

General Engineering Laboratories, Inc., Charleston, SC.  
2040 Savage Rd  
Charleston SC 29407

## Chain of Custody/Analysis Request

COC/Lab Request #:  
12-1253

Page 1 of 1

**Client Contact:**

Lab Agreement # : 126310011

Site Name: Los Alamos National Laboratory

Project Number :

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐

7 Day - ☐

14 Day - ☐

21 Day - ☐

28 Day - ☒

WSP-GENINORG  
WSP-Met+B+SN+SR+U

Rad Screening Info:

Yes, Below Background

Field Sample ID

Sample Date

Sample  
Time

Sample  
Matrix

CAPA-12-13290

Apr 27 2012

13:23

W

1 1

Special Instructions:

Special Instructions:

Relinquished by:

Relinquished by:

Relinquished by:

Date/Time:

Date/Time:

Date/Time:

Received by:

Received by:

Received by:

4/20/12 3:00

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 3855 EVENT NAME: Pajarito (General Surveillance)  
 Q3 Watershed Sampling  
 SAMPLE ID: CAPA-12-13290 WORK ORDER: NA

|                                 | <u>AS<br/>PLANNED</u> | <u>AS COLLECTED</u> |                      | <u>AS<br/>PLANNED</u> | <u>AS COLLECTED</u> |
|---------------------------------|-----------------------|---------------------|----------------------|-----------------------|---------------------|
| DATE COLLECTED<br>(MM/DD/YYYY): |                       | 04/27/2012          | FIELD MATRIX:        | WG                    | ok                  |
| TIME COLLECTED (HH:MM):         |                       | 1323                | MEDIA:               | WGA                   |                     |
| PRS ID:                         |                       | ok                  | SAMPLE TECH<br>CODE: | UA                    | BP                  |
| LOCATION ID: PCAO-8             |                       |                     | FIELD PREP:          | F                     |                     |
| LOCATION TYPE: MON              |                       |                     | FIELD QC TYPE:       | REG                   |                     |
| PORT: SINGLE<br>COMPLETION      |                       | ↓                   | SAMPLE USAGE:        | INV                   | ↓                   |

| PRIORITY | ORDER               | CONTAINER          | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|---------------------|--------------------|---|--------------|---------------|----------------------|
| N/A      | WSP-GENINORG        | 1 LITER POLY       | 1 | ICE          | Y             | N/A                  |
| ↓        | WSP-Met+B+SN+SR+U   | 1 LITER POLY       | 1 | HNO3         | Y             | ↓                    |
| ↓        | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4        | (N)           | ↓                    |

**SAMPLE COMMENTS:**

N/A

**LOCATION COMMENTS:**

N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.21 mg/L      Oxidation-Reduction Potential 235.8 MV      pH 6.37 SU  
 Specific Conductance 577 µS/cm      Temperature 13.23 deg C      Turbidity 6.21 NTU

**COLLECTED BY (PRINT)**

f. Storker

|   |  |   |  |
|---|--|---|--|
| RELINQUISHED BY<br>(Printed Name) <u>Andrew Storker</u><br>(Signature) <u>[Signature]</u> | Date/Time<br><u>4/27/12</u><br><u>1415</u> | RECEIVED BY <u>L. Greene</u><br>(Printed Name) <u>[Signature]</u><br>(Signature) <u>[Signature]</u> | Date/Time<br><u>4/27/12</u><br><u>2:15</u> |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)  | Date/Time                                  | RECEIVED BY<br>(Printed Name)<br>(Signature)  | Date/Time                                  |

Report Date 04/11/2012

## Data Validation Report

Chain Of Custody No. 12-1253

## 1. Distribution Of Samples In EDD.

|        | Analytical   | Regular | Field      | Trip   | Field  | Equipment |
|--------|--------------|---------|------------|--------|--------|-----------|
| SDG    | Method       | Samples | Duplicates | Blanks | Blanks | Blanks    |
| 303488 | EPA:120.1    | 1       |            |        |        |           |
| 303488 | EPA:150.1    | 1       |            |        |        |           |
| 303488 | EPA:160.1    | 1       |            |        |        |           |
| 303488 | EPA:245.2    | 1       |            |        |        |           |
| 303488 | EPA:300.0    | 1       |            |        |        |           |
| 303488 | EPA:310.1    | 1       |            |        |        |           |
| 303488 | SM:A2340B    | 1       |            |        |        |           |
| 303488 | SW-846:6010B | 1       |            |        |        |           |
| 303488 | SW-846:6020  | 1       |            |        |        |           |
| 303488 | SW-846:6850  | 1       |            |        |        |           |

|        | Analytical   | Analysis | Prep    | Regular | Field      | Trip   | Field  | Equipment | Method | Matrix | Matrix     |
|--------|--------------|----------|---------|---------|------------|--------|--------|-----------|--------|--------|------------|
| SDG    | Method       | Lot ID   | Lot ID  | Samples | Duplicates | Blanks | Blanks | Blanks    | Blanks | Spikes | Spike Dups |
| 303488 | EPA:120.1    | 1210920  | 1210920 | 1       |            |        |        |           |        |        |            |
| 303488 | EPA:150.1    | 1208900  | 1208900 | 1       |            |        |        |           |        |        |            |
| 303488 | EPA:160.1    | 1209153  | 1209153 | 1       |            |        |        |           |        | 1      |            |
| 303488 | EPA:245.2    | 1208500  | 1208499 | 1       |            |        |        |           |        | 1      | 1          |
| 303488 | EPA:300.0    | 1207431  | 1207431 | 1       |            |        |        |           |        | 1      |            |
| 303488 | EPA:310.1    | 1210449  | 1210449 | 1       |            |        |        |           |        | 1      | 1          |
| 303488 | SM:A2340B    | 1214284  | 1214284 | 1       |            |        |        |           |        |        |            |
| 303488 | SW-846:6010B | 1208720  | 1208719 | 1       |            |        |        |           |        | 1      | 1          |
| 303488 | SW-846:6020  | 1208718  | 1208717 | 1       |            |        |        |           |        | 1      | 1          |
| 303488 | SW-846:6850  | 1208033  | 1208032 | 1       |            |        |        |           |        | 1      | 1          |

## 2. Distribution Of Analytes In EDD.

| Analytical Method | Method Category   | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spikes | TICS |
|-------------------|-------------------|-----------------|---------------|----------------|-----------------|------------|--------|------|
| EPA:120.1         | GENERAL CHEMISTRY | CAPA-12-13290   | 1202653384    | DUP            |                 | 1          | 0      | 0    |
| EPA:120.1         | GENERAL CHEMISTRY | CAPA-12-13290   | 303488001     | REG            |                 | 1          | 0      | 0    |
| EPA:120.1         | GENERAL CHEMISTRY | LCS             | 1202653382    | LCS            |                 | 0          | 0      | 1    |
| EPA:150.1         | GENERAL CHEMISTRY | CAPA-12-13288   | 1202648411    | DUP            |                 | 1          | 0      | 0    |
| EPA:150.1         | GENERAL CHEMISTRY | CAPA-12-13290   | 303488001     | REG            |                 | 1          | 0      | 0    |
| EPA:160.1         | GENERAL CHEMISTRY | CAPA-12-13290   | 303488001     | REG            |                 | 1          | 0      | 0    |
| EPA:160.1         | GENERAL CHEMISTRY | CAPA-12-13345   | 1202648998    | DUP            |                 | 1          | 0      | 0    |
| EPA:160.1         | GENERAL CHEMISTRY | LCS             | 1202648999    | LCS            |                 | 0          | 0      | 1    |
| EPA:160.1         | GENERAL CHEMISTRY | MB              | 1202648997    | MB             |                 | 1          | 0      | 0    |
| EPA:245.2         | INORGANIC         | CAPA-12-13287   | 1202647539    | DUP            |                 | 1          | 0      | 0    |
| EPA:245.2         | INORGANIC         | CAPA-12-13287   | 1202647540    | MS             |                 | 0          | 0      | 1    |
| EPA:245.2         | INORGANIC         | CAPA-12-13290   | 303488001     | REG            |                 | 1          | 0      | 0    |
| EPA:245.2         | INORGANIC         | LCS             | 1202647538    | LCS            |                 | 0          | 0      | 1    |
| EPA:245.2         | INORGANIC         | MB              | 1202647537    | MB             |                 | 1          | 0      | 0    |
| EPA:300.0         | GENERAL CHEMISTRY | CAPA-12-13287   | 1202644915    | DUP            |                 | 4          | 0      | 0    |
| EPA:300.0         | GENERAL CHEMISTRY | CAPA-12-13290   | 303488001     | REG            |                 | 4          | 0      | 0    |
| EPA:300.0         | GENERAL CHEMISTRY | LCS             | 1202644917    | LCS            |                 | 0          | 0      | 4    |
| EPA:300.0         | GENERAL CHEMISTRY | MB              | 1202644914    | MB             |                 | 4          | 0      | 0    |
| EPA:310.1         | GENERAL CHEMISTRY | CAPA-12-13290   | 303488001     | REG            |                 | 2          | 0      | 0    |
| EPA:310.1         | GENERAL CHEMISTRY | CAPA-12-13345   | 1202652186    | DUP            |                 | 2          | 0      | 0    |

| Analytical | Post-Digestion | Lab Control | Lab Control | Blank  | Blank      | Lab        | Storage | Preparation | Reagent |
|------------|----------------|-------------|-------------|--------|------------|------------|---------|-------------|---------|
| Spikes     | Spikes         | Samples     | Sample Dups | Spikes | Spike Dups | Duplicates | Blanks  | Blanks      | Blanks  |
|            |                | 1           |             |        |            | 1          |         |             |         |
|            |                |             |             |        |            | 1          |         |             |         |
|            |                | 1           |             |        |            | 1          |         |             |         |
|            |                | 1           |             |        |            | 1          |         |             |         |
|            |                | 1           |             |        |            | 1          |         |             |         |
|            |                | 1           |             |        |            | 1          |         |             |         |
|            |                |             |             |        |            |            |         |             |         |
|            |                | 1           |             |        |            | 1          |         |             |         |
|            |                | 1           |             |        |            | 1          |         |             |         |
|            |                | 1           |             |        |            |            |         |             |         |

