**WSCF Laboratory**
PO Box 650 S3-30
Richland, WA 99352

January 15, 2014

Scot Fitzgerald
CH2M-HILL PRC
PO Box 1600
Richland, WA 99352

Dear Scot Fitzgerald,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF131613

Reference: (1) SOW, Mod 2, #36587, Release 3
(2) MSC-SD-CD-QAPP-017, current version, Waste Sampling & Characterization Facility Quality Assurance Program Plan

This letter contains the following information for sample delivery group WSCF131613

* Cover Sheet (Attachment 1)
* Narrative (Attachment 2)
* Analytical Results (Attachment 3)
* Sample Receipt Information (Attachment 4)

Very truly yours,

Electronically signed by Joseph Hale

For Lab Manager, Dan T. Smith

WSCF Analytical Lab

(509) 373-4804

Attachments 4

CC: w/Attachments

File/LB

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages

Including cover page

## WSCF SAF Number Cross Reference

Group # WSCF131613
Data Deliverable Date 01/15/14

| SAF # | Sample ID | Sample # | Matrix | Sampled | Received |
|---|---|---|---|---|---|
| F13-051 | B2RYP2 | 131613001 | WATER | 12/31/13 | 12/31/13 |
| F13-051 | B2RYP3 | 131613002 | WATER | 12/31/13 | 12/31/13 |

ATTACHMENT 2

# NARRATIVE

Consisting of 3 pages
Including cover page

Attachment 2
**Narrative**
WSCF131613

## Introduction

Samples were received at the WSCF laboratory as referenced on the WSCF SAF Number Cross Reference table included in the final report. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), to Contract 39818, Revision 4, "WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, C, D, J and U) may be applicable to this report, as appropriate.

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **C** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were C flagged (applies to inorganic and wet chemical analyses).
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **B (organic analyses)** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were B flagged.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.
- **o** – LCS recovery outside established laboratory acceptance limits.

## Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Attachment 2
**Narrative**
WSCF131613

**Inorganic Comments**

**ICP-AES Metals** – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Potassium and Sodium were detected in the Blank and evaluated.
- All other applicable QC controls are within the established limits.

**Radiochemistry Comments**

**Rad Chem** – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Matrix Spikes apply only to Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

Tracers are used to determine chemical yield. RPD is monitored in sample duplicate and is not required for tracer recovery per SOW.

**Strontium-89/90:**

- All applicable QC controls are within the established limits.

**Tritium:**

- Duplicate Relative Percent Difference(s) (RPD) did not meet the established laboratory limits. Duplicate Relative Percent Difference (RPD) does not apply to results below 5X the minimum detectable activity. No flags issued.
- All other applicable QC controls are within the established limits.

We certify that this data package 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 data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

ATTACHMENT 3

# ANALYTICAL RESULTS

Consisting of 14 pages
Including cover page

# WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600
Richland, WA 99352

Attention: Scot Fitzgerald

**Contract #** MOA-FH-CHPRC-2008
**Group #** WSCF131613
**Report Date** January 15, 2014

Analytical: Electronically signed by Joseph Hale

Client Services: Electronically signed by Heather Medley

*Solid samples results that have a 'Percent Solid' test are reported on a "dry weight basis", except results of TCLP, Percent Solid, and Total Activity. If no `Percent Solid' test is reported then the results are reported on an "as received" basis.*

## Batch QC List

**Attention** Scot Fitzgerald
**Department** Inorganic

**Group #** WSCF131613

| QC Batch | Analytical Batch | S# | Type | Sample # | Client Sample# | Original | Test |
|---|---|---|---|---|---|---|---|
| 225811 | 226131 | 5 | BLANK | 103357 | BLANK | | ICP-6010 - All possible metals |
| 225811 | 226131 | 7 | LCS | 103359 | LCS | | ICP-6010 - All possible metals |
| 225811 | 226131 | 9 | MS | 103360 | B2TLL6(131526007MS) | 131526007 | ICP-6010 - All possible metals |
| 225811 | 226131 | 10 | MSD | 103361 | B2TLL6(131526007MSD) | 131526007 | ICP-6010 - All possible metals |
| 225811 | 226131 | 18 | SAMPLE | 131613001 | B2RYP2 | | ICP-6010 - All possible metals |

