

JULY 23, 2012

WSCF Laboratory

PO Box 650 S3-30
Richland, WA 99352



July 23, 2012

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

Dear Scot Fitzgerald,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF120841

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 WSCF120841

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

Very truly yours,

A handwritten signature in black ink, appearing to read "Joseph Hale", is written over a horizontal line.

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 # WSCF120841
Data Deliverable Date 08/13/12

| SAF # | Sample ID | Sample # | Matrix | Sampled | Received |
|--------------|------------------|-----------------|---------------|----------------|-----------------|
| X12-026 | B2KX76 | 120841001 | WATER | 06/27/12 | 06/27/12 |
| X12-026 | B2KX78 | 120841002 | WATER | 06/27/12 | 06/27/12 |
| X12-026 | B2KX79 | 120841003 | WATER | 06/27/12 | 06/27/12 |

ATTACHMENT 2

NARRATIVE

Consisting of 3 pages
Including cover page

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), Master Contract 39818, Revision 3, "Laboratory Analytical Services to CHPRC Soil and Groundwater Remediation Project."*

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.

Analytical Methodology for Requested Analyses

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

Inorganic Comments

Attachment 2
Narrative
WSCF120841

Total Organic Carbon – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

Organic Comments

TPHD-WA – 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):

- Sample B2KX76 (120841001) did not meet the acceptance limits for surrogate o-Terphenyl. Sample results were not flagged. The quality control report was flagged for surrogate recovery failure.
- 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, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

Gross Beta:

- Gross Beta – 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 23 pages
Including cover page

JULY 23, 2012

WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600
Richland, WA 99352

Attention: Scot Fitzgerald

Contract # MOA-FH-CHPRC-2008
Group # WSCF120841
Report Date July 23, 2012

Analytical: Electronically signed by Joseph Hale

Client Services: Electronically signed by Marisol Avila

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.

This information is intended for the use of the addressee only. If the reader of this report is not the intended recipient or is not authorized by the recipient to receive the report, you are hereby notified that any dissemination, distribution or copying of this report is strictly prohibited. If you have received this report in error, please notify WSCF Laboratory immediately by telephone at (509) 373-7005. Information designation of this report is the responsibility of the customer.

Batch QC List

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF120841

| QC Batch | Analytical Batch | S# | Type | Sample # | Client Sample# | Original | Test |
|----------|------------------|----|--------|-----------|----------------------|-----------|----------------------------------|
| 203955 | 204166 | 1 | BLANK | 77659 | BLANK | | Extractable Diesel and Petroleum |
| 203955 | 204166 | 2 | LCS | 77660 | LCS | | Extractable Diesel and Petroleum |
| 203955 | 204166 | 3 | MS | 77661 | B2KX76(120841001MS) | 120841001 | Extractable Diesel and Petroleum |
| 203955 | 204166 | 4 | MSD | 77662 | B2KX76(120841001MSD) | 120841001 | Extractable Diesel and Petroleum |
| 203955 | 204166 | 5 | SAMPLE | 120841002 | B2KX78 | | Extractable Diesel and Petroleum |
| 203955 | 204166 | 6 | SAMPLE | 120841001 | B2KX76 | | Extractable Diesel and Petroleum |
| 203955 | 204166 | 7 | SAMPLE | 120841003 | B2KX79 | | Extractable Diesel and Petroleum |

Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF120841

| QC Batch | Analytical Batch | S# | Type | Sample # | Client Sample# | Original | Test |
|----------|------------------|----|--------|-----------|----------------------|-----------|------------------------|
| 204150 | 204359 | 1 | BLANK | 77760 | BLANK | | Gross Alpha/Gross Beta |
| 204150 | 204359 | 2 | LCS | 77761 | LCS | | Gross Alpha/Gross Beta |
| 204150 | 204359 | 3 | DUP | 77762 | B2LRT2(120857003DUP) | 120857003 | Gross Alpha/Gross Beta |
| 204150 | 204359 | 6 | SAMPLE | 120841001 | B2KX76 | | Gross Alpha/Gross Beta |
| 204150 | 204359 | 7 | SAMPLE | 120841002 | B2KX78 | | Gross Alpha/Gross Beta |
| 204150 | 204359 | 8 | SAMPLE | 120841003 | B2KX79 | | Gross Alpha/Gross Beta |

