

June 27, 2018

Rev 0



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June 21, 2018

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHCPRC SAF X18-031
Work Order: 451812
SDG: GEL451812

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 06, 2018. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

A handwritten signature in cursive script that reads "Anna Dupree".

Anna Dupree for
Heather Shaffer
Project Manager

Purchase Order: 300071 7H
Chain of Custody: X18-031-022, X18-031-024, X18-031-025, X18-031-026, X18-031-027 and X18-031-053
Enclosures



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Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHCPRC SAF X18-031
SDG: GEL451812**

June 21, 2018

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 06, 2018, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative.

Sample Identification

The laboratory received the following samples:

| <u>Laboratory Identification</u> | <u>Sample Description</u> |
|---|----------------------------------|
| 451812001 | B3JDM3 |
| 451812002 | B3JF5 |
| 451812003 | B3JDM7 |
| 451812004 | B3JDM9 |
| 451812005 | B3JDN0 |
| 451812006 | B3JDN3 |
| 451812007 | B3JDM1 |
| 451812008 | B3JDM2 |

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Metals and Radiochemistry.

We certify that this 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 signatures on this report.



Anna Dupree for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451812
Work Order #: 451812

Metals

Determination of Metals by ICP

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Determination of Metals by ICP-MS

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Radiochemistry

9310_ALPHABETA_GPC: ALPHA

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1204044111 (B3JDM7MS) and 1204044112 (B3JDM7MSD), aliquots were reduced to conserve sample volume.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

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| | | | |
|---|---|--|---|
| CH2M Hill Plateau Remediation Company | | C.O.C.# X18-031-022 Page 1 of 1 | |
| 457812 | | Telephone No.: 509-376-4650 | |
| Collector: Dan Woehle CHPRC | X18-031 | Contact/Requester: Karen Waters-Husted | Purchase Order/Charge Code: 304546 |
| Project Title: 300-FF-5 Uranium Sequestration | GEL Laboratories, LLC | Sampling Origin: Hanford Site | Ice Chest No.: 605-657742 |
| Shipped To (Lab): CERCLA | | Method of Shipment: Commercial Carrier | Bill of Lading/Air Bill No.: 772402173044 |
| Protocol: CERCLA | | Priority: 30 Days | Offsite Property No.: 9519 |
| POSSIBLE SAMPLE HAZARDS/REMARK ** ** 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 | |
| Sample No. B3JDM3 | Filter * N | Date W JUN 05 2018 | Time 0831 |
| No/Type Container 1x1-L P | Sample Analysis 9310_ALPHABETA_GPC: Gross Alpha | | Holding Time 6 Months |
| | | Preservative HNO3 to pH <2 | |

| | | | | | | | | | | |
|--|---|-----------|-----------------------------|------------------|------------|-----------------------------|--|------------------|-----------|--------------------------------------|
| Relinquished By: Dan Woehle CHPRC | JUN 05 2018 0850 | Signature | Christina Aguilar JCHPRC | JUN 05 2018 0850 | Signature | Christina Aguilar JCHPRC | Received By: Christina Aguilar JCHPRC | JUN 05 2018 0850 | Signature | Christina Aguilar JCHPRC |
| Relinquished By: Christina Aguilar JCHPRC | JUN 05 2018 0955 | Signature | Christina Aguilar JCHPRC | JUN 05 2018 0955 | Signature | Christina Aguilar JCHPRC | Received By: Leahy Wall JCHPRC | JUN 05 2018 0955 | Signature | Leahy Wall JCHPRC |
| Relinquished By: Leahy Wall JCHPRC | JUN 05 2018 1400 | Signature | Leahy Wall JCHPRC | JUN 05 2018 1400 | Signature | Leahy Wall JCHPRC | Received By: FEDEX | | Signature | FEDEX |
| Relinquished By: Fed Ex | | Signature | Fed Ex | | Signature | Fed Ex | Received By: Chakeris Tarpley GEL Laboratories | | Signature | Chakeris Tarpley GEL Laboratories |
| FINAL SAMPLE DISPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process): | | Disposed By: | | Date/Time: | | Matrix * | | | |
| | | | | | | | S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other | | | |

| | | | | | |
|--|---|--|---------------|--|---|
| <p>CH2M Hill Plateau Remediation Company</p> | | <p>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</p> | | <p>C.O.C.# X18-031-024</p> <p>Page 1 of 1</p> | |
| <p>Collector: Dan Woehle CH2M</p> | <p>Contact/Requester: Karen Waters-Husted</p> | <p>Telephone No.: 509-376-4650</p> | <p>451812</p> | | |
| <p>SAF No.: X18-031</p> | <p>Sampling Origin: Hanford Site</p> | <p>Purchase Order/Charge Code: 304546</p> | | | |
| <p>Project Title: 300-FF-5 Uranium Sequestration</p> | <p>Logbook No.: HNF-N-506-98-94</p> | <p>Ice Chest No.: 6005-1742</p> | | | |
| <p>Shipped To (Lab): GEL Laboratories, LLC</p> | <p>Method of Shipment: Commercial Carrier</p> | <p>Bill of Lading/Air Bill No.: 1724 0217 3044</p> | | | |
| <p>Protocol: CERCLA</p> | <p>Priority: 30 Days</p> | <p>Offsite Property No.: 9519</p> | | | |
| <p>POSSIBLE SAMPLE HAZARDS/REMARK</p> <p>** ** 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</p> | | <p>SPECIAL INSTRUCTIONS</p> <p>N/A</p> | | | |
| <p>Sample No.</p> | <p>Filter</p> | <p>Date</p> | <p>Time</p> | <p>No/Type Container</p> | <p>Sample Analysis</p> |
| B3JDF5 | Y | JUN 05 2018 | 10 34 | 1x500-mL G/P | 6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: Uranium (1) |
| B3JDM7 | N | JUN 05 2018 | 10 34 | 1x500-mL G/P | 6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: Uranium (1) |
| B3JDM7 | N | JUN 05 2018 | 10 34 | 1x1-L P | 9310_ALPHABETA_GPC: Gross Alpha |
| | | | | | Holding Time |
| | | | | | 6 Months |
| | | | | | 6 Months |
| | | | | | 6 Months |
| | | | | | Preservative |
| | | | | | HNO3 to pH <2 |
| | | | | | HNO3 to pH <2 |
| | | | | | HNO3 to pH <2 |