|              |                        |               |            |     |    |   |    |   |
|--------------|------------------------|---------------|------------|-----|----|---|----|---|
| EPA:310.1    | GENERAL CHEMISTRY      | CAPA-12-13345 | 1202652190 | MS  | 0  | 0 | 1  | 0 |
| EPA:310.1    | GENERAL CHEMISTRY      | LCS           | 1202652192 | LCS | 0  | 0 | 1  | 0 |
| EPA:310.1    | GENERAL CHEMISTRY      | MB            | 1202652183 | MB  | 3  | 0 | 0  | 0 |
| SM:A2340B    | INORGANIC              | CAPA-12-13290 | 303488001  | REG | 1  | 0 | 0  | 0 |
| SW-846:6010B | INORGANIC              | CAPA-12-13290 | 1202648017 | DUP | 17 | 0 | 0  | 0 |
| SW-846:6010B | INORGANIC              | CAPA-12-13290 | 1202648018 | MS  | 0  | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC              | CAPA-12-13290 | 303488001  | REG | 17 | 0 | 0  | 0 |
| SW-846:6010B | INORGANIC              | LCS           | 1202648016 | LCS | 0  | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC              | MB            | 1202648015 | MB  | 17 | 0 | 0  | 0 |
| SW-846:6020  | INORGANIC              | CAPA-12-13290 | 1202648012 | DUP | 11 | 0 | 0  | 0 |
| SW-846:6020  | INORGANIC              | CAPA-12-13290 | 1202648013 | MS  | 0  | 0 | 11 | 0 |
| SW-846:6020  | INORGANIC              | CAPA-12-13290 | 303488001  | REG | 11 | 0 | 0  | 0 |
| SW-846:6020  | INORGANIC              | LCS           | 1202648011 | LCS | 0  | 0 | 11 | 0 |
| SW-846:6020  | INORGANIC              | MB            | 1202648010 | MB  | 11 | 0 | 0  | 0 |
| SW-846:6850  | LCMS/MS<br>PERCHLORATE | CAPA-12-13287 | 1202646393 | MS  | 0  | 0 | 1  | 0 |
| SW-846:6850  | LCMS/MS<br>PERCHLORATE | CAPA-12-13287 | 1202646394 | MSD | 0  | 0 | 1  | 0 |
| SW-846:6850  | LCMS/MS<br>PERCHLORATE | CAPA-12-13290 | 303488001  | REG | 1  | 0 | 0  | 0 |
| SW-846:6850  | LCMS/MS<br>PERCHLORATE | LCS           | 1202646392 | LCS | 0  | 0 | 1  | 0 |
| SW-846:6850  | LCMS/MS<br>PERCHLORATE | MB            | 1202646391 | MB  | 1  | 0 | 0  | 0 |

**3. Are any analytes missing?**

No.

**4. Were any holding times exceeded?**

No.

**5. Any contaminants in blanks?**

No.

**Any samples affected by the presence of contaminants in blanks?**

| Field         | Blank Field | Blank Lab  | Blank        | Analytical | Parameter |       | Blank  | Sample | Lab       | Detect |          |
|---------------|-------------|------------|--------------|------------|-----------|-------|--------|--------|-----------|--------|----------|
| Sample ID     | Sample ID   | Sample ID  | Type         | Method     | Name      | Units | Result | Result | Qualifier | Limit  | Detected |
| CAPA-12-13290 | MB          | 1202647537 | METHOD BLANK | EPA:245.2  | Mercury   | ug/L  | -0.094 | 0.2    | U         | 0.2    | N        |

**6. Any surrogate recoveries outside the control limits?**

No.

**7. Any MS/MSD recoveries or RPDs outside the control limits?**

No.

**8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?**

No.

**9. Any Field Duplicate RPDs outside the desired limits?**

|             |            |         |
|-------------|------------|---------|
| Correction  | Correction | Use     |
| Factor (ND) | Factor (J) | Factors |
| 5           |            | Y       |

No.

**10. Any Lab Duplicate RPDs outside the desired limits?**

No.

**11. Any required reporting limits exceeded?**

No.

**12. Additional Validator's Comments.**

None.

**13. Display Flagged Data.**

No.

| Reason Code | Description |
|-------------|-------------|
|-------------|-------------|

|       |   |
|-------|---|
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
|-------|---|

|    |   |
|----|---|
| NQ | The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualify. The analyte is detected in the sample. |
|----|---|

|       |  |
|-------|--|
| U_LAB | The analytical laboratory qualified the analyte as not detected. |
|-------|--|

**14. Useable Result Count.**

| Field         | Location | Sample  | Analytical   | No. Unuseable | Total No. Of |
|---------------|----------|---------|--------------|---------------|--------------|
| Sample ID     | ID       | Purpose | Method       | Records       | Records      |
| CAPA-12-13290 | PCAO-8   | REG     | EPA:120.1    | 0             | 1            |
| CAPA-12-13290 | PCAO-8   | REG     | EPA:150.1    | 0             | 1            |
| CAPA-12-13290 | PCAO-8   | REG     | EPA:160.1    | 0             | 1            |
| CAPA-12-13290 | PCAO-8   | REG     | EPA:245.2    | 0             | 1            |
| CAPA-12-13290 | PCAO-8   | REG     | EPA:300.0    | 0             | 4            |
| CAPA-12-13290 | PCAO-8   | REG     | EPA:310.1    | 0             | 2            |
| CAPA-12-13290 | PCAO-8   | REG     | SM:A2340B    | 0             | 1            |
| CAPA-12-13290 | PCAO-8   | REG     | SW-846:6010B | 0             | 17           |
| CAPA-12-13290 | PCAO-8   | REG     | SW-846:6020  | 0             | 11           |
| CAPA-12-13290 | PCAO-8   | REG     | SW-846:6850  | 0             | 1            |



May 22, 2012

[www.gel.com](http://www.gel.com)

Keith Greene  
Los Alamos National Laboratory  
PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm111  
Los Alamos, New Mexico 87545

Re: LANL-WQH Water Samples  
Work Order: 303488  
SDG: 12-1253

Dear Keith Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on May 01, 2012, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. 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. 4485.

Sincerely,

Hope Taylor for  
Valerie Davis  
Project Manager

Purchase Order: 63641-10  
Chain of Custody: 12-1253  
Enclosures





**ARS International (63641-10)**  
**LANL-WQH Water Samples**  
**Work Order #: 303488**  
**SDG: 12-1253**

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# Case Narrative

**Case Narrative for  
ARS International (63641-10)  
LANL-WQH Water Samples  
Workorder #: 303488  
SDG # : 12-1253**

**May 22, 2012**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on May 01, 2012 for analysis. The sample was delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperature was checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following sample:

| <b><u>Laboratory ID</u></b> | <b><u>Client ID</u></b> |
|-----------------------------|-------------------------|
| 303488001                   | CAPA-12-13290           |

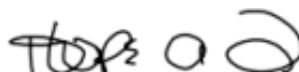
**Case Narrative**

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: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.



Hope Taylor for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 22 May 2012**

| <b>State</b>              | <b>Certification</b> |
|---------------------------|----------------------|
| Arizona                   | AZ0766               |
| Arkansas                  | 88-0651              |
| CLIA                      | 42D0904046           |
| California NELAP          | 01151CA              |
| Colorado                  | SC00012              |
| Connecticut               | PH-0169              |
| Delaware                  | SC00012              |
| DoD ELAP A2LA ISO 17025   | 2567.01              |
| Florida NELAP             | E87156               |
| Foreign Soils Permit      | P330-09-00191        |
| Georgia                   | SC00012              |
| Georgia SDWA              | 967                  |
| Hawaii                    | SC00012              |
| Idaho                     | SC00012              |
| Illinois NELAP            | 200029               |
| Indiana                   | C-SC-01              |
| Kansas NELAP              | E-10332              |
| Kentucky                  | 90129                |
| Louisiana NELAP           | 03046 (AI33904)      |
| Louisiana SDWA            | LA120008             |
| Maryland                  | 270                  |
| Massachusetts             | M-SC012              |
| Mississippi               | SC00012              |
| Nevada                    | SC000122011-1        |
| 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             |
| South Carolina Chemistry  | 10120001             |
| South Carolina Radiochemi | 10120002             |
| Tennessee                 | TN 02934             |
| Texas NELAP               | T104704235-12-7      |
| Utah NELAP                | SC00012              |
| Vermont                   | VT87156              |
| Virginia NELAP            | 460202               |
| Washington                | C780                 |
| Wisconsin                 | 999887790            |

# **Chain of Custody and Supporting Documentation**

General Engineering Laboratories, Inc., Charleston, SC.  
2040 Savage Rd  
Charleston SC 29407

## Chain of Custody/Analysis Request

COC/Lab Request #:  
12-1253

Page 1 of 1

303488

### Client Contact:

Lab Agreement # : 126310011

### Project Number :

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐  
7 Day - ☐  
14 Day - ☐  
21 Day - ☐  
28 Day - ☒

### Field Sample ID

CAPA-12-13290

### Sample Date

Apr 27 2012

### Sample Time

13:23

### Sample Matrix

W

Site Name: Los Alamos National Laboratory

WSP-GENINORG

WSP-Met+B+SN+SR+U

Rad Screening Info:

Yes, Below Background

Special Instructions:

### Special Instructions:

Relinquished by:

Melissa Montoya

Relinquished by:

Date/Time: 4/20/12 3:00

Received by:

5-1-12 @ 9:15

Relinquished by:

Date/Time:

Received by:

Date/Time:

## SAMPLE RECEIPT &amp; REVIEW FORM

|  |     |                                |  |
|--|-----|--------------------------------|--|
| Client: LANL   |     | SDG/AR/COC/Work Order: 12-1253 |  |
| Received By: SHANTA WHITLOCK   |     | Date Received: May 1, 2012     |  |
| Suspected Hazard Information   | Yes | No                             | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
| COC/Samples marked as radioactive?                                       |     | X                              | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0   |
| Classified Radioactive II or III by RSO?                                 |     | X                              | If yes, Were swipes taken of sample containers < action levels?  |
| COC/Samples marked containing PCBs?                                      |     | X                              |  |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? |     | X                              | If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.                     |
| Shipped as a DOT Hazardous?  |     | X                              | Hazard Class Shipped: UN#:   |
| Samples identified as Foreign Soil?                                      |     | X                              |  |