Batch QC List

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF120841

| QC Batch | Analytical Batch | S# | Type | Sample # | Client Sample# | Original | Test |
|----------|------------------|----|--------|-----------|----------------------|-----------|----------------------|
| 204957 | 204957 | 2 | BLANK | 78356 | BLANK | | Total Organic Carbon |
| 204957 | 204957 | 3 | LCS | 78357 | LCS | | Total Organic Carbon |
| 204957 | 204957 | 4 | MS | 78358 | B2L9N1(120838018MS) | 120838018 | Total Organic Carbon |
| 204957 | 204957 | 5 | MSD | 78359 | B2L9N1(120838018MSD) | 120838018 | Total Organic Carbon |
| 204957 | 204957 | 13 | SAMPLE | 120841001 | B2KX76 | | Total Organic Carbon |
| 204957 | 204957 | 14 | SAMPLE | 120841002 | B2KX78 | | Total Organic Carbon |
| 204957 | 204957 | 15 | SAMPLE | 120841003 | B2KX79 | | Total Organic Carbon |

Method Reference

Attention Scot Fitzgerald
Department Organic, Semivolatiles

Group # WSCF120841

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-523-493 | NWTPH-Dx, Extractible Diesel and Petroleum Productions Analysis in Soil and Water | | |
| | WDOE | WDOE | Total Petroleum Hydrocarbons in Diesel |
| | HEIS | WTPH_DIESEL | TPH Diesel |

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 # WSCF120841

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-508-415 | Operation Of The Protean 2-Inch Alpha/Beta Counting System For Gross Alpha/ Beta Samples | | |
| | HEIS | ALPHA_GPC | Gross Alpha by GPC |
| | HEIS | BETA_GPC | Gross Beta by GPC |
| | HEIS | SRTOT_SEP_PRECIP_GPC | Strontium beta isotopic, GPC |

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 Wet Chemistry

Group # WSCF120841

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-344-406 | Total Organic Carbon (TOC) Based on SW-846 | | |
| | EPA SW-846 | 9060 | Total Organic Carbon |
| | HEIS | 9060_TOC | Total Organic Carbon |

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>

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Organic, Semivolatiles

Group # WSCF120841

Sample # 120841001
SAF# X12-026
Sample ID B2KX76

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|--|-----------|------------|----|--------|--------|-------|----|-----|-----|-----------------|
| Total Petroleum Hydrocarbons (Water Prep) | | | | | | | | | | 06/28/12 |
| Extractable Diesel and Petroleum | | | | | | | | | | |
| Diesel | TPHDIESEL | LA-523-493 | U | <70 | | ug/L | 1 | 70 | 100 | 07/02/12 |

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

D - Analyte was reported at a secondary diltution factor.

E - The calibration exceeds the calibration range (GC/MS).

J - Analyte < lowest calibration but >= MDL.

N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).

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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF120841

Sample # 120841002
 SAF# X12-026
 Sample ID B2KX78

Matrix WATER
 Sampled 06/27/12
 Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|--|-----------|------------|----|--------|--------|-------|----|-----|-----|-----------------|
| Total Petroleum Hydrocarbons (Water Prep) | | | | | | | | | | 06/28/12 |
| Extractable Diesel and Petroleum | | | | | | | | | | |
| Diesel | TPHDIESEL | LA-523-493 | U | <70 | | ug/L | 1 | 70 | 100 | 07/02/12 |