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|--|------------------|--------------------|------------------|-------------|------------------|---|------------------|--------------------|------------------|-------------|------------------|
| <p>Relinquished By: Dan Woehle CH2M</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1116</p> | <p>Date/Time</p> | <p>Received By: Christina Aguilar JCHPRC</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1116</p> | <p>Date/Time</p> |
| <p>Relinquished By: Christina Aguilar JCHPRC</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By: FEDEX</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By: FEDEX</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By: Chakeris Tarplin GEL Laboratories</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
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| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> |
| <p>Relinquished By:</p> | <p>Signature</p> | <p>JUN 05 2018</p> | <p>Date/Time</p> | <p>1405</p> | <p>Date/Time</p> | <p>Received By:</p> | | | | | |

| | | | | |
|---|--|---|---------------------------|---|
| CH2MHill Plateau Remediation Company | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 457812 | | C.O.C.# X18-031-025 Page 1 of 1 |
| Collector: Dan Woehle CHPRC | Contact/Requester: Karen Waters-Husted | Telephone No.: 509-376-4650 | | |
| SAF No.: X18-031 | Sampling Origin: Hanford Site | Purchase Order/Charge Code: 304546 | | |
| Project Title: 300-FF-5 Uranium Sequestration | Logbook No.: HNF-N-506 - 98 - 921 | Ice Chest No.: 605-1742 | | |
| Shipped To (Lab): GEL Laboratories, LLC | Method of Shipment Commercial Carrier | Bill of Lading/Air Bill No.: 112402173044 | | |
| Protocol: CERCLA | Priority: 30 Days | Offsite Property No.: 9519 | | |
| POSSIBLE SAMPLE HAZARDS/REMARK ** ** 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 | | |
| Sample No. B3JDM9 | Filter N | Time JUN 05 2018 1137 | No/Type Container 1x1-L P | Sample Analysis 9310_ALPHABETA_GPC: Gross Alpha |
| | | | Holding Time 6 Months | Preservative HNO3 to pH <2 |

| | | | | | | | |
|---|-------------------------------------|-------------------|------------|---|-------------------------------------|-----------------------------|--|
| Relinquished By: Dan Woehle CHPRC | Signature: <i>Dan Woehle</i> | Date: JUN 05 2018 | Time: 1138 | Received By: Christina Aguilar CHPRC | Signature: | Date/Time: JUN 05 2018 1139 | Matrix * |
| Relinquished By: Christina Aguilar CHPRC | Signature: <i>Christina Aguilar</i> | Date: JUN 05 2018 | Time: 1402 | Received By: FEDEX | Signature: | Date/Time: | S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air |
| Relinquished By: Fed EX | Signature: | Date/Time: | Date/Time: | Received By: GEL Laboratories | Signature: <i>Christina Aguilar</i> | Date/Time: 6/5/18 | DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other |
| Relinquished By: | Signature: | Date/Time: | Date/Time: | Received By: | Signature: | Date/Time: | |
| Relinquished By: | Signature: | Date/Time: | Date/Time: | Disposed By: | Signature: | Date/Time: | |

| | | | | |
|---|---|---|-------------------------------|--|
| CH2MHill Plateau Remediation Company | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 451812 | | C.O.C.# X18-031-026 Page 1 of 1 |
| Collector: Dan Woehle CHPRC | Contact/Requester: Karen Waters-Husted | Telephone No.: 509-376-4650 | | |
| SAF No.: X18-031 | Sampling Origin: Hanford Site | Purchase Order/Charge Code: 304546 | | |
| Project Title: 300-FF-5 Uranium Sequestration | Logbook No.: HNF-N-506 598-94 | Ice Chest No.: 6005-1742 | | |
| Shipped To (Lab): GEL Laboratories, LLC | Method of Shipment: Commercial Carrier | Bill of Lading/Air Bill No.: 772402173044 | | |
| Protocol: CERCLA | Priority: 30 Days | Offsite Property No.: 9519 | | |
| POSSIBLE SAMPLE HAZARDS/REMARK ** ** 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 | | |
| Sample No. B3JDNO | Filter N | Time 1131 | No/Type Container 1x1-L P | Sample Analysis 9310_ALPHABETA_GPC: Gross Alpha |
| | | Holding Time 6 Months | Preservative HNO3 to pH <2 | |