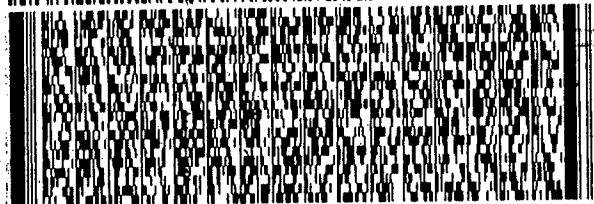
| Sample Receipt Criteria   | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items)  |
|---|-----|----|----|--|
| 1 Shipping containers received intact and sealed?                 | X   |    |    | Circle Applicable:<br>Seals broken    Damaged container    Leaking container    Other (describe)   |
| 2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*     | X   |    |    | Preservation Method: Ice bags <b>Blue ice</b> Dry ice    None    Other (describe) <b>5C</b><br>*all temperatures are recorded in Celsius |
| 2a Daily check performed and passed on IR temperature gun?        | X   |    |    | Temperature Device Serial #: <b>51050004</b><br>Secondary Temperature Device Serial # (If Applicable):                                   |
| 3 Chain of custody documents included with shipment?              | X   |    |    |  |
| 4 Sample containers intact and sealed?                            | X   |    |    | Circle Applicable:<br>Seals broken    Damaged container    Leaking container    Other (describe)   |
| 5 Samples requiring chemical preservation at proper pH?           | X   |    |    | Sample ID's, containers affected and observed pH:<br>If Preservation added, Lot#:  |
| 6 VOA vials free of headspace (defined as < 6mm bubble)?          |     |    | X  | Sample ID's and containers affected:   |
| 7 Are Encore containers present?                                  |     |    | X  | (If yes, immediately deliver to Volatiles laboratory)  |
| 8 Samples received within holding time?                           | X   |    |    | ID's and tests affected:   |
| 9 Sample ID's on COC match ID's on bottles?                       | X   |    |    | Sample ID's and containers affected:   |
| 10 Date & time on COC match date & time on bottles?               | X   |    |    | Sample ID's affected:  |
| 11 Number of containers received match number indicated on COC?   | X   |    |    | Sample ID's affected:  |
| 12 Are sample containers identifiable as GEL provided?            |     |    | X  |  |
| 13 COC form is properly signed in relinquished/received sections? | X   |    |    |  |
| 14 Carrier and tracking number.                                   |     |    |    | Circle Applicable:<br><b>FedEx Air</b> FedEx Ground    UPS    Field Services    Courier    Other<br><b>7209 7856 6000</b>                |

Comments (Use Continuation Form if needed):



**BILL SENDER**

REF: MR1A013AGWFO



**FedEx**  
Express



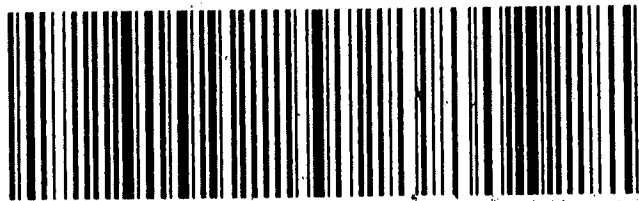
111171106060125

**TUE - 01 MAY A1**  
**PRIORITY OVERNIGHT**

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SC-US CHS

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# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|-----------|-------------|
|-----------|-------------|

|     |   |
|-----|---|
| *   | A quality control analyte recovery is outside of specified acceptance criteria  |
| **  | Analyte is a surrogate compound   |
| <   | Result is less than value reported  |
| >   | Result is greater than value reported   |
| ^   | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  |
| A   | The TIC is a suspected aldol-condensation product   |
| B   | Target analyte was detected in the associated blank   |
| B   | Metals-Either presence of analyte detected in the associated blank, or<br>MDL/IDL < sample value < PQL  |
| BD  | Results are either below the MDC or tracer recovery is low  |
| C   | Analyte has been confirmed by GC/MS analysis  |
| D   | Results are reported from a diluted aliquot of the sample   |
| d   | 5-day BOD-The 2:1 depletion requirement was not met for this sample   |
| E   | Organics-Concentration of the target analyte exceeds the instrument calibration range   |
| E   | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria   |
| H   | Analytical holding time was exceeded  |
| h   | Preparation or preservation holding time was exceeded   |
| J   | Value is estimated  |
| N   | Metals-The Matrix spike sample recovery is not within specified control limits  |
| N   | Organics-Presumptive evidence based on mass spectral library search to make a tentative<br>identification of the analyte (TIC). Quantitation is based on nearest internal standard<br>response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration<br>by 4X or more   |
| ND  | Analyte concentration is not detected above the reporting limit   |
| UI  | Gamma Spectroscopy-Uncertain identification   |
| X   | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  |
| Y   | QC Samples were not spiked with this compound   |
| Z   | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.  |

# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorate by LC/MSMS  
ARS International (ARSL)  
SDG 12-1253**

**Method/Analysis Information**

**Procedure:** **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1208033

Prep Batch Number: 1208032

**Sample Analysis**

| <b>Sample ID</b> | <b>Client ID</b>                                      |
|------------------|---|
| 303488001        | CAPA-12-13290   |
| 1202646395       | Interference Check Sample (ICS)                       |
| 1202646391       | Method Blank (MB)                                     |
| 1202646392       | Laboratory Control Sample (LCS)                       |
| 1202646393       | 303221003(CAPA-12-13287) Matrix Spike (MS)            |
| 1202646394       | 303221003(CAPA-12-13287) Matrix Spike Duplicate (MSD) |

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 9.

**Calibration Information**

**Initial Calibration**

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**CCV Requirements**

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**CCB Requirements**

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information****Method Blank (MB) Statement**

The MB(s) analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**

The interference check sample (ICS) met all recovery acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**

Sample 303221003 (CAPA-12-13287) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**

The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**

The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**

The RPD(s) between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**

The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

**Technical Information****Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**

Re-extractions or re-analyses were not required in this SDG.

**Miscellaneous Information****Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG for this analytical batch.

**Manual Integrations**

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**

The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

**System Configuration**

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and



dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

#### **Chromatographic Columns**

Chromatographic separation of perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

#### **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

ARSL001 ARS International (63641-10)

Client SDG: 12-1253 GEL Work Order: 303488

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

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

#### 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: Patricia Steele

Date: 23 MAY 2012

Title: Data Validator

# **Sample Data Summary**

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1208032Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13290Date Received: 01-MAY-12GEL Job No (SDG): 12-1253GEL Sample ID: 303488001Date Filtered: 14-MAY-12Injection Volume (uL): 20%Solids:     

| CAS No.    | Analyte^                  | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed   | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate               | .05 | .2 | 0.371 | ug/L  |   | 1               | 14-MAY-12 19:27 | per0514025a |
|            | Perchlorate Isotope Ratio |     |    | 3.1   |       |   | 1               | 14-MAY-12 19:27 | per0514025a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.378 | ug/L  |   | 1               | 14-MAY-12 19:27 | per0514025a |
|            | Perchlorate-O(18)         |     |    | 0.560 | ug/L  |   | 1               | 14-MAY-12 19:27 | per0514025a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

# **Quality Control Summary**

**Perchlorate Laboratory Control Sample**

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 12-1253

**Extract Batch Code:** 1208032

**Date Filtered:** 14-MAY-12

**Matrix:** WATER

**Sample ID:** 1202646392

| Analyte^                  | True  | Found | Units | %Rec | Q | Control Limits |
|---------------------------|-------|-------|-------|------|---|----------------|
| Perchlorate               | 0.200 | .186  | ug/L  | 93.2 |   | 85 - 115       |
| Perchlorate Isotope Ratio |       | 3.08  |       |      |   | -              |
| Perchlorate-101           | 0.200 | .191  | ug/L  | 95.4 |   | 85 - 115       |
| Perchlorate-O(18)         |       | .48   | ug/L  |      |   | -              |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

### Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 12-1253

**Extract Batch Code:** 1208032

**Date Extracted:** 14-MAY-12

**GEL MS/PS ID:** 1202646393

**Client ID:** CAPA-12-13287

**GEL MSD/PSD ID:** 1202646394

**QC Type:** MS

| Compound^                 | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---------------------------|-------------|-------------|-------|---------|----------|----------|-----------|-------|-----------|----------------|
| Perchlorate               | 0.200       | 0.265       | ug/L  | 0.482   | 108      | .511     | 123       | 5.74  | 30        | 75 - 125       |
| Perchlorate Isotope Ratio | 0           | 3.16        |       | 3.12    |          | 3.19     |           | 2.23  |           | -              |
| Perchlorate-101           | 0.200       | 0.265       | ug/L  | 0.487   | 111      | .504     | 120       | 3.51  | 30        | 75 - 125       |
| Perchlorate-O(18)         | 0           | 0.581       | ug/L  | 0.579   |          | .6       |           | 3.68  |           | -              |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data



## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1208032Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 14-MAY-12GEL Job No (SDG): 12-1253GEL Sample ID: 1202646391Date Filtered: 14-MAY-12Injection Volume (uL): 20%Solids:     

| CAS No.    | Analyte^                  | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed   | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate               | .05 | .2 | 0.050 | ug/L  | U | 1               | 14-MAY-12 18:04 | per0514014a |
|            | Perchlorate Isotope Ratio |     |    |       |       |   | 1               | 14-MAY-12 18:04 | per0514014a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.050 | ug/L  | U | 1               | 14-MAY-12 18:04 | per0514014a |
|            | Perchlorate-O(18)         |     |    | 0.517 | ug/L  |   | 1               | 14-MAY-12 18:04 | per0514014a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1208032Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 14-MAY-12GEL Job No (SDG): 12-1253GEL Sample ID: 1202646392Date Filtered: 14-MAY-12Injection Volume (uL): 20%Solids:         

| CAS No.    | Analyte^                  | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed   | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate               | .05 | .2 | 0.186 | ug/L  | J | 1               | 14-MAY-12 18:12 | per0514015a |
|            | Perchlorate Isotope Ratio |     |    | 3.08  |       |   | 1               | 14-MAY-12 18:12 | per0514015a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.191 | ug/L  | J | 1               | 14-MAY-12 18:12 | per0514015a |
|            | Perchlorate-O(18)         |     |    | 0.480 | ug/L  |   | 1               | 14-MAY-12 18:12 | per0514015a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1208032Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 12-1253GEL Sample ID: 1202646395Date Filtered: 14-MAY-12Injection Volume (uL): 20

