

SAF-RC-234
100-IU-2 & 100-IU-6 Remaining
Waste Sites – Other
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required

KW 4/14/16
INITIAL/DATE

COMMENTS:

SDG JP1040

SAF-RC-234

Rad only

Chem only

Rad & Chem

Complete

Partial

Sample Location: 600-385 Stained Soil

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Richland
2800 George Washington Way
Richland, WA 99352
Tel: (509)375-3131

TestAmerica Job ID: 300-2781-1
TestAmerica Sample Delivery Group: JP1040
Client Project/Site: 600-385 Stained Soil

For:
Washington Closure Hanford
2620 Fermi Avenue
Richland, Washington 99354

Attn: Joan H Kessner



Authorized for release by:
4/11/2016 11:06:48 AM
Steven Campbell, Quality Assurance Assistant
steven.campbell@testamericainc.com

Designee for
Rhonda Wagar, Project Manager II
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LINKS

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www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

Qualifiers

General Chemistry

| Qualifier | Qualifier Description |
|-----------|--------------------------------|
| U | Analyzed for but not detected. |

Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|----------------|---|
| ▫ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

Case Narrative

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

Job ID: 300-2781-1

Laboratory: TestAmerica Richland

Narrative

Job Narrative
300-2781-1
JP1040 / RC-234

Comments

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.

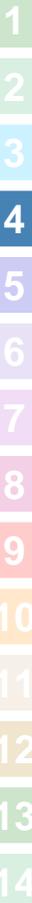
Receipt

The sample was received on 4/7/2016 11:45 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.7° C.

General Chemistry

Hexavalent Chromium by EPA method 7196A:

The LCS, batch blank, samples, sample duplicate and sample matrix spike results are within contractual requirements.



Detection Summary

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

Client Sample ID: J1V8V1

Lab Sample ID: 300-2781-1

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Richland

Client Sample Results

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

Client Sample ID: J1V8V1
Date Collected: 04/07/16 09:00
Date Received: 04/07/16 11:45

Lab Sample ID: 300-2781-1
Matrix: Other Solid Sample

General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------|--------|-----------|-----|------|-------|---|----------------|----------------|---------|
| Cr (VI) | 0.17 | U | 2.2 | 0.17 | mg/Kg | ☼ | 04/08/16 10:28 | 04/08/16 14:00 | 1 |

QC Sample Results

Client: Washington Closure Hanford
 Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
 SDG: JP1040

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 300-3735/1-A
Matrix: Solid
Analysis Batch: 3743

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3735

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------|-----------|--------------|-----|------|-------|---|----------------|----------------|---------|
| Cr (VI) | 0.15 | U | 2.0 | 0.15 | mg/Kg | | 04/08/16 10:28 | 04/08/16 13:12 | 1 |

Lab Sample ID: LCS 300-3735/2-A
Matrix: Solid
Analysis Batch: 3743

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3735

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---------|-------------|------------|---------------|-------|---|------|--------------|
| Cr (VI) | 20.0 | 19.44 | | mg/Kg | | 97 | 85 - 115 |

Lab Sample ID: 300-2781-1 MS
Matrix: Other Solid Sample
Analysis Batch: 3743

Client Sample ID: J1V8V1
Prep Type: Total/NA
Prep Batch: 3735

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---------|---------------|------------------|-------------|-----------|--------------|-------|---|------|--------------|
| Cr (VI) | 0.17 | U | 32.9 | 28.46 | | mg/Kg | ☼ | 87 | 75 - 125 |

Lab Sample ID: 300-2781-1 MSI
Matrix: Other Solid Sample
Analysis Batch: 3743

Client Sample ID: J1V8V1
Prep Type: Total/NA
Prep Batch: 3735

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSI Result | MSI Qualifier | Unit | D | %Rec | %Rec. Limits |
|---------|---------------|------------------|-------------|------------|---------------|-------|---|------|--------------|
| Cr (VI) | 0.17 | U | 738 | 722.9 | | mg/Kg | ☼ | 98 | |

Lab Sample ID: 300-2781-1 DU
Matrix: Other Solid Sample
Analysis Batch: 3743

Client Sample ID: J1V8V1
Prep Type: Total/NA
Prep Batch: 3735

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---------|---------------|------------------|-----------|--------------|-------|---|-----|-----------|
| Cr (VI) | 0.17 | U | 0.17 | U | mg/Kg | ☼ | NC | 35 |

QC Association Summary

Client: Washington Closure Hanford
 Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
 SDG: JP1040