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
 D - Analyte was reported at a secondary diltution factor.
 E - The calibration exceeds the calibration range (GC/MS).
 J - Analyte < lowest calibration but >= MDL.
 N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
 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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Organic, Semivolatiles

Group # WSCF120841

Sample # 120841003
SAF# X12-026
Sample ID B2KX79

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|--|-----------|------------|----|--------|--------|-------|----|-----|-----|-----------------|
| Total Petroleum Hydrocarbons (Water Prep) | | | | | | | | | | 06/28/12 |
| Extractable Diesel and Petroleum | | | | | | | | | | |
| Diesel | TPHDIESEL | LA-523-493 | | 390 | | ug/L | 1 | 70 | 100 | 07/02/12 |

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

D - Analyte was reported at a secondary diltution factor.

E - The calibration exceeds the calibration range (GC/MS).

J - Analyte < lowest calibration but >= MDL.

N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).

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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF120841

Sample # 120841001
SAF# X12-026
Sample ID B2KX76

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|---|------------|------------|----|--------|--------|-------|----|-----|-----|-----------------|
| Preparation for Alpha/Beta (Gross) (W) | | | | | | | | | | 07/03/12 |
| Gross Alpha/Gross Beta | | | | | | | | | | |
| Gross Beta | 12587-47-2 | LA-508-415 | U | 3.6 | 2.5 | pCi/L | 1 | 3.9 | | 07/10/12 |

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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF120841

Sample # 120841002
SAF# X12-026
Sample ID B2KX78

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|---|------------|------------|----|--------|--------|-------|----|-----|-----|-----------------|
| Preparation for Alpha/Beta (Gross) (W) | | | | | | | | | | 07/03/12 |
| Gross Alpha/Gross Beta | | | | | | | | | | |
| Gross Beta | 12587-47-2 | LA-508-415 | U | -3.8 | 2 | pCi/L | 1 | 3.7 | | 07/10/12 |

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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF120841

Sample # 120841003
SAF# X12-026
Sample ID B2KX79

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|---|------------|------------|----|--------|--------|-------|----|-----|-----|-----------------|
| Preparation for Alpha/Beta (Gross) (W) | | | | | | | | | | 07/03/12 |
| Gross Alpha/Gross Beta | | | | | | | | | | |
| Gross Beta | 12587-47-2 | LA-508-415 | U | -1.9 | 2.2 | pCi/L | 1 | 3.9 | | 07/10/12 |

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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Wet Chemistry

Group # WSCF120841

Sample # 120841001
SAF# X12-026
Sample ID B2KX76

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|-----------------------------|-------|------------|----|--------|--------|-------|----|------|------|----------|
| 07/18/12 | | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | | |
| Total Organic Carbon | TOC | LA-344-406 | | 0.632 | | mg/L | 1 | 0.10 | 0.30 | 07/18/12 |

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

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary diltution factor.
 N - MS and/or MSD sample recovery outside control limits.
 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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Wet Chemistry

Group # WSCF120841

Sample # 120841002
SAF# X12-026
Sample ID B2KX78

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|-----------------------------|-------|------------|----|--------|--------|-------|----|------|------|----------|
| 07/18/12 | | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | | |
| Total Organic Carbon | TOC | LA-344-406 | U | <0.10 | | mg/L | 1 | 0.10 | 0.30 | 07/18/12 |

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

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary diltution factor.
 N - MS and/or MSD sample recovery outside control limits.
 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)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Wet Chemistry

Group # WSCF120841

Sample # 120841003
SAF# X12-026
Sample ID B2KX79

Matrix WATER
Sampled 06/27/12
Received 06/27/12

| Test Performed | CAS # | Method | RQ | Result | TP Err | Units | DF | MDL | PQL | Analyzed |
|-----------------------------|-------|------------|----|--------|--------|-------|----|------|------|----------|
| 07/18/12 | | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | | |
| Total Organic Carbon | TOC | LA-344-406 | | 1.31 | | mg/L | 1 | 0.10 | 0.30 | 07/18/12 |