## Batch QC List

**Attention** Scot Fitzgerald
**Department** Radiochemistry

**Group #** WSCF131613

| QC Batch | Analytical Batch | S# | Type | Sample # | Client Sample# | Original | Test |
|---|---|---|---|---|---|---|---|
| 225511 | 226300 | 1 | BLANK | 103252 | BLANK | | Tritium by LSC |
| 225511 | 226300 | 2 | LCS | 103253 | LCS | | Tritium by LSC |
| 225511 | 226300 | 4 | DUP | 103254 | B2RW99(131605002DUP | 131605002 | Tritium by LSC |
| 225511 | 226300 | 5 | MSPK | 103255 | B2RW99(131605002MSP | | Tritium by LSC |
| 225511 | 226300 | 18 | SAMPLE | 131613002 | B2RYP3 | | Tritium by LSC |
| 225603 | 226032 | 1 | BLANK | 103279 | BLANK | | Strontium 89/90 (GPC/GEA) |
| 225603 | 226032 | 2 | LCS | 103280 | LCS | | Strontium 89/90 (GPC/GEA) |
| 225603 | 226032 | 3 | DUP | 103281 | B2RW99(131605002DUP | 131605002 | Strontium 89/90 (GPC/GEA) |
| 225603 | 226032 | 5 | SAMPLE | 131613002 | B2RYP3 | | Strontium 89/90 (GPC/GEA) |

## Method Reference

**Attention** Scot Fitzgerald
**Department** Inorganic

**Group #** WSCF131613

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

**LA-505-411** Elemental Analysis by ICP Atomic Emission Spectroscopy (ICP AES)

| | | |
|---|---|---|
| EPA SW-846 | 6010C | Inductively Coupled Plasma-Atomic Emmision Spectrometry |
| HEIS | 6010_METALS_ICP | Inductively Coupled Plasma-Atomic Emmision Spectrometry |

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at http://www7.rl.gov/rapidweb/AS-DOL/index.cfm

## Method Reference

**Attention** Scot Fitzgerald
**Department** Radiochemistry

**Group #** WSCF131613

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

| | | | |
|---|---|---|---|
| **LA-218-413** | Tritium By Ion Removal Using Eichrom Resin Columns (Prep) | | |
| | N/A | PREP METHOD | |
| **LA-220-406** | Strontium-89 and 90 in Aqueous Samples by SR-SPEC Separation | | |
| | HEIS | SRTOT_SEP_PRECIP_GPC | Strontium 89/90, by Sr-Spec Sep. |
| **LA-508-421** | Operation of the Tri-Carb Model 2500TR Liquid Scintillation Analyzer | | |
| | HEIS | ALPHA_LSC | A/B Liquid Scintillation |
| | HEIS | BETA_LSC | A/B Liquid Scintillation |
| | HEIS | TC99_3MDSK_LSC | TC99 by Liquid Scintillation |
| | HEIS | TRITIUM_EIE_LSC | Tritium, by Eichrome ion exchange, LSC |

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at http://www7.rl.gov/rapidweb/AS-DOL/index.cfm

**Attention** Scot Fitzgerald
**Department** Inorganic

**Group #** WSCF131613

**Sample #** 131613001
**SAF#** F13-051
**Sample ID** B2RYP2

**Matrix** WATER
**Sampled** 12/31/13
**Received** 12/31/13

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|---|---|---|---|---|---|---|---|---|---|---|
| **ICPAES Prep (W)** | | | | | | | | | | **01/08/14** |
| **ICP-6010 - All possible metals** | | | | | | | | | | |
| Iron | 7439-89-6 | LA-505-411 | | 487 | | ug/L | 1 | 40 | 50 | 01/09/14 |
| Magnesium | 7439-95-4 | LA-505-411 | | 9010 | | ug/L | 1 | 60 | 750 | 01/09/14 |
| Manganese | 7439-96-5 | LA-505-411 | | 78.2 | | ug/L | 1 | 4.0 | 5.0 | 01/09/14 |
| Potassium | 7440-09-7 | LA-505-411 | C | 5560 | | ug/L | 1 | 250 | 4000 | 01/09/14 |
| Sodium | 7440-23-5 | LA-505-411 | | 12400 | | ug/L | 1 | 100 | 500 | 01/09/14 |
| Chromium | 7440-47-3 | LA-505-411 | B | 5.30 | | ug/L | 1 | 5.0 | 10 | 01/09/14 |
| Cobalt | 7440-48-4 | LA-505-411 | U | <4.0 | | ug/L | 1 | 4.0 | 20 | 01/09/14 |
| Calcium | 7440-70-2 | LA-505-411 | | 38100 | | ug/L | 1 | 50 | 1000 | 01/09/14 |

MDL = Minimum Detection Limit
RQ = Result Qualifier
TP Err = Total Propagated Error
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary dilution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)
o - LCS recovery outside established laboratory acceptance limits.
o - LCS recovery outside established laboratory acceptance limits.

