



October 12, 2015

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

Re: CHPRC SAF X16-001  
Work Order: 382655  
SDG: GEL382655

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 07, 2015. 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,

Sarah Edwards for  
Heather Shaffer  
Project Manager

Purchase Order: 300071JDBA 7H  
Chain of Custody: X16-001-221 and X16-001-224  
Enclosures



Table of Contents

Case Narrative.....1  
Chain of Custody and Supporting Documentation.....4  
Data Review Qualifier Definitions.....8  
Laboratory Certifications.....11  
Radiological Analysis.....13  
    Sample Data Summary.....18  
    Quality Control Data.....21

# Case Narrative

October 19, 2015

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF X16-001  
SDG: GEL382655

October 12, 2015

**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 October 07, 2015, 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 and DER

**Sample Identification**

The laboratory received the following samples:

| <b>Laboratory Identification</b> | <b>Sample Description</b> |
|----------------------------------|---------------------------|
| 382655001                        | B32TC0                    |
| 382655002                        | B32TC2                    |

**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: Radiochemistry.

This package, to the best of my knowledge, 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.

*Sarah M Edwards*  
October 19, 2015

Sarah Edwards for  
Heather Shaffer  
Project Manager

# **Chain of Custody and Supporting Documentation**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X16-001-221**  
Page 1 of 1

*382655*

|                  |                           |                    |                          |                             |                    |
|------------------|---------------------------|--------------------|--------------------------|-----------------------------|--------------------|
| Collector        | S.W. King/CHPRC           | Contact/Requester  | Karen Waters-Husted      | Telephone No.               | 509-376-4650       |
| SAF No.          | X16-001                   | Sampling Origin    | Hanford Site             | Purchase Order/Charge Code  | 303271             |
| Project Title    | 100-BC-5 RI, OCTOBER 2015 | Logbook No.        | HNF-N-506 <i>Ne 1 72</i> | Ice Chest No.               | <i>625-494</i>     |
| Shipped To (Lab) | GEL Laboratories, LLC     | Method of Shipment | Commercial Carrier       | Bill of Lading/Air Bill No. | <i>77467177377</i> |
| Protocol         | CERCLA                    | Priority:          | 15 Days                  | Offsite Property No.        | <i>6025</i>        |

**PRIORITY**  
SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes  No   
Submit deliverables & invoices to ^CPP Sample Management.

**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

|            |          |                       |             |                   |                          |              |              |
|------------|----------|-----------------------|-------------|-------------------|--------------------------|--------------|--------------|
| Sample No. | Filter * | Date                  | Time        | No/Type Container | Sample Analysis          | Holding Time | Preservative |
| B32TC0     | N        | <i>09 OCT 06 2015</i> | <i>1040</i> | 1x500-mL P        | TRITIUM_DIST_LSC: COMMON | 6 Months     | None         |

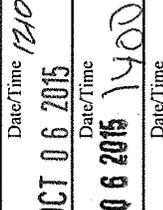
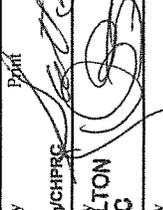
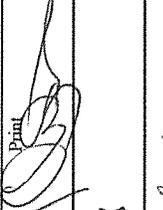
|                 |                       |           |                            |             |                       |      |                    |           |                            |          |
|-----------------|-----------------------|-----------|----------------------------|-------------|-----------------------|------|--------------------|-----------|----------------------------|----------|
| Relinquished By | S.W. King/CHPRC       | Date/Time | <i>09 OCT 06 2015 1210</i> | Received By | CHRIS FULTON<br>CHPRC | Sign | <i>[Signature]</i> | Date/Time | <i>09 OCT 06 2015 1210</i> | Matrix * |
| Relinquished By | CHRIS FULTON<br>CHPRC | Date/Time | <i>14 OCT 06 2015 1400</i> | Received By | FEDEX                 | Sign |                    | Date/Time |                            |          |
| Relinquished By | <i>[Signature]</i>    | Date/Time |                            | Received By | <i>[Signature]</i>    | Sign | <i>[Signature]</i> | Date/Time | <i>14 7.15/0905</i>        |          |