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

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 N - MS and/or MSD sample recovery outside control limits.
 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)

Quality Control Report

Attention Scot Fitzgerald
Department Organic, Semivolatiles

Group # WSCF120841

Analytical Batch 204166 (QC Batch: 203955)
Associated Samples 120841001, 120841002, 120841003

Test Extractable Diesel and Petroleum

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | RQ | Analyzed |
|--------------|-----------|----------------|---------------------------|-------|---------|----------|------|-----------|---------------------|----------|
| BLANK | | | | | | | | | | |
| | | | QC Sample #77659 | | | | | | | |
| Diesel | TPHDIESEL | <80 | | ug/L | | | | | U | 07/02/12 |
| LCS | | | | | | | | | | |
| | | | QC Sample #77660 | | | | | | | |
| Diesel | TPHDIESEL | 3100 | | ug/L | 123.2 | 65 - 128 | | | | 07/02/12 |
| MS | | | | | | | | | | |
| | | | QC Sample #77661 | | | | | | | |
| | | | Original 120841001 | | | | | | | |
| Diesel | TPHDIESEL | <70 | 2900 | ug/L | 121.1 | 73 - 123 | | | | 07/02/12 |
| MSD | | | | | | | | | | |
| | | | QC Sample #77662 | | | | | | | |
| | | | Original 120841001 | | | | | | | |
| | | | | | | | | | Paired 77661 | |
| Diesel | TPHDIESEL | <70 | 2900 | ug/L | 121.2 | 73 - 123 | 0.00 | 20 | | 07/02/12 |

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF120841

Analytical Batch 204359 (QC Batch: 204150) **Test** Gross Alpha/Gross Beta
Associated Samples 120841001, 120841002, 120841003

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | RQ | Analyzed |
|--------------|------------|---------------------------|----------|-------|---------|----------|-------|-----------|-----|----------|
| BLANK | | QC Sample #77760 | | | | | | | | |
| Gross Beta | 12587-47-2 | | -4.4 | pCi/L | | | | | U | 07/10/12 |
| LCS | | QC Sample #77761 | | | | | | | | |
| Gross Beta | 12587-47-2 | | 250 | pCi/L | 97.7 | 80 - 120 | | | | 07/10/12 |
| DUP | | QC Sample #77762 | | | | | | | | |
| | | Original 120857003 | | | | | | | | |
| Gross Beta | 12587-47-2 | | 13 | pCi/L | | | 42.40 | 20 | * X | 07/10/12 |

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

Quality Control Report

Attention Scot Fitzgerald
Department Wet Chemistry

Group # WSCF120841

Analytical Batch 204957 (QC Batch: 204957) **Test** Total Organic Carbon
Associated Samples 120841001, 120841002, 120841003

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | RQ | Analyzed |
|----------------------|-------|----------------|---------------------------|-------|---------|----------|------|-----------|---------------------|----------|
| BLANK | | | | | | | | | | |
| | | | QC Sample #78356 | | | | | | | |
| Total Organic Carbon | TOC | | <0.045 | mg/L | | | | | U | 07/18/12 |
| LCS | | | | | | | | | | |
| | | | QC Sample #78357 | | | | | | | |
| Total Organic Carbon | TOC | | 2.06 | mg/L | 103.1 | 80 - 120 | | | | 07/18/12 |
| MS | | | | | | | | | | |
| | | | QC Sample #78358 | | | | | | | |
| | | | Original 120838018 | | | | | | | |
| Total Organic Carbon | TOC | | 2.04 | mg/L | 101.8 | 75 - 125 | | | | 07/18/12 |
| MSD | | | | | | | | | | |
| | | | QC Sample #78359 | | | | | | | |
| | | | Original 120838018 | | | | | | | |
| Total Organic Carbon | TOC | | 1.99 | mg/L | 99.4 | 75 - 125 | 1.90 | 20 | Paired 78358 | 07/18/12 |

