

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Denver

4955 Yarrow Street

Arvada, CO 80002

Tel: (303)736-0100

TestAmerica Job ID: 280-98413-1

TestAmerica Sample Delivery Group: DN0159

Client Project/Site: W17-006

For:

CH2M Hill Plateau Remediation Company

PO BOX 1600, MS H8-41

Richland, Washington 99352

Attn: Mr. Scot Fitzgerald



Authorized for release by:

7/3/2017 6:01:26 PM

Darlene Bandy, Project Manager I

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darlene.bandy@testamericainc.com



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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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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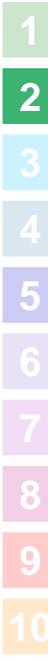


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Case Narrative

Client: CH2M Hill Plateau Remediation Company
 Project/Site: W17-006

TestAmerica Job ID: 280-98413-1
 SDG: DN0159

Job ID: 280-98413-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: CH2M Hill Plateau Remediation Company

Job Number: 280-98413-1

SDG #: DN0159
SAF#(s): W17-006

Date SDG Closed: June 19, 2017
Data Deliverable: 30 Day / Summary

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.

LCS/LCSD = Laboratory Control Sample/Laboratory Control Sample Duplicate
 MS/MSD = Matrix Spike/Matrix Spike Duplicate

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 samples were received on 6/17/2017 8:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

ALKALINITY

Samples B39XP3 (280-98413-1) and B39XR0 (280-98413-2) were analyzed for Alkalinity in accordance with SM20 2320B. The samples were analyzed on 06/27/2017.

Alkalinity as CaCO₃ was detected in method blank MB 280-379126/31 at a level that was above the method detection limit (MDL) but below the reporting limit (RL). The value should be considered an estimate, and has been flagged "B". Because the concentration in the method blank was not present at a level greater than the RL, corrective action is deemed unnecessary. If the associated samples reported a result above the MDL and/or RL and the method blank concentration was greater than 5% of the sample concentration, the result has been flagged "C".

No additional analytical or quality issues were noted.

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager or designee and the laboratory's client services representative as verified by their signature on this report.

Reviewed and approved:

Darlene Bandy
 Project Manager

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 280-98413-1

SDG Number: DN0159

Login Number: 98413**List Number: 1****Creator: Pottruff, Reed W****List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|--------|---------|
| Radioactivity wasn't checked or is \leq background as measured by a survey meter. | True | 60 CPM |
| The cooler's custody seal, if present, is intact. | True | |
| 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 | 3.4°C |
| 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. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

1585 LBS

| | | | |
|---------------------------------------|---------------------------------------|---|---|
| CH2M Hill Plateau Remediation Company | | C.O.C.# W17-006-179 | |
| Collector Malcolm Chunn CHPRC | | Page 1 of 1 | |
| SAF No. W17-006 | Project Title RCRA, JUNE 2017 | Contact/Requester Karen Waters-Husted | Telephone No. 509-376-4650 |
| Shipped To (Lab) TestAmerica Denver | Method of Shipment Commercial Carrier | Sampling Origin Hanford Site | Purchase Order/Charge Code 300071 |
| Protocol RCRA | Priority: 30 Days | Logbook No. HNF-N-506 92/94 | Ice Chest No. GWS-632 |
| POSSIBLE SAMPLE HAZARDS/REMARKS | | Bill of Lading/Air Bill No. 7794 2479 99 21 | Offsite Property No. 8060 |
| SPECIAL INSTRUCTIONS | | Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| N/A | | Hold Time | |
| Sample No. B39XP3 | Filter N | No/Type Container 1x250-mL G/P | Sample Analysis 2320_ALKALINITY: COMMON |
| Date 6-16-17 | Time 1131 | Holding Time 14 Days | Preservative Cool <=6C |