Relinquished By: *[Signature]* Date/Time: *14 7.15/0905*  
Disposal Method (e.g., Return to customer, per lab procedure, used in process)

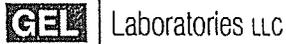
October 19, 2015

October 19, 2015

|  |  |   |   |
|--|--|---|---|
| CH2M Hill Plateau Remediation Company  |  | C.O.C.#<br><b>X16-001-224</b>   |   |
| Collector: <b>\$W. King/CHPRC</b>  |  | Telephone No. <b>509-376-4650</b>   | Page 1 of 1                                     |
| SAF No. <b>X16-001</b>   | Contact/Requester <b>Karen Waters-Husted</b> | Purchase Order/Charge Code <b>303271</b>  |   |
| Project Title <b>100-BC-5 RI, OCTOBER 2015</b>   | Sampling Origin <b>Hanford Site</b>          | Ice Chest No. <b>6025-494</b>   |   |
| Shipped To (Lab) <b>GEL Laboratories, LLC</b>  | Logbook No. <b>HNF-N-506-7e1-72</b>          | Bill of Lading/Air Bill No. <b>77467717-7377</b>  |   |
| Protocol <b>CERCLA</b>   | Method of Shipment <b>Commercial Carrier</b> | Offsite Property No. <b>6025</b>  |   |
| Priority: <b>15 Days</b>   |  | Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |   |
| <b>PRIORITY</b><br><b>SPECIAL INSTRUCTIONS Hold Time</b><br>Submit deliverables & invoices to *CPP Sample Management.  |  |   |   |
| <b>POSSIBLE SAMPLE HAZARDS/REMARKS</b><br>** ** 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 |  |   |   |
| Sample No. <b>B32TC2</b>   | Filter * <b>N</b>                            | No/Type Container <b>1x500-mL P</b>   | Sample Analysis <b>TRITIUM_DIST_LSC: COMMON</b> |
| Date <b>OCT 06 2015 11:18</b>  | Time <b>11:18</b>                            | Holding Time <b>6 Months</b>  | Preservative <b>None</b>                        |

|   |   |  |                                   |  |   |           |                                |   |
|---|---|--|-----------------------------------|--|---|-----------|--------------------------------|---|
| Relinquished By <b>\$W. King/CHPRC</b>    | Print  | Sign   | Date/Time <b>1210</b>             | Received By <b>CHRIS FULTON CHPRC</b>      | Print   | Sign      | Date/Time <b>1210</b>          | Matrix *<br>S = Soil DS = Drum Solids<br>SE = Sediment DL = Drum Liquids<br>SO = Solid T = Tissue<br>SL = Sludge W1 = Wipe<br>W = Water L = Liquid<br>O = Oil V = Vegetation<br>A = Air X = Other |
| Relinquished By <b>CHRIS FULTON CHPRC</b> | Print  | Sign   | Date/Time <b>OCT 06 2015</b>      | Received By <b>FEDEx</b>                   | Print  | Sign      | Date/Time <b>OCT 06 2015</b>   |   |
| Relinquished By <b>FedEx</b>              | Print  | Sign   | Date/Time <b>OCT 06 2015 1400</b> | Received By <b>John Bonds Andrew Bonds</b> | Print   | Sign      | Date/Time <b>10.7.15/10905</b> |   |
| Relinquished By                           | Print   | Sign   | Date/Time                         | Received By                                | Print   | Sign      | Date/Time                      |   |
| <b>FINAL SAMPLE DISPOSITION</b>           |   | Disposal Method (e.g., Return to customer, per lab procedure, used in process) |                                   | Disposed By                                |   | Date/Time |                                |   |