%Solids:

| CAS No.    | Analyte^                  | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed   | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate               | .05 | .2 | 0.226 | ug/L  |   | 1               | 14-MAY-12 18:19 | per0514016a |
|            | Perchlorate Isotope Ratio |     |    | 3.24  |       |   | 1               | 14-MAY-12 18:19 | per0514016a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.221 | ug/L  |   | 1               | 14-MAY-12 18:19 | per0514016a |
|            | Perchlorate-O(18)         |     |    | 0.558 | ug/L  |   | 1               | 14-MAY-12 18:19 | per0514016a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1208032Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13287MSDate Received: 25-APR-12GEL Job No (SDG): 12-1253GEL Sample ID: 1202646393Date Filtered: 14-MAY-12Injection Volume (uL): 20%Solids:     

| CAS No.    | Analyte^                  | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed   | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate               | .05 | .2 | 0.482 | ug/L  |   | 1               | 14-MAY-12 18:34 | per0514018a |
|            | Perchlorate Isotope Ratio |     |    | 3.12  |       |   | 1               | 14-MAY-12 18:34 | per0514018a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.487 | ug/L  |   | 1               | 14-MAY-12 18:34 | per0514018a |
|            | Perchlorate-O(18)         |     |    | 0.579 | ug/L  |   | 1               | 14-MAY-12 18:34 | per0514018a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1208032Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13287MSDDate Received: 25-APR-12GEL Job No (SDG): 12-1253GEL Sample ID: 1202646394Date Filtered: 14-MAY-12Injection Volume (uL): 20%Solids:     

| CAS No.    | Analyte^                  | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed   | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate               | .05 | .2 | 0.511 | ug/L  |   | 1               | 14-MAY-12 18:42 | per0514019a |
|            | Perchlorate Isotope Ratio |     |    | 3.19  |       |   | 1               | 14-MAY-12 18:42 | per0514019a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.504 | ug/L  |   | 1               | 14-MAY-12 18:42 | per0514019a |
|            | Perchlorate-O(18)         |     |    | 0.600 | ug/L  |   | 1               | 14-MAY-12 18:42 | per0514019a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative  
ARS International (ARSL)  
SDG 12-1253**

**Sample Analysis**

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 303488001        | CAPA-12-13290                                    |
| 1202648015       | Method Blank (MB) <b>ICP</b>                     |
| 1202648016       | Laboratory Control Sample (LCS)                  |
| 1202648019       | 303488001(CAPA-12-13290L) Serial Dilution (SD)   |
| 1202648017       | 303488001(CAPA-12-13290D) Sample Duplicate (DUP) |
| 1202648018       | 303488001(CAPA-12-13290S) Matrix Spike (MS)      |
| 1202648010       | Method Blank (MB) <b>ICP-MS</b>                  |
| 1202648011       | Laboratory Control Sample (LCS)                  |
| 1202648014       | 303488001(CAPA-12-13290L) Serial Dilution (SD)   |
| 1202648012       | 303488001(CAPA-12-13290D) Sample Duplicate (DUP) |
| 1202648013       | 303488001(CAPA-12-13290S) Matrix Spike (MS)      |
| 1202647537       | Method Blank (MB) <b>CVAA</b>                    |
| 1202647538       | Laboratory Control Sample (LCS)                  |
| 1202647541       | 303221003(CAPA-12-13287L) Serial Dilution (SD)   |
| 1202647539       | 303221003(CAPA-12-13287D) Sample Duplicate (DUP) |
| 1202647540       | 303221003(CAPA-12-13287S) Matrix Spike (MS)      |

**Method/Analysis Information**

|                                       |  |
|---------------------------------------|--|
| <b>Analytical Batch:</b>              | 1208720, 1208718, 1208500 and 1214284  |
| <b>Prep Batch :</b>                   | 1208719, 1208717 and 1208499   |
| <b>Standard Operating Procedures:</b> | GL-MA-E-013 REV# 20, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 24, GL-MA-E-010 REV# 25 and GL-GC-E-107 REV# 7 |
| <b>Analytical Method:</b>             | SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B                                  |
| <b>Prep Method :</b>                  | SW846 3005A and EPA 245.1/245.2 Prep   |



## **Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

### **System Configuration**

The Hardness as CaCO<sub>3</sub> is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

### **Calibration Information**

#### **Instrument Calibration**

All initial calibration requirements have been met for this sample delivery group (SDG).

#### **CRDL Requirements**

All CRDL standard(s) met the referenced advisory control limits.

#### **ICSA/ICSAB Statement**

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blank (CCB) Requirements**

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

**Quality Control (QC) Information****Method Blank (MB) Statement**

The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**

The following samples were selected as the quality control (QC) samples for this SDG: 303488001 (CAPA-12-13290)-ICP and ICP-MS and 303221003 (CAPA-12-13287)-CVAA.

**Matrix Spike (MS) Recovery Statement**

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL/MDL for CVAA, 50X the IDL/MDL for ICP, and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

**Technical Information****Holding Time Specifications**

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in

hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

#### **Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

#### **Sample Dilutions**

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instruments. Dilutions were required for this SDG in order to minimize tin suppression due to matrix interferences.

#### **Preparation Information**

The samples in this SDG were prepared exactly according to the cited SOP.

#### **Miscellaneous Information**

##### **Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

##### **Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

##### **Additional Comments**

Additional comments were not required for this SDG.

Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**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.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer: Deule Date: 05/25/12

# **Sample Data Summary**

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-1253 GEL Work Order: 303488

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

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by



05/25/12

**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 12-1253

METHOD TYPE: EPA

SAMPLE ID: 303488001

CLIENT ID: CAPA-12-13290

CONTRACT: ESHL00210

MATRIX:W

DATE RECEIVED 01-MAY-12

LEVEL: Low %SOLIDS:

| <u>CAS No</u> | <u>Analyte</u> | <u>Result</u> | <u>Units</u> | <u>C</u> | <u>Qual</u> | <u>M*</u> | <u>MDL</u> | <u>DF</u> | <u>Inst ID</u> | <u>Analytical Run</u> |
|---------------|----------------|---------------|--------------|----------|-------------|-----------|------------|-----------|----------------|-----------------------|
| 7439-97-6     | Mercury        | 0.067         | ug/L         | U        |             | AV        | 0.067      | 1         | MER536         | 051512W1-4            |
| 7631-86-9     | Silica         | 40.5          | mg/L         |          |             | P         | 0.053      | 1         | OPTIMA3        | 051112A-1             |
| 7429-90-5     | Aluminum       | 72.2          | ug/L         | J        |             | P         | 68         | 1         | OPTIMA3        | 051112A-1             |
| 7440-36-0     | Antimony       | 1             | ug/L         | U        |             | MS        | 1          | 1         | ICPMS6         | 120511-3              |
| 7440-38-2     | Arsenic        | 1.7           | ug/L         | U        |             | MS        | 1.7        | 1         | ICPMS6         | 120511-3              |
| 7440-39-3     | Barium         | 273           | ug/L         |          |             | P         | 1          | 1         | OPTIMA3        | 051112A-1             |
| 7440-41-7     | Beryllium      | 1             | ug/L         | U        |             | P         | 1          | 1         | OPTIMA3        | 051112A-1             |
| 7440-42-8     | Boron          | 18.2          | ug/L         | J        |             | P         | 15         | 1         | OPTIMA3        | 051112A-1             |
| 7440-43-9     | Cadmium        | 0.11          | ug/L         | U        |             | MS        | 0.11       | 1         | ICPMS6         | 120511-3              |
| 7440-70-2     | Calcium        | 46200         | ug/L         |          |             | P         | 50         | 1         | OPTIMA3        | 051112A-1             |
| 7440-47-3     | Chromium       | 2             | ug/L         | U        |             | MS        | 2          | 1         | ICPMS6         | 120511-3              |
| 7440-48-4     | Cobalt         | 1             | ug/L         | U        |             | P         | 1          | 1         | OPTIMA3        | 051112A-1             |
| 7440-50-8     | Copper         | 3             | ug/L         | U        |             | P         | 3          | 1         | OPTIMA3        | 051112A-1             |
| 7439-89-6     | Iron           | 30            | ug/L         | U        |             | P         | 30         | 1         | OPTIMA3        | 051112A-1             |
| 7439-92-1     | Lead           | 0.5           | ug/L         | U        |             | MS        | 0.5        | 1         | ICPMS6         | 120511-3              |
| 7439-95-4     | Magnesium      | 14900         | ug/L         |          |             | P         | 110        | 1         | OPTIMA3        | 051112A-1             |
| 7439-96-5     | Manganese      | 2             | ug/L         | U        |             | P         | 2          | 1         | OPTIMA3        | 051112A-1             |
| 7439-98-7     | Molybdenum     | 0.539         | ug/L         |          |             | MS        | 0.165      | 1         | ICPMS6         | 120511-3              |
| 7440-02-0     | Nickel         | 1.62          | ug/L         | J        |             | MS        | 0.5        | 1         | ICPMS6         | 120511-3              |
| 7440-09-7     | Potassium      | 5990          | ug/L         |          |             | P         | 50         | 1         | OPTIMA3        | 051112A-1             |
| 7782-49-2     | Selenium       | 1.5           | ug/L         | U        |             | MS        | 1.5        | 1         | ICPMS6         | 120511-3              |
| 7440-22-4     | Silver         | 0.2           | ug/L         | U        |             | MS        | 0.2        | 1         | ICPMS6         | 120511-3              |
| 7440-23-5     | Sodium         | 31200         | ug/L         |          |             | P         | 100        | 1         | OPTIMA3        | 051112A-1             |
| 7440-24-6     | Strontium      | 358           | ug/L         |          |             | P         | 1          | 1         | OPTIMA3        | 051112A-1             |
| 7440-28-0     | Thallium       | 0.45          | ug/L         | U        |             | MS        | 0.45       | 1         | ICPMS6         | 120511-3              |
| 7440-31-5     | Tin            | 12.5          | ug/L         | U        |             | P         | 12.5       | 5         | OPTIMA3        | 051112A-1             |

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 12-1253**METHOD TYPE:** EPA**SAMPLE ID:** 303488001**CLIENT ID:** CAPA-12-13290**CONTRACT:** ESHL00210**MATRIX:**W**DATE RECEIVED** 01-MAY-12**LEVEL:** Low **%SOLIDS:**