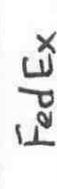
280-98413 Chain of Custody

3.4 IR# 70.0 Transfer RP 6-17-17

| | | | | | | | | |
|---------------------------------------|--------------|--|----------------------------|-----------------------------------|-------|-----------|----------------------------|---------------------------|
| Relinquished By Malcolm Chunn CHPRC | Print M.C.C. | Sign | Date/Time JUN 16 2017 1150 | Received By Kevin Patterson CHPRC | Print | Sign | Date/Time JUN 16 2017 1150 | Matrix * DS = Drum Solids |
| Relinquished By Kevin Patterson CHPRC | Print | Sign | Date/Time JUN 16 2017 1430 | Received By FEDEX | Print | Sign | Date/Time | DL = Drum Liquids |
| Relinquished By FedEx | Print | Sign | Date/Time | Received By Reed Pottruff | Print | Sign | Date/Time 6-17-17 0835 | T = Tissue |
| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time | WI = Wipe |
| | | | | | | | | L = Liquid |
| | | | | | | | | V = Vegetation |
| | | | | | | | | X = Other |
| FINAL SAMPLE DISPOSITION | | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | | Disposed By | | Date/Time | | |
| PRINTED ON 5/15/2017 | | FSR ID = FSR41880 | | A-6004-842 (REV 2) | | | | |

1 2 3 4 5 6 7 8 9 10

| | | | | | |
|---|-------------|---|---------------------------|--|-----------------------------------|
| CH2M Hill Plateau Remediation Company | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | C.O.C.# W17-006-186 | |
| Collector Malcolm Chunn CHPRC | | Contact/Requester Karen Waters-Husted | | Telephone No. 509-376-4650 | |
| SAF No. W17-006 | | Sampling Origin Hanford Site | | Purchase Order/Charge Code 300071 | |
| Project Title RCRA, JUNE 2017 | | Logbook No. HNF-N-50692 / 94 | | Ice Chest No. GWS-630 | |
| Shipped To (Lab) TestAmerica Denver | | Method of Shipment Commercial Carrier | | Bill of Lading/Air Bill No. 779424799922 | |
| Protocol RCRA | | Priority: 30 Days | | Offsite Property No. 8060 | |
| POSSIBLE SAMPLE HAZARDS/REMARKS ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1 | | SPECIAL INSTRUCTIONS N/A | | Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Sample No. B39XRO | Filter N | * W | Date 6-16-17 | Time 0936 | No/Type Container 1x250-ml G/P |
| | | | Sample Analysis COMMON | Holding Time 14 Days | Preservative Cool <=6C |

| | | | | | | | | | |
|---|--|----------------|--|---|---|-----------------------|-------------------------------|---|---|
| Relinquished By Malcolm Chunn CHPRC | Print  | Sign MR Cl | Date/Time JUN 16 2017 1015 | Received By Kevin Patterson CHPRC | Print  | Sign FEDEX | Date/Time JUN 16 2017 1015 | Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air | DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other |
| Relinquished By Kevin Patterson CHPRC | Print  | Sign Fed Ex | Date/Time JUN 16 2017 1430 | Received By FEDEX | Print FEDEX | Sign FEDEX | Date/Time JUN 16 2017 1430 | | |
| Relinquished By Kevin Patterson CHPRC | Print  | Sign Fed Ex | Date/Time JUN 16 2017 1430 | Received By Reed Pottruff CHPRC | Print  | Sign Reed Pottruff | Date/Time 6-17-17 0835 | | |
| Relinquished By Kevin Patterson CHPRC | Print  | Sign Fed Ex | Date/Time JUN 16 2017 1430 | Received By Reed Pottruff CHPRC | Print  | Sign Reed Pottruff | Date/Time 6-17-17 0835 | | |
| FINAL SAMPLE DISPOSITION | | | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | | | Disposed By | | | Date/Time |



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779424799922

Ship date:

Actual delivery:

Fri 6/16/2017

Sat 6/17/2017 8:35 am

Richland, WA US

Delivered

ARVADA, CO US

Signed for by: R.POTTRUFF

Travel History

| Date/Time | Activity | Location |
|-----------------------------|------------------------------------|-------------|
| 6/17/2017 - Saturday | | |
| 8:35 am | Delivered | ARVADA, CO |
| 7:51 am | At local FedEx facility | ARVADA, CO |
| 5:30 am | At destination sort facility | DENVER, CO |
| 4:28 am | Departed FedEx location | MEMPHIS, TN |
| 12:08 am | Arrived at FedEx location | MEMPHIS, TN |
| 6/16/2017 - Friday | | |
| 4:41 pm | Left FedEx origin facility | PASCO, WA |
| 3:24 pm | Shipment information sent to FedEx | |
| 3:20 pm | Picked up | PASCO, WA |