General Chemistry

Prep Batch: 3735

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|------------------|--------------------|-----------|-------------|--------|------------|
| 300-2781-1 | J1V8V1 | Total/NA | Other Solid | 3060A | |
| 300-2781-1 DU | J1V8V1 | Total/NA | Sample | 3060A | |
| 300-2781-1 MS | J1V8V1 | Total/NA | Sample | 3060A | |
| 300-2781-1 MSI | J1V8V1 | Total/NA | Other Solid | 3060A | |
| LCS 300-3735/2-A | Lab Control Sample | Total/NA | Sample | 3060A | |
| MB 300-3735/1-A | Method Blank | Total/NA | Solid | 3060A | |

Analysis Batch: 3743

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|------------------|--------------------|-----------|-------------|--------|------------|
| 300-2781-1 | J1V8V1 | Total/NA | Other Solid | 7196A | 3735 |
| 300-2781-1 DU | J1V8V1 | Total/NA | Sample | 7196A | 3735 |
| 300-2781-1 MS | J1V8V1 | Total/NA | Sample | 7196A | 3735 |
| 300-2781-1 MSI | J1V8V1 | Total/NA | Other Solid | 7196A | 3735 |
| LCS 300-3735/2-A | Lab Control Sample | Total/NA | Sample | 7196A | 3735 |
| MB 300-3735/1-A | Method Blank | Total/NA | Solid | 7196A | 3735 |

Lab Chronicle

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

Client Sample ID: J1V8V1

Date Collected: 04/07/16 09:00

Date Received: 04/07/16 11:45

Lab Sample ID: 300-2781-1

Matrix: Other Solid Sample

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 3060A | | | 2.5112 g | 100 mL | 3735 | 04/08/16 10:28 | HR | TAL RCH |
| Total/NA | Analysis | 7196A | | 1 | 2.5112 g | 100 mL | 3743 | 04/08/16 14:00 | HR | TAL RCH |

Laboratory References:

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131

Certification Summary

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

Laboratory: TestAmerica Richland

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|------------|---------------|------------|------------------|-----------------|
| Washington | State Program | 10 | C565 | 08-13-16 |

| Analysis Method | Prep Method | Matrix | Analyte |
|-----------------|-------------|--------|---------|
|-----------------|-------------|--------|---------|

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Method Summary

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

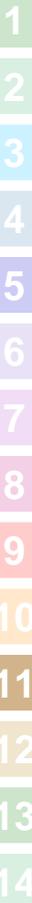
| Method | Method Description | Protocol | Laboratory |
|--------|----------------------|----------|------------|
| 7196A | Chromium, Hexavalent | SW846 | TAL RCH |

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131



Sample Summary

Client: Washington Closure Hanford
Project/Site: 600-385 Stained Soil

TestAmerica Job ID: 300-2781-1
SDG: JP1040

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|------------------|--------------------|----------------|----------------|
| 300-2781-1 | J1V8V1 | Other Solid Sample | 04/07/16 09:00 | 04/07/16 11:45 |

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Login Sample Receipt Checklist

Client: Washington Closure Hanford

Job Number: 300-2781-1

SDG Number: JP1040

Login Number: 2781

List Number: 1

Creator: Bock, Julie A

List Source: TestAmerica Richland

| Question | Answer | Comment |
|---|--------|---------|
| Radioactivity wasn't checked or is \leq background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | N/A | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4"). | N/A | |
| Multiphasic samples are not present. | N/A | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |



ANALYTICAL REPORT

Job Number: 280-81645-1

SDG Number: JP1040

Job Description: SAF# RC-234

For:

Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

Attention: Joan H Kessner



Approved for release.
Kae E Yoder
Senior Project Manager
4/13/2016 11:02 AM

Kae E Yoder, Senior Project Manager
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0190
kae.yoder@testamericainc.com
04/13/2016

The test results in this report relate only to the samples in this report and meet all requirements of NELAP, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

TestAmerica Laboratories, Inc.

TestAmerica Denver 4955 Yarrow Street, Arvada, CO 80002
Tel (303) 736-0100 Fax (303) 431-7171 www.testamericainc.com



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CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-81645-1

SDG #: JP1040

SAF#: RC-234

Date SDG Closed: April 8, 2016

Data Deliverable: 3 Day / Summary

| <u>CLIENT ID</u> | <u>LAB ID</u> | <u>ANALYSES REQUESTED</u> | <u>ANALYSES PERFORMED</u> |
|------------------|---------------|-------------------------------|---------------------------|
| J1V8V1 | 280-81645-1 | 6010/7471/9045/1311-6010-7470 | 6010B/7471A/9045C |

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. 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 signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The sample was received on 4/8/2016 9:35 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9° C.