| | | | | | | | | |
|--|------------------------|---|---------------------------|-------------------------|--|------------------------|--------------------------------|---|
| Relinquished By: Dan Woehle CHPRC | Signature | Date JUN 05 2018 | No/Type Container 1128 | Sample Analysis 1128 | Received By: Charolina Aguilar CHPRC | Signature | Date/Time JUN 05 2018 11:28 | Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other |
| Relinquished By: Charolina Aguilar CHPRC | Signature | Date/Time JUN 05 2018 14:00 | | | Received By: FEDEX | | | |
| Relinquished By: Fed Ex | Signature | Date/Time JUN 05 2018 | | | Received By: Bakeris Tappin GEL Laboratories | Signature | Date/Time 6/6/18 9:05 | |
| Relinquished By: Signature Date/Time | Signature Date/Time | Signature Date/Time | Signature Date/Time | Signature Date/Time | Signature Date/Time | Signature Date/Time | Signature Date/Time | Signature Date/Time |
| FINAL SAMPLE DISPOSITION | | Disposal Method (e.g., Return to customer, per lab procedure, used in process): | | | Disposed By: | | Date/Time: | |



SAMPLE RECEIPT & REVIEW FORM

| | | | |
|--|--|--|--|
| Client: <u>CPRC</u> | | SDG/AR/COC/Work Order: <u>45/812</u> | |
| Received By: <u>C. TARPLIN</u> | | Date Received: <u>06/06/18</u> <u>HS</u> | |
| Carrier and Tracking Number | | Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>772402172633</u> <u>772389919931</u> <u>772402173044</u> | |
| Suspected Hazard Information | Yes <input type="checkbox"/> No <input type="checkbox"/> | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. | |
| Shipped as a DOT Hazardous? | <input checked="" type="checkbox"/> | Hazard Class Shipped: _____ UN#: _____ | |
| COC/Samples marked or classified as radioactive? | <input checked="" type="checkbox"/> | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> (CPM)/ mR/Hr Classified as <u>Rad 1</u> Rad 2 Rad 3 | |
| Is package, COC, and/or Samples marked HAZ? | <input checked="" type="checkbox"/> | If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____ | |

| Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|-------------------------------------|----|-------------------------------------|---|
| 1 Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | | | |
| 3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | <input checked="" type="checkbox"/> | | | Preservation Method: <u>Wet ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>1°C</u> |
| 4 Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | | | Temperature Device Serial #: _____ IR4-17 Secondary Temperature Device Serial # (If Applicable): _____ |
| 5 Sample containers intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 6 Samples requiring chemical preservation at proper pH? | | | <input checked="" type="checkbox"/> | Sample ID's and Containers Affected: <u>B3JLB6 Gamma bottle received unpreserved. Preserved upon arrival.</u> If Preservation added, Lot#: <u>1803308P</u> |
| 7 Do any samples require Volatile Analysis? | <input checked="" type="checkbox"/> | | | If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No _____ N/A _____ (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No _____ N/A _____ Sample ID's and containers affected: _____ |
| 8 Samples received within holding time? | <input checked="" type="checkbox"/> | | | ID's and tests affected: _____ |
| 9 Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | | | Sample ID's and containers affected: _____ |
| 10 Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | | | Sample ID's affected: _____ |
| 11 Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | | | Sample ID's affected: _____ |
| 12 Are sample containers identifiable as GEL provided? | | | <input checked="" type="checkbox"/> | |
| 13 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | | | |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AST Date 6/6/18 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

| Qualifier | Qualifier Definition | Department | Fraction |
|-----------|---|-------------------|---------------|
| U | Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error. | | |
| J | The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated | Organics | |
| P | Aroclor target analyte with greater than 25% difference between column analyses. | Organics | |
| C | Analyte has been confirmed by GC/MS analysis | Organics | Pesticide |
| B | The analyte was detected in both the associated QC blank and in the sample. | Organics | |
| E | Concentration exceeds the calibration range of the instrument | Organics | |
| A | The TIC is a suspected aldol-condensation product | Organics | Semi-Volatile |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | |
| N | Spike Sample recovery is outside control limits. | | |
| * | Duplicate analysis not within control limits | Inorganics | |
| > | Result greater than quantifiable range or greater than upper limit of the analysis range | General Chemistry | |
| Z | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | |
| B | The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). | Inorganics | Metals |
| D | Results are reported from a diluted aliquot of sample. | | |
| E | Reported value is estimated due to interferences. See comment in narrative. | Inorganics | Metals |
| M | Duplicate precision not met. | Inorganics | Metals |
| o | Analyte failed to recover within LCS limits (Organics only) | Organics | |
| S | Reported value determined by the Method of Standard Additions (MSA) | Inorganics | |
| T | Spike and/or spike duplicate sample recovery is outside control limits. | Organics | |
| W | Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency. | Inorganics | |
| B | The analyte was detected in the associated method blank \geq MDC or $>$ 5% sample activity. | Radiological | |
| Y | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | |
| + | Correlation coefficient for Method of Standard Additions (MSA) is < 0.995 | Inorganics | |
| B | The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). | General Chemistry | |
| C | Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $>$ 5% of the measured concentration and/or decision level for associated samples. | Inorganics | Metals |
| C | Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $>$ 5% of the measured concentration and/or decision level for associated samples. | General Chemistry | |
| < | Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide | General Chemistry | |
| UX | Gamma Spectroscopy--Uncertain identification | Radiological | |