**Attention** Scot Fitzgerald
**Department** Radiochemistry

**Group #** WSCF131613

**Sample #** 131613002
**SAF#** F13-051
**Sample ID** B2RYP3

**Matrix** WATER
**Sampled** 12/31/13
**Received** 12/31/13

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|---|---|---|---|---|---|---|---|---|---|---|
| **Strontium 89/90 WATER/LIQUID PREP** | | | | | | | | | | **01/07/14** |
| **Strontium 89/90 (GPC/GEA)** | | | | | | | | | | |
| Strontium-89_90 | SR-RAD | LA-220-406 | U | -0.16 | .66 | pCi/L | 1 | 1.2 | | 01/10/14 |
| **Tritium by LSC EICHROM WA/LIQ PREP** | | | | | | | | | | **01/07/14** |
| **Tritium by LSC** | | | | | | | | | | |
| Tritium | 10028-17-8 | LA-508-421 | | 2800 | 610 | pCi/L | 1 | 260 | | 01/14/14 |

MDL = Minimum Detection Limit
RQ = Result Qualifier
TP Err = Total Propagated Error
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
U - Analyzed for but not detected above limiting criteria.
N - Spike Recovery is Outside Control Limits.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

o - LCS recovery outside established laboratory acceptance limits.

## Quality Control Report

**Attention** Scot Fitzgerald
**Department** Radiochemistry

**Group #** WSCF131613

**Analytical Batch** 226032 (QC Batch: 225603) **Test** Strontium 89/90 (GPC/GEA)
**Associated Samples** 131613002

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | | RQ | Analyzed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BLANK** | | | **QC Sample #103279** | | | | | | | | |
| Strontium-89_90 | SR-RAD | | 0.47 | pCi/L | | | | | | U | 01/10/14 |
| **LCS** | | | **QC Sample #103280** | | | | | | | | |
| Strontium-89_90 | SR-RAD | | 90 | pCi/L | 96.8 | 80 - 120 | | | | | 01/10/14 |
| **DUP** | | | **QC Sample #103281** | | | | | | | | |
| | | | **Original 131605002** | | | | | | | | |
| Strontium-89_90 | SR-RAD | | -0.22 | pCi/L | | | -4326.30 | 20 | * | U | 01/10/14 |

* - QC result out of range n/a - Not Applicable

## Quality Control Report

**Attention** Scot Fitzgerald
**Department** Inorganic

**Group #** WSCF131613

**Analytical Batch** 226131 (QC Batch: 225811) **Test** ICP-6010 - All possible metals
**Associated Samples** 131613001

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | RQ | Analyzed |
|---|---|---|---|---|---|---|---|---|---|---|
| **BLANK** | | | **QC Sample #103357** | | | | | | | |
| Iron | 7439-89-6 | | <40 | ug/L | | | | | U | 01/09/14 |
| Magnesium | 7439-95-4 | | <60 | ug/L | | | | | U | 01/09/14 |
| Manganese | 7439-96-5 | | <4.0 | ug/L | | | | | U | 01/09/14 |
| Potassium | 7440-09-7 | | 382 | ug/L | | | | | B | 01/09/14 |
| Sodium | 7440-23-5 | | 221 | ug/L | | | | | B | 01/09/14 |
| Chromium | 7440-47-3 | | <5.0 | ug/L | | | | | U | 01/09/14 |
| Cobalt | 7440-48-4 | | <4.0 | ug/L | | | | | U | 01/09/14 |
| Calcium | 7440-70-2 | | <50 | ug/L | | | | | U | 01/09/14 |
| **LCS** | | | **QC Sample #103359** | | | | | | | |
| Iron | 7439-89-6 | | 1080 | ug/L | 108 | 80 - 120 | | | | 01/09/14 |
| Magnesium | 7439-95-4 | | 10400 | ug/L | 103.9 | 80 - 120 | | | | 01/09/14 |
| Manganese | 7439-96-5 | | 1040 | ug/L | 103.9 | 80 - 120 | | | | 01/09/14 |
| Potassium | 7440-09-7 | | 11200 | ug/L | 112 | 80 - 120 | | | | 01/09/14 |
| Sodium | 7440-23-5 | | 10700 | ug/L | 106.9 | 80 - 120 | | | | 01/09/14 |
| Chromium | 7440-47-3 | | 1020 | ug/L | 102.4 | 80 - 120 | | | | 01/09/14 |
| Cobalt | 7440-48-4 | | 1020 | ug/L | 101.5 | 80 - 120 | | | | 01/09/14 |