Sample J1V8V1, requesting TCLP Metals 1311/6010B/7470A analyses, was leached and placed on hold, as instructed on the Chain of Custody. On 4/13/2016, the client instructed the laboratory to cancel the TCLP Metals analyses.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-319979 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Aluminum and Barium are present in the method blank associated with batch 280-319979. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V8V1; therefore, control limits are not applicable.

The Matrix Spike performed on sample J1V8V1 exhibited percent recoveries outside the control limits for Boron, Selenium and Silicon, and the associated sample results have been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1V8V1 exhibited RPD data outside the control limits for Molybdenum, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9045C - PH

SU = standard units

No anomalies were encountered.

DATA REPORTING QUALIFIERS

Client: Washington Closure Hanford

Job Number: 280-81645-1

Sdg Number: JP1040

| Lab Section | Qualifier | Description |
|-------------|-----------|---|
| Metals | | |
| | U | Analyzed for but not detected. |
| | B | Estimated result. Result is less than the RL, but greater than MDL |
| | 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| | N | Recovery exceeds upper or lower control limits |
| | M | Sample duplicate precision not met. |
| | X | Serial dilution in the analytical batch indicates that physical and chemical interferences are present. |

SAMPLE SUMMARY

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

| Lab Sample ID | Client Sample ID | Client Matrix | Date/Time Sampled | Date/Time Received |
|----------------------|-------------------------|----------------------|--------------------------|---------------------------|
| 280-81645-1 | J1V8V1 | Solid | 04/07/2016 0900 | 04/08/2016 0935 |

METHOD SUMMARY

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

| Description | Lab Location | Method | Preparation Method |
|------------------------------------|--------------|-------------|--------------------|
| Matrix: Solid | | | |
| Metals (ICP) | TAL DEN | SW846 6010B | |
| Preparation, Metals | TAL DEN | | SW846 3050B |
| pH | TAL DEN | SW846 9045C | |
| Deionized Water Leaching Procedure | TAL DEN | | ASTM DI Leach |

Lab References:

TAL DEN = TestAmerica Denver

Method References:

ASTM = ASTM International

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Washington Closure Hanford

Job Number: 280-81645-1

Sdg Number: JP1040

| Method | Analyst | Analyst ID |
|---------------|------------------|-------------------|
| SW846 6010B | Rhoades, Chris R | CRR |
| SW846 9045C | Simons, Nicole A | NAS |

SAMPLE RESULTS

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-81645-1

Sdg Number: JP1040

Client Sample ID: J1V8V1

Lab Sample ID: 280-81645-1

Date Sampled: 04/07/2016 0900

Client Matrix: Solid

Date Received: 04/08/2016 0935

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-320027 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-319979 Lab File ID: 25b040816.asc
Dilution: 1.0 Initial Weight/Volume: 1.199 g
Analysis Date: 04/08/2016 2025 Final Weight/Volume: 100 mL
Prep Date: 04/08/2016 1440

| Analyte | DryWt Corrected: N | Result (mg/Kg) | Qualifier | MDL | RL |
|------------|--------------------|----------------|-----------|-------|------|
| Aluminum | | 14000 | X | 1.3 | 4.2 |
| Arsenic | | 5.6 | | 0.55 | 0.83 |
| Barium | | 96.5 | X | 0.063 | 0.42 |
| Beryllium | | 0.48 | | 0.028 | 0.17 |
| Boron | | 0.82 | U N | 0.82 | 1.7 |
| Cadmium | | 0.15 | B | 0.034 | 0.17 |
| Calcium | | 4140 | X | 11.8 | 41.7 |
| Chromium | | 27.8 | X | 0.048 | 0.17 |
| Cobalt | | 6.7 | X | 0.083 | 0.83 |
| Copper | | 31.7 | X | 0.18 | 0.83 |
| Iron | | 25400 | X | 3.2 | 4.2 |
| Lead | | 6.6 | | 0.23 | 0.42 |
| Magnesium | | 4190 | X | 3.1 | 16.7 |
| Manganese | | 159 | X | 0.083 | 0.83 |
| Molybdenum | | 0.62 | B M | 0.22 | 1.7 |
| Nickel | | 20.2 | X | 0.10 | 3.3 |
| Potassium | | 1060 | | 34.2 | 250 |
| Selenium | | 0.72 | U N | 0.72 | 0.83 |
| Silicon | | 858 | X N | 4.7 | 8.3 |
| Silver | | 0.13 | U | 0.13 | 0.17 |
| Sodium | | 262 | | 49.2 | 100 |
| Vanadium | | 85.1 | X | 0.078 | 1.7 |
| Zinc | | 33.3 | X | 0.33 | 0.83 |