October 19, 2015



SAMPLE RECEIPT & REVIEW FORM

|  |   |
|--|---|
| Client: <u>CPRC</u>  | SDG/AR/COC/Work Order:  |
| Received By: <u>SE</u>   | Date Received: <u>10.7.15</u>   |
| Suspected Hazard Information   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
| COC/Samples marked as radioactive?                                       | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0 cpm</u>   |
| Classified Radioactive II or III by RSO?                                 | If yes, Were swipes taken of sample containers < action levels?   |
| COC/Samples marked containing PCBs?                                      |   |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.  |
| Shipped as a DOT Hazardous?  | Hazard Class Shipped: UN#:  |
| Samples identified as Foreign Soil?                                      |   |

| 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 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*     | <input checked="" type="checkbox"/> |    |    | Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe)<br>*all temperatures are recorded in Celsius <u>3, 4</u>   |
| 2a Daily check performed and passed on IR temperature gun?        | <input checked="" type="checkbox"/> |    |    | Temperature Device Serial #: <u>201404337</u><br>Secondary Temperature Device Serial # (If Applicable):                                |
| 3 Chain of custody documents included with shipment?              | <input checked="" type="checkbox"/> |    |    |  |
| 4 Sample containers intact and sealed?                            | <input checked="" type="checkbox"/> |    |    | Circle Applicable: Seals broken Damaged container Leaking container Other (describe)   |
| 5 Samples requiring chemical preservation at proper pH?           | <input checked="" type="checkbox"/> |    |    | Sample ID's, containers affected and observed pH:<br>If Preservation added, Lot#:  |
| 6 Do Low Level Perchlorate samples have headspace as required?    | <input checked="" type="checkbox"/> |    |    | Sample ID's and containers affected:   |
| 7 VOA vials contain acid preservation?                            | <input checked="" type="checkbox"/> |    |    | (If unknown, select No)  |
| 8 VOA vials free of headspace (defined as < 6mm bubble)?          | <input checked="" type="checkbox"/> |    |    | Sample ID's and containers affected:   |
| 9 Are Encore containers present?                                  | <input checked="" type="checkbox"/> |    |    | (If yes, immediately deliver to Volatiles laboratory)  |
| 10 Samples received within holding time?                          | <input checked="" type="checkbox"/> |    |    | ID's and tests affected:   |
| 11 Sample ID's on COC match ID's on bottles?                      | <input checked="" type="checkbox"/> |    |    | Sample ID's and containers affected:   |
| 12 Date & time on COC match date & time on bottles?               | <input checked="" type="checkbox"/> |    |    | Sample ID's affected:  |
| 13 Number of containers received match number indicated on COC?   | <input checked="" type="checkbox"/> |    |    | Sample ID's affected:  |
| 14 Are sample containers identifiable as GEL provided?            | <input checked="" type="checkbox"/> |    |    |  |
| 15 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> |    |    |  |
| 16 Carrier and tracking number.                                   |                                     |    |    | Circle Applicable:<br>FedEx Air FedEx Ground UPS Field Services Courier Other<br><u>FedEx Air</u> 7746 7717 7377-4<br>7746 7717 7664-3 |

Comments (Use Continuation Form if needed):