* - QC result out of range n/a - Not Applicable

## Quality Control Report

**Attention** Scot Fitzgerald
**Department** Inorganic

**Group #** WSCF131613

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | RQ | Analyzed |
|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 7440-70-2 | | 21000 | ug/L | 104.8 | 80 - 120 | | | | 01/09/14 |
| **MS** | | | **QC Sample #103360** | | | | | | | |
| | | | **Original 131526007** | | | | | | | |
| Iron | 7439-89-6 | | 1020 | ug/L | 102.3 | 75 - 125 | | | | 01/09/14 |
| Magnesium | 7439-95-4 | | 10200 | ug/L | 102.5 | 75 - 125 | | | | 01/09/14 |
| Manganese | 7439-96-5 | | 1010 | ug/L | 101.3 | 75 - 125 | | | | 01/09/14 |
| Potassium | 7440-09-7 | | 10700 | ug/L | 106.7 | 75 - 125 | | | | 01/09/14 |
| Sodium | 7440-23-5 | | 10500 | ug/L | 104.9 | 75 - 125 | | | | 01/09/14 |
| Chromium | 7440-47-3 | | 1000 | ug/L | 100 | 75 - 125 | | | | 01/09/14 |
| Cobalt | 7440-48-4 | | 979 | ug/L | 97.9 | 75 - 125 | | | | 01/09/14 |
| Calcium | 7440-70-2 | | 19000 | ug/L | 95 | 75 - 125 | | | | 01/09/14 |
| **MSD** | | | **QC Sample #103361** | | | | | | | |
| | | | **Original 131526007** | | | | | **Paired** | **103360** | |
| Iron | 7439-89-6 | | 1000 | ug/L | 100 | 75 - 125 | 2.30 | 20 | | 01/09/14 |
| Magnesium | 7439-95-4 | | 10000 | ug/L | 100.4 | 75 - 125 | 0.70 | 20 | | 01/09/14 |
| Manganese | 7439-96-5 | | 990 | ug/L | 99 | 75 - 125 | 2.30 | 20 | | 01/09/14 |
| Potassium | 7440-09-7 | | 10200 | ug/L | 102.1 | 75 - 125 | 2.40 | 20 | | 01/09/14 |
| Sodium | 7440-23-5 | | 9750 | ug/L | 97.5 | 75 - 125 | 2.70 | 20 | | 01/09/14 |
| Chromium | 7440-47-3 | | 977 | ug/L | 97.7 | 75 - 125 | 2.40 | 20 | | 01/09/14 |
| Cobalt | 7440-48-4 | | 951 | ug/L | 95.1 | 75 - 125 | 3.00 | 20 | | 01/09/14 |
| Calcium | 7440-70-2 | | 19800 | ug/L | 99.1 | 75 - 125 | 0.90 | 20 | | 01/09/14 |

* - QC result out of range

n/a - Not Applicable

## Quality Control Report

**Attention** Scot Fitzgerald
**Department** Radiochemistry

**Group #** WSCF131613

**Analytical Batch** 226300 (QC Batch: 225511) **Test** Tritium by LSC
**Associated Samples** 131613002

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | | RQ | Analyzed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BLANK** | | | **QC Sample #103252** | | | | | | | | |
| Tritium | 10028-17-8 | | 59 | pCi/L | | | | | | U | 01/14/14 |
| **LCS** | | | **QC Sample #103253** | | | | | | | | |
| Tritium | 10028-17-8 | | 3200 | pCi/L | 97.5 | 80 - 120 | | | | | 01/14/14 |
| **DUP** | | | **QC Sample #103254** | | | | | | | | |
| | | | **Original 131605002** | | | | | | | | |
| Tritium | 10028-17-8 | | 370 | pCi/L | | | 39.50 | 20 | * | X | 01/14/14 |
| **MSPK** | | | **QC Sample #103255** | | | | | | | | |
| Tritium | 10028-17-8 | | 19000 | pCi/L | 93.7 | 75 - 125 | | | | | 01/14/14 |