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
Department Organic, Semivolatiles

Group # WSCF120841

Analytical Batch 204166 (QC Batch: 203955)
Associated Samples 120841001, 120841002, 120841003

Test Extractable Diesel and Petroleum

| Analyte | CAS # | Original Found | QC Found | Units | % Recov | Limits | RPD | RPD Limit | RQ | Analyzed |
|---------------|---------|----------------|----------|---------------------------|---------|----------|-----|---------------------|----|----------|
| SAMPLE | | | | Sample #120841001 | | | | | | |
| o-Terphenyl | 84-15-1 | | | | 131.8 | 70 - 130 | | | X | 07/02/12 |
| SAMPLE | | | | Sample #120841002 | | | | | | |
| o-Terphenyl | 84-15-1 | | | | 122.9 | 70 - 130 | | | | 07/02/12 |
| SAMPLE | | | | Sample #120841003 | | | | | | |
| o-Terphenyl | 84-15-1 | | | | 122.5 | 70 - 130 | | | | 07/02/12 |
| BLANK | | | | QC Sample #77659 | | | | | | |
| o-Terphenyl | 84-15-1 | | | | 124.8 | 70 - 130 | | | | 07/02/12 |
| LCS | | | | QC Sample #77660 | | | | | | |
| o-Terphenyl | 84-15-1 | | | | 121.7 | 70 - 130 | | | | 07/02/12 |
| MS | | | | QC Sample #77661 | | | | | | |
| | | | | Original 120841001 | | | | | | |
| o-Terphenyl | 84-15-1 | | | | 117.2 | 70 - 130 | | | | 07/02/12 |
| MSD | | | | QC Sample #77662 | | | | | | |
| | | | | Original 120841001 | | | | | | |
| | | | | | | | | Paired 77661 | | |
| o-Terphenyl | 84-15-1 | | | | 118.4 | 70 - 130 | n/a | | | 07/02/12 |

* - QC result out of range

n/a - Not Applicable

Analytical Comment Report

Attention: Scot Fitzgerald

Group #

WSCF120841

120841001

B2KX76

Department Organic, Semivolatiles

Analyte o-Terphenyl - Extractable Diesel and Petroleum
[1] Surrogate recovery outside of established laboratory control limits.

Analytical Comment Report

Attention: Scot Fitzgerald

Group # WSCF120841

Quality Control Comments

Department Radiochemistry

77762 B2LRT2(120857003DUP)

Analyte Gross Beta - Gross Alpha/Gross Beta

[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 5 pages
Including cover page

Waste Sampling and Characterization Facility
P.O. Box 1970 S3-30, Richland WA 99352
Phone: (509) 373-7004/FAX: (509) 373-7134

ACKNOWLEDGEMENT OF SAMPLES RECEIVED

WSCF Laboratory

PO Box 650 S3-30
 Richland, WA 99352

ATTN: Scot Fitzgerald

Customer Code: CHPRC

PO #: 401647

Work Order #: 120841

Profile #: X12-026-037

Proj. Mgr.:

Phone:

The following samples were received from you on 6/27/2012 9:55:00 AM. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

| Sample # | Sample ID | Matrix | Collected | Received |
|---------------------------|-----------|--------|-----------------|-----------------|
| Tests scheduled | | | | |
| 120841001 | B2KX76 | WATER | 6/27/2012 08:23 | 6/27/2012 09:55 |
| GAB-BO-W; TOC-W; TPHDWA-W | | | | |
| 120841002 | B2KX78 | WATER | 6/27/2012 07:00 | 6/27/2012 09:55 |
| GAB-BO-W; TOC-W; TPHDWA-W | | | | |
| 120841003 | B2KX79 | WATER | 6/27/2012 09:07 | 6/27/2012 09:55 |
| GAB-BO-W; TOC-W; TPHDWA-W | | | | |