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| <u>CAS No</u> | <u>Analyte</u>    | <u>Result</u> | <u>Units</u> | <u>C</u> | <u>Qual</u> | <u>M*</u> | <u>MDL</u> | <u>DF</u> | <u>Inst ID</u> | <u>Analytical Run</u> |
|---------------|-------------------|---------------|--------------|----------|-------------|-----------|------------|-----------|----------------|-----------------------|
| 7440-61-1     | Uranium           | 0.067         | ug/L         | U        |             | MS        | 0.067      | 1         | ICPMS6         | 120511-2              |
| 7440-62-2     | Vanadium          | 1             | ug/L         | U        |             | P         | 1          | 1         | OPTIMA3        | 051112A-1             |
| 7440-66-6     | Zinc              | 5.06          | ug/L         | J        |             | P         | 3.3        | 1         | OPTIMA3        | 051112A-1             |
|               | Hardness as CaCO3 | 177           | mg/L         |          |             |           | 0.453      | 1         | CALC001        |                       |

**\*Analytical Methods:**

**MS** SW846 3005/6020 DOE-AL  
**P** SW846 3005/6010B  
**AV** EPA 245.1/245.2  
SM 2340 B



# **Quality Control Summary**

**METALS**  
**-3b-**  
**PREPARATION BLANK SUMMARY**

**SDG NO.** 12-1253  
**Contract:** ESHL00210  
**Matrix:** W

| <u>Sample ID</u> | <u>Analyte</u> | <u>Result</u> | <u>Units</u> | <u>Acceptance Window</u> | <u>Conc Qual</u> | <u>M*</u> | <u>MDL</u> | <u>RDL</u> |
|------------------|----------------|---------------|--------------|--------------------------|------------------|-----------|------------|------------|
| 1202647537       | Mercury        | -0.094        | ug/L         | +/-0.2                   | J                | AV        | 0.067      | 0.2        |
| 1202648010       | Antimony       | 1             | ug/L         | +/-3                     | U                | MS        | 1          | 3          |
|                  | Arsenic        | 1.7           | ug/L         | +/-5                     | U                | MS        | 1.7        | 5          |
|                  | Cadmium        | 0.11          | ug/L         | +/-1                     | U                | MS        | 0.11       | 1          |
|                  | Chromium       | 2             | ug/L         | +/-10                    | U                | MS        | 2          | 10         |
|                  | Lead           | 0.5           | ug/L         | +/-2                     | U                | MS        | 0.5        | 2          |
|                  | Molybdenum     | 0.165         | ug/L         | +/-0.5                   | U                | MS        | 0.165      | 0.5        |
|                  | Nickel         | 0.5           | ug/L         | +/-2                     | U                | MS        | 0.5        | 2          |
|                  | Selenium       | 1.5           | ug/L         | +/-5                     | U                | MS        | 1.5        | 5          |
|                  | Silver         | 0.2           | ug/L         | +/-1                     | U                | MS        | 0.2        | 1          |
|                  | Thallium       | 0.45          | ug/L         | +/-2                     | U                | MS        | 0.45       | 2          |
|                  | Uranium        | 0.067         | ug/L         | +/-0.2                   | U                | MS        | 0.067      | 0.2        |
| 1202648015       | Aluminum       | 68            | ug/L         | +/-200                   | U                | P         | 68         | 200        |
|                  | Barium         | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Beryllium      | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Boron          | 15            | ug/L         | +/-50                    | U                | P         | 15         | 50         |
|                  | Calcium        | 50            | ug/L         | +/-200                   | U                | P         | 50         | 200        |
|                  | Cobalt         | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Copper         | 3             | ug/L         | +/-10                    | U                | P         | 3          | 10         |
|                  | Iron           | 30            | ug/L         | +/-100                   | U                | P         | 30         | 100        |
|                  | Magnesium      | 110           | ug/L         | +/-300                   | U                | P         | 110        | 300        |
|                  | Manganese      | 2             | ug/L         | +/-10                    | U                | P         | 2          | 10         |
|                  | Potassium      | 50            | ug/L         | +/-150                   | U                | P         | 50         | 150        |
|                  | Silica         | 0.053         | mg/L         | +/-0.213                 | U                | P         | 0.053      | 0.213      |
|                  | Sodium         | 100           | ug/L         | +/-300                   | U                | P         | 100        | 300        |
|                  | Strontium      | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Tin            | 2.5           | ug/L         | +/-10                    | U                | P         | 2.5        | 10         |
|                  | Vanadium       | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Zinc           | 3.3           | ug/L         | +/-10                    | U                | P         | 3.3        | 10         |

## \*Analytical Methods:

**MS** SW846 3005/6020 DOE-AL  
**P** SW846 3005/6010B  
**AV** EPA 245.1/245.2

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 12-1253 Client ID: CAPA-12-13287S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 303221003 Spike ID: 1202647540

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance<br/>Limit</u> | <u>Spiked<br/>Result</u> | <u>C</u> | <u>Sample<br/>Result</u> | <u>C</u> | <u>Spike<br/>Added</u> | <u>%<br/>Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Mercury        | ug/L         | 75-125                      | 1.99                     |          | 0.067                    | U        | 2                      | 99.3                  |             | AV        |

\*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 12-1253

Client ID: CAPA-12-13290S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 303488001

Spike ID: 1202648013

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance<br/>Limit</u> | <u>Spiked<br/>Result</u> | <u>C</u> | <u>Sample<br/>Result</u> | <u>C</u> | <u>Spike<br/>Added</u> | <u>%<br/>Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Antimony       | ug/L         | 75-125                      | 200                      |          | 1                        | U        | 200                    | 100                   |             | MS        |
| Arsenic        | ug/L         | 75-125                      | 78.2                     |          | 1.7                      | U        | 80                     | 97.8                  |             | MS        |
| Cadmium        | ug/L         | 75-125                      | 11.1                     |          | 0.11                     | U        | 10                     | 111                   |             | MS        |
| Chromium       | ug/L         | 75-125                      | 49.3                     |          | 2                        | U        | 50                     | 94.7                  |             | MS        |
| Lead           | ug/L         | 75-125                      | 39.8                     |          | 0.5                      | U        | 40                     | 99.5                  |             | MS        |
| Molybdenum     | ug/L         | 75-125                      | 52.6                     |          | 0.539                    |          | 50                     | 104                   |             | MS        |
| Nickel         | ug/L         | 75-125                      | 47.8                     |          | 1.62                     | J        | 50                     | 92.3                  |             | MS        |
| Selenium       | ug/L         | 75-125                      | 20.3                     |          | 1.5                      | U        | 20                     | 102                   |             | MS        |
| Silver         | ug/L         | 75-125                      | 53.3                     |          | 0.2                      | U        | 50                     | 106                   |             | MS        |
| Thallium       | ug/L         | 75-125                      | 92.4                     |          | 0.45                     | U        | 100                    | 92.2                  |             | MS        |
| Uranium        | ug/L         | 75-125                      | 52.7                     |          | 0.067                    | U        | 50                     | 105                   |             | MS        |

\*Analytical Methods:

MS SW846 3005/6020 DOE-AL

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 12-1253

Client ID: CAPA-12-13290S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 303488001

Spike ID: 1202648018

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance<br/>Limit</u> | <u>Spiked<br/>Result</u> | <u>C</u> | <u>Sample<br/>Result</u> | <u>C</u> | <u>Spike<br/>Added</u> | <u>%<br/>Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Aluminum       | ug/L         | 75-125                      | 4870                     |          | 72.2                     | J        | 5000                   | 96                    |             | P         |
| Barium         | ug/L         | 75-125                      | 750                      |          | 273                      |          | 500                    | 95.4                  |             | P         |
| Beryllium      | ug/L         | 75-125                      | 484                      |          | 1                        | U        | 500                    | 96.8                  |             | P         |
| Boron          | ug/L         | 75-125                      | 513                      |          | 18.2                     | J        | 500                    | 99                    |             | P         |
| Calcium        | ug/L         |                             | 51300                    |          | 46200                    |          | 5000                   | 104                   | N/A         | P         |
| Cobalt         | ug/L         | 75-125                      | 464                      |          | 1                        | U        | 500                    | 92.6                  |             | P         |
| Copper         | ug/L         | 75-125                      | 484                      |          | 3                        | U        | 500                    | 96.7                  |             | P         |
| Iron           | ug/L         | 75-125                      | 4900                     |          | 30                       | U        | 5000                   | 97.8                  |             | P         |
| Magnesium      | ug/L         | 75-125                      | 20000                    |          | 14900                    |          | 5000                   | 103                   |             | P         |
| Manganese      | ug/L         | 75-125                      | 466                      |          | 2                        | U        | 500                    | 93                    |             | P         |
| Potassium      | ug/L         | 75-125                      | 10600                    |          | 5990                     |          | 5000                   | 92                    |             | P         |
| Silica         | mg/L         | 75-125                      | 50.4                     |          | 40.5                     |          | 10.7                   | 92.5                  |             | P         |
| Sodium         | ug/L         |                             | 36500                    |          | 31200                    |          | 5000                   | 106                   | N/A         | P         |
| Strontium      | ug/L         | 75-125                      | 830                      |          | 358                      |          | 500                    | 94.5                  |             | P         |
| Tin            | ug/L         | 75-125                      | 489                      |          | 12.5                     | U        | 500                    | 97.8                  |             | P         |
| Vanadium       | ug/L         | 75-125                      | 492                      |          | 1                        | U        | 500                    | 98.3                  |             | P         |
| Zinc           | ug/L         | 75-125                      | 464                      |          | 5.06                     | J        | 500                    | 91.8                  |             | P         |

\*Analytical Methods:

P

SW846 3005/6010B

**Metals**  
**–6–**  
**Duplicate Sample Summary**

**SDG No.:** 12-1253**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CAPA-12-13287D**Matrix:** LIQUID**Level:** Low**Sample ID:** 303221003**Duplicate ID:** 1202647539**Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance<br>Limit | Sample<br>Result | C | Duplicate<br>Result | C | RPD | Qual | M* |
|---------|-------|---------------------|------------------|---|---------------------|---|-----|------|----|
| Mercury | ug/L  |                     | 0.067            | U | 0.067               | U |     |      | AV |