Laboratory Certifications

List of current GEL Certifications as of 21 June 2018

| State | Certification |
|--------------------------|------------------------------|
| Alaska | 17-018 |
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California | 2940 |
| Colorado | SC00012 |
| Connecticut | PH-0169 |
| Delaware | SC00012 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330-15-00283, P330-15-00253 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC00012 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas NELAP | E-10332 |
| Kentucky SDWA | 90129 |
| Kentucky Wastewater | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA180011 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Michigan | 9976 |
| Mississippi | SC00012 |
| Nebraska | NE-OS-26-13 |
| Nevada | SC000122018-1 |
| New Hampshire NELAP | 205415 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| North Dakota | R-158 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68-00485 |
| Puerto Rico | SC00012 |
| S. Carolina Radiochem | 10120002 |
| South Carolina Chemistry | 10120001 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235-18-13 |
| Utah NELAP | SC000122018-26 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780 |
| West Virginia | 997404 |

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451812
Work Order #: 451812

Product: Determination of Metals by ICP**Analytical Method:** SW846 3005A/6010D**Analytical Procedure:** GL-MA-E-013 REV# 30**Analytical Batch:** 1771140**Product: Determination of Metals by ICP-MS****Analytical Method:** SW846 3005A/6020B**Analytical Procedure:** GL-MA-E-014 REV# 32**Analytical Batch:** 1771136**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 14**Preparation Batches:** 1771135 and 1771138

The following samples were analyzed using the above methods and analytical procedure(s).

| <u>GEL Sample ID#</u> | <u>Client Sample Identification</u> |
|------------------------------|--|
| 451812002 | B3JF5 |
| 451812003 | B3JDM7 |
| 451812007 | B3JDM1 |
| 451812008 | B3JDM2 |
| 1204043958 | Method Blank (MB) ICP |
| 1204043959 | Laboratory Control Sample (LCS) |
| 1204043962 | 451732001(NonSDGL) Serial Dilution (SD) |
| 1204043960 | 451732001(NonSDGS) Matrix Spike (MS) |
| 1204043961 | 451732001(NonSDGSD) Matrix Spike Duplicate (MSD) |
| 1204043941 | Method Blank (MB) ICP-MS |
| 1204043942 | Laboratory Control Sample (LCS) |
| 1204043945 | 451732001(NonSDGL) Serial Dilution (SD) |
| 1204043943 | 451732001(NonSDGS) Matrix Spike (MS) |
| 1204043944 | 451732001(NonSDGSD) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Calibration Information**ICSA/ICSAB Statement**

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL451812 GEL Work Order: 451812

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Nik-Cole Elmore

Date: 21 JUN 2018

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451812

CONTRACT: CPRC0X18031

METHOD TYPE: SW846

SAMPLE ID:451812002

BASIS: As Received

DATE COLLECTED 05-JUN-18

CLIENT ID: B3JJF5

LEVEL: Low

DATE RECEIVED 06-JUN-18

MATRIX: WATER

%SOLIDS: 0

| CAS | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----------|-----------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7440-42-8 | Boron | 50.6 | ug/L | | 15 | 50 | 50 | 1 | P | JWJ | 06/19/18 15:12 | 061918-1 | 1771140 |
| 7440-70-2 | Calcium | 56200 | ug/L | | 50 | 200 | 200 | 1 | P | JWJ | 06/19/18 15:12 | 061918-1 | 1771140 |
| 7439-89-6 | Iron | 30 | ug/L | U | 30 | 100 | 100 | 1 | P | JWJ | 06/19/18 15:12 | 061918-1 | 1771140 |
| 7439-95-4 | Magnesium | 11100 | ug/L | | 110 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:12 | 061918-1 | 1771140 |
| 7440-09-7 | Potassium | 6230 | ug/L | | 50 | 150 | 150 | 1 | P | JWJ | 06/19/18 15:12 | 061918-1 | 1771140 |
| 7440-23-5 | Sodium | 21900 | ug/L | | 100 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:12 | 061918-1 | 1771140 |
| 7440-61-1 | Uranium | 33.6 | ug/L | | 0.067 | 0.2 | 15 | 1 | MS | SKJ | 06/12/18 21:03 | 180612-2 | 1771136 |
| 7440-62-2 | Vanadium | 10.1 | ug/L | | 1 | 5 | 5 | 1 | P | JWJ | 06/19/18 15:12 | 061918-1 | 1771140 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1771136 | 1771135 | SW846 3005A | 50 | mL | 50 | mL | 06/06/18 | JXM8 |
| 1771140 | 1771138 | SW846 3005A | 50 | mL | 50 | mL | 06/07/18 | SXW1 |

