

[illegible]

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

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102558

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | OK           | FIELD MATRIX:        | W             | OK            |
| TIME COLLECTED<br>(HH:MM):      | 1334          |              | MEDIA:               | UA            | ↓             |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | UA            | GSP           |
| LOCATION ID:                    | R-33 S1       |              | FIELD PREP:          | UF            | OK            |
| LOCATION TYPE:                  | NA            |              | FIELD QC TYPE:       | FD            | ↓             |
| TOP DEPTH:                      | ↓             | ↓            | SAMPLE USAGE:        | QC            | ↓             |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |               | YES / NO / NA |

| PRIORITY | ORDER        | CONTAINER          | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|--------------|--------------------|---|--------------|---------------|----------------------|
| NA       | MSGP-Hg      | 1 LITER POLY       | 1 | HNO3         | Y             | NA                   |
| ↓        | WSP-CN(T)    | 250 ML POLY        | 1 | NAOH         | ↓             | ↓                    |
| ↓        | WSP-GrossA/B | 1 LITER POLY       | 1 | HNO3         | ↓             | ↓                    |
| ↓        | WSP-RAD      | 1 GAL POLY         | 1 | HNO3         | ↓             | ↓                    |
| ↓        | WSP-TKN+TOC  | 500 ML AMBER GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen \_\_\_\_\_ mg/L      Flow (in gpm) \_\_\_\_\_ GPM      Oxidation-Reduction Potential \_\_\_\_\_ mV  
 pH \_\_\_\_\_ SU      Specific Conductance \_\_\_\_\_ uS/cm      Temperature \_\_\_\_\_ deg C  
 Turbidity \_\_\_\_\_ NTU

COLLECTED BY (PRINT): J. Berryhill &amp; T. Bonham

|   |                             |   |                             |
|---|-----------------------------|---|-----------------------------|
| RELINQUISHED BY<br>(Printed Name) Austin Tosh<br>(Signature) <i>Austin Tosh</i> | Date/Time<br>8-6-15<br>1605 | RECEIVED BY<br>(Printed Name) Sherwood<br>(Signature) <i>Sherwood</i> | Date/Time<br>8/6/15<br>1605 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature)                          | Date/Time                   |

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

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102559

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | GK           | FIELD MATRIX:        | W             | GK            |
| TIME COLLECTED<br>(HH:MM):      | 1334          |              | MEDIA:               | UA            | ↓             |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | UA            | GSP           |
| LOCATION ID:                    | R-33 S1       |              | FIELD PREP:          | F             | OK            |
| LOCATION TYPE:                  | NA            |              | FIELD QC TYPE:       | FD            | ↓             |
| TOP DEPTH:                      | ↓             |              | SAMPLE USAGE:        | QC            | ↓             |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |               | YES / NO / NA |

| PRIORITY | ORDER                        | CONTAINER             | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|------------------------------|-----------------------|---|--------------|---------------|----------------------|
| NA       | WSP-All Metals               | 1 LITER POLY          | 1 | HNO3 ICE     | Y             | NA                   |
| ↓        | WSP-<br>GENINORG+PerChlorate | 1 LITER POLY          | 1 | ICE          | ↓             | ↓                    |
| ↓        | WSP-<br>NH3+NO3/NO2          | 500 ML AMBER<br>GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen \_\_\_\_\_ mg/L      Flow (in gpm) \_\_\_\_\_ GPM      Oxidation-Reduction Potential \_\_\_\_\_ mV  
 pH \_\_\_\_\_ SU      Specific Conductance \_\_\_\_\_ uS/cm      Temperature \_\_\_\_\_ deg C  
 Turbidity \_\_\_\_\_ NTU

COLLECTED BY (PRINT): T. Bonham &amp; J. Berryhill

|   |                             |   |                             |
|---|-----------------------------|---|-----------------------------|
| RELINQUISHED BY<br>(Printed Name) Austin Tosh<br>(Signature) <i>Austin Tosh</i> | Date/Time<br>8-6-15<br>1605 | RECEIVED BY<br>(Printed Name) S. Sherwood<br>(Signature) <i>S. Sherwood</i> | Date/Time<br>8/6/15<br>1605 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   |

Report Date: 07/31/2015

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102580

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | OK           | FIELD MATRIX:        | WG            | OK            |
| TIME COLLECTED<br>(HH:MM):      | 1334          |              | MEDIA:               | UA            | ↓             |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | UA            | GSP           |
| LOCATION ID:                    | R-33 S1       |              | FIELD PREP:          | UF            | OK            |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           | ↓             |
| TOP DEPTH:                      | NA            |              | SAMPLE USAGE:        | INV           | ↓             |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |               | YES / NO / NA |

| PRIORITY | ORDER        | CONTAINER          | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|--------------|--------------------|---|--------------|---------------|----------------------|
| NA       | MSGP-Hg      | 1 LITER POLY       | 1 | HNO3         | Y             | NA                   |
| ↓        | WSP-CN(T)    | 250 ML POLY        | 1 | NAOH         | ↓             | ↓                    |
|          | WSP-GrossA/B | 1 LITER POLY       | 1 | HNO3         |               |                      |
|          | WSP-RAD      | 1 GAL POLY         | 1 | HNO3         |               |                      |
| ↓        | WSP-TKN+TOC  | 500 ML AMBER GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS: None

LOCATION COMMENTS: Sampled 40' From running generator

## FIELD PARAMETERS:

|                  |      |      |                      |     |       |                               |       |       |
|------------------|------|------|----------------------|-----|-------|-------------------------------|-------|-------|
| Dissolved Oxygen | 5.35 | mg/L | Flow (in gpm)        | 0.6 | GPM   | Oxidation-Reduction Potential | 102.0 | mV    |
| pH               | 7.32 | SU   | Specific Conductance | 147 | uS/cm | Temperature                   | 22.76 | deg C |
| Turbidity        | 0.6  | NTU  |                      |     |       |                               |       |       |

COLLECTED BY (PRINT): T. Bonham &amp; J. Berryhill

|  |                             |  |                             |
|--|-----------------------------|--|-----------------------------|
| RELINQUISHED BY<br>(Printed Name) Austin Tash<br>(Signature) Austin Tash | Date/Time<br>8-6-15<br>1605 | RECEIVED BY<br>(Printed Name) S. Sherwood<br>(Signature) S. Sherwood | Date/Time<br>8/6/15<br>1605 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                         | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature)                         | Date/Time                   |

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102581

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED    |
|---------------------------------|---------------|--------------|----------------------|---------------|-----------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | OK           | FIELD MATRIX:        | WG            | OK              |
| TIME COLLECTED<br>(HH:MM):      | 1500          |              | MEDIA:               | UA            | ↓               |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | UA            | GSP             |
| LOCATION ID:                    | R-33 S2       |              | FIELD PREP:          | UF            | OK              |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           | ↓               |
| TOP DEPTH:                      | NA            |              | SAMPLE USAGE:        | INV           | ↓               |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |               | YES / NO / (NA) |

| PRIORITY | ORDER        | CONTAINER          | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|--------------|--------------------|---|--------------|---------------|----------------------|
| NA       | MSGP-Hg      | 1 LITER POLY       | 1 | HNO3         | Y             | NA                   |
| ↓        | WSP-CN(T)    | 250 ML POLY        | 1 | NAOH         | ↓             | ↓                    |
| ↓        | WSP-GrossA/B | 1 LITER POLY       | 1 | HNO3         | ↓             | ↓                    |
| ↓        | WSP-RAD      | 1 GAL POLY         | 1 | HNO3         | ↓             | ↓                    |
| ↓        | WSP-TKN+TOC  | 500 ML AMBER GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS: None

LOCATION COMMENTS: Sampled 40' from running diesel generator

## FIELD PARAMETERS:

|                  |       |      |                      |     |       |                               |       |       |
|------------------|-------|------|----------------------|-----|-------|-------------------------------|-------|-------|
| Dissolved Oxygen | 6.55  | mg/L | Flow (in gpm)        | 2.8 | GPM   | Oxidation-Reduction Potential | 104.2 | mv    |
| pH               | 7.40  | SU   | Specific Conductance | 144 | uS/cm | Temperature                   | 22.38 | deg C |
| Turbidity        | 0.007 | NTU  |                      |     |       |                               |       |       |

COLLECTED BY (PRINT): T. Bonham &amp; J. Berryhill

|   |                             |   |                             |
|---|-----------------------------|---|-----------------------------|
| RELINQUISHED BY<br>(Printed Name) Austin Tsch<br>(Signature) <i>Austin Tsch</i> | Date/Time<br>8-6-15<br>1605 | RECEIVED BY<br>(Printed Name) S. Sherwood<br>(Signature) <i>S. Sherwood</i> | Date/Time<br>8/6/15<br>1605 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   |

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102584

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | OK           | FIELD MATRIX:        | WG            | OK            |
| TIME COLLECTED<br>(HH:MM):      | 1121          |              | MEDIA:               | UA            |               |
| PRS ID:                         | OK            |              | SAMPLE TECH<br>CODE: | UA            | BSF           |
| LOCATION ID:                    | R-44 S1       |              | FIELD PREP:          | UF            | OK            |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           |               |
| TOP DEPTH:                      | OK            |              | SAMPLE USAGE:        | INV           |               |
| BOTTOM DEPTH:                   |               |              | EXCAVATED:           |               | YES / NO / NA |

| PRIORITY | ORDER       | CONTAINER          | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|-------------|--------------------|---|--------------|---------------|----------------------|
| MA       | MSGP-Hg     | 1 LITER POLY       | 1 | HNO3         | Y             | MA                   |
|          | WSP-CN(T)   | 250 ML POLY        | 1 | NAOH         |               |                      |
|          | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4        |               |                      |

## SAMPLE COMMENTS:

## LOCATION COMMENTS:

dred generator running 50' away

## FIELD PARAMETERS:

|                  |      |      |                      |      |       |                               |       |       |
|------------------|------|------|----------------------|------|-------|-------------------------------|-------|-------|
| Dissolved Oxygen | 6.84 | mg/L | Flow (in gpm)        | 3.33 | GPM   | Oxidation-Reduction Potential | 156.6 | mV    |
| pH               | 7.77 | SU   | Specific Conductance | 138  | uS/cm | Temperature                   | 21.00 | deg C |
| Turbidity        | 0.4  | NTU  |                      |      |       |                               |       |       |

## COLLECTED BY (PRINT):

A.V. J. + D. Jerns/16

|  |                             |  |                             |
|--|-----------------------------|--|-----------------------------|
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time                   |

Report Date: 07/31/2015

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102585

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED                                   |
|---------------------------------|---------------|--------------|----------------------|---------------|--|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | ok           | FIELD MATRIX:        | WG            | ok   |
| TIME COLLECTED<br>(HH:MM):      | 1309          |              | MEDIA:               | UA            |  |
| PRS ID:                         | ok            |              | SAMPLE TECH<br>CODE: | UA            | GSP  |
| LOCATION ID:                    | R-44 S2       |              | FIELD PREP:          | UF            | ok   |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           |  |
| TOP DEPTH:                      | ok            |              | SAMPLE USAGE:        | INV           |  |
| BOTTOM DEPTH:                   |               |              | EXCAVATED:           |               | YES / <input checked="" type="radio"/> NO / NA |

| PRIORITY | ORDER       | CONTAINER          | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|-------------|--------------------|---|--------------|---------------|----------------------|
| NA       | MSGP-Hg     | 1 LITER POLY       | 1 | HNO3         | Y             | NA                   |
|          | WSP-CN(T)   | 250 ML POLY        | 1 | NAOH         |               |                      |
|          | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4        |               |                      |

## SAMPLE COMMENTS:

## LOCATION COMMENTS:

diesel generator running 50' away

## FIELD PARAMETERS:

|                  |      |      |                      |      |       |                               |       |       |
|------------------|------|------|----------------------|------|-------|-------------------------------|-------|-------|
| Dissolved Oxygen | 7.06 | mg/L | Flow (in gpm)        | 3.45 | GPM   | Oxidation-Reduction Potential | 136.2 | mV    |
| pH               | 7.85 | SU   | Specific Conductance | 145  | uS/cm | Temperature                   | 21.57 | deg C |
| Turbidity        | 0.3  | NTU  |                      |      |       |                               |       |       |

## COLLECTED BY (PRINT):

D. Saramillo

|  |                             |  |                             |
|--|-----------------------------|--|-----------------------------|
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time                   |

Report Date: 07/31/2015

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102604

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED    |
|---------------------------------|---------------|--------------|----------------------|---------------|-----------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | OK           | FIELD MATRIX:        | WG            | OK              |
| TIME COLLECTED<br>(HH:MM):      | 1334          |              | MEDIA:               | UA            | ↓               |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | UA            | GSP             |
| LOCATION ID:                    | R-33 S1       |              | FIELD PREP:          | F             | OK              |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           | ↓               |
| TOP DEPTH:                      | NA            |              | SAMPLE USAGE:        | INV           | ↓               |
| BOTTOM DEPTH:                   | ↓             | ✓            | EXCAVATED:           |               | YES / NO / (NA) |

| PRIORITY | ORDER                            | CONTAINER             | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------------------------|-----------------------|---|--------------|---------------|----------------------|
| NA       | WSP-All Metals                   | 1 LITER POLY          | 1 | HNO3 ICE     | Y             | NA                   |
| ↓        | WSP-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          | ↓             | ↓                    |
| ↓        | WSP-<br>NH3+NO3/NO2              | 500 ML AMBER<br>GLASS | 1 | H2SO4        | ↓             | ↓                    |