Analysis Method: 6010B Analysis Batch: 280-320085 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-319979 Lab File ID: 25C040816.asc
Dilution: 1.0 Initial Weight/Volume: 1.199 g
Analysis Date: 04/09/2016 0117 Final Weight/Volume: 100 mL
Prep Date: 04/08/2016 1440

| Analyte | DryWt Corrected: N | Result (mg/Kg) | Qualifier | MDL | RL |
|----------|--------------------|----------------|-----------|------|------|
| Antimony | | 0.32 | U | 0.32 | 0.50 |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

General Chemistry

Client Sample ID: J1V8V1

Lab Sample ID: 280-81645-1
Client Matrix: Solid

Date Sampled: 04/07/2016 0900
Date Received: 04/08/2016 0935

| Analyte | Result | Qual | Units | RL | RL | Dil | Method |
|-----------------------------|--------|------|-------|--------------------------------|-------|--------------------|--------|
| pH adj. to 25 deg C-Soluble | 7.70 | | SU | 0.100 | 0.100 | 1.0 | 9045C |
| Analysis Batch: 280-319988 | | | | Analysis Date: 04/08/2016 1524 | | DryWt Corrected: N | |

QUALITY CONTROL RESULTS

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

Method Blank - Batch: 280-319979

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 280-319979/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 04/08/2016 2020
Prep Date: 04/08/2016 1440
Leach Date: N/A

Analysis Batch: 280-320027
Prep Batch: 280-319979
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25b040816.asc
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

| Analyte | Result | Qual | MDL | RL |
|------------|--------|------|-------|------|
| Aluminum | 1.70 | B | 1.6 | 5.0 |
| Arsenic | 0.66 | U | 0.66 | 1.0 |
| Barium | 0.0820 | B | 0.076 | 0.50 |
| Beryllium | 0.033 | U | 0.033 | 0.20 |
| Boron | 0.98 | U | 0.98 | 2.0 |
| Cadmium | 0.041 | U | 0.041 | 0.20 |
| Calcium | 14.1 | U | 14.1 | 50.0 |
| Chromium | 0.058 | U | 0.058 | 0.20 |
| Cobalt | 0.10 | U | 0.10 | 1.0 |
| Copper | 0.22 | U | 0.22 | 1.0 |
| Iron | 3.8 | U | 3.8 | 5.0 |
| Lead | 0.27 | U | 0.27 | 0.50 |
| Magnesium | 3.7 | U | 3.7 | 20.0 |
| Manganese | 0.10 | U | 0.10 | 1.0 |
| Molybdenum | 0.26 | U | 0.26 | 2.0 |
| Nickel | 0.12 | U | 0.12 | 4.0 |
| Potassium | 41.0 | U | 41.0 | 300 |
| Selenium | 0.86 | U | 0.86 | 1.0 |
| Silicon | 5.7 | U | 5.7 | 10.0 |
| Silver | 0.16 | U | 0.16 | 0.20 |
| Sodium | 59.0 | U | 59.0 | 120 |
| Vanadium | 0.094 | U | 0.094 | 2.0 |
| Zinc | 0.40 | U | 0.40 | 1.0 |

Method Blank - Batch: 280-319979

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 280-319979/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 04/09/2016 0112
Prep Date: 04/08/2016 1440
Leach Date: N/A

Analysis Batch: 280-320085
Prep Batch: 280-319979
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25C040816.asc
Initial Weight/Volume: 1 g
Final Weight/Volume: 100 mL

| Analyte | Result | Qual | MDL | RL |
|----------|--------|------|------|------|
| Antimony | 0.38 | U | 0.38 | 0.60 |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