***Analytical Methods:**

P SW846 3005A/6010D
MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451812

CONTRACT: CPRC0X18031

METHOD TYPE: SW846

SAMPLE ID: 451812003

BASIS: As Received

DATE COLLECTED 05-JUN-18

CLIENT ID: B3JDM7

LEVEL: Low

DATE RECEIVED 06-JUN-18

MATRIX: WATER

%SOLIDS: 0

| CAS | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----------|-----------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7440-42-8 | Boron | 49.4 | ug/L | B | 15 | 50 | 50 | 1 | P | JWJ | 06/19/18 15:15 | 061918-1 | 1771140 |
| 7440-70-2 | Calcium | 55700 | ug/L | | 50 | 200 | 200 | 1 | P | JWJ | 06/19/18 15:15 | 061918-1 | 1771140 |
| 7439-89-6 | Iron | 88.6 | ug/L | B | 30 | 100 | 100 | 1 | P | JWJ | 06/19/18 15:15 | 061918-1 | 1771140 |
| 7439-95-4 | Magnesium | 10800 | ug/L | | 110 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:15 | 061918-1 | 1771140 |
| 7440-09-7 | Potassium | 6180 | ug/L | | 50 | 150 | 150 | 1 | P | JWJ | 06/19/18 15:15 | 061918-1 | 1771140 |
| 7440-23-5 | Sodium | 21700 | ug/L | | 100 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:15 | 061918-1 | 1771140 |
| 7440-61-1 | Uranium | 35.6 | ug/L | | 0.067 | 0.2 | 15 | 1 | MS | SKJ | 06/12/18 21:07 | 180612-2 | 1771136 |
| 7440-62-2 | Vanadium | 10.1 | ug/L | | 1 | 5 | 5 | 1 | P | JWJ | 06/19/18 15:15 | 061918-1 | 1771140 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1771136 | 1771135 | SW846 3005A | 50 | mL | 50 | mL | 06/06/18 | JXM8 |
| 1771140 | 1771138 | SW846 3005A | 50 | mL | 50 | mL | 06/07/18 | SXW1 |

***Analytical Methods:**

P SW846 3005A/6010D
MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451812

CONTRACT: CPRC0X18031

METHOD TYPE: SW846

SAMPLE ID:451812007

BASIS: As Received

DATE COLLECTED 05-JUN-18

CLIENT ID: B3JDM1

LEVEL: Low

DATE RECEIVED 06-JUN-18

MATRIX: WATER

%SOLIDS: 0

| CAS | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----------|-----------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7440-42-8 | Boron | 15 | ug/L | U | 15 | 50 | 50 | 1 | P | JWJ | 06/19/18 15:19 | 061918-1 | 1771140 |
| 7440-70-2 | Calcium | 19800 | ug/L | | 50 | 200 | 200 | 1 | P | JWJ | 06/19/18 15:19 | 061918-1 | 1771140 |
| 7439-89-6 | Iron | 420 | ug/L | | 30 | 100 | 100 | 1 | P | JWJ | 06/19/18 15:19 | 061918-1 | 1771140 |
| 7439-95-4 | Magnesium | 4680 | ug/L | | 110 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:19 | 061918-1 | 1771140 |
| 7440-09-7 | Potassium | 1960 | ug/L | | 50 | 150 | 150 | 1 | P | JWJ | 06/19/18 15:19 | 061918-1 | 1771140 |
| 7440-23-5 | Sodium | 8160 | ug/L | | 100 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:19 | 061918-1 | 1771140 |
| 7440-61-1 | Uranium | 22.5 | ug/L | | 0.067 | 0.2 | 15 | 1 | MS | SKJ | 06/12/18 21:11 | 180612-2 | 1771136 |
| 7440-62-2 | Vanadium | 4.86 | ug/L | B | 1 | 5 | 5 | 1 | P | JWJ | 06/19/18 15:19 | 061918-1 | 1771140 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1771136 | 1771135 | SW846 3005A | 50 | mL | 50 | mL | 06/06/18 | JXM8 |
| 1771140 | 1771138 | SW846 3005A | 50 | mL | 50 | mL | 06/07/18 | SXW1 |

***Analytical Methods:**

P SW846 3005A/6010D
MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL451812

CONTRACT: CPRC0X18031

METHOD TYPE: SW846

SAMPLE ID: 451812008

BASIS: As Received

DATE COLLECTED 05-JUN-18

CLIENT ID: B3JDM2

LEVEL: Low

DATE RECEIVED 06-JUN-18

MATRIX: WATER

%SOLIDS: 0

| CAS | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----------|-----------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7440-42-8 | Boron | 15 | ug/L | U | 15 | 50 | 50 | 1 | P | JWJ | 06/19/18 15:21 | 061918-1 | 1771140 |
| 7440-70-2 | Calcium | 19800 | ug/L | | 50 | 200 | 200 | 1 | P | JWJ | 06/19/18 15:21 | 061918-1 | 1771140 |
| 7439-89-6 | Iron | 30 | ug/L | U | 30 | 100 | 100 | 1 | P | JWJ | 06/19/18 15:21 | 061918-1 | 1771140 |
| 7439-95-4 | Magnesium | 4600 | ug/L | | 110 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:21 | 061918-1 | 1771140 |
| 7440-09-7 | Potassium | 1950 | ug/L | | 50 | 150 | 150 | 1 | P | JWJ | 06/19/18 15:21 | 061918-1 | 1771140 |
| 7440-23-5 | Sodium | 8100 | ug/L | | 100 | 300 | 300 | 1 | P | JWJ | 06/19/18 15:21 | 061918-1 | 1771140 |
| 7440-61-1 | Uranium | 21.5 | ug/L | | 0.067 | 0.2 | 15 | 1 | MS | SKJ | 06/12/18 21:15 | 180612-2 | 1771136 |
| 7440-62-2 | Vanadium | 4.8 | ug/L | B | 1 | 5 | 5 | 1 | P | JWJ | 06/19/18 15:21 | 061918-1 | 1771140 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1771136 | 1771135 | SW846 3005A | 50 | mL | 50 | mL | 06/06/18 | JXM8 |
| 1771140 | 1771138 | SW846 3005A | 50 | mL | 50 | mL | 06/07/18 | SXW1 |