# **Data Review Qualifier Definitions**

## Project Specific Qualifier Definitions for GEL Client Code: **CPRC**

| Code | Status     | Qualifier Definition  | CofA | Department        | Fraction      | Additional Comments  |
|------|------------|---|------|-------------------|---------------|--|
| U    | Programmed | Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  | Y    |                   |               | Includes MDA, TPU, count uncert.   |
| J    | Programmed | 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                                    | Y    | Organics          |               | Organics only  |
| P    | Programmed | Aroclor target analyte with greater than 25% difference between column analyses.  | Y    | Organics          |               | PCB only   |
| C    | Manual     | Analyte has been confirmed by GC/MS analysis  | Y    | Organics          | Pesticide     | IF GC/MS confirmation was attempted but unsuccessful do not qualify with C |
| B    | Programmed | The analyte was detected in both the associated QC blank and in the sample.   | Y    | Organics          |               |  |
| E    | Manual     | Concentration exceeds the calibration range of the instrument   | Y    | Organics          |               | Qualifier Uploaded   |
| A    | Manual     | The TIC is a suspected aldol-condensation product   | Y    | Organics          | Semi-Volatile | Uploaded with TIC  |
| X    | Programmed | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  | Y    |                   |               | Replaces H Hold Date In RAD replaces UI. Same usage as standard X as well. |
| N    | Programmed | Spike Sample recovery is outside control limits.  | Y    |                   |               |  |
| *    | Programmed | Duplicate analysis not within control limits  | Y    | Inorganics        |               |  |
| >    | Programmed | Result greater than quantifiable range or greater than upper limit of the analysis range  | Y    | General Chemistry |               |  |
| Z    | Manual     | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  | Y    |                   |               |  |
| B    | Programmed | 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).   | Y    | Inorganics        | Metals        | Replaces J Estimated Value   |
| D    | Programmed | Results are reported from a diluted aliquot of sample.  | Y    |                   |               | Dilution   |
| E    | Programmed | Reported value is estimated due to interferences. See comment in narrative.   | Y    | Inorganics        | Metals        | GEL E  |
| M    | Manual     | Duplicate precision not met.  | Y    | Inorganics        | Metals        | Replaces *   |
| o    | Programmed | Analyte failed to recover within LCS limits (Organics only)   | Y    | Organics          |               |  |
| S    | Manual     | Reported value determined by the Method of Standard Additions (MSA)   | Y    | Inorganics        |               | Not coded B/C Rarely performed   |
| T    | Programmed | Spike and/or spike duplicate sample recovery is outside control limits.   | Y    | Organics          |               | GC/MS only   |
| W    | Manual     | Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.   | Y    | Inorganics        |               | No GFAA in house.  |
| B    | Programmed | The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is $\geq$ MDA for this sample  | Y    | Radiological      |               |  |
| Y    | Manual     | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  | Y    |                   |               |  |
| +    | Manual     | Correlation coefficient for Method of Standard Additions (MSA) is < 0.995   | Y    | Inorganics        |               |  |
| B    | Programmed | 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).   | Y    | General Chemistry |               | Replaces J Estimated Value   |
| C    | Programmed | 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. | Y    | Inorganics        | Metals        | Replaces B Blank Detection   |
| C    | Programmed | 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. | Y    | General Chemistry |               | Replaces B Blank Detection   |
| <    | Programmed | Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide   | Y    | General Chemistry |               | for Reactive CN/S  |

**Project Specific Qualifier Definitions for GEL Client Code: CPRC**

| <b>Code</b> | <b>Status</b> | <b>Qualifier Definition</b>                  | <b>CofA</b> | <b>Department</b> | <b>Fraction</b> | <b>Additional Comments</b> |
|-------------|---------------|--|-------------|-------------------|-----------------|----------------------------|
| UX          | Manual        | Gamma Spectroscopy--Uncertain identification | Y           | Radiological      |                 |                            |

# Laboratory Certifications

**List of current GEL Certifications as of 12 October 2015**

| <b>State</b>             | <b>Certification</b>         |
|--------------------------|------------------------------|
| Alaska                   | UST-110                      |
| Arkansas                 | 88-0651                      |
| CLIA                     | 42D0904046                   |
| California               | 2940 Interim                 |
| Colorado                 | SC00012                      |
| Connecticut              | PH-0169                      |
| Delaware                 | SC000122013-10               |
| DoD ELAP/ ISO17025 A2LA  | 2567.01                      |
| Florida NELAP            | E87156                       |
| Foreign Soils Permit     | P330-12-00283, P330-12-00284 |
| Georgia                  | SC00012                      |
| Georgia SDWA             | 967                          |
| Hawaii                   | SC000122013-10               |
| 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           | LA150001                     |
| Maryland                 | 270                          |
| Massachusetts            | M-SC012                      |
| Michigan                 | 9976                         |
| Mississippi              | SC000122013-10               |
| Nebraska                 | NE-OS-26-13                  |
| Nevada                   | SC000122016-1                |
| New Hampshire NELAP      | 2054                         |
| New Jersey NELAP         | SC002                        |
| New Mexico               | SC00012                      |
| New York NELAP           | 11501                        |
| North Carolina           | 233                          |
| North Carolina SDWA      | 45709                        |
| Oklahoma                 | 9904                         |
| Pennsylvania NELAP       | 68-00485                     |
| Plant Material Permit    | PDEP-12-00260                |
| S.Carolina Radchem       | 10120002                     |
| South Carolina Chemistry | 10120001                     |
| Tennessee                | TN 02934                     |
| Texas NELAP              | T104704235-15-10             |
| Utah NELAP               | SC000122015-18               |
| Vermont                  | VT87156                      |
| Virginia NELAP           | 460202                       |
| Washington               | C780                         |
| West Virginia            | 997404                       |