Lab Control Sample - Batch: 280-319979

Method: 6010B
Preparation: 3050B

| | | |
|-----------------------------------|----------------------------|-----------------------------|
| Lab Sample ID: LCS 280-319979/2-A | Analysis Batch: 280-320027 | Instrument ID: MT_025 |
| Client Matrix: Solid | Prep Batch: 280-319979 | Lab File ID: 25b040816.asc |
| Dilution: 1.0 | Leach Batch: N/A | Initial Weight/Volume: 1 g |
| Analysis Date: 04/08/2016 2022 | Units: mg/Kg | Final Weight/Volume: 100 mL |
| Prep Date: 04/08/2016 1440 | | |
| Leach Date: N/A | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|------------|--------------|--------|--------|----------|------|
| Aluminum | 200 | 178.2 | 89 | 82 - 116 | |
| Arsenic | 100 | 92.00 | 92 | 85 - 110 | |
| Barium | 200 | 201.2 | 101 | 87 - 112 | |
| Beryllium | 5.00 | 4.62 | 92 | 84 - 114 | |
| Boron | 100 | 95.63 | 96 | 80 - 120 | |
| Cadmium | 10.0 | 9.63 | 96 | 87 - 110 | |
| Calcium | 5000 | 4904 | 98 | 82 - 114 | |
| Chromium | 20.0 | 19.71 | 99 | 84 - 114 | |
| Cobalt | 50.0 | 47.46 | 95 | 87 - 110 | |
| Copper | 25.0 | 24.60 | 98 | 88 - 110 | |
| Iron | 100 | 96.79 | 97 | 87 - 120 | |
| Lead | 50.0 | 47.80 | 96 | 86 - 110 | |
| Magnesium | 5000 | 4619 | 92 | 90 - 110 | |
| Manganese | 50.0 | 44.64 | 89 | 88 - 110 | |
| Molybdenum | 100 | 101.2 | 101 | 86 - 110 | |
| Nickel | 50.0 | 47.51 | 95 | 87 - 110 | |
| Potassium | 5000 | 4913 | 98 | 89 - 110 | |
| Selenium | 200 | 179.1 | 90 | 83 - 110 | |
| Silicon | 1000 | 176.6 | 18 | 10 - 70 | |
| Silver | 5.00 | 4.56 | 91 | 87 - 114 | |
| Sodium | 5000 | 4953 | 99 | 90 - 112 | |
| Vanadium | 50.0 | 44.97 | 90 | 88 - 110 | |
| Zinc | 50.0 | 42.86 | 86 | 76 - 114 | |

Lab Control Sample - Batch: 280-319979

Method: 6010B
Preparation: 3050B

| | | |
|-----------------------------------|----------------------------|-----------------------------|
| Lab Sample ID: LCS 280-319979/2-A | Analysis Batch: 280-320085 | Instrument ID: MT_025 |
| Client Matrix: Solid | Prep Batch: 280-319979 | Lab File ID: 25C040816.asc |
| Dilution: 1.0 | Leach Batch: N/A | Initial Weight/Volume: 1 g |
| Analysis Date: 04/09/2016 0115 | Units: mg/Kg | Final Weight/Volume: 100 mL |
| Prep Date: 04/08/2016 1440 | | |
| Leach Date: N/A | | |

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|----------|--------------|--------|--------|----------|------|
| Antimony | 50.0 | 48.63 | 97 | 82 - 110 | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

Matrix Spike - Batch: 280-319979

Method: 6010B
Preparation: 3050B

| | | |
|--------------------------------|----------------------------|--------------------------------|
| Lab Sample ID: 280-81645-1 | Analysis Batch: 280-320027 | Instrument ID: MT_025 |
| Client Matrix: Solid | Prep Batch: 280-319979 | Lab File ID: 25b040816.asc |
| Dilution: 1.0 | Leach Batch: N/A | Initial Weight/Volume: 1.342 g |
| Analysis Date: 04/08/2016 2033 | Units: mg/Kg | Final Weight/Volume: 100 mL |
| Prep Date: 04/08/2016 1440 | | |
| Leach Date: N/A | | |