**\*Analytical Methods:**

AV EPA 245.1/245.2

**Metals**  
**–6–**  
**Duplicate Sample Summary**

SDG No.: 12–1253

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPA–12–13290D

Matrix: LIQUID

Level: Low

Sample ID: 303488001

Duplicate ID: 1202648012

Percent Solids for Dup: N/A

| Analyte    | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD  | Qual | M* |
|------------|-------|------------------|---------------|---|------------------|---|------|------|----|
| Antimony   | ug/L  |                  | 1 U           |   | 1 U              |   |      |      | MS |
| Arsenic    | ug/L  |                  | 1.7 U         |   | 1.7 U            |   |      |      | MS |
| Cadmium    | ug/L  |                  | 0.11 U        |   | 0.11 U           |   |      |      | MS |
| Chromium   | ug/L  |                  | 2 U           |   | 2 U              |   |      |      | MS |
| Lead       | ug/L  |                  | 0.5 U         |   | 0.5 U            |   |      |      | MS |
| Molybdenum | ug/L  | +/- .5           | 0.539         |   | 0.48 J           |   | 11.6 |      | MS |
| Nickel     | ug/L  | +/- 2            | 1.62 J        |   | 1.73 J           |   | 6.39 |      | MS |
| Selenium   | ug/L  |                  | 1.5 U         |   | 1.5 U            |   |      |      | MS |
| Silver     | ug/L  |                  | 0.2 U         |   | 0.2 U            |   |      |      | MS |
| Thallium   | ug/L  |                  | 0.45 U        |   | 0.45 U           |   |      |      | MS |
| Uranium    | ug/L  |                  | 0.067 U       |   | 0.067 U          |   |      |      | MS |

\*Analytical Methods:

MS SW846 3005/6020 DOE–AL

**Metals**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 12-1253

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPA-12-13290D

Matrix: LIQUID

Level: Low

Sample ID: 303488001

Duplicate ID: 1202648017

Percent Solids for Dup: N/A

| Analyte   | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD  | Qual | M* |
|-----------|-------|------------------|---------------|---|------------------|---|------|------|----|
| Aluminum  | ug/L  |                  | 72.2 J        |   | 68 U             |   | 200  |      | P  |
| Barium    | ug/L  | +/-20%           | 273           |   | 265              |   | 2.68 |      | P  |
| Beryllium | ug/L  |                  | 1 U           |   | 1 U              |   |      |      | P  |
| Boron     | ug/L  | +/-50            | 18.2 J        |   | 17.5 J           |   | 3.88 |      | P  |
| Calcium   | ug/L  | +/-20%           | 46200         |   | 45400            |   | 1.69 |      | P  |
| Cobalt    | ug/L  |                  | 1 U           |   | 1 U              |   |      |      | P  |
| Copper    | ug/L  |                  | 3 U           |   | 3 U              |   |      |      | P  |
| Iron      | ug/L  |                  | 30 U          |   | 30 U             |   |      |      | P  |
| Magnesium | ug/L  | +/-20%           | 14900         |   | 14600            |   | 2.36 |      | P  |
| Manganese | ug/L  |                  | 2 U           |   | 2 U              |   |      |      | P  |
| Potassium | ug/L  | +/-20%           | 5990          |   | 5830             |   | 2.7  |      | P  |
| Silica    | mg/L  | +/-20%           | 40.5          |   | 39.5             |   | 2.59 |      | P  |
| Sodium    | ug/L  | +/-20%           | 31200         |   | 30700            |   | 1.71 |      | P  |
| Strontium | ug/L  | +/-20%           | 358           |   | 350              |   | 2.22 |      | P  |
| Tin       | ug/L  |                  | 12.5 U        |   | 12.5 U           |   |      |      | P  |
| Vanadium  | ug/L  |                  | 1 U           |   | 1 U              |   |      |      | P  |
| Zinc      | ug/L  | +/-10            | 5.06 J        |   | 5.17 J           |   | 2.15 |      | P  |

\*Analytical Methods:

P SW846 3005/6010B



## METALS

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## Laboratory Control Sample Summary

SDG NO. 12-1253

Contract: ESHL00210

Aqueous LCS Source: GEL

Solid LCS Source:

| <u>Sample ID</u> | <u>Analyte</u> | <u>Units</u> | <u>True Value</u> | <u>Result</u> | <u>C</u> | <u>% Recovery</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1202647538       | Mercury        | ug/L         | 2                 | 2.02          |          | 101               | 85-115                  | AV        |

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Laboratory Control Sample Summary

SDG NO. 12-1253

Contract: ESHL00210

Aqueous LCS Source:O2si

Solid LCS Source:

| <u>Sample ID</u> | <u>Analyte</u> | <u>Units</u> | <u>True Value</u> | <u>Result</u> | <u>C</u> | <u>% Recovery</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1202648011       |                |              |                   |               |          |                   |                         |           |
|                  | Antimony       | ug/L         | 50                | 50.6          |          | 101               | 80-120                  | MS        |
|                  | Arsenic        | ug/L         | 50                | 51.4          |          | 103               | 80-120                  | MS        |
|                  | Cadmium        | ug/L         | 50                | 53.1          |          | 106               | 80-120                  | MS        |
|                  | Chromium       | ug/L         | 50                | 49.5          |          | 99.1              | 80-120                  | MS        |
|                  | Lead           | ug/L         | 50                | 50.9          |          | 102               | 80-120                  | MS        |
|                  | Molybdenum     | ug/L         | 50                | 51.4          |          | 103               | 80-120                  | MS        |
|                  | Nickel         | ug/L         | 50                | 50.1          |          | 100               | 80-120                  | MS        |
|                  | Selenium       | ug/L         | 50                | 52.8          |          | 106               | 80-120                  | MS        |
|                  | Silver         | ug/L         | 50                | 55.2          |          | 110               | 80-120                  | MS        |
|                  | Thallium       | ug/L         | 50                | 49.3          |          | 98.7              | 80-120                  | MS        |
|                  | Uranium        | ug/L         | 50                | 50.9          |          | 102               | 80-120                  | MS        |

## \*Analytical Methods:

MS SW846 3005/6020 DOE-AL

## METALS

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## Laboratory Control Sample Summary

SDG NO. 12-1253

Contract: ESHL00210

Aqueous LCS Source:OS2I

Solid LCS Source:

| <u>Sample ID</u> | <u>Analyte</u> | <u>Units</u> | <u>True Value</u> | <u>Result</u> | <u>C</u> | <u>% Recovery</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1202648016       |                |              |                   |               |          |                   |                         |           |
|                  | Aluminum       | ug/L         | 5000              | 4860          |          | 97.3              | 80-120                  | P         |
|                  | Barium         | ug/L         | 500               | 486           |          | 97.2              | 80-120                  | P         |
|                  | Beryllium      | ug/L         | 500               | 477           |          | 95.4              | 80-120                  | P         |
|                  | Boron          | ug/L         | 500               | 477           |          | 95.4              | 80-120                  | P         |
|                  | Calcium        | ug/L         | 5000              | 4880          |          | 97.7              | 80-120                  | P         |
|                  | Cobalt         | ug/L         | 500               | 478           |          | 95.5              | 80-120                  | P         |
|                  | Copper         | ug/L         | 500               | 480           |          | 96.1              | 80-120                  | P         |
|                  | Iron           | ug/L         | 5000              | 4950          |          | 98.9              | 80-120                  | P         |
|                  | Magnesium      | ug/L         | 5000              | 5060          |          | 101               | 80-120                  | P         |
|                  | Manganese      | ug/L         | 500               | 475           |          | 95                | 80-120                  | P         |
|                  | Potassium      | ug/L         | 5000              | 4970          |          | 99.3              | 80-120                  | P         |
|                  | Silica         | mg/L         | 10.7              | 10.2          |          | 95.2              | 80-120                  | P         |
|                  | Sodium         | ug/L         | 5000              | 4890          |          | 97.7              | 80-120                  | P         |
|                  | Strontium      | ug/L         | 500               | 484           |          | 96.9              | 80-120                  | P         |
|                  | Tin            | ug/L         | 500               | 485           |          | 97                | 80-120                  | P         |
|                  | Vanadium       | ug/L         | 500               | 482           |          | 96.3              | 80-120                  | P         |
|                  | Zinc           | ug/L         | 500               | 462           |          | 92.4              | 80-120                  | P         |

## \*Analytical Methods:

P SW846 3005/6010B

## METALS

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## Serial Dilution Sample Summary

**SDG NO.** 12-1253 **Client ID:** CAPA-12-13287L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 303221003 **Serial Dilution ID:** 1202647541

| <u>Analyte</u> | <u>Initial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>Serial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>%<br/>Difference</u> | <u>Qual</u> | <u>Acceptance<br/>Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Mercury        | .067                              | U        | .335                             | U        |                         |             |                             | AV        |

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Serial Dilution Sample Summary

SDG NO. 12-1253

Client ID: CAPA-12-13290L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 303488001

Serial Dilution ID: 1202648014

| <u>Analyte</u> | <u>Initial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>Serial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>%<br/>Difference</u> | <u>Qual</u> | <u>Acceptance<br/>Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Antimony       | 1                                 | U        | 5                                | U        |                         |             |                             | MS        |
| Arsenic        | 1.7                               | U        | 8.5                              | U        |                         |             |                             | MS        |
| Cadmium        | .11                               | U        | .55                              | U        |                         |             |                             | MS        |
| Chromium       | 2                                 | U        | 10                               | U        |                         |             |                             | MS        |
| Lead           | .5                                | U        | 2.5                              | U        |                         |             |                             | MS        |
| Molybdenum     | .539                              |          | .825                             | U        | 100                     |             |                             | MS        |
| Nickel         | 1.62                              | J        | 2.5                              | U        | 100                     |             |                             | MS        |
| Selenium       | 1.5                               | U        | 7.5                              | U        |                         |             |                             | MS        |
| Silver         | .2                                | U        | 1                                | U        |                         |             |                             | MS        |
| Thallium       | .45                               | U        | 2.25                             | U        |                         |             |                             | MS        |
| Uranium        | .067                              | U        | .335                             | U        |                         |             |                             | MS        |

## \*Analytical Methods:

MS SW846 3005/6020 DOE-AL

## METALS

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## Serial Dilution Sample Summary

SDG NO. 12-1253

Client ID: CAPA-12-13290L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 303488001