## SAMPLE COMMENTS:

## LOCATION COMMENTS:

## FIELD PARAMETERS:

Dissolved Oxygen \_\_\_\_\_ mg/L      Flow (in gpm) \_\_\_\_\_ GPM      Oxidation-Reduction Potential \_\_\_\_\_ mV  
pH \_\_\_\_\_ SU      Specific Conductance \_\_\_\_\_ uS/cm      Temperature \_\_\_\_\_ deg C  
Turbidity \_\_\_\_\_ NTU

## COLLECTED BY (PRINT):

|   |                             |   |                             |
|---|-----------------------------|---|-----------------------------|
| RELINQUISHED BY<br>(Printed Name) Austin Tesh<br>(Signature) <i>Austin Tesh</i> | Date/Time<br>8-6-15<br>1605 | RECEIVED BY<br>(Printed Name) S. Sherwood<br>(Signature) <i>S. Sherwood</i> | Date/Time<br>8/6/15<br>1605 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   |

Report Date: 07/31/2015



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102605

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | OK           | FIELD MATRIX:        | WG            | OK            |
| TIME COLLECTED<br>(HH:MM):      | 1500          |              | MEDIA:               | UA            | ↓             |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | UA            | GSP           |
| LOCATION ID:                    | R-33 S2       |              | FIELD PREP:          | F             | OK            |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           | ↓             |
| TOP DEPTH:                      | NA            |              | SAMPLE USAGE:        | INV           | ↓             |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |               | YES / NO / NA |

| PRIORITY | ORDER                            | CONTAINER             | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------------------------|-----------------------|---|--------------|---------------|----------------------|
| NA       | WSP-All Metals                   | 1 LITER POLY          | 1 | HNO3 ICE     | Y             | NA                   |
| ↓        | WSP-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          | ↓             | ↓                    |
| ↓        | WSP-<br>NH3+NO3/NO2              | 500 ML AMBER<br>GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen \_\_\_\_\_ mg/L Flow (in gpm) \_\_\_\_\_ GPM Oxidation-Reduction Potential \_\_\_\_\_ mV  
pH \_\_\_\_\_ SU Specific Conductance \_\_\_\_\_ uS/cm Temperature \_\_\_\_\_ deg C  
Turbidity \_\_\_\_\_ NTU

COLLECTED BY (PRINT): T. Bonham &amp; J. Bee Barryhill

|   |                             |  |                             |
|---|-----------------------------|--|-----------------------------|
| RELINQUISHED BY<br>(Printed Name) Austin Tesh<br>(Signature) <i>Austin Tesh</i> | Date/Time<br>8-6-15<br>1605 | RECEIVED BY <i>Sherwood</i><br>(Printed Name) <i>Sherwood</i><br>(Signature) <i>Sherwood</i> | Date/Time<br>8/6/15<br>1605 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature)   | Date/Time                   |

Report Date: 07/31/2015

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102608

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED |
|---------------------------------|---------------|--------------|----------------------|---------------|--------------|
| Date Collected<br>(MM/DD/YYYY): | 08/16/2015    | 08           | FIELD MATRIX:        | WG            | ok           |
| TIME COLLECTED<br>(HH:MM):      | 1:21          |              | MEDIA:               | UA            |              |
| PRS ID:                         | ok            |              | SAMPLE TECH<br>CODE: | UA            | GSP          |
| LOCATION ID:                    | R-44 S1       |              | FIELD PREP:          | F             | ok           |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           |              |
| TOP DEPTH:                      | ok            |              | SAMPLE USAGE:        | INV           |              |
| BOTTOM DEPTH:                   |               |              | EXCAVATED:           |               | YES / @ / NA |

| PRIORITY | ORDER                            | CONTAINER             | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------------------------|-----------------------|---|--------------|---------------|----------------------|
| 1        | WSP-All Metals                   | 1 LITER POLY          | 1 | HNO3 ICE     | Y             | 1                    |
| 1        | WSP-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          | Y             | 1                    |
| 1        | WSP-<br>NH3+NO3/NO2              | 500 ML AMBER<br>GLASS | 1 | H2SO4        | Y             | 1                    |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

|                  |       |      |                         |       |       |                                  |       |       |
|------------------|-------|------|-------------------------|-------|-------|----------------------------------|-------|-------|
| Dissolved Oxygen | _____ | mg/L | Flow (l/gpm)            | _____ | GPM   | Oxidation-Reduction<br>Potential | _____ | mV    |
| pH               | _____ | SU   | Specific<br>Conductance | _____ | uS/cm | Temperature                      | _____ | deg C |
| Turbidity        | _____ | NTU  |                         |       |       |                                  |       |       |

COLLECTED BY (PRINT): D. Teramello

|  |                             |  |                             |
|--|-----------------------------|--|-----------------------------|
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time                   |

Report Date: 07/31/2015

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102609

WORK ORDER: NA

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 08/06/2015    | ok           | FIELD MATRIX:        | WG            | ok            |
| TIME COLLECTED<br>(HH:MM):      | 1304          |              | MEDIA:               | UA            |               |
| PRS ID:                         | ok            |              | SAMPLE TECH<br>CODE: | UA            | GSP           |
| LOCATION ID:                    | R-44 S2       |              | FIELD PREP:          | F             | ok            |
| LOCATION TYPE:                  | MON           |              | FIELD QC TYPE:       | REG           |               |
| TOP DEPTH:                      | ok            |              | SAMPLE USAGE:        | INV           |               |
| BOTTOM DEPTH:                   |               |              | EXCAVATED:           |               | YES / NO / NA |

| PRIORITY | ORDER                            | CONTAINER             | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------------------------|-----------------------|---|--------------|---------------|----------------------|
| MA       | WSP-All Metals                   | 1 LITER POLY          | 1 | HNO3 ICE     | Y             | MA                   |
|          | WSP-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          |               |                      |
|          | WSP-<br>NH3+NO3/NO2              | 500 ML AMBER<br>GLASS | 1 | H2SO4        |               |                      |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen \_\_\_\_\_ mg/L      Flow (in gpm) \_\_\_\_\_ GPM      Oxidation-Reduction Potential \_\_\_\_\_ mV  
 pH \_\_\_\_\_ SU      Specific Conductance \_\_\_\_\_ uS/cm      Temperature \_\_\_\_\_ deg C  
 Turbidity \_\_\_\_\_ NTU

COLLECTED BY (PRINT):

D. Jaramilla

|  |                             |  |                             |
|--|-----------------------------|--|-----------------------------|
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>8/6/15<br>1400 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time                   | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time                   |

Report Date: 07/31/2015

## DATA VALIDATION REPORT

Chain Of Custody No. 2015-2084

### 1. Distribution Of Samples In EDD.

| SDG    | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|--------|-------------------|-----------------|------------------|-------------|--------------|------------------|
| 379019 | EPA:120.1         | 4               | 1                |             |              |                  |
| 379019 | EPA:150.1         | 4               | 1                |             |              |                  |
| 379019 | EPA:160.1         | 4               | 1                |             |              |                  |
| 379019 | EPA:245.2         | 8               | 2                |             |              |                  |
| 379019 | EPA:300.0         | 4               | 1                |             |              |                  |
| 379019 | EPA:310.1         | 4               | 1                |             |              |                  |
| 379019 | EPA:335.4         | 4               | 1                |             |              |                  |
| 379019 | EPA:350.1         | 4               | 1                |             |              |                  |
| 379019 | EPA:351.2         | 4               | 1                |             |              |                  |
| 379019 | EPA:353.2         | 4               | 1                |             |              |                  |
| 379019 | EPA:365.4         | 4               | 1                |             |              |                  |
| 379019 | EPA:900           | 2               | 1                |             |              |                  |
| 379019 | EPA:901.1         | 2               | 1                |             |              |                  |
| 379019 | EPA:905.0         | 2               | 1                |             |              |                  |
| 379019 | HASL-300:AM-241   | 2               | 1                |             |              |                  |
| 379019 | HASL-300:ISOPU    | 2               | 1                |             |              |                  |
| 379019 | HASL-300:ISOU     | 2               | 1                |             |              |                  |
| 379019 | SM:A2340B         | 4               | 1                |             |              |                  |
| 379019 | SW-846:6010C      | 4               | 1                |             |              |                  |
| 379019 | SW-846:6020       | 4               | 1                |             |              |                  |
| 379019 | SW-846:6850       | 4               | 1                |             |              |                  |
| 379019 | SW-846:9060       | 4               | 1                |             |              |                  |

| SDG    | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 379019 | EPA:120.1         | 1499837         | 1499837     | 4               | 1                |             |              |                  |               |               |                   |                   |                       | 1                   |                         |             |                  | 1              |                |                    |                |
| 379019 | EPA:150.1         | 1499835         | 1499835     | 4               | 1                |             |              |                  |               |               |                   |                   |                       | 1                   |                         |             |                  | 2              |                |                    |                |

## DATA VALIDATION REPORT

| SDG    | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 379019 | EPA:160.1         | 1499735         | 1499735     | 4               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:245.2         | 1503572         | 1503571     | 8               | 2                |             |              |                  | 1             | 2             |                   |                   |                       | 1                   |                         |             | 2                |                |                |                    |                |
| 379019 | EPA:300.0         | 1500059         | 1500059     | 4               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:310.1         | 1499840         | 1499840     | 4               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:335.4         | 1498741         | 1498740     | 4               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:350.1         | 1499451         | 1499449     | 4               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:351.2         | 1499653         | 1499651     | 4               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:353.2         | 1499212         | 1499212     | 4               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:365.4         | 1499655         | 1499654     | 4               | 1                |             |              |                  | 1             | 2             |                   |                   |                       | 1                   |                         |             | 2                |                |                |                    |                |
| 379019 | EPA:900           | 1501030         | 1501030     | 2               | 1                |             |              |                  | 1             | 1             | 1                 |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:900           | 1504918         | 1504918     | 2               | 1                |             |              |                  | 1             | 1             | 1                 |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | EPA:901.1         | 1499679         | 1499679     | 2               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 2                |                |                |                    |                |
| 379019 | EPA:905.0         | 1501028         | 1501028     | 2               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | HASL-300:AM-241   | 1499559         | 1499559     | 2               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | HASL-300:ISOPU    | 1499560         | 1499560     | 2               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | HASL-300:ISOU     | 1499562         | 1499562     | 2               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | SM:A2340B         | 1501953         | 1501953     | 4               | 1                |             |              |                  |               |               |                   |                   |                       |                     |                         |             |                  |                |                |                    |                |
| 379019 | SW-846:6010C      | 1499471         | 1499470     | 4               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | SW-846:6020       | 1499480         | 1499479     | 4               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 379019 | SW-846:6850       | 1500488         | 1500487     | 4               | 1                |             |              |                  | 1             | 1             | 1                 |                   |                       | 1                   |                         |             |                  |                |                |                    |                |
| 379019 | SW-846:9060       | 1500166         | 1500166     | 4               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |

### 2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203372696    | DUP            | 1               | 0          | 0                | 0    |

## DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:120.1         | GENERAL CHEMISTRY          | LCS             | 1203372695    | LCS            | 0               | 0          | 1                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-15-102604  | 1203372688    | DUP            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203372687    | DUP            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | LCS             | 1203372686    | LCS            | 0               | 0          | 1                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-15-102604  | 1203372379    | DUP            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | LCS             | 1203372378    | LCS            | 0               | 0          | 1                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | MB              | 1203372377    | MB             | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102558  | 379019003     | FD             | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102580  | 379019001     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102581  | 379019005     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102584  | 379019007     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102585  | 379019009     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CASA-15-102643  | 1203382650    | DUP            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CASA-15-102643  | 1203382652    | MS             | 0               | 0          | 1                | 0    |
| EPA:245.2         | INORGANIC                  | LCS             | 1203382648    | LCS            | 0               | 0          | 1                | 0    |
| EPA:245.2         | INORGANIC                  | MB              | 1203382647    | MB             | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | WTESR-15-97804  | 1203382649    | DUP            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | WTESR-15-97804  | 1203382651    | MS             | 0               | 0          | 1                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203373270    | DUP            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | LCS             | 1203373269    | LCS            | 0               | 0          | 4                | 0    |

## DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:300.0         | GENERAL CHEMISTRY          | MB              | 1203373268    | MB             | 4               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203372714    | DUP            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203372716    | MS             | 0               | 0          | 1                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | LCS             | 1203372712    | LCS            | 0               | 0          | 1                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | MB              | 1203372710    | MB             | 2               | 0          | 0                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | CAMO-15-102558  | 379019003     | FD             | 1               | 0          | 0                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | CAMO-15-102580  | 1203371911    | DUP            | 1               | 0          | 0                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | CAMO-15-102580  | 1203371912    | MS             | 0               | 0          | 1                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | CAMO-15-102580  | 379019001     | REG            | 1               | 0          | 0                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | CAMO-15-102581  | 379019005     | REG            | 1               | 0          | 0                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | CAMO-15-102584  | 379019007     | REG            | 1               | 0          | 0                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | CAMO-15-102585  | 379019009     | REG            | 1               | 0          | 0                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | LCS             | 1203369924    | LCS            | 0               | 0          | 1                | 0    |
| EPA:335.4         | GENERAL CHEMISTRY          | MB              | 1203369923    | MB             | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203371696    | DUP            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203371697    | MS             | 0               | 0          | 1                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | LCS             | 1203371693    | LCS            | 0               | 0          | 1                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | MB              | 1203371692    | MB             | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-15-102558  | 379019003     | FD             | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-15-102580  | 379019001     | REG            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-15-102581  | 379019005     | REG            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-15-102584  | 379019007     | REG            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-15-102585  | 379019009     | REG            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CASA-15-102633  | 1203372231    | DUP            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CASA-15-102633  | 1203372232    | MS             | 0               | 0          | 1                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | LCS             | 1203372230    | LCS            | 0               | 0          | 1                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | MB              | 1203372229    | MB             | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |

## DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203372742    | DUP            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | LCS             | 1203371096    | LCS            | 0               | 0          | 1                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | MB              | 1203371095    | MB             | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203372235    | DUP            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CASA-15-102647  | 1203372236    | MS             | 0               | 0          | 1                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CASA-15-102650  | 1203375689    | DUP            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CASA-15-102650  | 1203375690    | MS             | 0               | 0          | 1                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | LCS             | 1203372234    | LCS            | 0               | 0          | 1                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | MB              | 1203372233    | MB             | 1               | 0          | 0                | 0    |
| EPA:900           | RAD                        | CAMO-15-102558  | 1203375956    | DUP            | 1               | 0          | 0                | 0    |
| EPA:900           | RAD                        | CAMO-15-102558  | 1203375957    | MS             | 0               | 0          | 1                | 0    |
| EPA:900           | RAD                        | CAMO-15-102558  | 1203375958    | MSD            | 0               | 0          | 1                | 0    |
| EPA:900           | RAD                        | CAMO-15-102558  | 379019003     | FD             | 2               | 0          | 0                | 0    |
| EPA:900           | RAD                        | CAMO-15-102580  | 1203386176    | DUP            | 1               | 0          | 0                | 0    |
| EPA:900           | RAD                        | CAMO-15-102580  | 1203386177    | MS             | 0               | 0          | 1                | 0    |
| EPA:900           | RAD                        | CAMO-15-102580  | 1203386178    | MSD            | 0               | 0          | 1                | 0    |
| EPA:900           | RAD                        | CAMO-15-102580  | 379019001     | REG            | 2               | 0          | 0                | 0    |
| EPA:900           | RAD                        | CAMO-15-102581  | 379019005     | REG            | 2               | 0          | 0                | 0    |
| EPA:900           | RAD                        | LCS             | 1203375959    | LCS            | 0               | 0          | 1                | 0    |
| EPA:900           | RAD                        | LCS             | 1203386179    | LCS            | 0               | 0          | 1                | 0    |
| EPA:900           | RAD                        | MB              | 1203375955    | MB             | 1               | 0          | 0                | 0    |
| EPA:900           | RAD                        | MB              | 1203386175    | MB             | 1               | 0          | 0                | 0    |
| EPA:901.1         | RAD                        | CAMO-15-102558  | 379019003     | FD             | 5               | 0          | 0                | 0    |
| EPA:901.1         | RAD                        | CAMO-15-102580  | 1203372294    | DUP            | 5               | 0          | 0                | 0    |
| EPA:901.1         | RAD                        | CAMO-15-102580  | 379019001     | REG            | 5               | 0          | 0                | 0    |
| EPA:901.1         | RAD                        | CAMO-15-102581  | 379019005     | REG            | 5               | 0          | 0                | 0    |
| EPA:901.1         | RAD                        | LCS             | 1203372293    | LCS            | 0               | 0          | 3                | 0    |
| EPA:901.1         | RAD                        | MB              | 1203372291    | MB             | 5               | 0          | 0                | 0    |
| EPA:901.1         | RAD                        | WTLAP-15-97349  | 1203372292    | DUP            | 5               | 0          | 0                | 0    |
| EPA:905.0         | RAD                        | CAMO-15-102558  | 379019003     | FD             | 1               | 0          | 0                | 0    |
| EPA:905.0         | RAD                        | CAMO-15-102580  | 379019001     | REG            | 1               | 0          | 0                | 0    |
| EPA:905.0         | RAD                        | CAMO-15-102581  | 1203375952    | DUP            | 1               | 0          | 0                | 0    |
| EPA:905.0         | RAD                        | CAMO-15-102581  | 1203375953    | MS             | 0               | 0          | 1                | 0    |



# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:905.0         | RAD                        | CAMO-15-102581  | 379019005     | REG            | 1               | 0          | 0                | 0    |
| EPA:905.0         | RAD                        | LCS             | 1203375954    | LCS            | 0               | 0          | 1                | 0    |
| EPA:905.0         | RAD                        | MB              | 1203375951    | MB             | 1               | 0          | 0                | 0    |
| HASL-300:AM-241   | RAD                        | CAMO-15-102558  | 379019003     | FD             | 1               | 0          | 0                | 0    |
| HASL-300:AM-241   | RAD                        | CAMO-15-102580  | 1203371987    | DUP            | 1               | 0          | 0                | 0    |
| HASL-300:AM-241   | RAD                        | CAMO-15-102580  | 379019001     | REG            | 1               | 0          | 0                | 0    |
| HASL-300:AM-241   | RAD                        | CAMO-15-102581  | 379019005     | REG            | 1               | 0          | 0                | 0    |
| HASL-300:AM-241   | RAD                        | LCS             | 1203371988    | LCS            | 0               | 0          | 1                | 0    |
| HASL-300:AM-241   | RAD                        | MB              | 1203371986    | MB             | 1               | 0          | 0                | 0    |
| HASL-300:ISOPU    | RAD                        | CAMO-15-102558  | 379019003     | FD             | 2               | 0          | 0                | 0    |
| HASL-300:ISOPU    | RAD                        | CAMO-15-102580  | 1203371990    | DUP            | 2               | 0          | 0                | 0    |
| HASL-300:ISOPU    | RAD                        | CAMO-15-102580  | 379019001     | REG            | 2               | 0          | 0                | 0    |
| HASL-300:ISOPU    | RAD                        | CAMO-15-102581  | 379019005     | REG            | 2               | 0          | 0                | 0    |
| HASL-300:ISOPU    | RAD                        | LCS             | 1203371991    | LCS            | 0               | 0          | 1                | 0    |
| HASL-300:ISOPU    | RAD                        | MB              | 1203371989    | MB             | 2               | 0          | 0                | 0    |
| HASL-300:ISOU     | RAD                        | CAMO-15-102558  | 379019003     | FD             | 3               | 0          | 0                | 0    |
| HASL-300:ISOU     | RAD                        | CAMO-15-102580  | 1203371995    | DUP            | 3               | 0          | 0                | 0    |
| HASL-300:ISOU     | RAD                        | CAMO-15-102580  | 379019001     | REG            | 3               | 0          | 0                | 0    |
| HASL-300:ISOU     | RAD                        | CAMO-15-102581  | 379019005     | REG            | 3               | 0          | 0                | 0    |
| HASL-300:ISOU     | RAD                        | LCS             | 1203371996    | LCS            | 0               | 0          | 1                | 0    |
| HASL-300:ISOU     | RAD                        | MB              | 1203371994    | MB             | 3               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-15-102559  | 379019004     | FD             | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-15-102604  | 379019002     | REG            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-15-102605  | 379019006     | REG            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-15-102608  | 379019008     | REG            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-15-102609  | 379019010     | REG            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CASA-15-102647  | 1203371768    | DUP            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CASA-15-102647  | 1203371769    | MS             | 0               | 0          | 17               | 0    |
| SW-846:6010C      | INORGANIC                  | LCS             | 1203371767    | LCS            | 0               | 0          | 17               | 0    |
| SW-846:6010C      | INORGANIC                  | MB              | 1203371766    | MB             | 17              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-15-102559  | 379019004     | FD             | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-15-102604  | 379019002     | REG            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-15-102605  | 379019006     | REG            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-15-102608  | 379019008     | REG            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-15-102609  | 379019010     | REG            | 11              | 0          | 0                | 0    |

## DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| SW-846:6020       | INORGANIC                  | CASA-15-102647  | 1203371802    | DUP            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CASA-15-102647  | 1203371803    | MS             | 0               | 0          | 11               | 0    |
| SW-846:6020       | INORGANIC                  | LCS             | 1203371801    | LCS            | 0               | 0          | 11               | 0    |
| SW-846:6020       | INORGANIC                  | MB              | 1203371800    | MB             | 11              | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-15-102559  | 1203374487    | MS             | 0               | 0          | 1                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-15-102559  | 1203374488    | MSD            | 0               | 0          | 1                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-15-102559  | 379019004     | FD             | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-15-102604  | 379019002     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-15-102605  | 379019006     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-15-102608  | 379019008     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-15-102609  | 379019010     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | LCS             | 1203374486    | LCS            | 0               | 0          | 1                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | MB              | 1203374485    | MB             | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-15-102558  | 379019003     | FD             | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-15-102573  | 1203373636    | DUP            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-15-102580  | 379019001     | REG            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-15-102581  | 379019005     | REG            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-15-102584  | 379019007     | REG            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-15-102585  | 379019009     | REG            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | LCS             | 1203373634    | LCS            | 0               | 0          | 1                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | MB              | 1203373633    | MB             | 1               | 0          | 0                | 0    |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

# DATA VALIDATION REPORT

| Blank FS ID | Blank Lab Sample | Blank Type   | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|-------------|------------------|--------------|-------------------|--------|----------------|------------------|---------------|-----------------|---------------------------|
| MB          | 1203371800       | METHOD BLANK | SW-846.6020       | W      | Arsenic        | 3.12             | J             | ug/L            | 5.00                      |
| MB          | 1203371800       | METHOD BLANK | SW-846.6020       | W      | Molybdenum     | .227             | J             | ug/L            | 0.500                     |

| Field Sample ID | Blank Lab  | Blank Type   | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|-----------------|------------|--------------|-------------------|----------------|------------------|-----------------|------------|---------------|---------------------|-------------|----------------------------|----------------------------|-------------|
| CAMO-15-102604  | 1203371800 | METHOD BLANK | SW-846.6020       | Arsenic        | 3.12             | ug/L            | 1.77       | J             | 5.00                | Y           | 5                          | 100                        | Y           |
| CAMO-15-102604  | 1203371800 | METHOD BLANK | SW-846.6020       | Molybdenum     | .227             | ug/L            | 1.15       |               | 0.500               | Y           | 5                          | 100                        | Y           |
| CAMO-15-102559  | 1203371800 | METHOD BLANK | SW-846.6020       | Molybdenum     | .227             | ug/L            | 1.13       |               | 0.500               | Y           | 5                          | 100                        | Y           |
| CAMO-15-102605  | 1203371800 | METHOD BLANK | SW-846.6020       | Molybdenum     | .227             | ug/L            | .947       |               | 0.500               | Y           | 5                          | 100                        | Y           |
| CAMO-15-102608  | 1203371800 | METHOD BLANK | SW-846.6020       | Molybdenum     | .227             | ug/L            | .865       |               | 0.500               | Y           | 5                          | 100                        | Y           |
| CAMO-15-102609  | 1203371800 | METHOD BLANK | SW-846.6020       | Molybdenum     | .227             | ug/L            | .775       |               | 0.500               | Y           | 5                          | 100                        | Y           |

6. Any surrogate recoveries outside the control limits?

No.