| Analyte | Sample Result/Qual | Spike Amount | Result | % Rec. | Limit | Qual |
|------------|--------------------|--------------|--------|--------|----------|------|
| Aluminum | 14000 | 149 | 16180 | 1497 | 50 - 200 | 4 |
| Arsenic | 5.6 | 74.5 | 62.64 | 77 | 76 - 111 | |
| Barium | 96.5 | 149 | 244.8 | 100 | 52 - 159 | |
| Beryllium | 0.48 | 3.73 | 3.40 | 78 | 72 - 105 | |
| Boron | 0.82 U | 74.5 | 57.50 | 77 | 80 - 120 | N |
| Cadmium | 0.15 B | 7.45 | 6.24 | 82 | 40 - 130 | |
| Calcium | 4140 | 3730 | 7801 | 98 | 43 - 165 | |
| Chromium | 27.8 | 14.9 | 41.03 | 89 | 70 - 200 | |
| Cobalt | 6.7 | 37.3 | 35.97 | 78 | 72 - 106 | |
| Copper | 31.7 | 18.6 | 45.91 | 76 | 37 - 187 | |
| Iron | 25400 | 74.5 | 25570 | 218 | 70 - 200 | 4 |
| Lead | 6.6 | 37.3 | 35.54 | 78 | 70 - 200 | |
| Magnesium | 4190 | 3730 | 7129 | 79 | 64 - 145 | |
| Manganese | 159 | 37.3 | 192.2 | 90 | 40 - 200 | 4 |
| Molybdenum | 0.62 B | 74.5 | 61.88 | 82 | 75 - 103 | |
| Nickel | 20.2 | 37.3 | 49.00 | 77 | 61 - 126 | |
| Potassium | 1060 | 3730 | 4495 | 92 | 56 - 172 | |
| Selenium | 0.72 U | 149 | 111.0 | 75 | 76 - 104 | N |
| Silicon | 858 | 745 | 808.4 | -7 | 20 - 200 | N |
| Silver | 0.13 U | 3.73 | 2.84 | 76 | 75 - 141 | |
| Sodium | 262 | 3730 | 3518 | 87 | 78 - 111 | |
| Vanadium | 85.1 | 37.3 | 120.2 | 94 | 50 - 169 | |
| Zinc | 33.3 | 37.3 | 62.25 | 78 | 70 - 200 | |

Matrix Spike - Batch: 280-319979

Method: 6010B
Preparation: 3050B

| | | |
|--------------------------------|----------------------------|--------------------------------|
| Lab Sample ID: 280-81645-1 | Analysis Batch: 280-320085 | Instrument ID: MT_025 |
| Client Matrix: Solid | Prep Batch: 280-319979 | Lab File ID: 25C040816.asc |
| Dilution: 1.0 | Leach Batch: N/A | Initial Weight/Volume: 1.342 g |
| Analysis Date: 04/09/2016 0125 | Units: mg/Kg | Final Weight/Volume: 100 mL |
| Prep Date: 04/08/2016 1440 | | |
| Leach Date: N/A | | |

| Analyte | Sample Result/Qual | Spike Amount | Result | % Rec. | Limit | Qual |
|----------|--------------------|--------------|--------|--------|----------|------|
| Antimony | 0.32 U | 37.3 | 10.05 | 27 | 20 - 200 | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

Duplicate - Batch: 280-319979

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-81645-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 04/08/2016 2030
Prep Date: 04/08/2016 1440
Leach Date: N/A

Analysis Batch: 280-320027
Prep Batch: 280-319979
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25b040816.asc
Initial Weight/Volume: 1.241 g
Final Weight/Volume: 100 mL

| Analyte | Sample Result/Qual | Result | RPD | Limit | Qual |
|------------|--------------------|--------|-----|-------|------|
| Aluminum | 14000 | 13250 | 5 | 40 | |
| Arsenic | 5.6 | 5.54 | 1 | 30 | |
| Barium | 96.5 | 103.7 | 7 | 30 | |
| Beryllium | 0.48 | 0.473 | 2 | 30 | |
| Boron | 0.82 U | 0.79 | NC | 30 | U |
| Cadmium | 0.15 B | 0.143 | 5 | 30 | B |
| Calcium | 4140 | 4327 | 4 | 30 | |
| Chromium | 27.8 | 25.44 | 9 | 40 | |
| Cobalt | 6.7 | 7.06 | 5 | 30 | |
| Copper | 31.7 | 29.26 | 8 | 30 | |
| Iron | 25400 | 24850 | 2 | 40 | |
| Lead | 6.6 | 6.25 | 6 | 40 | |
| Magnesium | 4190 | 4121 | 2 | 30 | |
| Manganese | 159 | 178.9 | 12 | 40 | |
| Molybdenum | 0.62 B | 0.431 | 36 | 30 | B M |
| Nickel | 20.2 | 18.94 | 6 | 30 | |
| Potassium | 1060 | 979.2 | 8 | 40 | |
| Selenium | 0.72 U | 0.69 | NC | 30 | U |
| Silicon | 858 | 968.3 | 12 | 40 | |
| Silver | 0.13 U | 0.13 | NC | 30 | U |
| Sodium | 262 | 269.0 | 3 | 30 | |
| Vanadium | 85.1 | 84.41 | 0.8 | 30 | |
| Zinc | 33.3 | 32.18 | 3 | 40 | |

Duplicate - Batch: 280-319979

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-81645-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 04/09/2016 0122
Prep Date: 04/08/2016 1440
Leach Date: N/A