***Analytical Methods:**

P SW846 3005A/6010D
MS SW846 3005A/6020B

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: June 21, 2018

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 451812

| Parmname | NOM | Sample | Qual | QC | Units | RPD/D% | REC% | Range | Anlst | Date | Time |
|--------------------------------|---------|-----------|-------|-------|-------|--------|------|------------|-------|----------|-------|
| Metals Analysis - ICPMS | | | | | | | | | | | |
| Batch | 1771136 | | | | | | | | | | |
| QC1204043942 | | LCS | | | | | | | | | |
| Uranium | 50.0 | | | 51.9 | ug/L | | 104 | (80%-120%) | SKJ | 06/12/18 | 20:00 |
| QC1204043941 | | MB | | | | | | | | | |
| Uranium | | | U | 0.067 | ug/L | | | | | 06/12/18 | 19:56 |
| QC1204043943 | | 451732001 | MS | | | | | | | | |
| Uranium | 50.0 | 396 | | 435 | ug/L | | N/A | (75%-125%) | | 06/12/18 | 20:08 |
| QC1204043944 | | 451732001 | MSD | | | | | | | | |
| Uranium | 50.0 | 396 | | 436 | ug/L | 0.256 | N/A | (0%-20%) | | 06/12/18 | 20:12 |
| QC1204043945 | | 451732001 | SDILT | | | | | | | | |
| Uranium | | 396 | D | 80.8 | ug/L | 2.17 | | (0%-20%) | | 06/12/18 | 20:20 |
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 1771140 | | | | | | | | | | |
| QC1204043959 | | LCS | | | | | | | | | |
| Boron | 500 | | | 496 | ug/L | | 99.3 | (80%-120%) | JWJ | 06/19/18 | 14:46 |
| Calcium | 5000 | | | 4870 | ug/L | | 97.4 | (80%-120%) | | | |
| Iron | 5000 | | | 4900 | ug/L | | 98 | (80%-120%) | | | |
| Magnesium | 5000 | | | 4970 | ug/L | | 99.5 | (80%-120%) | | | |
| Potassium | 5000 | | | 4680 | ug/L | | 93.7 | (80%-120%) | | | |
| Sodium | 5000 | | | 4740 | ug/L | | 94.7 | (80%-120%) | | | |

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QC Summary

Workorder: 451812

Page 2 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD/D% | REC% | Range | Anlst | Date | Time |
|----------------------------|--------------|--------|------|-------|-------|--------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 1771140 | | | | | | | | | | |
| Vanadium | 500 | | | 499 | ug/L | | 99.7 | (80%-120%) | JWJ | 06/19/18 | 14:46 |
| QC1204043958 | MB | | | | | | | | | | |
| Boron | | | U | 15.0 | ug/L | | | | | 06/19/18 | 14:42 |
| Calcium | | | U | 50.0 | ug/L | | | | | | |
| Iron | | | U | 30.0 | ug/L | | | | | | |
| Magnesium | | | U | 110 | ug/L | | | | | | |
| Potassium | | | U | 50.0 | ug/L | | | | | | |
| Sodium | | | U | 100 | ug/L | | | | | | |
| Vanadium | | | U | 1.00 | ug/L | | | | | | |
| QC1204043960 | 451732001 MS | | | | | | | | | | |
| Boron | 500 | 147 | | 639 | ug/L | | 98.6 | (75%-125%) | | 06/19/18 | 14:52 |
| Calcium | 5000 | 36600 | | 41000 | ug/L | | N/A | (75%-125%) | | | |
| Iron | 5000 | U 30.0 | | 4860 | ug/L | | 96.9 | (75%-125%) | | | |
| Magnesium | 5000 | 8910 | | 13700 | ug/L | | 96.6 | (75%-125%) | | | |
| Potassium | 5000 | 5710 | | 10300 | ug/L | | 92.6 | (75%-125%) | | | |
| Sodium | 5000 | 25500 | | 29700 | ug/L | | N/A | (75%-125%) | | | |

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QC Summary

Workorder: 451812

Page 3 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD/D% | REC% | Range | Anlst | Date | Time |
|------------------------------|---------|--------|------|-------|-------|--------|------|------------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 1771140 | | | | | | | | | | |
| Vanadium | 500 | 11.4 | | 499 | ug/L | | 97.5 | (75%-125%) | JWJ | 06/19/18 | 14:52 |
| QC1204043961 451732001 MSD | | | | | | | | | | | |
| Boron | 500 | 147 | | 629 | ug/L | 1.72 | 96.4 | (0%-20%) | | 06/19/18 | 14:54 |
| Calcium | 5000 | 36600 | | 40500 | ug/L | 1.4 | N/A | (0%-20%) | | | |
| Iron | 5000 | U | 30.0 | 4900 | ug/L | 0.89 | 97.7 | (0%-20%) | | | |
| Magnesium | 5000 | 8910 | | 13600 | ug/L | 1.02 | 93.9 | (0%-20%) | | | |
| Potassium | 5000 | 5710 | | 10300 | ug/L | 0.543 | 91.5 | (0%-20%) | | | |
| Sodium | 5000 | 25500 | | 29200 | ug/L | 1.45 | N/A | (0%-20%) | | | |
| Vanadium | 500 | 11.4 | | 498 | ug/L | 0.239 | 97.3 | (0%-20%) | | | |
| QC1204043962 451732001 SDILT | | | | | | | | | | | |
| Boron | | 147 | BD | 32.2 | ug/L | 9.88 | | (0%-20%) | | 06/19/18 | 14:56 |
| Calcium | | 36600 | D | 8130 | ug/L | 11.2 | | (0%-20%) | | | |
| Iron | | U | 13.6 | DU | 150 | ug/L | N/A | (0%-20%) | | | |
| Magnesium | | 8910 | D | 2000 | ug/L | 12 | | (0%-20%) | | | |
| Potassium | | 5710 | D | 1290 | ug/L | 12.9 | | (0%-20%) | | | |
| Sodium | | 25500 | D | 5750 | ug/L | 12.8 | | (0%-20%) | | | |