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

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name          | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|-----------------|------------------|-------------------|-------------------|-------------------------|-----------------|---------------|---------------|-------------------|--------------------|----------------|----------------|-----------------|-----|-----------|
| CASA-15-102633  | 1203372232       |                   | EPA.351.2         | Total Kjeldahl Nitrogen | 1499651         | 08-13-2015    | W             | 61                | 110                | 90             | 10             |                 |     |           |

## DATA VALIDATION REPORT

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name     | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result   | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|-------------|------------|-----------------|----------------|--------------------|------------------|-------------------|-------------------|---------------|----------------------|-------------------------|-------------|--------------|-----------|---------------|--------------|------------|--------------------|------------|-------------|---------|-----------------|------------------------|----------|
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | HASL-300-AM-241   | Americium-241     | U             | U                    | R5                      | N           | -0.0356      | pCi/L     | -0.0356       | pCi/L        | 0.0507     | 0.00436            | W          | 08/06/2015  | 1499559 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:901.1         | Cesium-137        | U             | U                    | R5                      | N           | .696         | pCi/L     | .696          | pCi/L        | 5.91       | 1.57               | W          | 08/06/2015  | 1499679 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:901.1         | Cobalt-60         | U             | U                    | R5                      | N           | 1.59         | pCi/L     | 1.59          | pCi/L        | 6.76       | 1.58               | W          | 08/06/2015  | 1499679 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:900           | Gross alpha       | U             | U                    | R5                      | N           | .166         | pCi/L     | .166          | pCi/L        | 2.83       | 0.719              | W          | 08/06/2015  | 1501030 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:900           | Gross beta        | U             | U                    | R5                      | N           | 2.61         | pCi/L     | 2.61          | pCi/L        | 2.71       | 0.914              | W          | 08/06/2015  | 1504918 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:901.1         | Neptunium-237     | U             | U                    | R5                      | N           | 4.15         | pCi/L     | 4.15          | pCi/L        | 11.5       | 3.09               | W          | 08/06/2015  | 1499679 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | HASL-300:ISOPU    | Plutonium-238     | U             | U                    | R5                      | N           | .0000000006  | pCi/L     | .0000000006   | pCi/L        | 0.0332     | 0.0049             | W          | 08/06/2015  | 1499560 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | HASL-300:ISOPU    | Plutonium-239/240 | U             | U                    | R5                      | N           | .00000000016 | pCi/L     | .00000000016  | pCi/L        | 0.0443     | 0.00693            | W          | 08/06/2015  | 1499560 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:901.1         | Potassium-40      | U             | U                    | R5                      | N           | -10.4        | pCi/L     | -10.4         | pCi/L        | 77.2       | 19.9               | W          | 08/06/2015  | 1499679 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:901.1         | Sodium-22         | U             | U                    | R5                      | N           | -1.69        | pCi/L     | -1.69         | pCi/L        | 5.30       | 1.56               | W          | 08/06/2015  | 1499679 | VAL             | Y                      |          |
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | EPA:905.0         | Strontium-90      | U             | U                    | R5                      | N           | -.17         | pCi/L     | -.17          | pCi/L        | 0.439      | 0.118              | W          | 08/06/2015  | 1501028 | VAL             | Y                      |          |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Parameter Name    | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result  | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|-------------|------------|-----------------|----------------|--------------------|------------------|-------------------|-------------------|---------------|----------------------|-------------------------|-------------|-------------|-----------|---------------|--------------|------------|--------------------|------------|-------------|---------|-----------------|------------------------|----------|
| R-33 S1     | 2015-2084  | CAMO-15-102558  | FD             | INIT               | RAD              | HASL-300:ISOU     | Uranium-235/236   | U             | U                    | R5                      | N           | .0435       | pCi/L     | .0435         | pCi/L        | 0.0577     | 0.0118             | W          | 08/06/2015  |         | 1499562         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102559  | FD             | INIT               | INORGANIC        | SW-846:6020       | Molybdenum        | U             | U                    | I4                      | N           | 1.13        | ug/L      | 1.13          | ug/L         |            |                    | W          | 08/06/2015  |         | 1499480         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | HASL-300:AM-241   | Americium-241     | U             | U                    | R5                      | N           | .0101       | pCi/L     | .0101         | pCi/L        | 0.0574     | 0.00534            | W          | 08/06/2015  |         | 1499559         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:901.1         | Cesium-137        | U             | U                    | R5                      | N           | .845        | pCi/L     | .845          | pCi/L        | 8.47       | 1.76               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:901.1         | Cobalt-60         | U             | U                    | R5                      | N           | 1.61        | pCi/L     | 1.61          | pCi/L        | 5.49       | 1.21               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:900           | Gross alpha       | U             | U                    | R5                      | N           | .708        | pCi/L     | .708          | pCi/L        | 3.00       | 0.822              | W          | 08/06/2015  |         | 1501030         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:900           | Gross beta        | U             | U                    | R5                      | N           | 1.78        | pCi/L     | 1.78          | pCi/L        | 2.80       | 0.879              | W          | 08/06/2015  |         | 1504918         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:901.1         | Neptunium-237     | U             | U                    | R5                      | N           | -2.29       | pCi/L     | -2.29         | pCi/L        | 10.3       | 3.00               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | HASL-300:ISOPU    | Plutonium-238     | U             | U                    | R5                      | N           | -.00801     | pCi/L     | -.00801       | pCi/L        | 0.0333     | 0.00491            | W          | 08/06/2015  |         | 1499560         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | HASL-300:ISOPU    | Plutonium-239/240 | U             | U                    | R5                      | N           | -.00601     | pCi/L     | -.00601       | pCi/L        | 0.0443     | 0.00448            | W          | 08/06/2015  |         | 1499560         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:901.1         | Potassium-40      | U             | U                    | R5                      | N           | -8.24       | pCi/L     | -8.24         | pCi/L        | 58.3       | 18.2               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:901.1         | Sodium-22         | U             | U                    | R5                      | N           | .298        | pCi/L     | .298          | pCi/L        | 5.70       | 1.44               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102580  | REG            | INIT               | RAD              | EPA:905.0         | Strontium-90      | U             | U                    | R5                      | N           | -.186       | pCi/L     | -.186         | pCi/L        | 0.475      | 0.128              | W          | 08/06/2015  |         | 1501028         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | HASL-300:AM-241   | Americium-241     | U             | U                    | R5                      | N           | .0000000013 | pCi/L     | .0000000013   | pCi/L        | 0.0557     | 0.00619            | W          | 08/06/2015  |         | 1499559         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | EPA:901.1         | Cesium-137        | U             | U                    | R5                      | N           | -1.06       | pCi/L     | -1.06         | pCi/L        | 4.94       | 1.44               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | EPA:901.1         | Cobalt-60         | U             | U                    | R5                      | N           | .595        | pCi/L     | .595          | pCi/L        | 5.03       | 1.40               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | EPA:900           | Gross alpha       | U             | U                    | R5                      | N           | -.919       | pCi/L     | -.919         | pCi/L        | 2.96       | 0.710              | W          | 08/06/2015  |         | 1501030         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | EPA:901.1         | Neptunium-237     | U             | U                    | R5                      | N           | -2.44       | pCi/L     | -2.44         | pCi/L        | 9.70       | 2.94               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | HASL-300:ISOPU    | Plutonium-238     | U             | U                    | R5                      | N           | -.0039      | pCi/L     | -.0039        | pCi/L        | 0.0324     | 0.00552            | W          | 08/06/2015  |         | 1499560         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | HASL-300:ISOPU    | Plutonium-239/240 | U             | U                    | R5                      | N           | -.00195     | pCi/L     | -.00195       | pCi/L        | 0.0431     | 0.00436            | W          | 08/06/2015  |         | 1499560         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | EPA:901.1         | Potassium-40      | U             | U                    | R5                      | N           | 17.6        | pCi/L     | 17.6          | pCi/L        | 45.9       | 18.1               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | EPA:901.1         | Sodium-22         | U             | U                    | R5                      | N           | .0258       | pCi/L     | .0258         | pCi/L        | 5.16       | 1.37               | W          | 08/06/2015  |         | 1499679         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | EPA:905.0         | Strontium-90      | U             | U                    | R5                      | N           | -.0584      | pCi/L     | -.0584        | pCi/L        | 0.484      | 0.133              | W          | 08/06/2015  |         | 1501028         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102581  | REG            | INIT               | RAD              | HASL-300:ISOU     | Uranium-235/236   | U             | U                    | R5                      | N           | .0494       | pCi/L     | .0494         | pCi/L        | 0.0537     | 0.0115             | W          | 08/06/2015  |         | 1499562         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102604  | REG            | INIT               | INORGANIC        | SW-846:6020       | Arsenic           | U             | U                    | I4                      | N           | 1.77        | ug/L      | 1.77          | ug/L         |            |                    | W          | 08/06/2015  |         | 1499480         | VAL                    | Y        |
| R-33 S1     | 2015-2084  | CAMO-15-102604  | REG            | INIT               | INORGANIC        | SW-846:6020       | Molybdenum        | U             | U                    | I4a                     | Y           | 1.15        | ug/L      | 1.15          | ug/L         |            |                    | W          | 08/06/2015  |         | 1499480         | VAL                    | Y        |
| R-33 S2     | 2015-2084  | CAMO-15-102605  | REG            | INIT               | INORGANIC        | SW-846:6020       | Molybdenum        | U             | U                    | I4                      | N           | .947        | ug/L      | .947          | ug/L         |            |                    | W          | 08/06/2015  |         | 1499480         | VAL                    | Y        |
| R-44 S1     | 2015-2084  | CAMO-15-102608  | REG            | INIT               | INORGANIC        | SW-846:6020       | Molybdenum        | U             | U                    | I4                      | N           | .865        | ug/L      | .865          | ug/L         |            |                    | W          | 08/06/2015  |         | 1499480         | VAL                    | Y        |
| R-44 S2     | 2015-2084  | CAMO-15-102609  | REG            | INIT               | INORGANIC        | SW-846:6020       | Molybdenum        | U             | U                    | I4                      | N           | .775        | ug/L      | .775          | ug/L         |            |                    | W          | 08/06/2015  |         | 1499480         | VAL                    | Y        |

Reason Code

Description

## DATA VALIDATION REPORT

### Reason Code

### Description

|       |   |
|-------|---|
| I4    | the sample result is =<5x the concentration of related analyte in the method blank.   |
| I4a   | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x                |
| 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 qualifire. The analyte is detected in the sample. |
| R5    | Analyte is not detected because the amount reported is less than the MDC.   |
| U_LAB | The analytical laboratory qualified the analyte as not detected.  |

### 14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-15-102558  | R-33 S1     | FD             | EPA:245.2         | 0                     | 1             |
| CAMO-15-102558  | R-33 S1     | FD             | EPA:335.4         | 0                     | 1             |
| CAMO-15-102558  | R-33 S1     | FD             | EPA:351.2         | 0                     | 1             |
| CAMO-15-102558  | R-33 S1     | FD             | EPA:900           | 0                     | 2             |
| CAMO-15-102558  | R-33 S1     | FD             | EPA:901.1         | 0                     | 5             |
| CAMO-15-102558  | R-33 S1     | FD             | EPA:905.0         | 0                     | 1             |
| CAMO-15-102558  | R-33 S1     | FD             | HASL-300:AM-241   | 0                     | 1             |
| CAMO-15-102558  | R-33 S1     | FD             | HASL-300:ISOPU    | 0                     | 2             |
| CAMO-15-102558  | R-33 S1     | FD             | HASL-300:ISOU     | 0                     | 3             |
| CAMO-15-102558  | R-33 S1     | FD             | SW-846:9060       | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:120.1         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:150.1         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:160.1         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:245.2         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:300.0         | 0                     | 4             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:310.1         | 0                     | 2             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:350.1         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:353.2         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | EPA:365.4         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | SM:A2340B         | 0                     | 1             |
| CAMO-15-102559  | R-33 S1     | FD             | SW-846:6010C      | 0                     | 17            |
| CAMO-15-102559  | R-33 S1     | FD             | SW-846:6020       | 0                     | 11            |
| CAMO-15-102559  | R-33 S1     | FD             | SW-846:6850       | 0                     | 1             |

## DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-15-102580  | R-33 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102580  | R-33 S1     | REG            | EPA:335.4         | 0                     | 1             |
| CAMO-15-102580  | R-33 S1     | REG            | EPA:351.2         | 0                     | 1             |
| CAMO-15-102580  | R-33 S1     | REG            | EPA:900           | 0                     | 2             |
| CAMO-15-102580  | R-33 S1     | REG            | EPA:901.1         | 0                     | 5             |
| CAMO-15-102580  | R-33 S1     | REG            | EPA:905.0         | 0                     | 1             |
| CAMO-15-102580  | R-33 S1     | REG            | HASL-300:AM-241   | 0                     | 1             |
| CAMO-15-102580  | R-33 S1     | REG            | HASL-300:ISOPU    | 0                     | 2             |
| CAMO-15-102580  | R-33 S1     | REG            | HASL-300:ISOU     | 0                     | 3             |
| CAMO-15-102580  | R-33 S1     | REG            | SW-846:9060       | 0                     | 1             |
| CAMO-15-102581  | R-33 S2     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102581  | R-33 S2     | REG            | EPA:335.4         | 0                     | 1             |
| CAMO-15-102581  | R-33 S2     | REG            | EPA:351.2         | 0                     | 1             |
| CAMO-15-102581  | R-33 S2     | REG            | EPA:900           | 0                     | 2             |
| CAMO-15-102581  | R-33 S2     | REG            | EPA:901.1         | 0                     | 5             |
| CAMO-15-102581  | R-33 S2     | REG            | EPA:905.0         | 0                     | 1             |
| CAMO-15-102581  | R-33 S2     | REG            | HASL-300:AM-241   | 0                     | 1             |
| CAMO-15-102581  | R-33 S2     | REG            | HASL-300:ISOPU    | 0                     | 2             |
| CAMO-15-102581  | R-33 S2     | REG            | HASL-300:ISOU     | 0                     | 3             |
| CAMO-15-102581  | R-33 S2     | REG            | SW-846:9060       | 0                     | 1             |
| CAMO-15-102584  | R-44 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102584  | R-44 S1     | REG            | EPA:335.4         | 0                     | 1             |
| CAMO-15-102584  | R-44 S1     | REG            | EPA:351.2         | 0                     | 1             |
| CAMO-15-102584  | R-44 S1     | REG            | SW-846:9060       | 0                     | 1             |
| CAMO-15-102585  | R-44 S2     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102585  | R-44 S2     | REG            | EPA:335.4         | 0                     | 1             |
| CAMO-15-102585  | R-44 S2     | REG            | EPA:351.2         | 0                     | 1             |
| CAMO-15-102585  | R-44 S2     | REG            | SW-846:9060       | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:120.1         | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:150.1         | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:160.1         | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:300.0         | 0                     | 4             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:310.1         | 0                     | 2             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:350.1         | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:353.2         | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | EPA:365.4         | 0                     | 1             |

## DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-15-102604  | R-33 S1     | REG            | SM:A2340B         | 0                     | 1             |
| CAMO-15-102604  | R-33 S1     | REG            | SW-846:6010C      | 0                     | 17            |
| CAMO-15-102604  | R-33 S1     | REG            | SW-846:6020       | 0                     | 11            |
| CAMO-15-102604  | R-33 S1     | REG            | SW-846:6850       | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:120.1         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:150.1         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:160.1         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:300.0         | 0                     | 4             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:310.1         | 0                     | 2             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:350.1         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:353.2         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | EPA:365.4         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | SM:A2340B         | 0                     | 1             |
| CAMO-15-102605  | R-33 S2     | REG            | SW-846:6010C      | 0                     | 17            |
| CAMO-15-102605  | R-33 S2     | REG            | SW-846:6020       | 0                     | 11            |
| CAMO-15-102605  | R-33 S2     | REG            | SW-846:6850       | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:120.1         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:150.1         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:160.1         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:300.0         | 0                     | 4             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:310.1         | 0                     | 2             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:350.1         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:353.2         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | EPA:365.4         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | SM:A2340B         | 0                     | 1             |
| CAMO-15-102608  | R-44 S1     | REG            | SW-846:6010C      | 0                     | 17            |
| CAMO-15-102608  | R-44 S1     | REG            | SW-846:6020       | 0                     | 11            |
| CAMO-15-102608  | R-44 S1     | REG            | SW-846:6850       | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:120.1         | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:150.1         | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:160.1         | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:300.0         | 0                     | 4             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:310.1         | 0                     | 2             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:350.1         | 0                     | 1             |



### DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-15-102609  | R-44 S2     | REG            | EPA:353.2         | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | EPA:365.4         | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | SM:A2340B         | 0                     | 1             |
| CAMO-15-102609  | R-44 S2     | REG            | SW-846:6010C      | 0                     | 17            |
| CAMO-15-102609  | R-44 S2     | REG            | SW-846:6020       | 0                     | 11            |
| CAMO-15-102609  | R-44 S2     | REG            | SW-846:6850       | 0                     | 1             |



September 03, 2015

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

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

Re: LANL- WQH Water Samples  
Work Order: 379019  
SDG: 2015-2084

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on August 11, 2015, and analyzed for General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. 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

Chain of Custody: 2015-2084  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 379019**  
**SDG: 2015-2084**

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 379019  
SDG # : 2015-2084**

**September 03, 2015**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on August 11, 2015 for analysis. The samples were 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 temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

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

| <b><u>Laboratory ID</u></b> | <b><u>Client ID</u></b> |
|-----------------------------|-------------------------|
| 379019001                   | CAMO-15-102580          |
| 379019002                   | CAMO-15-102604          |
| 379019003                   | CAMO-15-102558          |
| 379019004                   | CAMO-15-102559          |
| 379019005                   | CAMO-15-102581          |
| 379019006                   | CAMO-15-102605          |
| 379019007                   | CAMO-15-102584          |
| 379019008                   | CAMO-15-102608          |
| 379019009                   | CAMO-15-102585          |
| 379019010                   | CAMO-15-102609          |

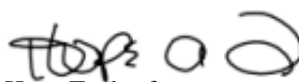
**Case Narrative**

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, Perchlorates by LCMSMS and Radiochemistry.

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.

A handwritten signature in black ink, appearing to read 'Hope Taylor'.

Hope Taylor for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 03 September 2015**

| <b>State</b>             | <b>Certification</b>         |
|--------------------------|------------------------------|
| Alaska                   | UST-110                      |
| Arkansas                 | 88-0651                      |
| CLIA                     | 42D0904046                   |
| California               | 2940 Interim                 |
| Colorado                 | SC00012                      |
| Connecticut              | PH-0169                      |
| Delaware                 | SC000122013-10               |
| DoD ELAP/ ISO17025 A2LA  | 2567.01                      |
| Florida NELAP            | E87156                       |
| Foreign Soils Permit     | P330-12-00283, P330-12-00284 |
| Georgia                  | SC00012                      |
| Georgia SDWA             | 967                          |
| Hawaii                   | SC000122013-10               |
| Idaho Chemistry          | SC00012                      |
| Idaho Radiochemistry     | SC00012                      |
| Illinois NELAP           | 200029                       |
| Indiana                  | C-SC-01                      |
| Kansas NELAP             | E-10332                      |
| Kentucky SDWA            | 90129                        |
| Kentucky Wastewater      | 90129                        |
| Louisiana NELAP          | 03046 (AI33904)              |
| Louisiana SDWA           | LA150001                     |
| Maryland                 | 270                          |
| Massachusetts            | M-SC012                      |
| Michigan                 | 9976                         |
| Mississippi              | SC000122013-10               |
| Nebraska                 | NE-OS-26-13                  |
| Nevada                   | SC000122016-1                |
| New Hampshire NELAP      | 2054                         |
| New Jersey NELAP         | SC002                        |
| New Mexico               | SC00012                      |
| New York NELAP           | 11501                        |
| North Carolina           | 233                          |
| North Carolina SDWA      | 45709                        |
| Oklahoma                 | 9904                         |
| Pennsylvania NELAP       | 68-00485                     |
| Plant Material Permit    | PDEP-12-00260                |
| S.Carolina Radchem       | 10120002                     |
| South Carolina Chemistry | 10120001                     |
| Tennessee                | TN 02934                     |
| Texas NELAP              | T104704235-15-10             |
| Utah NELAP               | SC000122015-18               |
| Vermont                  | VT87156                      |
| Virginia NELAP           | 460202                       |
| Washington               | C780                         |
| West Virginia            | 997404                       |



# **Chain of Custody and Supporting Documentation**

379019

|                     |  |   |  |  |  |               |  |             |  |                |  |  |  |                          |  |              |  |                     |  |         |  |             |  |
|---------------------|--|---|--|--|--|---------------|--|-------------|--|----------------|--|--|--|--------------------------|--|--------------|--|---------------------|--|---------|--|-------------|--|
| General Engineering |  | Chain of Custody/Analysis Request         |  |  |  |               |  |             |  |                |  | COC/Lab Request #:<br>2015-2084<br>Page 1 of 1         |  |                          |  |              |  |                     |  |         |  |             |  |
| Charleston SC       |  | Site Name: Los Alamos National Laboratory |  |  |  |               |  |             |  |                |  | Lab Agreement #:                                       |  |                          |  |              |  |                     |  |         |  |             |  |
| Client Contact:     |  | Project Number:                           |  | Analysis Turnaround Time:  |  | Sample Date   |  | Sample Time |  | Sample Matrix  |  | Rad Screening Info:                                    |  |                          |  |              |  |                     |  |         |  |             |  |
|                     |  |   |  | <input type="checkbox"/> 24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/><br><input type="checkbox"/> 7 Days - <input type="checkbox"/><br><input type="checkbox"/> 14 Days - <input type="checkbox"/><br><input type="checkbox"/> 21 Days - <input type="checkbox"/><br><input checked="" type="checkbox"/> 28 Days - <input type="checkbox"/> |  |               |  |             |  |                |  | Lab Reporting Limit Type:<br>Sample Quantitation Limit |  |                          |  |              |  |                     |  |         |  |             |  |
|                     |  |   |  |  |  |               |  |             |  |                |  |  |  |                          |  |              |  |                     |  |         |  |             |  |
| Field Sample ID     |  | Sample Date                               |  | Sample Time  |  | Sample Matrix |  | MSGP-Hg     |  | WSP-All Metals |  | WSP-CN(T)  |  | WSP-GENINORG+PerChlorate |  | WSP-GrossA/B |  | WSP-NH3+NO3/NO2+PO4 |  | WSP-RAD |  | WSP-TKN+TOC |  |
|                     |  |   |  |  |  |               |  |             |  |                |  |  |  |                          |  |              |  |                     |  |         |  |             |  |
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|                     |  |   |  |  |  |               |  |             |  |                |  |  |  |                          |  |              |  |                     |  |         |  |             |  |

**SAMPLE RECEIPT & REVIEW FORM**

|  |   |  |  |
|--|---|--|--|
| Client: <b>LANL</b>  |   | SDG/AR/COC/Work Order: <b>2015-2084</b>  |  |
| Received By: <b>Brielle Luthman</b>                                      |   | Date Received: <b>8/11/15 0845</b>   |  |
| Suspected Hazard Information   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |  |
| COC/Samples marked as radioactive?                                       | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <b>0</b>  |  |
| Classified Radioactive II or III by RSO?                                 | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | If yes, Were swipes taken of sample containers < action levels? <b>0</b>   |  |
| COC/Samples marked containing PCBs?                                      | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |  |  |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.                     |  |
| Shipped as a DOT Hazardous?  | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Hazard Class Shipped: UN#:   |  |
| Samples identified as Foreign Soil?                                      | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |  |  |

| Sample Receipt Criteria   | Yes                                 | NA                       | No                                  | Comments/Qualifiers (Required for Non-Conforming Items)   |
|---|-------------------------------------|--------------------------|-------------------------------------|---|
| 1 Shipping containers received intact and sealed?                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Circle Applicable:<br>Seals broken Damaged container Leaking container Other (describe)   |
| 2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Preservation Method: Ice bags <b>Blue ice</b> Dry ice None Other (describe)<br>*all temperatures are recorded in Celsius  |
| 2a Daily check performed and passed on IR temperature gun?                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Temperature Device Serial #:<br>Secondary Temperature Device Serial # (If Applicable): <b>E5032015835</b>   |
| 3 Chain of custody documents included with shipment?                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |   |
| 4 Sample containers intact and sealed?                                    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Circle Applicable:<br>Seals broken Damaged container Leaking container Other (describe)   |
| 5 Samples requiring chemical preservation at proper pH?                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Sample ID's, containers affected and observed pH:<br>If Preservation added, Lot#:   |
| 6 Do Low Level Perchlorate samples (EPA 6850) have headspace as required? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Sample ID's and containers affected:  |
| 7 VOA vials free of headspace (defined as < 6mm bubble)?                  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Sample ID's and containers affected:  |
| 8 Are Encore containers present?  | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | (If yes, immediately deliver to Volatiles laboratory)   |
| 9 Samples received within holding time?                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | ID's and tests affected:  |
| 10 Sample ID's on COC match ID's on bottles?                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Sample ID's and containers affected:  |
| 11 Date & time on COC match date & time on bottles?                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Sample ID's affected:   |
| 12 Number of containers received match number indicated on COC?           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Sample ID's affected:   |
| 13 Are sample containers identifiable as GEL provided?                    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |   |
| 14 COC form is properly signed in relinquished/received sections?         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |   |
| 15 Carrier and tracking number.   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | Circle Applicable:<br><b>FedEx Air</b> FedEx Ground UPS Field Services Courier Other<br><br><b>5908 1779 3028-2°</b><br><b>5908 1779 2970-1°</b><br><b>5908 1779 2960-22°</b> |

Comments (Use Continuation Form if needed):

ORIGIN ID:SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 10AUG15  
ACTWGT: 46.0 LB MAN  
CAD: 0014176/CAFE2807

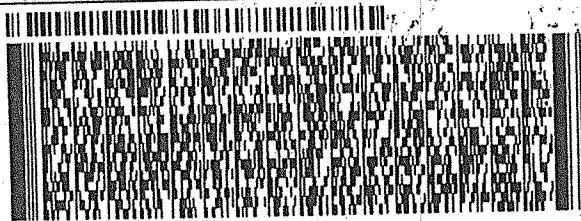
BILL SENDER

10 VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: MRSW12CHWCA0



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J1412140/2001UV

2 of 2

MP# 5908 1779 3028

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Mstr# 5908 1779 3017

0201

X7 CHSA

TUE - 11 AUG 10:30A  
PRIORITY OVERNIGHT

2

29407

SC-US CHS

Part # 156149-434 RIT2 10/11 \*\*



ORIGIN ID:SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 10AUG15  
ACTWGT: 50.0 LB MAN  
CAD: 0014176/CAFE2807

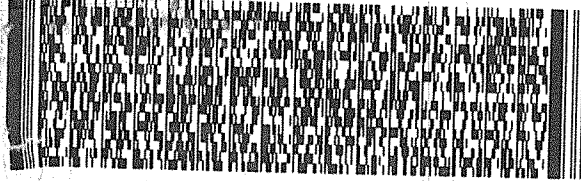
BILL SENDER

TO **VALERIE DAVIS**  
**GENERAL ENGINEERING LAB**  
**2040 SAVAGE RD**

**CHARLESTON SC 29407**

(843) 666-8171

REF: MRSW12CHWCFO



**FedEx**  
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J14121407308100

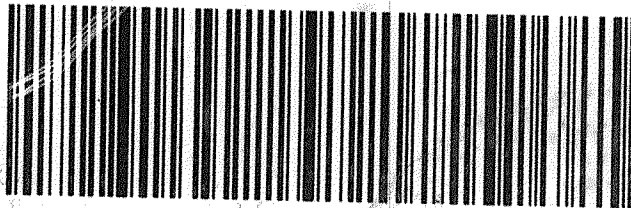
RK# 5908 1779 2970  
201

**TUE - 11 AUG 10:30A**  
**PRIORITY OVERNIGHT**

**X7 CHSA**

**29407**  
**SC-US CHS**

PSN# 155143-434 RT2 10/11 %



ORIGIN ID:SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 10AUG15  
ACTWGT: 59.0 LB MAN  
CAD: 0014176/CAFE2807

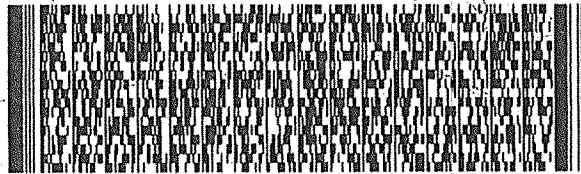
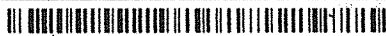
BILL SENDER

0 **VALERIE DAVIS**  
**GENERAL ENGINEERING LAB**  
**2040 SAVAGE RD**

**CHARLESTON SC 29407**

(843) 566-8171

REF: MRGW04BAGWED



**FedEx**  
Express



J141214073001uv

TRK# 5908 1779 2960  
0201

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**PRIORITY OVERNIGHT**

**X7 CHSA 22°**

**29407**

SC-US CHS

Part # 150148-434 RIT2 10/11



# **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.  |



P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.  
For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2015-2084  
Work Order #: 379019**

**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: 1500488

Prep Batch Number: 1500487

**Sample Analysis**

| <b>Sample ID</b> | <b>Client ID</b>                                       |
|------------------|--|
| 379019002        | CAMO-15-102604   |
| 379019004        | CAMO-15-102559   |
| 379019006        | CAMO-15-102605   |
| 379019008        | CAMO-15-102608   |
| 379019010        | CAMO-15-102609   |
| 1203374489       | Interference Check Sample (ICS)                        |
| 1203374485       | Method Blank (MB)                                      |
| 1203374486       | Laboratory Control Sample (LCS)                        |
| 1203374487       | 379019004(CAMO-15-102559) Matrix Spike (MS)            |
| 1203374488       | 379019004(CAMO-15-102559) 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# 12.