Analysis Batch: 280-320085
Prep Batch: 280-319979
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25C040816.asc
Initial Weight/Volume: 1.241 g
Final Weight/Volume: 100 mL

| Analyte | Sample Result/Qual | Result | RPD | Limit | Qual |
|----------|--------------------|--------|-----|-------|------|
| Antimony | 0.32 U | 0.31 | NC | 40 | U |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-81645-1
Sdg Number: JP1040

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 280-319988

Method: 9045C

Preparation: N/A

| | | |
|--|----------------------------|--------------------------------------|
| LCS Lab Sample ID: LCS 280-319961/22-A | Analysis Batch: 280-319988 | Instrument ID: No Equipment Assigned |
| Client Matrix: Solid | Prep Batch: N/A | Lab File ID: N/A |
| Dilution: 1.0 | Leach Batch: 280-319961 | Initial Weight/Volume: 1 mL |
| Analysis Date: 04/08/2016 1427 | Units: SU | Final Weight/Volume: 1 mL |
| Prep Date: N/A | | |
| Leach Date: 04/08/2016 1237 | | |

| | | |
|--|----------------------------|--------------------------------------|
| LCSD Lab Sample ID: LCSD 280-319961/23-A | Analysis Batch: 280-319988 | Instrument ID: No Equipment Assigned |
| Client Matrix: Solid | Prep Batch: N/A | Lab File ID: N/A |
| Dilution: 1.0 | Leach Batch: 280-319961 | Initial Weight/Volume: 1 mL |
| Analysis Date: 04/08/2016 1524 | Units: SU | Final Weight/Volume: 1 mL |
| Prep Date: N/A | | |
| Leach Date: 04/08/2016 1237 | | |

| Analyte | % Rec. | | Limit | RPD | RPD Limit | LCS Qual | LCSD Qual |
|-----------------------------|--------|------|----------|-----|-----------|----------|-----------|
| | LCS | LCSD | | | | | |
| pH adj. to 25 deg C-Soluble | 101 | 100 | 97 - 103 | 0 | 5 | | |

Laboratory Control/

Laboratory Duplicate Data Report - Batch: 280-319988

Method: 9045C

Preparation: N/A

| | |
|--|-----------|
| LCS Lab Sample ID: LCS 280-319961/22-A | Units: SU |
| Client Matrix: Solid | |
| Dilution: 1.0 | |
| Analysis Date: 04/08/2016 1427 | |
| Prep Date: N/A | |
| Leach Date: 04/08/2016 1237 | |

| |
|--|
| LCSD Lab Sample ID: LCSD 280-319961/23-A |
| Client Matrix: Solid |
| Dilution: 1.0 |
| Analysis Date: 04/08/2016 1524 |
| Prep Date: N/A |
| Leach Date: 04/08/2016 1237 |

| Analyte | LCS Spike Amount | LCSD Spike Amount | LCS Result/Qual | LCSD Result/Qual |
|-----------------------------|------------------|-------------------|-----------------|------------------|
| pH adj. to 25 deg C-Soluble | 7.00 | 7.00 | 7.040 | 7.030 |

Duplicate - Batch: 280-319988

Method: 9045C

Preparation: N/A

| | | |
|--------------------------------|----------------------------|--------------------------------------|
| Lab Sample ID: 280-81645-1 | Analysis Batch: 280-319988 | Instrument ID: No Equipment Assigned |
| Client Matrix: Solid | Prep Batch: N/A | Lab File ID: N/A |
| Dilution: 1.0 | Leach Batch: 280-319961 | Initial Weight/Volume: 1 mL |
| Analysis Date: 04/08/2016 1524 | Units: SU | Final Weight/Volume: 1 mL |
| Prep Date: N/A | | |
| Leach Date: 04/08/2016 1237 | | |

| Analyte | Sample Result/Qual | Result | RPD | Limit | Qual |
|-----------------------------|--------------------|--------|-----|-------|------|
| pH adj. to 25 deg C-Soluble | 7.70 | 7.730 | 0.4 | 5 | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-81645-1