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QC Summary

Workorder: 451812

Page 4 of 4

| Parmname | NOM | Sample | Qual | QC | Units | RPD/D% | REC% | Range | Anlst | Date | Time |
|----------------------------|---------|--------|------|------|-------|--------|------|----------|-------|----------|-------|
| Metals Analysis-ICP | | | | | | | | | | | |
| Batch | 1771140 | | | | | | | | | | |
| Vanadium | | 11.4 | BD | 2.58 | ug/L | 13.3 | | (0%-20%) | JWJ | 06/19/18 | 14:56 |

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451812
Work Order #: 451812

Product: 9310_ALPHABETA_GPC: ALPHA
Analytical Method: 9310_ALPHABETA_GPC
Analytical Procedure: GL-RAD-A-001 REV# 20
Analytical Batch: 1771210

The following samples were analyzed using the above methods and analytical procedure(s).

| <u>GEL Sample ID#</u> | <u>Client Sample Identification</u> |
|------------------------------|--|
| 451812001 | B3JDM3 |
| 451812003 | B3JDM7 |
| 451812004 | B3JDM9 |
| 451812005 | B3JDN0 |
| 451812006 | B3JDN3 |
| 1204044109 | Method Blank (MB) |
| 1204044110 | 451812003(B3JDM7) Sample Duplicate (DUP) |
| 1204044111 | 451812003(B3JDM7) Matrix Spike (MS) |
| 1204044112 | 451812003(B3JDM7) Matrix Spike Duplicate (MSD) |
| 1204044113 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1204044111 (B3JDM7MS) and 1204044112 (B3JDM7MSD), aliquots were reduced to conserve sample volume.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL451812 GEL Work Order: 451812

The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Theresa Austin

Date: 13 JUN 2018

Title: Group Leader

Sample Data Summary

**Rad
Certificate of Analysis
Sample Summary**

| | | |
|------------------------------------|--|----------------------------------|
| SDG Number: GEL451812 | Client: CPRC001 | Project: CPRC0X18031 |
| Lab Sample ID: 451812001 | Date Collected: 06/05/2018 08:31 | Matrix: WATER |
| | Date Received: 06/06/2018 09:05 | |
| Client ID: B3JDM3 | | Prep Basis: "As Received" |
| Batch ID: 1771210 | Method: 9310_ALPHABETA_GPC | SOP Ref: GL-RAD-A-001 |
| Run Date: 06/08/2018 08:25 | Analyst: AXH4 | Instrument: PIC10A |
| Data File: AB1771210.xls | Aliquot: 150 mL | Count Time: 130 min |
| Prep Batch: 1771210 | Prep Method: EPA 900.0/SW846 9310 | |
| Prep Date: 06/06/2018 15:18 | | |

| CAS No. | Parmname | Qual | Result | Units | Uncert | TPU | MDC | RDL |
|------------|----------------|------|--------|-------|---------|------|------|------|
| 12587-46-1 | Alpha ALPHA | | 50.2 | pCi/L | +/-6.09 | 10.3 | 2.99 | 3.00 |

| Surrogate/Tracer recovery | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-------|-----------|-------------------|
|---------------------------|--------|---------|-------|-----------|-------------------|

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

| | | |
|------------------------------------|--|----------------------------------|
| SDG Number: GEL451812 | Client: CPRC001 | Project: CPRC0X18031 |
| Lab Sample ID: 451812004 | Date Collected: 06/05/2018 11:31 | Matrix: WATER |
| | Date Received: 06/06/2018 09:05 | |
| Client ID: B3JDM9 | Method: 9310_ALPHA_BETA_GPC | Prep Basis: "As Received" |
| Batch ID: 1771210 | Analyst: AXH4 | SOP Ref: GL-RAD-A-001 |
| Run Date: 06/08/2018 08:26 | Aliquot: 150 mL | Instrument: PIC8B |
| Data File: AB1771210.xls | Prep Method: EPA 900.0/SW846 9310 | Count Time: 110 min |
| Prep Batch: 1771210 | | |
| Prep Date: 06/06/2018 15:18 | | |

| CAS No. | Parmname | Qual | Result | Units | Uncert | TPU | MDC | RDL |
|------------|----------------|------|--------|-------|---------|------|------|------|
| 12587-46-1 | Alpha ALPHA | | 102 | pCi/L | +/-9.32 | 19.3 | 2.99 | 3.00 |

| Surrogate/Tracer recovery | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-------|-----------|-------------------|
|---------------------------|--------|---------|-------|-----------|-------------------|

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The MDC is a sample specific MDC.