### **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.

#### **ICV Requirements**

All associated initial calibration verification standard(s) (ICV) 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 analyzed with this SDG met the acceptance criteria.

#### **Interference Check Sample (ICS)**

The ICS spike recoveries met the acceptance criteria.

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

The LCS spike recoveries met the acceptance limits.

#### **QC Sample Designation**

Client sample 379019004 (CAMO-15-102559) was chosen for matrix spike and matrix spike duplicate analysis.

#### **Matrix Spike (MS) Recovery Statement**

The MS recoveries were within the established acceptance limits.

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

The RPDs 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**

Sample 379019002 (CAMO-15-102604) was re-analyzed to confirm potential carryover from the previous sample analysis. The re-analysis data were reported. The 1203374486 (LCS) was re-analyzed due to non-conforming spike recoveries in the initial analysis. The re-analysis met acceptance criteria, and the data are reported.

## **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.

### **Manual Integrations**

Manual integrations were not required for any data file associated with this SDG.

### **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 a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. 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**

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

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

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-2084 GEL Work Order: 379019


#### 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: Michael Penny

Date: 19 AUG 2015

Title: Group Leader



# **Sample Data Summary**

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102604Date Received: 11-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 379019002Date Filtered: 14-AUG-15Injection 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 | 0.398 | ug/L  |   | 1               | 15-AUG-15 13:48 | per0815014a |
|            | Perchlorate Isotope Ratio |     |    | 3.06  |       |   | 1               | 15-AUG-15 13:48 | per0815014a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.413 | ug/L  |   | 1               | 15-AUG-15 13:48 | per0815014a |
|            | Perchlorate-O(18)         |     |    | 0.491 | ug/L  |   | 1               | 15-AUG-15 13:48 | per0815014a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102559Date Received: 11-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 379019004Date Filtered: 14-AUG-15Injection 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 | 0.404 | ug/L  |   | 1               | 14-AUG-15 22:51 | per0814018a |
|            | Perchlorate Isotope Ratio |     |    | 3.18  |       |   | 1               | 14-AUG-15 22:51 | per0814018a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.393 | ug/L  |   | 1               | 14-AUG-15 22:51 | per0814018a |
|            | Perchlorate-O(18)         |     |    | 0.479 | ug/L  |   | 1               | 14-AUG-15 22:51 | per0814018a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102605Date Received: 11-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 379019006Date Filtered: 14-AUG-15Injection 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 | 0.350 | ug/L  |   | 1               | 14-AUG-15 23:30 | per0814021a |
|            | Perchlorate Isotope Ratio |     |    | 3.08  |       |   | 1               | 14-AUG-15 23:30 | per0814021a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.351 | ug/L  |   | 1               | 14-AUG-15 23:30 | per0814021a |
|            | Perchlorate-O(18)         |     |    | 0.468 | ug/L  |   | 1               | 14-AUG-15 23:30 | per0814021a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102608Date Received: 11-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 379019008Date Filtered: 14-AUG-15Injection 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 | 0.435 | ug/L  |   | 1               | 15-AUG-15 00:22 | per0814025a |
|            | Perchlorate Isotope Ratio |     |    | 2.94  |       |   | 1               | 15-AUG-15 00:22 | per0814025a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.456 | ug/L  |   | 1               | 15-AUG-15 00:22 | per0814025a |
|            | Perchlorate-O(18)         |     |    | 0.476 | ug/L  |   | 1               | 15-AUG-15 00:22 | per0814025a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102609Date Received: 11-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 379019010Date Filtered: 14-AUG-15Injection 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 | 0.358 | ug/L  |   | 1               | 15-AUG-15 00:35 | per0814026a |
|            | Perchlorate Isotope Ratio |     |    | 3.08  |       |   | 1               | 15-AUG-15 00:35 | per0814026a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.359 | ug/L  |   | 1               | 15-AUG-15 00:35 | per0814026a |
|            | Perchlorate-O(18)         |     |    | 0.493 | ug/L  |   | 1               | 15-AUG-15 00:35 | per0814026a |

^ 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): 2015-2084

Extract Batch Code: 1500487

Date Filtered: 14-AUG-15

Matrix: WATER

Sample ID: 1203374486

| Analyte^                  | True  | Found | Units | %Rec | Q | Control Limits |
|---------------------------|-------|-------|-------|------|---|----------------|
| Perchlorate               | 0.200 | .195  | ug/L  | 97.5 |   | 85 - 115       |
| Perchlorate Isotope Ratio |       | 3.04  |       |      |   | -              |
| Perchlorate-101           | 0.200 | .203  | ug/L  | 102  |   | 85 - 115       |
| Perchlorate-O(18)         |       | .463  | 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):** 2015-2084

**Extract Batch Code:** 1500487

**Date Extracted:** 14-AUG-15

**GEL MS/PS ID:** 1203374487

**Client ID:** CAMO-15-102559

**GEL MSD/PSD ID:** 1203374488

**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       | 0.404       | ug/L  | 0.591   | 93.5     | .566     | 81.2      | 4.27  | 30        | 75 - 125       |
| Perchlorate Isotope Ratio | 0           | 3.18        |       | 3.14    |          | 3        |           | 4.64  |           | -              |
| Perchlorate-101           | 0.200       | 0.393       | ug/L  | 0.581   | 94.3     | .584     | 95.4      | .362  | 30        | 75 - 125       |
| Perchlorate-O(18)         | 0           | 0.479       | ug/L  | 0.480   |          | .49      |           | 2.11  |           | -              |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 14-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 1203374485Date Filtered: 14-AUG-15Injection 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 | 0.200 | ug/L  | U | 1               | 14-AUG-15 21:34 | per0814012a |
|            | Perchlorate Isotope Ratio |     |    |       |       |   | 1               | 14-AUG-15 21:34 | per0814012a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.200 | ug/L  | U | 1               | 14-AUG-15 21:34 | per0814012a |
|            | Perchlorate-O(18)         |     |    | 0.486 | ug/L  |   | 1               | 14-AUG-15 21:34 | per0814012a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 14-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 1203374486Date Filtered: 14-AUG-15Injection 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 | 0.195 | ug/L  | J | 1               | 15-AUG-15 13:21 | per0815012a |
|            | Perchlorate Isotope Ratio |     |    | 3.04  |       |   | 1               | 15-AUG-15 13:21 | per0815012a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.203 | ug/L  |   | 1               | 15-AUG-15 13:21 | per0815012a |
|            | Perchlorate-O(18)         |     |    | 0.463 | ug/L  |   | 1               | 15-AUG-15 13:21 | per0815012a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2015-2084GEL Sample ID: 1203374489Date Filtered: 14-AUG-15Injection 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 | 0.241 | ug/L  |   | 1               | 14-AUG-15 22:00 | per0814014a |
|            | Perchlorate Isotope Ratio |     |    | 3.09  |       |   | 1               | 14-AUG-15 22:00 | per0814014a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.241 | ug/L  |   | 1               | 14-AUG-15 22:00 | per0814014a |
|            | Perchlorate-O(18)         |     |    | 0.514 | ug/L  |   | 1               | 14-AUG-15 22:00 | per0814014a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102559MSDate Received: 11-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 1203374487Date Filtered: 14-AUG-15Injection 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 | 0.591 | ug/L  |   | 1               | 14-AUG-15 23:04 | per0814019a |
|            | Perchlorate Isotope Ratio |     |    | 3.14  |       |   | 1               | 14-AUG-15 23:04 | per0814019a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.581 | ug/L  |   | 1               | 14-AUG-15 23:04 | per0814019a |
|            | Perchlorate-O(18)         |     |    | 0.480 | ug/L  |   | 1               | 14-AUG-15 23:04 | per0814019a |

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102559MSDDate Received: 11-AUG-15GEL Job No (SDG): 2015-2084GEL Sample ID: 1203374488Date Filtered: 14-AUG-15Injection 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 | 0.566 | ug/L  |   | 1               | 14-AUG-15 23:17 | per0814020a |
|            | Perchlorate Isotope Ratio |     |    | 3     |       |   | 1               | 14-AUG-15 23:17 | per0814020a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.584 | ug/L  |   | 1               | 14-AUG-15 23:17 | per0814020a |
|            | Perchlorate-O(18)         |     |    | 0.490 | ug/L  |   | 1               | 14-AUG-15 23:17 | per0814020a |

^ 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**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2015-2084**  
**Work Order #: 379019**

| <b>Sample ID</b> | <b>Client ID</b>                                  |
|------------------|---|
| 379019001        | CAMO-15-102580                                    |
| 379019002        | CAMO-15-102604                                    |
| 379019003        | CAMO-15-102558                                    |
| 379019004        | CAMO-15-102559                                    |
| 379019005        | CAMO-15-102581                                    |
| 379019006        | CAMO-15-102605                                    |
| 379019007        | CAMO-15-102584                                    |
| 379019008        | CAMO-15-102608                                    |
| 379019009        | CAMO-15-102585                                    |
| 379019010        | CAMO-15-102609                                    |
| 1203371766       | Method Blank (MB) <b>ICP</b>                      |
| 1203371767       | Laboratory Control Sample (LCS)                   |
| 1203371770       | 379011002(CASA-15-102647L) Serial Dilution (SD)   |
| 1203371768       | 379011002(CASA-15-102647D) Sample Duplicate (DUP) |
| 1203371769       | 379011002(CASA-15-102647S) Matrix Spike (MS)      |
| 1203371800       | Method Blank (MB) <b>ICP-MS</b>                   |
| 1203371801       | Laboratory Control Sample (LCS)                   |
| 1203371804       | 379011002(CASA-15-102647L) Serial Dilution (SD)   |
| 1203371802       | 379011002(CASA-15-102647D) Sample Duplicate (DUP) |
| 1203371803       | 379011002(CASA-15-102647S) Matrix Spike (MS)      |
| 1203382647       | Method Blank (MB) <b>CVAA</b>                     |
| 1203382648       | Laboratory Control Sample (LCS)                   |
| 1203382653       | 379110004(WTESR-15-97804L) Serial Dilution (SD)   |
| 1203382649       | 379110004(WTESR-15-97804D) Sample Duplicate (DUP) |
| 1203382651       | 379110004(WTESR-15-97804S) Matrix Spike (MS)      |

**Sample Analysis**

**Method/Analysis Information**

|                                       |   |
|---------------------------------------|---|
| <b>Analytical Batch:</b>              | 1499471, 1499480, 1503572 and 1501953   |
| <b>Prep Batch :</b>                   | 1499470, 1499479 and 1503571  |
| <b>Standard Operating Procedures:</b> | GL-MA-E-013 REV# 24, GL-MA-E-006 REV# 12, GL-MA-E-014 REV# 26, GL-MA-E-010 REV# 30 and GL-GC-E-107 REV# 9 |
| <b>Analytical Method:</b>             | SW846 3005A/6010C, SW846 3005A/6020A, 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 an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

### **Calibration Information**

#### **Instrument Calibration**

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

#### **CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 379019002 (CAMO-15-102604), 379019004 (CAMO-15-102559), 379019006 (CAMO-15-102605), 379019008 (CAMO-15-102608) and 379019010 (CAMO-15-102609)-ICP.

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

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

#### **Continuing Calibration Blanks (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: 379011002 (CASA-15-102647)-ICP and ICP-MS and 379110004 (WTESR-15-97804)-CVAA.

**Matrix Spike (MS/MSD) Recovery Statement**

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

**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 reporting 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. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

**Serial Dilution % Difference Statement**

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

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

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. 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**

The samples in this SDG did not require dilutions.

**Preparation Information**

The samples in this SDG were not diluted and prepared 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**

A data exception report was not required for this SDG.

**Additional Comments**

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

$$\text{Hardness} = 2.497 (\text{Ca}) + 4.118 (\text{Mg})$$

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.