Sdg Number: JP1040

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|----------------------------------|--------------------|--------------|---------------|--------|------------|
| Metals | | | | | |
| Prep Batch: 280-319979 | | | | | |
| LCS 280-319979/2-A | Lab Control Sample | T | Solid | 3050B | |
| MB 280-319979/1-A | Method Blank | T | Solid | 3050B | |
| 280-81645-1 | J1V8V1 | T | Solid | 3050B | |
| 280-81645-1DU | Duplicate | T | Solid | 3050B | |
| 280-81645-1MS | Matrix Spike | T | Solid | 3050B | |
| Analysis Batch:280-320027 | | | | | |
| LCS 280-319979/2-A | Lab Control Sample | T | Solid | 6010B | 280-319979 |
| MB 280-319979/1-A | Method Blank | T | Solid | 6010B | 280-319979 |
| 280-81645-1 | J1V8V1 | T | Solid | 6010B | 280-319979 |
| 280-81645-1DU | Duplicate | T | Solid | 6010B | 280-319979 |
| 280-81645-1MS | Matrix Spike | T | Solid | 6010B | 280-319979 |
| Analysis Batch:280-320085 | | | | | |
| LCS 280-319979/2-A | Lab Control Sample | T | Solid | 6010B | 280-319979 |
| MB 280-319979/1-A | Method Blank | T | Solid | 6010B | 280-319979 |
| 280-81645-1 | J1V8V1 | T | Solid | 6010B | 280-319979 |
| 280-81645-1DU | Duplicate | T | Solid | 6010B | 280-319979 |
| 280-81645-1MS | Matrix Spike | T | Solid | 6010B | 280-319979 |

Report Basis

T = Total

General Chemistry

| | | | | | |
|----------------------------------|------------------------------|---|-------|----------|--|
| Prep Batch: 280-319961 | | | | | |
| LCS 280-319961/22-A | Lab Control Sample | S | Solid | DI Leach | |
| LCSD 280-319961/23-A | Lab Control Sample Duplicate | S | Solid | DI Leach | |
| 280-81645-1 | J1V8V1 | S | Solid | DI Leach | |
| 280-81645-1DU | Duplicate | S | Solid | DI Leach | |
| Analysis Batch:280-319988 | | | | | |
| LCS 280-319961/22-A | Lab Control Sample | S | Solid | 9045C | |
| LCSD 280-319961/23-A | Lab Control Sample Duplicate | S | Solid | 9045C | |
| 280-81645-1 | J1V8V1 | S | Solid | 9045C | |
| 280-81645-1DU | Duplicate | S | Solid | 9045C | |

Report Basis

S = Soluble

90% permission
✓ gmu

Project 28002142

Report Due: 4/11/2016

TALs TAT: 6 Day - RUSH

Drb.
4-8-16

Temp 11 IR# 7
CF -0.2 Initials [Signature]
Date: 04/08/16

Sample Check-in List

Date/Time Received: 0935 08 April GM Screen Result 13 microR/hr

Client: Washington Closure Hanford SDG#: SP1040 NA [] SAF#: RC-234 NA []

Job Number: 81045 Chain of Custody # RC-234-030

Shipping Container ID: WCH-11-010 Air Bill # 7700 6314 6827

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? NA [] Yes No []

4. Cooler Temperature °C: 0.9 NA [] 5. Vermiculite/packing materials is NA Wet [] Dry []

6. Number of samples in shipping container: 1

7. Sample holding times exceeded? NA [] Yes [] No

8. Samples have:
 Tape
 Custody Seals
 Hazard Labels
 Appropriate Sample Labels

9. Samples are:
 In Good Condition
 Broken
 Leaking
 Have Air Bubbles
 (Only for samples requiring no head space.)

10. Sample pH taken? NA pH<2 [] pH>2 [] pH>9 [] Amount HNO₃ Added _____

11. Sample Location, Sample Collector Listed? *
 *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: [Signature] Date: 08 April

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

Client Informed on _____ by _____ Person Contacted _____

[] No action necessary; process as is.

Project Manager Darlene Bondy Date 4-8-16

ORIGIN D:PSCA (509) 376-7492
1192 SHIPPING
US FIVE CO INC H
2985 STEVENS DR
RICHLAND WA 99354
UNITED STATES US

SHIP DATE: 07APR16
ACT WGT: 18.00 LB
CAD: 109266502INET3730

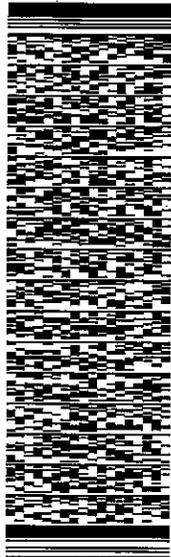
BILL THIRD PARTY

TO KAE YODER
TESTAMERICA
4955 YARROW ST.

ARVADA CO 80002

REF: 0303982700

(303) 736-0190
INV: DEPT:



#161616820001m

TRK# 7760 6314 6827
0201

FRI - 08 APR 10:30A
PRIORITY OVERNIGHT

XHWHHA

80002
co-us DEN



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