**Rad
Certificate of Analysis
Sample Summary**

| | | |
|------------------------------------|--|----------------------------------|
| SDG Number: GEL451812 | Client: CPRC001 | Project: CPRC0X18031 |
| Lab Sample ID: 451812005 | Date Collected: 06/05/2018 11:31 | Matrix: WATER |
| | Date Received: 06/06/2018 09:05 | |
| Client ID: B3JDNO | | Prep Basis: "As Received" |
| Batch ID: 1771210 | Method: 9310_ALPHABETA_GPC | SOP Ref: GL-RAD-A-001 |
| Run Date: 06/08/2018 08:26 | Analyst: AXH4 | Instrument: PIC6B |
| Data File: AB1771210.xls | Aliquot: 150 mL | Count Time: 130 min |
| Prep Batch: 1771210 | Prep Method: EPA 900.0/SW846 9310 | |
| Prep Date: 06/06/2018 15:18 | | |

| CAS No. | Parmname | Qual | Result | Units | Uncert | TPU | MDC | RDL |
|------------|----------------|------|--------|-------|---------|------|------|------|
| 12587-46-1 | Alpha ALPHA | | 101 | pCi/L | +/-9.14 | 18.9 | 2.87 | 3.00 |

| Surrogate/Tracer recovery | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-------|-----------|-------------------|
|---------------------------|--------|---------|-------|-----------|-------------------|

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

| | | |
|------------------------------------|--|----------------------------------|
| SDG Number: GEL451812 | Client: CPRC001 | Project: CPRC0X18031 |
| Lab Sample ID: 451812006 | Date Collected: 06/05/2018 11:01 | Matrix: WATER |
| | Date Received: 06/06/2018 09:05 | |
| Client ID: B3JDN3 | | Prep Basis: "As Received" |
| Batch ID: 1771210 | Method: 9310_ALPHABETA_GPC | SOP Ref: GL-RAD-A-001 |
| Run Date: 06/08/2018 08:26 | Analyst: AXH4 | Instrument: PIC7D |
| Data File: AB1771210.xls | Aliquot: 150 mL | Count Time: 120 min |
| Prep Batch: 1771210 | Prep Method: EPA 900.0/SW846 9310 | |
| Prep Date: 06/06/2018 15:18 | | |

| CAS No. | Parmname | Qual | Result | Units | Uncert | TPU | MDC | RDL |
|------------|----------------|------|--------|-------|---------|------|------|------|
| 12587-46-1 | Alpha ALPHA | | 21.6 | pCi/L | +/-4.32 | 5.58 | 2.86 | 3.00 |

| Surrogate/Tracer recovery | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-------|-----------|-------------------|
|---------------------------|--------|---------|-------|-----------|-------------------|

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: June 13, 2018
Page 1 of 2

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 451812

| Parmname | NOM | Sample | Qual | QC | Units | QC Criteria | Range | Analyst | Date Time |
|---------------------|-----------|--------|------|------------------|-------|--------------------|-------|---------|---------------|
| Rad Gas Flow | | | | | | | | | |
| Batch | 1771210 | | | | | | | | |
| QC1204044109 | MB | | | | | | | | |
| Alpha | | | U | -0.067 | pCi/L | | | AXH4 | 06/08/1808:26 |
| | | | | Uncert: +/-0.955 | | | | | |
| | | | | TPU: +/-0.956 | | | | | |
| QC1204044110 | 451812003 | DUP | | | | | | | |
| Alpha | | 29.6 | | 30.0 | pCi/L | | | | 06/09/1813:10 |
| | | | | Uncert: +/-4.91 | | RPD: 1 (0%-20%) | | | |
| | | | | TPU: +/-6.89 | | RER: 0.0905 (0-2) | | | |
| QC1204044111 | 451812003 | MS | | | | | | | |
| Alpha | | 483 | 29.6 | 485 | pCi/L | REC: 94 (75%-125%) | | | 06/08/1808:27 |
| | | | | Uncert: +/-4.91 | | | | | |
| | | | | TPU: +/-6.89 | | | | | |
| QC1204044112 | 451812003 | MSD | | | | | | | |
| Alpha | | 483 | 29.6 | 487 | pCi/L | REC: 95 (75%-125%) | | | 06/08/1808:28 |
| | | | | Uncert: +/-4.91 | | RPD: 0 (0%-20%) | | | |
| | | | | TPU: +/-6.89 | | RER: 0.0334 (0-2) | | | |
| QC1204044113 | LCS | | | | | | | | |
| Alpha | | 80.5 | | 72.1 | pCi/L | REC: 90 (80%-120%) | | | 06/08/1808:28 |
| | | | | Uncert: +/-7.16 | | | | | |
| | | | | TPU: +/-14.0 | | | | | |

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The analyte was detected in the associated method blank >= MDC or >5% sample activity.
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- UX Gamma Spectroscopy--Uncertain identification
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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QC Summary

Workorder: 451812

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| Parmname | NOM | Sample | Qual | QC | Units | QC Criteria | Range | Analyst | Date | Time |
|----------|-----|--------|------|----|-------|-------------|-------|---------|------|------|
|----------|-----|--------|------|----|-------|-------------|-------|---------|------|------|

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

** Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.