Test Acronym Description

| Test Acronym | Description |
|--------------|------------------------------|
| GAB-BO-W | Gross Alpha/Beta (B only)(W) |
| TOC-W | Total Organic Carbon (W) |
| TPHDWA-W | TPHD-WA (W) |

Sample Receipt

C.O.C.#
X12-026-037
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company

Collector: *Aguilar*
 SAF No.: X12-026
 Project Title: SHORELINE, JUNE 2012
 Shipped To (Lab): **Waste Sampling & Characterization**
 Protocol: SURV

Contact/Requester: Karen Waters-Husted
 Sampling Origin: Ilanford Site
 Logbook No.: HNF-N-506 46 / 33
 Method of Shipment: GOVERNMENT VEHICLE
 Priority: 45 Days

Telephone No.: 376-4650
 Purchase Order/Charge Code: 300071ES20
 Ice Chest No.: N/A
 Bill of Lading/Air Bill No.: N/A
 Offsite Property No.: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS
 *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1996/1993)

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 Site Wide Generator Knowledge Information Form applies.
 The CACN for all analytical work at WSCF is 401647
 FV11 and FV12 samples cannot be in the same SDG

120841

| Sample No. | Filter | Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|------------|--------|---------|------|-------------------|---------------------------|--------------|-------------------------------|
| B2KX76 | N | 6-27-12 | 0823 | 1x250-mL aG | 9060_TOC: TOC (1) | 28 Days | HCl or H2SO4 to pH <2/Cool-4C |
| B2KX76 | N | 6-27-12 | 0823 | 1x500-mL GP | Gross Beta | 6 Months | HNO3 to pH <2 |
| B2KX76 | N | 6-27-12 | 0823 | 3x1-L aG | TPH-Diesel Range - WTPH-D | 14/40 Days | HCl to pH <2/Cool-4C |

| | | | |
|--------------------------------------|---------------------------|---------------------------------|---------------------------|
| Relinquished By <i>Am Aguilar</i> | Date/Time 6-27-12 0955 | Received By <i>JA Frazee</i> | Date/Time 6-27-12 0955 |
| Relinquished By | Date/Time | Received By | Date/Time |
| Relinquished By | Date/Time | Received By | Date/Time |

Disposal Method (e.g., Return to customer, per lab procedure, used in process):
 Disposed By: _____ Date/Time: _____

A-6004-842 (REV 2)

PRINTED 0 4/4/2012

Sample Receipt

Chain of Custody

C.O.C.# **X12-026-038**
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2MHill Plateau Remediation Company

Collector: Aguilar Contact/Requester: Karen Waters-Husted Telephone No.: 376-4650

SAF No.: X12-026 Sampling Origin: Hanford Site Purchase Order/Charge Code: 30007IES20

Project Title: SHORELINE, JUNE 2012 Logbook No.: HNF-N-506 Ice Chest No.: N/A Bill of Lading/Air Bill No.: N/A

Shipped To (Lab): Waste Sampling & Characterization Method of Shipment: GOVERNMENT VEHICLE (Offsite Property No.): N/A

Protocol: SURV Priority: 45 Days SPECIAL INSTRUCTIONS: Hold Time Total Activity Exemption: Yes No