* - QC result out of range n/a - Not Applicable

## Quality Control Report

**Attention** Scot Fitzgerald
**Department** Radiochemistry

**Group #** WSCF131613

**Analytical Batch** 226032 (QC Batch: 225603) **Test** Strontium 89/90 (GPC/GEA)
**Associated Samples** 131613002

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | RQ | Analyzed |
|---|---|---|---|---|---|---|---|---|---|---|
| **BLANK** | | | **QC Sample #103279** | | | | | | | |
| Strontium Nitrate | 10042-76-9 | | | mg | 84.3 | 25 - 105 | | | | 01/10/14 |
| **LCS** | | | **QC Sample #103280** | | | | | | | |
| Strontium Nitrate | 10042-76-9 | | | mg | 75.2 | 25 - 105 | | | | 01/10/14 |
| **DUP** | | | **QC Sample #103281** | | | | | | | |
| | | | **Original 131605002** | | | | | | | |
| Strontium Nitrate | 10042-76-9 | | | mg | 87.6 | 25 - 105 | n/a | | | 01/10/14 |
| **SAMPLE** | | | **Sample #131613002** | | | | | | | |
| Strontium Nitrate | 10042-76-9 | | | mg | 79.3 | 25 - 105 | | | | 01/10/14 |

* - QC result out of range n/a - Not Applicable

## Analytical Comment Report

**Attention:** Scot Fitzgerald

**Group #** WSCF131613

## Quality Control Comments

**Department** Radiochemistry

103254 B2RW99(131605002DUP)

**Analyte** Tritium - Tritium by LSC

[1] The duplicate is outside of default RPD limits. RPD limit does not apply to results less than 5X the Minimum Detectable Concentration.

ATTACHMENT4

## SAMPLE RECEIPT

Consisting of 4 pages
Including cover page

*Waste Sampling and Characterization Facility*
*P.O. Box 650 S3-30, Richland WA 99352*
*Phone: (509) 373-7005/FAX: (509) 372-0456*

# ACKNOWLEDGEMENT OF SAMPLES RECEIVED

**WSCF Laboratory**
PO Box 650 S3-30
Richland, WA 99352

**ATTN:** Scot Fitzgerald

| | |
|---|---|
| **Customer Code:** | CHPRC |
| **CACN:** | 404401 |
| **Work Order #:** | 131613 |
| **Customer Work ID:** | F13-051-309 |
| **Due Date:** | 01/15/2014 |

The following samples were received from you on 12/31/2013 3:00:00 PM. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact WSCF Client Services. Thank you for using Waste Sampling and Characterization Facility.

| Sample # | Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 131613001 | B2RYP2 | WATER | 12/31/2013 14:27 | 12/31/2013 15:00 |

| Procedure | Compound List |
|---|---|
| ICP-6010 - All possible metals | Fe,Mg,Mn,K,Na,Cr,Co,Ca |

| Sample # | Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 131613002 | B2RYP3 | WATER | 12/31/2013 14:27 | 12/31/2013 15:00 |

| Procedure | Compound List |
|---|---|
| Strontium 89/90 (GPC/GEA) | SR89/90 |
| Tritium by LSC | H3 |

## Chain of Custody

**CH2MHill Plateau Remediation Company** — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — **F13-051-109** — **PAGE 1 OF 1**

| | | | | | |
|---|---|---|---|---|---|
| **COLLECTOR** Kruse Chas | **COMPANY CONTACT** TODAK, D | **TELEPHONE NO.** 376-6427 | **PROJECT COORDINATOR** TODAK, D | **PRICE CODE** 7C | **DATA TURNAROUND** 15 Days / 15 Days |
| **SAMPLING LOCATION** C8776, J-0K4 | **PROJECT DESIGNATION** Sampling and Analysis of New Wells in 100-BC Area - Water | | **SAF NO.** F13-051 | **AIR QUALITY** ☐ | |
| **ICE CHEST NO.** NA | **FIELD LOGBOOK NO.** HNF-N-502-25/51 | **ACTUAL SAMPLE DEPTH** 136.5 ft | **COA** 303220ES10 | **METHOD OF SHIPMENT** GOVERNMENT VEHICLE | **ORIGINAL** |
| **SHIPPED TO** Waste Sampling & Characterization | **OFFSITE PROPERTY NO.** N/A | | **BILL OF LADING/AIR BILL NO.** N/A | | |

