

EQ Batch, Test: None All Tests: 88EA, 7211438 88EA, 7211440 88EA,

Prep Tech:



| 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: |
|---------------------------------------|-------------------|-----------------------------|------------------------|-------------------|----------------|---------------------------------|--------------------------|-----------|
| J3M32-1-AA J7G260357-1-SAMP | | | | | | | | |
| 07/26/2007 12:20 | | AmtRec: 500MLP | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 2 J3M33-1-AA J7G260357-2-SAMP | | | | | | | | |
| 07/26/2007 13:50 | | AmtRec: 500MLP | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 3 J3M34-1-AA J7G260357-3-SAMP | | | | | | | | |
| 07/26/2007 13:50 | | AmtRec: 500MLP | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 4 J3M35-1-AA J7G260357-4-SAMP | | | | | | | | |
| 07/26/2007 08:38 | | AmtRec: 500MLP | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 5 J3M35-1-AC-S J7G260357-4-MS | | | | | | | | |
| 07/26/2007 08:38 | | AmtRec: 500MLP | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 6 J3M35-1-AD-D J7G260357-4-MSD | | | | | | | | |
| 07/26/2007 08:38 | | AmtRec: 500MLP | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 7 J3M35-1-AE-X J7G260357-4-DUP | | | | | | | | |
| 07/26/2007 08:38 | | AmtRec: 500MLP | #Containers: 1 | | | Scr: | Alpha: | Beta: |

STL Richland
Richland Wa.

Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2
pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added

Page 1 ISV - Insufficient Volume for Analysis

WO Cnt: 7

ICOC v4.8.26

7/30/2007 1:03:58 PM

Sample Preparation/Analysis

Balance Id: _____

127642, Washington Closure Hanford
Bechtel Hanford, Inc.

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
SI CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 08/10/2007

Sep1 DT/Tm Tech: _____

Batch: 7211438 WATER mg/L

PM, Quote: SS , 27023

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 | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|--|----------------|--------------------------|---------------------|----------------|-------------|------------------------------|-----------------------|-----------|
| 8 J3M36-1-AA J7G260357-5-SAMP 07/26/2007 08:38 | | | | | | | | |
| 9 J3M38-1-AA J7G260357-6-SAMP 07/26/2007 09:35 | | | | | | | | |
| 10 J3M39-1-AA J7G260357-7-SAMP 07/26/2007 09:35 | | | | | | | | |
| 11 J3M4A-1-AA J7G260357-8-SAMP 07/26/2007 12:20 | | | | | | | | |
| 12 J3VRA-1-AA-B J7G300000-438-BLK 07/26/2007 08:38 | | | | | | | | |
| 13 J3VRA-1-AC-C J7G300000-438-LCS 07/26/2007 08:38 | | | | | | | | |

Sample Preparation/Analysis

Balance Id:

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
 EA Chromium, Hexavalent (7196A)
 SI CLIENT: HANFORD

Pipet #:

AnalyDueDate: 08/10/2007

Sep1 DT/Tm Tech:

Batch: 7211438

mg/L

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 | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|--------------------------------------|-------------------|-----------------------------|------------------------|-------------------|----------------|---------------------------------|--------------------------|-----------|
|--------------------------------------|-------------------|-----------------------------|------------------------|-------------------|----------------|---------------------------------|--------------------------|-----------|

Comments:

All Clients for Batch:

127642, Washington Closure Hanford

Bechtel Hanford, Inc.

, SS , 27023

J3M321AA-SAMP Constituent List:

| | | | | | |
|---------------|-----------|------|--------|---------|--------|
| HEXCHROME | RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |
| J3M351AC-MS: | | | | | |
| HEXCHROME | RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |
| J3M351AD-MSD: | | | | | |
| HEXCHROME | RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |
| J3VRA1AA-BLK: | | | | | |
| HEXCHROME | RDL:0.002 | mg/L | LCL: | UCL: | RPD: |
| J3VRA1AC-LCS: | | | | | |
| HEXCHROME | RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |

J3M321AA-SAMP Calc Info:

| | | | | |
|----------------------|------------------|--------------|-------------|---------|
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3M351AC-MS: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3M351AD-MSD: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3VRA1AA-BLK: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3VRA1AC-LCS: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |

Approved By _____

Date: _____

STL RICHLAND AMENDED

7/30/2007 1:03:59 PM

Sample Preparation/Analysis

Balance Id:

127642, Washington Closure Hanford
Bechtel Hanford, Inc.