POSSIBLE SAMPLE HAZARDS/REMARKS
 ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.3 (1990/1993)
 Site Wide Generator Knowledge Information Form applies
 The CACN for all analytical work at WSCP is 401647
 FY11 and FY12 samples cannot be in the same SDG

| Sample No. | Filter | Date | Time | No./Type Container | Sample Analysis | Holding Time | Preservative |
|------------|--------|---------|------|--------------------|---------------------------|--------------|-------------------------------|
| B2KX78 | N | 6-27-12 | 0700 | 1x250-mL aG | 9060_TOC, TOC (1) | 28 Days | HCl or H2SO4 to pH <2/Cool-4C |
| B2KX78 | N | 6-27-12 | 0700 | 1x500-mL G/P | Gross Beta | 6 Months | HNO3 to pH <2 |
| B2KX78 | N | 6-27-12 | 0700 | 3x1-L aG | TPH-Diesel Range - WTPH-D | 14/40 Days | HCl to pH <2/Cool-4C |

| | | | | | | | | |
|------------------------------------|-------|------|--------------------------------|--|-------|------|--------------------------------|---|
| Relinquished By: <u>Am Aguilar</u> | Print | Sign | Date/Time: <u>6-27-12 0955</u> | Received By: <u>JA Frazier</u> | Print | Sign | Date/Time: <u>6-27-12 0955</u> | Matrix * |
| Relinquished By: | | | Date/Time: | Received By: | | | Date/Time: | S = Soil DS = Drum Solids SF = Sediment DL = Drums Liquids SO = Solid T = Tissue SL = Sludge WJ = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other |
| Relinquished By: | | | Date/Time: | Received By: | | | Date/Time: | |
| Relinquished By: | | | Date/Time: | Received By: | | | Date/Time: | |
| FINAL SAMPLE DISPOSITION | | | | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | | | | Date/Time |
| PRINTED ON 4/4/2012 | | | | | | | | A-6004-842 (REV 2) |

Sample Receipt

Chain of Custody

C.O.C. # **X12-026-039**
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2MHill Plateau Remediation Company

Collector: Aguilar Contact/Requester: Karen Waters-Husted Telephone No.: 376-4650
 SAF No.: X12-026 Sampling Origin: Hanford Site Purchase Order/Charge Code: 300071ES20
 Project Title: SHORELINE, JUNE 2012 Logbook No.: HNF-N-506 44 / 33 Ice Chest No.: N/A
 Shipped To (Lab): Waste Sampling & Characterization Method of Shipment: GOVERNMENT VEHICLE Bill of Lading/Air Bill No.: N/A
 Protocol: SURV Priority: 45 Days Offsite Property No.: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS
 *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993).
SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 Site Wide Generator Knowledge Information Form applies.
 The CACN for all analytical work at WSCF is 401647.
 FY11 and FY12 samples cannot be in the same SDG.

| Sample No. | Filter | Date | Time | Nr/Type Container | Sample Analysis | Holding Time | Preservative |
|------------|--------|---------|------|-------------------|---------------------------|--------------|-------------------------------|
| B2KX79 3 | N | 6-27-12 | 0907 | 1x250-mL aG | 9060_TOC: TOC (1) | 28 Days | HCl or H2SO4 to pH <2/Cool-4C |
| B2KX79 1 | N | 6-27-12 | 0907 | 1x500-mL G/P | Gross Beta | 6 Months | HNO3 to pH <2 |
| B2KX79 2 | N | 6-27-12 | 0907 | 3x1-L aG | TPH-Diesel Range - WTPH-D | 14/40 Days | HCl to pH <2/Cool-4C |

| Retrieved By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time | Matrix * |
|--------------|------------|------------|--------------|-------------|------------|------------|--------------|--|
| Em Aguilar | Em Aguilar | Em Aguilar | 6-27-12 0955 | JA Aguilar | JA Aguilar | JA Aguilar | 6-27-12 0955 | S = Soil, DS = Drum Solids, SE = Sediment, DL = Drum Liquids, SO = Solid, T = Tissue, W = Water, SL = Sludge, WI = Wipe, L = Liquid, O = Oil, V = Vegetation, A = Air, X = Other |
| Retrieved By | | | Date/Time | Received By | | | Date/Time | |
| Retrieved By | | | Date/Time | Received By | | | Date/Time | |

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Date/Time
 Disposed By: _____
 PRINTED ON 4/4/2012 A-6004-842 (REV 2)