# Radiological Analysis

October 19, 2015

Radiochemistry

Technical Case Narrative

CH2M Hill Plateau Remediation Company (CPRC)

SDG #: GEL382655

Work Order #: 382655

"  
"  
"

Method/Analysis Information

"

**Product:** TRITIUM\_DIST\_LSC: COMMON

Cpcnf \deci'O gj qf <' VTK/KWO aF KUVaNUE

Cpcnf \deci'Dcvej 'P wo dgt<' 37353; 5

"

**Sample ID \*\*\*\*\* Client ID**

5: 4877223" D54VE2

5: 4877224" D54VE4

3425629639" O gj qf 'Drcpn'O D+

3425629642" Ncdqtcvqt { 'Eqpvtqni'Uco r rg'NE U+

342562963; " 5: 487; 225'D54Z: 8+'Uco r rg'F wr rdecvg'F WR+

342562963; " 5: 487; 225'D54Z: 8+'O cvtkz 'Ur lng'O U+

"

Uco r rgu'5: 4877'223'cpf '224'lp'vj ku'UF I 'y gtg'cpcnf | gf 'qp'cp'\$cu'tgeglxgf '\$'dcuku0"

**SOP Reference**

Rtqegf wtg'hqt'r tgr ctcvqp.'cpcnf uku'cpf 'tgr qt vki 'qh'cpcnf \deci'f cvc'ctg'eqpvtqmgf 'd { 'I GN'Ncdqtcvqt'lg'u'NNE'cu Ucpf ctf 'Qr gtcvki 'Rtqegf wtg'UQR+0Vj g'f cvc'f kuewugf 'lp'vj ku'pcttcvkg'j cu'dggp'cpcnf | gf 'lp'ceeqtf cpeg'y kj I N/TCF/C/224'TGX%430"

**Calibration Information:**

"

**Calibration Information**

Cm'lpk'kcn'cpf 'eqp'vkwpi 'ecr'dtcvqp'tgs wkt go gpw'j cxg'dggp'o g'0"

"

**Standards Information**

Ucpf ctf 'uq'wkwpu'hqt'vj gug'cpcnf uku'ctg'P KUV'tcegcdrg'qt'xgt'kgf'y kj 'c'P KUV'tcegcdrg'ucpf ctf 'cpf'wugf dghqt'vj g'g'zr ktcvqp'f cvgu0"

"

**Sample Geometry**

Cm'leqwp'vki 'uq'wtegu'y gtg'r tgr ctgf 'lp'vj g'uco g'i gqo gw { 'cu'vj g'ecr'dtcvqp'ucpf ctf u0"

**Quality Control (QC) Information:**

"

**Blank Information**

Vj g'drcpn'ixqno g'ku'tgr t'gug'pvc'xg'qh'vj g'uco r rg'xqno g'lp'vj ku'dcvej 0"

"

**QC Information**

Cm'qh'vj g'S E'uco r rgu'o gg'vj g'tgs wkt gf 'ceegr v'peg'iko ku'y kj 'vj g'hqmy lpi 'gzegr v'qpu<T ghgt'vq'F cvc Gzegr v'qp'T gr qt v'F GT +0"

"



October 19, 2015

**GEL LABORATORIES LLC**

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

**Qualifier Definition Report  
for**

ERTE223'EJ 40 J km'Rrcvcw'Tgo gf kvcqp'Ego r cp{  
ErkpvUF I <I GN5: 4877"I GN"Y qtm'Qtf gt<5: 4877

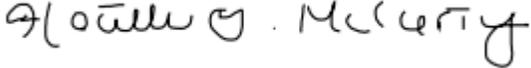
**The Qualifiers in this report are defined as follows:**

W""Cpcn{ | gf 'hqt'dw'pqv'f gvev'f'cdq'xg'ho k'kpi "etkgtk'0'k'pen'f'gu'OFN.'OFC.'RS N.'| gtq.'eqwp'kpi "gttqt.'cpf'vqcn  
cpcn{ v'ecr'gttqt0