Serial Dilution ID: 1202648019

| <u>Analyte</u> | <u>Initial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>Serial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>%<br/>Difference</u> | <u>Qual</u> | <u>Acceptance<br/>Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Aluminum       | 72.2                              | J        | 340                              | U        | 100                     |             |                             | P         |
| Barium         | 273                               |          | 265                              |          | 2.8                     |             | 10                          | P         |
| Beryllium      | 1                                 | U        | 5                                | U        |                         |             |                             | P         |
| Boron          | 18.2                              | J        | 75                               | U        | 100                     |             |                             | P         |
| Calcium        | 46200                             |          | 46900                            |          | 1.51                    |             | 10                          | P         |
| Cobalt         | 1                                 | U        | 5                                | U        |                         |             |                             | P         |
| Copper         | 3                                 | U        | 15                               | U        |                         |             |                             | P         |
| Iron           | 30                                | U        | 150                              | U        |                         |             |                             | P         |
| Magnesium      | 14900                             |          | 15600                            |          | 4.56                    |             | 10                          | P         |
| Manganese      | 2                                 | U        | 10                               | U        |                         |             |                             | P         |
| Potassium      | 5990                              |          | 6400                             |          | 6.83                    |             | 10                          | P         |
| Silica         | 40500                             |          | 40000                            |          | 1.18                    |             | 10                          | P         |
| Sodium         | 31200                             |          | 32100                            |          | 2.64                    |             | 10                          | P         |
| Strontium      | 358                               |          | 364                              |          | 1.67                    |             | 10                          | P         |
| Tin            | 2.5                               | U        | 12.5                             | U        |                         |             |                             | P         |
| Vanadium       | 1                                 | U        | 5                                | U        |                         |             |                             | P         |
| Zinc           | 5.06                              | J        | 16.5                             | U        | 100                     |             |                             | P         |

## \*Analytical Methods:

P SW846 3005/6010B

# **General Chem Analysis**

# Case Narrative



**General Chemistry Narrative  
ARS International (ARSL)  
SDG 12-1253**

**Method/Analysis Information**

**Product:**                    **Specific Conductivity**

**Analytical Batch:**    1210920                                    **Method:**    EPA120.1 Specific Conductivity

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 303488001        | CAPA-12-13290                                   |
| 1202653382       | Laboratory Control Sample (LCS)                 |
| 1202653384       | 303488001(CAPA-12-13290) Sample Duplicate (DUP) |

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Conductivity analysis was performed on a Orion Star A212 Conductivity Meter.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 303488001 (CAPA-12-13290).

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information****Data Exception (DER) Documentation**

A DER was not required for this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### **Method/Analysis Information**

**Product:** pH

**Analytical Batch:** 1208900 **Method:** EPA 150.1 pH

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 303488001        | CAPA-12-13290                                   |
| 1202648410       | Laboratory Control Sample (LCS)                 |
| 1202648411       | 303489002(CAPA-12-13288) Sample Duplicate (DUP) |

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 20.

### **Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

### **Calibration Information**

The Electrode analysis was performed on a PerpHect pH Meter Orion 370.

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

### **Quality Control (QC) Information**

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 303489002 (CAPA-12-13288).

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

The following sample from this sample group was received by the lab outside of the method specified holding time: 303488001 (CAPA-12-13290).

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1075256 303488001 (CAPA-12-13290).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1207431

**Method:** EPA 300.0 Anions Liquid 28 day

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 303488001        | CAPA-12-13290                                   |
| 1202644914       | Method Blank (MB)                               |
| 1202644915       | 303221003(CAPA-12-13287) Sample Duplicate (DUP) |
| 1202644916       | 303221003(CAPA-12-13287) Post Spike (PS)        |
| 1202644917       | Laboratory Control Sample (LCS)                 |

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 21.

### **Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

### **Calibration Information**

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Continuing Calibration Blanks**

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

### **Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**

The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 303221003 (CAPA-12-13287).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1202644916 (CAPA-12-13287).

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The following samples in this sample group were diluted due to high concentration: 1202644915 (CAPA-12-13287), 1202644916 (CAPA-12-13287) and 303488001 (CAPA-12-13290).

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1076964 1202644916 (CAPA-12-13287).

**Manual Integrations**

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1202644915 (CAPA-12-13287), 1202644916 (CAPA-12-13287), 1202644917 (LCS) and 303488001 (CAPA-12-13290).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### **Method/Analysis Information**

**Product:** Solids, Total Dissolved

**Analytical Batch:** 1209153

**Method:** EPA 160.1 Solids and Dissolved-F

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 303488001        | CAPA-12-13290                                   |
| 1202648997       | Method Blank (MB)                               |
| 1202648998       | 303443003(CAPA-12-13345) Sample Duplicate (DUP) |
| 1202648999       | Laboratory Control Sample (LCS)                 |

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 11.

### **Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

### **Calibration Information**

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Quality Control (QC) Information**

#### **Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

#### **Laboratory Control Sample (LCS) Recovery**



The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 303443003 (CAPA-12-13345).

**Duplicate Relative Percent Difference (RPD) Statement**

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202648998 (CAPA-12-13345).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Sample Aliquot**

A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1077517 303488001 (CAPA-12-13290).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### **Method/Analysis Information**

**Product:** Alkalinity

**Analytical Batch:** 1210449      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 303488001        | CAPA-12-13290                                   |
| 1202652186       | 303443003(CAPA-12-13345) Sample Duplicate (DUP) |
| 1202652190       | 303443003(CAPA-12-13345) Matrix Spike (MS)      |
| 1202652192       | Laboratory Control Sample (LCS)                 |

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 9.

### **Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

### **Calibration Information**

The Titration analysis was performed on a manually operated buret.

### **Initial Standardization**

The titrant was properly standardized

### **Quality Control (QC) Information**

#### **Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 303443003 (CAPA-12-13345).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**

The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

A DER was not required for this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**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.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer:



Date:

25May12

# **Sample Data Summary**

## GEL LABORATORIES LLC

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### Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-1253 GEL Work Order: 303488

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

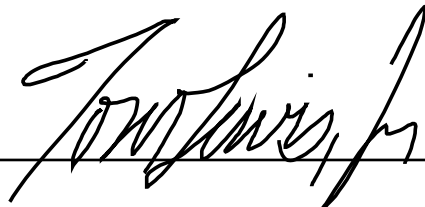
- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by

A handwritten signature in black ink, appearing to read "Tom Davis, Jr.", is written over a horizontal line.

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## Certificate of Analysis

Report Date: May 24, 2012

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm111  
Los Alamos, New Mexico 87545

Contact: Keith Greene  
Project: LANL-WQH Water Samples

Client SDG: 12-1253

Client Sample ID: CAPA-12-13290  
Sample ID: 303488001  
Matrix: W  
Collect Date: 27-APR-12 13:23  
Receive Date: 01-MAY-12  
Collector: Client

Project: ESHL00210  
Client ID: ARSL001

| Parameter                                    | Qualifier | Result | DL    | RL    | Units    | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|----------|----|---------|----------|------|---------|--------|
| Conductivity Analysis                        |           |        |       |       |          |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Conductivity                                 |           | 569    | 1.00  | 1.00  | umhos/cm | 1  | TXT1    | 05/09/12 | 1222 | 1210920 | 1      |
| Electrode Analysis                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 150.1 pH "As Received"                   |           |        |       |       |          |    |         |          |      |         |        |
| pH at Temp 16.1C                             | H         | 6.70   | 0.010 | 0.100 | SU       | 1  | LXA1    | 05/02/12 | 1507 | 1208900 | 2      |
| Ion Chromatography                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 300.0 Anions Liquid 28 day "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Bromide                                      | J         | 0.0909 | 0.067 | 0.200 | mg/L     | 1  | MAR1    | 05/08/12 | 0402 | 1207431 | 3      |
| Fluoride                                     |           | 0.113  | 0.033 | 0.100 | mg/L     | 1  |         |          |      |         |        |
| Sulfate                                      |           | 16.1   | 0.133 | 0.400 | mg/L     | 1  |         |          |      |         |        |
| Chloride                                     |           | 128    | 0.670 | 2.00  | mg/L     | 10 | MAR1    | 05/08/12 | 2127 | 1207431 | 4      |
| Solids Analysis                              |           |        |       |       |          |    |         |          |      |         |        |
| EPA 160.1 Solids, Dissolved-F "As Received"  |           |        |       |       |          |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 351    | 3.40  | 14.3  | mg/L     |    | LYG1    | 05/03/12 | 1019 | 1209153 | 5      |
| Titration Analysis                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 52.1   | 0.725 | 1.00  | mg/L     |    | LXA1    | 05/08/12 | 1725 | 1210449 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 0.725 | 1.00  | mg/L     |    |         |          |      |         |        |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | EPA 120.1   |                  |
| 2      | EPA 150.1   |                  |
| 3      | EPA 300.0   |                  |
| 4      | EPA 300.0   |                  |
| 5      | EPA 160.1   |                  |
| 6      | EPA 310.1   |                  |

# **Quality Control Summary**



# GEL LABORATORIES LLC

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## QC Summary

Report Date: May 24, 2012  
Page 1 of 3

Los Alamos National Laboratory  
PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm111  
Los Alamos, New Mexico