Shipment Facts

| | | | |
|---------------------------------|---|---------------------------|---------------------------|
| Tracking number | 779424799922 | Service | FedEx Priority Overnight |
| Weight | 85 lbs / 38.56 kgs | Signature services | Direct signature required |
| Delivered To | Shipping/Receiving | Total pieces | 1 |
| Total shipment weight | 85 lbs / 38.56 kgs | Terms | Third Party |
| Shipper reference | PTR#8060 | Packaging | Your Packaging |
| Special handling section | For Saturday Delivery, Additional Handling Surcharge, Direct Signature Required | Standard transit | 6/17/2017 by 12:00 pm |



Search or tracking number Subr

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Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98413-1
SDG: DN0159

Qualifiers

General Chemistry

| Qualifier | Qualifier Description |
|-----------|--|
| B | Estimated result. Result is less than the RL, but greater than MDL |

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 | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| 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 (Radiochemistry) |
| 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) |

Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98413-1
SDG: DN0159

| Method | Method Description | Protocol | Laboratory |
|----------|--------------------|----------|------------|
| SM 2320B | Alkalinity | SM | TAL DEN |

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100



Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98413-1
SDG: DN0159

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|------------------|--------|----------------|----------------|
| 280-98413-1 | B39XP3 | Water | 06/16/17 11:31 | 06/17/17 08:35 |
| 280-98413-2 | B39XR0 | Water | 06/16/17 09:36 | 06/17/17 08:35 |

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Client Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: W17-006

TestAmerica Job ID: 280-98413-1
 SDG: DN0159

General Chemistry

Client Sample ID: B39XP3
Date Collected: 06/16/17 11:31
Date Received: 06/17/17 08:35

Lab Sample ID: 280-98413-1
Matrix: Water

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------------------|--------|-----------|------|------|------|---|----------|----------------|---------|
| Alkalinity as CaCO3 | 86400 | | 5000 | 1070 | ug/L | | | 06/27/17 12:47 | 1 |

Client Sample ID: B39XR0
Date Collected: 06/16/17 09:36
Date Received: 06/17/17 08:35

Lab Sample ID: 280-98413-2
Matrix: Water

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------------------|--------|-----------|------|------|------|---|----------|----------------|---------|
| Alkalinity as CaCO3 | 86400 | | 5000 | 1070 | ug/L | | | 06/27/17 12:17 | 1 |

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QC Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: W17-006

TestAmerica Job ID: 280-98413-1
 SDG: DN0159

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-379126/31
 Matrix: Water
 Analysis Batch: 379126

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------------------|-----------|--------------|------|------|------|---|----------|----------------|---------|
| Alkalinity as CaCO3 | 2490 | B | 5000 | 1070 | ug/L | - | | 06/27/17 12:41 | 1 |

Lab Sample ID: LCS 280-379126/30
 Matrix: Water
 Analysis Batch: 379126

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec Limits |
|---------------------|-------------|------------|---------------|------|---|------|-------------|
| Alkalinity as CaCO3 | 200000 | 194500 | | ug/L | - | 97 | 80 - 120 |

Lab Sample ID: 280-98413-1 DU
 Matrix: Water
 Analysis Batch: 379126

Client Sample ID: B39XP3
 Prep Type: Total/NA

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---------------------|---------------|------------------|-----------|--------------|------|---|-----|-----------|
| Alkalinity as CaCO3 | 86400 | | 86530 | | ug/L | - | 0.2 | 20 |

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QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98413-1
SDG: DN0159

General Chemistry

Analysis Batch: 379126

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|-------------------|--------------------|-----------|--------|----------|------------|
| 280-98413-1 | B39XP3 | Total/NA | Water | SM 2320B | |
| 280-98413-2 | B39XR0 | Total/NA | Water | SM 2320B | |
| MB 280-379126/31 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-379126/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 280-98413-1 DU | B39XP3 | Total/NA | Water | SM 2320B | |