**Review/Validation**

I GN'tgs w'k'gu'cm'cpcn{ v'ecr'f'cvc'q'dg'xgt'k'k'f' "d{ "c's w'c'k'k'f' "f'cvc't'g'x'k'g'gt'0" k'p'c'f'f'k'k'p'."cm'ENR'rkng'f'grk'x'g'cd'ng'u  
t'geg'k'g'c'v'j' k'f' "g'x'g'nt'g'x'k'g'y "q'h'v'j' g' "t'c'v'k'p'c'n'f'cvc'r'c'c'c'c'i'g'0"

Vj'g'hq'm'y k'pi "f'cvc'x'c'r'f'c'v'q't'x'g't'k'k'f' "v'j' g' "k'p'q'to'c'v'k'p'r't'g'g'p'v'g'f' "k'p'v'j' k'u'f'cvc't'g'r'q't'v'

Signature: 

Name: Heather McCarty

Date: 16 OCT 2015

Title: Analyst II

| <b>DATA EXCEPTION REPORT</b>  |   |  |                             |
|---|---|--|-----------------------------|
| <b>Mo.Day Yr.</b><br>12-OCT-15  | <b>Division:</b><br>Radiochemistry          | <b>Quality Criteria:</b><br>Specifications | <b>Type:</b><br>Process     |
| <b>Instrument Type:</b><br>LSC  | <b>Test / Method:</b><br>EPA 906.0 Modified | <b>Matrix Type:</b><br>Liquid              | <b>Client Code:</b><br>CPRC |
| <b>Batch ID:</b><br>1513193   | <b>Sample Numbers:</b><br>See Below         |  |                             |
| <b>Potentially affected work order(s)(SDG):</b> 382601(GEL382601),382603(GEL382603),382605(GEL382605),382655(GEL382655),382659(GEL382659)   |   |  |                             |
| <b>Application Issues:</b><br>RDL less than MDA   |   |  |                             |
| <b>Specification and Requirements Exception Description:</b>  |   | <b>DER Disposition:</b>                    |                             |
| <p>1. Samples 382601002, 382655002, 382659003, 382659005, 1203407417, and 1203407418 do not meet the required detection limit. The samples were counted the maximum count time of 120 minutes to achieve the best possible results.</p> |   | <p>1. Reporting results.</p>               |                             |

**Originator's Name:**

Lyndsey Pace 12-OCT-15

**Data Validator/Group Leader:**

Lesley Anderson 12-OCT-15

# Sample Data Summary

October 19, 2015  
Rad

**Certificate of Analysis  
Sample Summary**

|                                    |   |                                  |
|------------------------------------|---|----------------------------------|
| <b>SDG Number:</b> GEL382655       | <b>Client:</b> CPRC001                  | <b>Project:</b> CPRC0X16001      |
| <b>Lab Sample ID:</b> 382655001    | <b>Date Collected:</b> 10/06/2015 10:40 | <b>Matrix:</b> WATER             |
|                                    | <b>Date Received:</b> 10/07/2015 09:05  |                                  |
| <b>Client ID:</b> B32TC0           | <b>Method:</b> TRITIUM_DIST_LSC         | <b>Prep Basis:</b> "As Received" |
| <b>Batch ID:</b> 1513193           | <b>Analyst:</b> GXR1                    | <b>SOP Ref:</b> GL-RAD-A-002     |
| <b>Run Date:</b> 10/09/2015 22:05  | <b>Aliquot:</b> 50 mL                   | <b>Instrument:</b> LSCPINK       |
| <b>Data File:</b> T1513193.xls     | <b>Prep Method:</b> EPA 906.0 Modified  | <b>Count Time:</b> 120.0297 min  |
| <b>Prep Batch:</b> 1513193         |   |                                  |
| <b>Prep Date:</b> 10/09/2015 00:00 |   |                                  |

| CAS No.    | Parmname | Qual | Result | Units | Uncert | TPU | MDC | RDL |
|------------|----------|------|--------|-------|--------|-----|-----|-----|
| 10028-17-8 | Tritium  |      | 2170   | pCi/L | +/-161 | 450 | 114 | 100 |