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)

Pipet #:

AnalysDueDate: 08/10/2007

5I CLIENT: HANFORD

Sep1 DT/Tm Tech:

Batch: 7211440 SEDIMENT mg/L

PM, Quote: SS , 27023

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

STL RICHLAND
RICHLAND WA
AMENDED



| 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 |
|--|----------------|--------------------------|---------------------|----------------|-------------|------------------------------|-----------------------|----------|
| 1 J3T78-1-AA J7G260357-9-SAMP 07/26/2007 12:20 | | | | | | | | |
| 2 J3T8C-1-AA J7G260357-10-SAMP 07/26/2007 12:20 | | | | | | | | |
| 3 J3T8C-1-AC-S J7G260357-10-MS 07/26/2007 12:20 | | | | | | | | |
| 4 J3T8C-1-AD-D J7G260357-10-MSD 07/26/2007 12:20 | | | | | | | | |
| 5 J3T8C-1-AE-X J7G260357-10-DUP 07/26/2007 12:20 | | | | | | | | |
| 6 J3T8D-1-AA J7G260357-11-SAMP 07/26/2007 12:20 | | | | | | | | |
| 7 J3T8J-1-AA J7G260357-12-SAMP 07/26/2007 12:20 | | | | | | | | |

7/30/2007 1:04:00 PM

Sample Preparation/Analysis

Balance Id:

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)

Pipet #:

5I CLIENT: HANFORD

Sep1 DT/Tm Tech:

AnalyDueDate: 08/10/2007

Sep2 DT/Tm Tech:

Batch: 7211440

mg/L

SEQ Batch, Test: None

Prep Tech:

| 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: |
|-----------------------------------|----------------|--------------------------|---------------------|----------------|-------------|------------------------------|-----------------------|-----------|
|-----------------------------------|----------------|--------------------------|---------------------|----------------|-------------|------------------------------|-----------------------|-----------|

8 J3VRP-1-AA-B

J7G300000-440-BLK



07/26/2007 12:20 AmtRec: #Containers: 1 Scr: Alpha: Beta:

9 J3VRP-1-AC-C

J7G300000-440-LCS



07/26/2007 12:20 AmtRec: #Containers: 1 Scr: Alpha: Beta:

Comments:

All Clients for Batch:
127642, Washington Closure Hanford Bechtel Hanford, Inc. SS, 27023

J3T781AA-SAMP Constituent List:

| | | | | |
|---------------------|------|--------|---------|--------|
| HEXCHROME RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |
| J3T8C1AC-MS: | | | | |
| HEXCHROME RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |
| J3T8C1AD-MSD: | | | | |
| HEXCHROME RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |
| J3VRP1AA-BLK: | | | | |
| HEXCHROME RDL:0.002 | mg/L | LCL: | UCL: | RPD: |
| J3VRP1AC-LCS: | | | | |
| HEXCHROME RDL:0.002 | mg/L | LCL:85 | UCL:115 | RPD:20 |

J3T781AA-SAMP Calc Info:

| | | | | |
|----------------------|------------------|--------------|-------------|---------|
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3T8C1AC-MS: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3T8C1AD-MSD: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3VRP1AA-BLK: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |
| J3VRP1AC-LCS: | | | | |
| Uncert Level (#s): 2 | Decay to SaDt: Y | Blk Subt.: N | Sci.Not.: Y | ODRs: B |

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Sample Preparation/Analysis

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
SI CLIENT: HANFORD

Balance Id: _____

Pipet #: _____

AnalyDueDate: 08/10/2007

Sep1 DT/Tm Tech: _____

Batch: 7211440

mg/L

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 | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|--------------------------------------|-------------------|-----------------------------|------------------------|-------------------|----------------|---------------------------------|--------------------------|-----------|
|--------------------------------------|-------------------|-----------------------------|------------------------|-------------------|----------------|---------------------------------|--------------------------|-----------|

Approved By _____

Date: _____

STL RICHLAND AMENDED

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