**MATRIX*** A=Air, DI=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

**SPECIAL HANDLING AND/OR STORAGE** 13/6/13

| SAMPLE NO. | MATRIX* | PRESERVATION | HOLDING TIME | TYPE OF CONTAINER | NO. OF CONTAINER(S) | VOLUME | SAMPLE ANALYSIS | SAMPLE DATE | SAMPLE TIME |
|---|---|---|---|---|---|---|---|---|---|
| B2RYP2 | WATER | HNO3 to pH <2 | 6 Months | G/P | 1 | 500 mL | See Item (1) in Special Instructions | 12-31-13 | 1427 |

**FILTER**

**CHAIN OF POSSESSION** — **SIGN/ PRINT NAMES**

| | | | |
|---|---|---|---|
| RELINQUISHED BY/REMOVED FROM | DATE/TIME 12-31-13 1730 | RECEIVED BY/STORED IN | DATE/TIME |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME 12-31-13 1730 |
| 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 |

**SPECIAL INSTRUCTIONS**

** The CACN for WSCF Analytical is 404401.☐** The 100 Area SAGRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. TRVL 13-109

(1) 6010_METALS_ICP: COMMON (Calcium, Chromium, Cobalt, Iron, Magnesium, Manganese, Potassium, Sodium);

**FILTER**

TRVL 13- 109

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | **RECEIVED BY** | **TITLE** | **DATE/TIME** |
| **FINAL SAMPLE DISPOSITION** | **DISPOSAL METHOD** | **DISPOSED BY** | **DATE/TIME** |

PRINTED ON 9/24/2013

A-6003-618 (REV 2)

## Chain of Custody

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F13-051-310

PAGE 1 OF 1

COLLECTOR: Kayla Chan

COMPANY CONTACT: TODAK, D

TELEPHONE NO.: 376-6427

PROJECT COORDINATOR: TODAK, D

PRICE CODE: 7C

DATA TURNAROUND: 15 Days / 15 Days

SAMPLING LOCATION: C8776, I-004

PROJECT DESIGNATION: Sampling and Analysis of New Wells in 100-BC Area - Water

SAF NO.: F13-051

AIR QUALITY: ☐

ICE CHEST NO.: NA

FIELD LOGBOOK NO.: HNF-N-507-25/51

ACTUAL SAMPLE DEPTH: 136.5 Ft

COA: 303220ES10

METHOD OF SHIPMENT: GOVERNMENT VEHICLE

ORIGINAL

SHIPPED TO: Waste Sampling & Characterization

OFFSITE PROPERTY NO.: N/A

BILL OF LADING/AIR BILL NO.: N/A

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | PRESERVATION | HOLDING TIME | TYPE OF CONTAINER | NO. OF CONTAINER(S) | VOLUME | SAMPLE ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|
| B2RYP3 002 | WATER | 12-31-12 | 1427 | HNO3 to pH <2 | 6 Months | G/P | 1 | 1L | SR90T_SEP_PR ECD_GRC COMMON; |
| | | | | None | 6 Months | G | 1 | 250mL | TRITIUH_EEE_L SC; COMMON |

SPECIAL HANDLING AND/OR STORAGE

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

| | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
|---|---|---|---|
| RELINQUISHED BY/REMOVED FROM | 12-31-12 1520 | RECEIVED BY/STORED IN | 12-31-12 1520 |
| 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 |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |

SPECIAL INSTRUCTIONS: ** The CACN for WSCF Analytical is 404401.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. TRVL-13-109

TRVL 13- 109

| | | | |
|---|---|---|---|
| LABORATORY SECTION | RECEIVED BY | TITLE | DATE/TIME |
| FINAL SAMPLE DISPOSITION | DISPOSAL METHOD | DISPOSED BY | DATE/TIME |

PRINTED ON 9/24/2013

A-6002-618 (REV 4)