Contact: Keith Greene

Workorder: 303488

| Parmname                     | NOM       | Sample | Qual  | QC   | Units    | RPD% | REC%   | Range      | Anlst      | Date     | Time  |
|------------------------------|-----------|--------|-------|------|----------|------|--------|------------|------------|----------|-------|
| <b>Conductivity Analysis</b> |           |        |       |      |          |      |        |            |            |          |       |
| Batch                        | 1210920   |        |       |      |          |      |        |            |            |          |       |
| QC1202653384                 | 303488001 | DUP    |       |      |          |      |        |            |            |          |       |
| Conductivity                 |           |        | 569   | 569  | umhos/cm | 0.00 |        | (0%-10%)   | TXT1       | 05/09/12 | 12:24 |
| QC1202653382                 | LCS       |        |       |      |          |      |        |            |            |          |       |
| Conductivity                 | 1410      |        |       | 1420 | umhos/cm |      | 100    | (95%-105%) |            | 05/09/12 | 12:17 |
| <b>Electrode Analysis</b>    |           |        |       |      |          |      |        |            |            |          |       |
| Batch                        | 1208900   |        |       |      |          |      |        |            |            |          |       |
| QC1202648411                 | 303489002 | DUP    |       |      |          |      |        |            |            |          |       |
| pH                           |           | H      | 6.78  | H    | 6.79     | SU   | 0.147  | (0%-10%)   | LXA1       | 05/02/12 | 15:13 |
| QC1202648410                 | LCS       |        |       |      |          |      |        |            |            |          |       |
| pH                           |           |        |       | 7.03 | SU       |      |        | (99%-101%) |            | 05/02/12 | 15:06 |
| <b>Ion Chromatography</b>    |           |        |       |      |          |      |        |            |            |          |       |
| Batch                        | 1207431   |        |       |      |          |      |        |            |            |          |       |
| QC1202644915                 | 303221003 | DUP    |       |      |          |      |        |            |            |          |       |
| Bromide                      |           | U      | ND    | U    | ND       | mg/L | N/A    |            | MAR1       | 05/08/12 | 01:51 |
| Chloride                     |           |        | 130   |      | 130      | mg/L | 0.110  | (0%-20%)   |            | 05/08/12 | 20:21 |
| Fluoride                     |           |        | 0.133 |      | 0.134    | mg/L | 1.12 ^ | (+/-0.100) |            | 05/08/12 | 01:51 |
| Sulfate                      |           |        | 13.3  |      | 13.8     | mg/L | 4.10   | (0%-20%)   |            |          |       |
| QC1202644917                 | LCS       |        |       |      |          |      |        |            |            |          |       |
| Bromide                      | 2.50      |        |       |      | 2.60     | mg/L |        | 104        | (90%-110%) | 05/08/12 | 00:45 |
| Chloride                     | 10.0      |        |       |      | 9.73     | mg/L |        | 97.3       | (90%-110%) |          |       |
| Fluoride                     | 5.00      |        |       |      | 5.09     | mg/L |        | 102        | (90%-110%) |          |       |
| Sulfate                      | 20.0      |        |       |      | 20.0     | mg/L |        | 99.8       | (90%-110%) |          |       |
| QC1202644914                 | MB        |        |       |      |          |      |        |            |            |          |       |
| Bromide                      |           |        | U     |      | ND       | mg/L |        |            |            | 05/08/12 | 00:12 |
| Chloride                     |           |        | U     |      | ND       | mg/L |        |            |            |          |       |
| Fluoride                     |           |        | U     |      | ND       | mg/L |        |            |            |          |       |
| Sulfate                      |           |        | U     |      | ND       | mg/L |        |            |            |          |       |
| QC1202644916                 | 303221003 | PS     |       |      |          |      |        |            |            |          |       |
| Bromide                      | 2.50      | U      | ND    |      | 2.64     | mg/L |        | 103        | (90%-110%) | 05/08/12 | 02:24 |
| Chloride                     | 10.0      |        | 13.0  |      | 24.6     | mg/L |        | 116 *      | (90%-110%) | 05/08/12 | 20:54 |
| Fluoride                     | 5.00      |        | 0.133 |      | 5.13     | mg/L |        | 99.9       | (90%-110%) | 05/08/12 | 02:24 |
| Sulfate                      | 20.0      |        | 13.3  |      | 35.5     | mg/L |        | 111 *      | (90%-110%) |          |       |
| <b>Solids Analysis</b>       |           |        |       |      |          |      |        |            |            |          |       |
| Batch                        | 1209153   |        |       |      |          |      |        |            |            |          |       |
| QC1202648998                 | 303443003 | DUP    |       |      |          |      |        |            |            |          |       |
| Total Dissolved Solids       |           | U      | ND    | U    | ND       | mg/L | N/A    |            | LYG1       | 05/03/12 | 10:19 |
| QC1202648999                 | LCS       |        |       |      |          |      |        |            |            |          |       |
| Total Dissolved Solids       | 300       |        |       |      | 300      | mg/L |        | 100        | (95%-105%) | 05/03/12 | 10:19 |
| QC1202648997                 | MB        |        |       |      |          |      |        |            |            |          |       |
| Total Dissolved Solids       |           |        | U     |      | ND       | mg/L |        |            |            | 05/03/12 | 10:19 |

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## QC Summary

Workorder: 303488

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| Parmname                     | NOM     | Sample | Qual | QC   | Units | RPD% | REC% | Range      | Anlst | Date     | Time  |
|------------------------------|---------|--------|------|------|-------|------|------|------------|-------|----------|-------|
| <b>Titration Analysis</b>    |         |        |      |      |       |      |      |            |       |          |       |
| Batch                        | 1210449 |        |      |      |       |      |      |            |       |          |       |
| QC1202652186 303443003 DUP   |         |        |      |      |       |      |      |            |       |          |       |
| Alkalinity, Total as CaCO3   | U       | ND     | U    | ND   | mg/L  | N/A  |      |            | LXA1  | 05/08/12 | 16:41 |
| Carbonate alkalinity (CaCO3) | U       | ND     | U    | ND   | mg/L  | N/A  |      |            |       |          |       |
| QC1202652192 LCS             |         |        |      |      |       |      |      |            |       |          |       |
| Alkalinity, Total as CaCO3   | 50.0    |        |      | 51.1 | mg/L  |      | 102  | (90%-110%) |       | 05/08/12 | 15:35 |
| QC1202652190 303443003 MS    |         |        |      |      |       |      |      |            |       |          |       |
| Alkalinity, Total as CaCO3   | 50.0    | U      | ND   | 51.6 | mg/L  |      | 102  | (80%-120%) |       | 05/08/12 | 16:46 |

### Notes:

RER is calculated at the 95% confidence level (2-sigma).

The Qualifiers in this report are defined as follows:

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- E Organics--Concentration of the target analyte exceeds the instrument calibration range
- F Estimated Value
- FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
- H Analytical holding time was exceeded
- J Value is estimated
- M Matrix Related Failure
- N Metals--The Matrix spike sample recovery is not within specified control limits
- N Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- P Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, difference is also <70%
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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## QC Summary

Workorder: 303488

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| Parmname | NOM  | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| Y        | QC Samples were not spiked with this compound  |        |      |    |       |      |      |       |       |      |      |
| Z        | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.                              |        |      |    |       |      |      |       |       |      |      |
| ^        | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |        |      |    |       |      |      |       |       |      |      |
| d        | 5-day BOD--The 2:1 depletion requirement was not met for this sample   |        |      |    |       |      |      |       |       |      |      |
| h        | Preparation or preservation holding time was exceeded  |        |      |    |       |      |      |       |       |      |      |

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

^ 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.

# Miscellaneous

DATA EXCEPTION REPORT

|  |                                      |  |                                   |
|--|--------------------------------------|--|-----------------------------------|
| <b>Mo.Day Yr.</b><br>03-MAY-12   | <b>Division:</b><br>Industrial       | <b>Quality Criteria:</b><br>Specifications | <b>Type:</b><br>Process           |
| <b>Instrument Type:</b><br>ELECTRODE   | <b>Test / Method:</b><br>EPA 150.1   | <b>Matrix Type:</b><br>Liquid              | <b>Client Code:</b><br>ESHL, PAES |
| <b>Batch ID:</b><br>1208900  | <b>Sample Numbers:</b><br>See below. |  |                                   |
| <b>Potentially affected work order(s)(SDG):</b> 303488(12-1253),303489(12-1254),303565   |                                      |  |                                   |
| <b>Application Issues:</b><br>Sample received out of holding                             |                                      |  |                                   |
| <b>Specification and Requirements<br/>Exception Description:</b>                         |                                      | <b>DER Disposition:</b>                    |                                   |
| 1. Sample received out of holding:<br><br>303488 001<br><br>303489 002<br><br>303565 001 |                                      | 1. Samples were received out of holding.   |                                   |

**Originator's Name:**

Lindsey Jensen 03-MAY-12

**Data Validator/Group Leader:**

Julia Hamilton 11-MAY-12

| DATA EXCEPTION REPORT  |                                     |  |                             |
|--|-------------------------------------|--|-----------------------------|
| <b>Mo.Day Yr.</b><br>09-MAY-12   | <b>Division:</b><br>Industrial      | <b>Quality Criteria:</b><br>Specifications   | <b>Type:</b><br>Process     |
| <b>Instrument Type:</b><br>IC  | <b>Test / Method:</b><br>EPA 300.0  | <b>Matrix Type:</b><br>Liquid  | <b>Client Code:</b><br>ESHL |
| <b>Batch ID:</b><br>1207431  | <b>Sample Numbers:</b><br>See Below |  |                             |
| <b>Potentially affected work order(s)(SDG):</b> 303221(12-1236),303234(12-1241),303443(12-1249),303488(12-1253),303489(12-1254)<br><b>Application Issues:</b><br>Failed Recovery for MS/PS |                                     |  |                             |
| <b>Specification and Requirements Exception Description:</b>   |                                     | <b>DER Disposition:</b>  |                             |
| 1. Failed Recovery for MS/PS:<br>QC   1202644916PS   |                                     | 1. The MS/PS failed required acceptance limits for chloride and sulfate due to matrix interference. Of the remaining anions in the MS/PS, all except Orthophosphate required acceptance limits. This failure is attributed to the matrix of the sample because the successful recovery of the other compounds indicate that the laboratory process was in control. This variance is judged to have no negative impact on the data. The deviation is noted in the Case Narrative and DER, and the data has been reported. |                             |

**Originator's Name:**  
Mary Sherwood      09-MAY-12

**Data Validator/Group Leader:**  
Virginia Wininger      09-MAY-12

| DATA EXCEPTION REPORT  |                                      |  |                             |
|--|--------------------------------------|--|-----------------------------|
| <b>Mo.Day Yr.</b><br>10-MAY-12   | <b>Division:</b><br>Industrial       | <b>Quality Criteria:</b><br>Specifications   | <b>Type:</b><br>Process     |
| <b>Instrument Type:</b><br>BALANCE   | <b>Test / Method:</b><br>SM 2540C    | <b>Matrix Type:</b><br>Liquid  | <b>Client Code:</b><br>ESHL |
| <b>Batch ID:</b><br>1209153  | <b>Sample Numbers:</b><br>See below. |  |                             |
| <b>Potentially affected work order(s)(SDG):</b> 303353,303443(12-1249),303488(12-1253),303489(12-1254),303596,303613(12-1268)<br><b>Application Issues:</b><br>Other |                                      |  |                             |
| <b>Specification and Requirements</b>  |                                      | <b>DER Disposition:</b>  |                             |
| <b>Exception Description:</b>  |                                      |  |                             |
| 1. Consecutive weight check criteria not met:<br><br>303488001 and 303489002   |                                      | 1. In order to meet consecutive weight check criteria, weight events must be within 0.0005g of each other. After initial weight checks failed this criteria, the analyst performed two additional weight events for Total Dissolved Solids. After four weight events, the analyst was unable to get the samples to conform to the criteria. The failure to meet weighback criteria is attributed to the matrix of the samples. |                             |

**Originator's Name:**

Lisa Gregory 10-MAY-12

**Data Validator/Group Leader:**

Julia Hamilton 11-MAY-12