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

**Comments:**

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

October 19, 2015

**Certificate of Analysis  
Sample Summary**

|                                    |   |                                  |
|------------------------------------|---|----------------------------------|
| <b>SDG Number:</b> GEL382655       | <b>Client:</b> CPRC001                  | <b>Project:</b> CPRC0X16001      |
| <b>Lab Sample ID:</b> 382655002    | <b>Date Collected:</b> 10/06/2015 11:18 | <b>Matrix:</b> WATER             |
|                                    | <b>Date Received:</b> 10/07/2015 09:05  |                                  |
| <b>Client ID:</b> B32TC2           | <b>Method:</b> TRITIUM_DIST_LSC         | <b>Prep Basis:</b> "As Received" |
| <b>Batch ID:</b> 1513193           | <b>Analyst:</b> GXR1                    | <b>SOP Ref:</b> GL-RAD-A-002     |
| <b>Run Date:</b> 10/10/2015 00:08  | <b>Aliquot:</b> 50 mL                   | <b>Instrument:</b> LSCPINK       |
| <b>Data File:</b> T1513193.xls     | <b>Prep Method:</b> EPA 906.0 Modified  | <b>Count Time:</b> 120.0297 min  |
| <b>Prep Batch:</b> 1513193         |   |                                  |
| <b>Prep Date:</b> 10/09/2015 00:00 |   |                                  |

| CAS No.    | Parmname | Qual | Result | Units | Uncert  | TPU  | MDC | RDL |
|------------|----------|------|--------|-------|---------|------|-----|-----|
| 10028-17-8 | Tritium  | U    | 95.6   | pCi/L | +/-70.3 | 72.7 | 114 | 100 |

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

**Comments:**

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.  
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: October 16, 2015  
Page 1 of 1

**Client :** CH2MHill Plateau Remediation Company  
MSIN R3-50 CHPRC  
PO Box 1600  
Richland, Washington 99352

**Contact:** Mr. Scot Fitzgerald

**Workorder:** 382655

| Parmname                        | NOM       | Sample | Qual | QC              | Units | QC Criteria | Range      | Analyst | Date Time     |
|---------------------------------|-----------|--------|------|-----------------|-------|-------------|------------|---------|---------------|
| <b>Rad Liquid Scintillation</b> |           |        |      |                 |       |             |            |         |               |
| Batch                           | 1513193   |        |      |                 |       |             |            |         |               |
| QC1203407417                    | MB        |        |      |                 |       |             |            |         |               |
| Tritium                         |           |        | U    | 31.6            | pCi/L |             |            | GXR1    | 10/10/1507:31 |
|                                 |           |        |      | Uncert: +/-65.3 |       |             |            |         |               |
|                                 |           |        |      | TPU: +/-65.6    |       |             |            |         |               |
| QC1203407418                    | 382659003 | DUP    |      |                 |       |             |            |         |               |
| Tritium                         |           | U      | 7.50 | U               | -29.9 |             |            |         | 10/10/1509:33 |
|                                 |           |        |      | Uncert: +/-63.7 |       | RPD: 0      | N/A        |         |               |
|                                 |           |        |      | TPU: +/-63.8    |       | RER: 0.84   | (0-2)      |         |               |
| QC1203407419                    | 382659003 | MS     |      |                 |       |             |            |         |               |
| Tritium                         | 1800      | U      | 7.50 |                 | 1410  | REC: 78     | (75%-125%) |         | 10/10/1511:36 |
|                                 |           |        |      | Uncert: +/-63.7 |       |             |            |         |               |
|                                 |           |        |      | TPU: +/-63.8    |       |             |            |         |               |
| QC1203407420                    | LCS       |        |      |                 |       |             |            |         |               |
| Tritium                         | 1800      |        |      |                 | 1830  | REC: 102    | (80%-120%) |         | 10/10/1511:53 |
|                                 |           |        |      | Uncert: +/-401  |       |             |            |         |               |
|                                 |           |        |      | TPU: +/-535     |       |             |            |         |               |

**Notes:**

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

The Qualifiers in this report are defined as follows:

- B The associated QC sample blank has a result  $\geq 2X$  the MDA and, after corrections, result is  $\geq$  MDA for this sample
- 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.
- UX Gamma Spectroscopy--Uncertain identification
- 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.

\*\* 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.