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-2084 GEL Work Order: 379019

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

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

#### **Review/Validation**

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

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

**Signature:**



**Name: Nik-Cole Elmore**

**Date: 04 SEP 2015**

**Title: Data Validator**

# **Sample Data Summary**

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019001**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102580**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:18 | 082715W1-7     | 1503572          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1503572          | 1503571    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 08/27/15 | MTM1    |

**\*Analytical Methods:**

AV EPA 245.1/245.2



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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019002**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102604**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:20 | 082715W1-7     | 1503572          |

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

SDG No: 2015-2084

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379019002

BASIS: As Received

DATE COLLECTED 06-AUG-15

CLIENT ID: CAMO-15-102604

LEVEL: Low

DATE RECEIVED 11-AUG-15

MATRIX: W

%SOLIDS: 0

| CAS No.   | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | PRB     | 09/02/15 01:44 | 150901-6       | 1499480          |
| 7440-38-2 | Arsenic    | 1.77   | ug/L  | J    | 1.7   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7440-39-3 | Barium     | 32.1   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-43-9 | Cadmium    | 0.110  | ug/L  | U    | 0.11  | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7440-70-2 | Calcium    | 11800  | ug/L  |      | 50    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-47-3 | Chromium   | 4.89   | ug/L  | J    | 2     | 10  | 10   | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7440-48-4 | Cobalt     | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7439-95-4 | Magnesium  | 3970   | ug/L  |      | 110   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7439-98-7 | Molybdenum | 1.15   | ug/L  |      | 0.165 | 0.5 | 0.5  | 1  | MS | PRB     | 09/02/15 01:44 | 150901-6       | 1499480          |
| 7440-02-0 | Nickel     | 0.745  | ug/L  | J    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7440-09-7 | Potassium  | 1500   | ug/L  |      | 50    | 150 | 150  | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7782-49-2 | Selenium   | 1.5    | ug/L  | U    | 1.5   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7631-86-9 | Silica     | 74400  | ug/L  |      | 53    | 213 | 213  | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-22-4 | Silver     | 0.20   | ug/L  | U    | 0.2   | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7440-23-5 | Sodium     | 11400  | ug/L  |      | 100   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-24-6 | Strontium  | 46.8   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-28-0 | Thallium   | 0.450  | ug/L  | U    | 0.45  | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:12 | 150901-2       | 1499480          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-61-1 | Uranium    | 0.759  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | PRB     | 09/02/15 01:44 | 150901-6       | 1499480          |
| 7440-62-2 | Vanadium   | 5.36   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:40 | 081715A-1      | 1499471          |

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 379019002**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102604**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|---------|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|         | Hardness as CaCO3 | 45.7   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | JJ2     | 08/20/15 10:45 |                | 1501953          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1499471          | 1499470    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |
| 1499480          | 1499479    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |

|         |         |                      |    |    |    |    |          |      |
|---------|---------|----------------------|----|----|----|----|----------|------|
| 1503572 | 1503571 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 08/27/15 | MTM1 |
|---------|---------|----------------------|----|----|----|----|----------|------|

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.1/245.2

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019003**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102558**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:22 | 082715W1-7     | 1503572          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1503572          | 1503571    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 08/27/15 | MTM1    |

**\*Analytical Methods:**

AV EPA 245.1/245.2

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019004**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102559**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:24 | 082715W1-7     | 1503572          |

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

SDG No: 2015-2084

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379019004

BASIS: As Received

DATE COLLECTED 06-AUG-15

CLIENT ID: CAMO-15-102559

LEVEL: Low

DATE RECEIVED 11-AUG-15

MATRIX: W

%SOLIDS: 0

| CAS No.   | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | PRB     | 09/02/15 01:46 | 150901-6       | 1499480          |
| 7440-38-2 | Arsenic    | 1.7    | ug/L  | U    | 1.7   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7440-39-3 | Barium     | 30.5   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-43-9 | Cadmium    | 0.110  | ug/L  | U    | 0.11  | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7440-70-2 | Calcium    | 11400  | ug/L  |      | 50    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-47-3 | Chromium   | 4.8    | ug/L  | J    | 2     | 10  | 10   | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7440-48-4 | Cobalt     | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7439-95-4 | Magnesium  | 3830   | ug/L  |      | 110   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7439-98-7 | Molybdenum | 1.13   | ug/L  |      | 0.165 | 0.5 | 0.5  | 1  | MS | PRB     | 09/02/15 01:46 | 150901-6       | 1499480          |
| 7440-02-0 | Nickel     | 0.754  | ug/L  | J    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7440-09-7 | Potassium  | 1410   | ug/L  |      | 50    | 150 | 150  | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7782-49-2 | Selenium   | 1.5    | ug/L  | U    | 1.5   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7631-86-9 | Silica     | 72100  | ug/L  |      | 53    | 213 | 213  | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-22-4 | Silver     | 0.20   | ug/L  | U    | 0.2   | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7440-23-5 | Sodium     | 11200  | ug/L  |      | 100   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-24-6 | Strontium  | 45.3   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-28-0 | Thallium   | 0.450  | ug/L  | U    | 0.45  | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:15 | 150901-2       | 1499480          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-61-1 | Uranium    | 0.731  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | PRB     | 09/02/15 01:46 | 150901-6       | 1499480          |
| 7440-62-2 | Vanadium   | 5.41   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:44 | 081715A-1      | 1499471          |

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 379019004**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102559**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|---------|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|         | Hardness as CaCO3 | 44.3   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | JJ2     | 08/20/15 10:45 |                | 1501953          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1499471          | 1499470    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |
| 1499480          | 1499479    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |

|         |         |                      |    |    |    |    |          |      |
|---------|---------|----------------------|----|----|----|----|----------|------|
| 1503572 | 1503571 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 08/27/15 | MTM1 |
|---------|---------|----------------------|----|----|----|----|----------|------|

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.1/245.2

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019005**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102581**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:25 | 082715W1-7     | 1503572          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1503572          | 1503571    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 08/27/15 | MTM1    |

**\*Analytical Methods:**

AV EPA 245.1/245.2



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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019006**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102605**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:27 | 082715W1-7     | 1503572          |

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

SDG No: 2015-2084

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379019006

BASIS: As Received

DATE COLLECTED 06-AUG-15

CLIENT ID: CAMO-15-102605

LEVEL: Low

DATE RECEIVED 11-AUG-15

MATRIX: W

%SOLIDS: 0

| CAS No.   | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | PRB     | 09/02/15 01:49 | 150901-6       | 1499480          |
| 7440-38-2 | Arsenic    | 1.7    | ug/L  | U    | 1.7   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7440-39-3 | Barium     | 36.3   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-43-9 | Cadmium    | 0.110  | ug/L  | U    | 0.11  | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7440-70-2 | Calcium    | 11400  | ug/L  |      | 50    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-47-3 | Chromium   | 5.52   | ug/L  | J    | 2     | 10  | 10   | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7440-48-4 | Cobalt     | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7439-95-4 | Magnesium  | 4320   | ug/L  |      | 110   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7439-98-7 | Molybdenum | 0.947  | ug/L  |      | 0.165 | 0.5 | 0.5  | 1  | MS | PRB     | 09/02/15 01:49 | 150901-6       | 1499480          |
| 7440-02-0 | Nickel     | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7440-09-7 | Potassium  | 2370   | ug/L  |      | 50    | 150 | 150  | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7782-49-2 | Selenium   | 1.5    | ug/L  | U    | 1.5   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7631-86-9 | Silica     | 80100  | ug/L  |      | 53    | 213 | 213  | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-22-4 | Silver     | 0.20   | ug/L  | U    | 0.2   | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7440-23-5 | Sodium     | 11200  | ug/L  |      | 100   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-24-6 | Strontium  | 46.5   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-28-0 | Thallium   | 0.450  | ug/L  | U    | 0.45  | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:18 | 150901-2       | 1499480          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-61-1 | Uranium    | 0.815  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | PRB     | 09/02/15 01:49 | 150901-6       | 1499480          |
| 7440-62-2 | Vanadium   | 5.37   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:47 | 081715A-1      | 1499471          |

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 379019006**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102605**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|---------|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|         | Hardness as CaCO3 | 46.3   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | JJ2     | 08/20/15 10:45 |                | 1501953          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1499471          | 1499470    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |
| 1499480          | 1499479    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |

|         |         |                      |    |    |    |    |          |      |
|---------|---------|----------------------|----|----|----|----|----------|------|
| 1503572 | 1503571 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 08/27/15 | MTM1 |
|---------|---------|----------------------|----|----|----|----|----------|------|

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.1/245.2

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019007**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102584**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:29 | 082715W1-7     | 1503572          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|------|---------|
|------------------|------------|-------------|------------------|-------|----------------|-------|------|---------|

|         |         |                      |    |    |    |    |          |      |
|---------|---------|----------------------|----|----|----|----|----------|------|
| 1503572 | 1503571 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 08/27/15 | MTM1 |
|---------|---------|----------------------|----|----|----|----|----------|------|

**\*Analytical Methods:**

AV EPA 245.1/245.2

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019008**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102608**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:30 | 082715W1-7     | 1503572          |

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

SDG No: 2015-2084

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379019008

BASIS: As Received

DATE COLLECTED 06-AUG-15

CLIENT ID: CAMO-15-102608

LEVEL: Low

DATE RECEIVED 11-AUG-15

MATRIX: W

%SOLIDS: 0

| CAS No.   | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | PRB     | 09/02/15 01:51 | 150901-6       | 1499480          |
| 7440-38-2 | Arsenic    | 1.7    | ug/L  | U    | 1.7   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7440-39-3 | Barium     | 20.3   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-43-9 | Cadmium    | 0.110  | ug/L  | U    | 0.11  | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7440-70-2 | Calcium    | 12400  | ug/L  |      | 50    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-47-3 | Chromium   | 15.6   | ug/L  |      | 2     | 10  | 10   | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7440-48-4 | Cobalt     | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7439-95-4 | Magnesium  | 3530   | ug/L  |      | 110   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7439-98-7 | Molybdenum | 0.865  | ug/L  |      | 0.165 | 0.5 | 0.5  | 1  | MS | PRB     | 09/02/15 01:51 | 150901-6       | 1499480          |
| 7440-02-0 | Nickel     | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7440-09-7 | Potassium  | 1070   | ug/L  |      | 50    | 150 | 150  | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7782-49-2 | Selenium   | 1.5    | ug/L  | U    | 1.5   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7631-86-9 | Silica     | 65500  | ug/L  |      | 53    | 213 | 213  | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-22-4 | Silver     | 0.20   | ug/L  | U    | 0.2   | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7440-23-5 | Sodium     | 8610   | ug/L  |      | 100   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-24-6 | Strontium  | 49.5   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-28-0 | Thallium   | 0.450  | ug/L  | U    | 0.45  | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:21 | 150901-2       | 1499480          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-61-1 | Uranium    | 0.375  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | PRB     | 09/02/15 01:51 | 150901-6       | 1499480          |
| 7440-62-2 | Vanadium   | 4.6    | ug/L  | J    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:50 | 081715A-1      | 1499471          |

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 379019008**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102608**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|---------|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|         | Hardness as CaCO3 | 45.4   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | JJ2     | 08/20/15 10:45 |                | 1501953          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1499471          | 1499470    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |
| 1499480          | 1499479    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |

|         |         |                      |    |    |    |    |          |      |
|---------|---------|----------------------|----|----|----|----|----------|------|
| 1503572 | 1503571 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 08/27/15 | MTM1 |
|---------|---------|----------------------|----|----|----|----|----------|------|

**\*Analytical Methods:****P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.1/245.2

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019009**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102585**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:35 | 082715W1-7     | 1503572          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|------|---------|
|------------------|------------|-------------|------------------|-------|----------------|-------|------|---------|

|         |         |                      |    |    |    |    |          |      |
|---------|---------|----------------------|----|----|----|----|----------|------|
| 1503572 | 1503571 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 08/27/15 | MTM1 |
|---------|---------|----------------------|----|----|----|----|----------|------|

**\*Analytical Methods:**

AV EPA 245.1/245.2



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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 379019010**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102609**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No.   | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 08/27/15 15:37 | 082715W1-7     | 1503572          |

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

SDG No: 2015-2084

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379019010

BASIS: As Received

DATE COLLECTED 06-AUG-15

CLIENT ID: CAMO-15-102609

LEVEL: Low

DATE RECEIVED 11-AUG-15

MATRIX: W

%SOLIDS: 0

| CAS No.   | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | PRB     | 09/02/15 01:53 | 150901-6       | 1499480          |
| 7440-38-2 | Arsenic    | 1.7    | ug/L  | U    | 1.7   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7440-39-3 | Barium     | 22.1   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-43-9 | Cadmium    | 0.110  | ug/L  | U    | 0.11  | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7440-70-2 | Calcium    | 13100  | ug/L  |      | 50    | 200 | 200  | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-47-3 | Chromium   | 7.72   | ug/L  | J    | 2     | 10  | 10   | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7440-48-4 | Cobalt     | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7439-95-4 | Magnesium  | 4180   | ug/L  |      | 110   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7439-98-7 | Molybdenum | 0.775  | ug/L  |      | 0.165 | 0.5 | 0.5  | 1  | MS | PRB     | 09/02/15 01:53 | 150901-6       | 1499480          |
| 7440-02-0 | Nickel     | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7440-09-7 | Potassium  | 1250   | ug/L  |      | 50    | 150 | 150  | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7782-49-2 | Selenium   | 1.5    | ug/L  | U    | 1.5   | 5   | 5    | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7631-86-9 | Silica     | 70400  | ug/L  |      | 53    | 213 | 213  | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-22-4 | Silver     | 0.20   | ug/L  | U    | 0.2   | 1   | 1    | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7440-23-5 | Sodium     | 9520   | ug/L  |      | 100   | 300 | 300  | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-24-6 | Strontium  | 51.6   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-28-0 | Thallium   | 0.450  | ug/L  | U    | 0.45  | 2   | 2    | 1  | MS | PRB     | 09/01/15 18:24 | 150901-2       | 1499480          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-61-1 | Uranium    | 0.450  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | PRB     | 09/02/15 01:53 | 150901-6       | 1499480          |
| 7440-62-2 | Vanadium   | 5.76   | ug/L  |      | 1     | 5   | 5    | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | HSC     | 08/17/15 16:53 | 081715A-1      | 1499471          |

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

**SDG No:** 2015-2084**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 379019010**BASIS:** As Received**DATE COLLECTED** 06-AUG-15**CLIENT ID:** CAMO-15-102609**LEVEL:** Low**DATE RECEIVED** 11-AUG-15**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|---------|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|         | Hardness as CaCO3 | 50     | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | JJ2     | 08/20/15 10:45 |                | 1501953          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1499471          | 1499470    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |
| 1499480          | 1499479    | SW846 3005A | 50               | mL    | 50             | mL    | 08/11/15 | JP1     |

|         |         |                      |    |    |    |    |          |      |
|---------|---------|----------------------|----|----|----|----|----------|------|
| 1503572 | 1503571 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 08/27/15 | MTM1 |
|---------|---------|----------------------|----|----|----|----|----------|------|

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.1/245.2

# **Quality Control Summary**

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

SDG NO. 2015-2084

Contract: ESHL00114

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> |
|------------------|----------------|---------------|--------------|--------------------------|------------------|-----------|------------|------------|
| 1203371766       | 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         | 53            | ug/L         | +/-213                   | U                | P         | 53         | 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         |
| 1203371800       | Antimony       | 1             | ug/L         | +/-3                     | U                | MS        | 1          | 3          |
|                  | Arsenic        | 3.12          | ug/L         | +/-5                     | J                | 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     | 0.227         | ug/L         | +/-0.5                   | J                | 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        |
| 1203382647       | Mercury        | 0.067         | ug/L         | +/-0.2                   | U                | AV        | 0.067      | 0.2        |

## \*Analytical Methods:

P SW846 3005A/6010C  
MS SW846 3005A/6020A  
AV EPA 245.1/245.2

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2015-2084

Client ID: CASA-15-102647S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 379011002

Spike ID: 1203371769

| <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                      | 5100                     |          | 68                       | U        | 5000                   | 102                   |             | P         |
| Barium         | ug/L         | 75-125                      | 571                      |          | 43.4                     |          | 500                    | 105                   |             | P         |
| Beryllium      | ug/L         | 75-125                      | 530                      |          | 1                        | U        | 500                    | 106                   |             | P         |
| Boron          | ug/L         | 75-125                      | 575                      |          | 32.1                     | J        | 500                    | 109                   |             | P         |
| Calcium        | ug/L         |                             | 29000                    |          | 24500                    |          | 5000                   | 90.8                  | N/A         | P         |
| Cobalt         | ug/L         | 75-125                      | 515                      |          | 1                        | U        | 500                    | 103                   |             | P         |
| Copper         | ug/L         | 75-125                      | 544                      |          | 3                        | U        | 500                    | 109                   |             | P         |
| Iron           | ug/L         | 75-125                      | 5340                     |          | 30                       | U        | 5000                   | 107                   |             | P         |
| Magnesium      | ug/L         | 75-125                      | 12200                    |          | 6920                     |          | 5000                   | 106                   |             | P         |
| Manganese      | ug/L         | 75-125                      | 525                      |          | 2                        | U        | 500                    | 105                   |             | P         |
| Potassium      | ug/L         | 75-125                      | 6680                     |          | 1550                     |          | 5000                   | 102                   |             | P         |
| Silica         | ug/L         |                             | 84400                    |          | 75900                    |          | 10700                  | 79.7                  | N/A         | P         |
| Sodium         | ug/L         | 75-125                      | 16800                    |          | 12300                    |          | 5000                   | 89.6                  |             | P         |
| Strontium      | ug/L         | 75-125                      | 577                      |          | 89.7                     |          | 500                    | 97.4                  |             | P         |
| Tin            | ug/L         | 75-125                      | 543                      |          | 2.73                     | J        | 500                    | 108                   |             | P         |
| Vanadium       | ug/L         | 75-125                      | 538                      |          | 7.35                     |          | 500                    | 106                   |             | P         |
| Zinc           | ug/L         | 75-125                      | 518                      |          | 7.9                      | J        | 500                    | 102                   |             | P         |

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2015-2084 Client ID: CASA-15-102647S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 379011002 Spike ID: 1203371803

| <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                      | 48.1                     |          | 1                        | U        | 50                     | 95.9                  |             | MS        |
| Arsenic        | ug/L         | 75-125                      | 52.1                     |          | 2.5                      | J        | 50                     | 99.2                  |             | MS        |
| Cadmium        | ug/L         | 75-125                      | 51                       |          | 0.11                     | U        | 50                     | 102                   |             | MS        |
| Chromium       | ug/L         | 75-125                      | 71.5                     |          | 20.8                     |          | 50                     | 101                   |             | MS        |
| Lead           | ug/L         | 75-125                      | 45.4                     |          | 0.5                      | U        | 50                     | 90.6                  |             | MS        |
| Molybdenum     | ug/L         | 75-125                      | 53.1                     |          | 1.68                     |          | 50                     | 103                   |             | MS        |
| Nickel         | ug/L         | 75-125                      | 50.1                     |          | 0.5                      | U        | 50                     | 99.5                  |             | MS        |
| Selenium       | ug/L         | 75-125                      | 52.8                     |          | 2.27                     | J        | 50                     | 101                   |             | MS        |
| Silver         | ug/L         | 75-125                      | 51.3                     |          | 0.2                      | U        | 50                     | 103                   |             | MS        |
| Thallium       | ug/L         | 75-125                      | 43.9                     |          | 0.45                     | U        | 50                     | 87.7                  |             | MS        |
| Uranium        | ug/L         | 75-125                      | 51.2                     |          | 0.687                    |          | 50                     | 101                   |             | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2015-2084 Client ID: WTESR-15-97804S

Contract: ESHL00114 Level: Low

Matrix: STORM WATER % Solids:

Sample ID: 379110004 Spike ID: 1203382651

| <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                      | 2.22                     |          | 0.067                    | U        | 2                      | 109                   |             | AV        |

## \*Analytical Methods:

AV EPA 245.1/245.2



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

SDG No.: 2015-2084

Lab Code: GEL

Contract: ESHL00114

Client ID: CASA-15-102647D

Matrix: WATER

Level: Low

Sample ID: 379011002

Duplicate ID: 1203371768

Percent Solids for Dup: N/A

| Analyte   | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD  | Qual | M* |
|-----------|-------|------------------|---------------|---|------------------|---|------|------|----|
| Aluminum  | ug/L  |                  | 68            | U | 145              | J | 200  |      | P  |
| Barium    | ug/L  | +/-20%           | 43.4          |   | 42.3             |   | 2.79 |      | P  |
| Beryllium | ug/L  |                  | 1             | U | 1                | U |      |      | P  |
| Boron     | ug/L  | +/-50            | 32.1          | J | 30.8             | J | 4.09 |      | P  |
| Calcium   | ug/L  | +/-20%           | 24500         |   | 24100            |   | 1.44 |      | 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%           | 6920          |   | 6810             |   | 1.54 |      | P  |
| Manganese | ug/L  |                  | 2             | U | 2                | U |      |      | P  |
| Potassium | ug/L  | +/-20%           | 1550          |   | 1540             |   | 1.04 |      | P  |
| Silica    | ug/L  | +/-20%           | 75900         |   | 74400            |   | 2.06 |      | P  |
| Sodium    | ug/L  | +/-20%           | 12300         |   | 12000            |   | 2.42 |      | P  |
| Strontium | ug/L  | +/-20%           | 89.7          |   | 88.8             |   | .974 |      | P  |
| Tin       | ug/L  | +/-10            | 2.73          | J | 2.76             | J | .972 |      | P  |
| Vanadium  | ug/L  | +/-5             | 7.35          |   | 7.12             |   | 3.16 |      | P  |
| Zinc      | ug/L  | +/-10            | 7.9           | J | 10.8             |   | 31   |      | P  |

\*Analytical Methods:

P SW846 3005A/6010C

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

SDG No.: 2015–2084

Lab Code: GEL

Contract: ESHL00114

Client ID: CASA–15–102647D

Matrix: WATER

Level: Low

Sample ID: 379011002

Duplicate ID: 1203371802

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  | +/-5             | 2.5 J         |   | 2.24 J           |   | 11.1 |      | MS |
| Cadmium    | ug/L  |                  | 0.11 U        |   | 0.11 U           |   |      |      | MS |
| Chromium   | ug/L  | +/-10            | 20.8          |   | 20.1             |   | 3.21 |      | MS |
| Lead       | ug/L  |                  | 0.5 U         |   | 0.5 U            |   |      |      | MS |
| Molybdenum | ug/L  | +/- .5           | 1.68          |   | 1.5              |   | 11.2 |      | MS |
| Nickel     | ug/L  |                  | 0.5 U         |   | 0.5 U            |   |      |      | MS |
| Selenium   | ug/L  | +/-5             | 2.27 J        |   | 1.72 J           |   | 27.9 |      | MS |
| Silver     | ug/L  |                  | 0.2 U         |   | 0.2 U            |   |      |      | MS |
| Thallium   | ug/L  |                  | 0.45 U        |   | 0.45 U           |   |      |      | MS |
| Uranium    | ug/L  | +/- .2           | 0.687         |   | 0.65             |   | 5.53 |      | MS |

\*Analytical Methods:

MS SW846 3005A/6020A

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

**SDG No.:** 2015–2084**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** WTESR–15–97804D**Matrix:** STORM WATER**Level:** Low**Sample ID:** 379110004**Duplicate ID:** 1203382649**Percent Solids for Dup:** N/A

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

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**\*Analytical Methods:**

AV EPA 245.1/245.2

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2015-2084

Contract: ESHL00114

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203371767       |                |              |                   |               |          |                   |                         |           |
|                  | Aluminum       | ug/L         | 5000              | 5070          |          | 101               | 80-120                  | P         |
|                  | Barium         | ug/L         | 500               | 525           |          | 105               | 80-120                  | P         |
|                  | Beryllium      | ug/L         | 500               | 521           |          | 104               | 80-120                  | P         |
|                  | Boron          | ug/L         | 500               | 530           |          | 106               | 80-120                  | P         |
|                  | Calcium        | ug/L         | 5000              | 5240          |          | 105               | 80-120                  | P         |
|                  | Cobalt         | ug/L         | 500               | 521           |          | 104               | 80-120                  | P         |
|                  | Copper         | ug/L         | 500               | 527           |          | 105               | 80-120                  | P         |
|                  | Iron           | ug/L         | 5000              | 5220          |          | 104               | 80-120                  | P         |
|                  | Magnesium      | ug/L         | 5000              | 5410          |          | 108               | 80-120                  | P         |
|                  | Manganese      | ug/L         | 500               | 526           |          | 105               | 80-120                  | P         |
|                  | Potassium      | ug/L         | 5000              | 5080          |          | 102               | 80-120                  | P         |
|                  | Silica         | ug/L         | 10700             | 10600         |          | 99.2              | 80-120                  | P         |
|                  | Sodium         | ug/L         | 5000              | 4900          |          | 98                | 80-120                  | P         |
|                  | Strontium      | ug/L         | 500               | 477           |          | 95.4              | 80-120                  | P         |
|                  | Tin            | ug/L         | 500               | 538           |          | 108               | 80-120                  | P         |
|                  | Vanadium       | ug/L         | 500               | 526           |          | 105               | 80-120                  | P         |
|                  | Zinc           | ug/L         | 500               | 508           |          | 102               | 80-120                  | P         |

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2015-2084

Contract: ESHL00114

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203371801       |                |              |                   |               |          |                   |                         |           |
|                  | Lead           | ug/L         | 50                | 48.2          |          | 96.4              | 80-120                  | MS        |
|                  | Molybdenum     | ug/L         | 50                | 51.2          |          | 102               | 80-120                  | MS        |
|                  | Nickel         | ug/L         | 50                | 51.6          |          | 103               | 80-120                  | MS        |
|                  | Selenium       | ug/L         | 50                | 54.7          |          | 109               | 80-120                  | MS        |
|                  | Silver         | ug/L         | 50                | 52.9          |          | 106               | 80-120                  | MS        |
|                  | Thallium       | ug/L         | 50                | 45.9          |          | 91.7              | 80-120                  | MS        |
|                  | Uranium        | ug/L         | 50                | 51.8          |          | 104               | 80-120                  | MS        |
|                  | Antimony       | ug/L         | 50                | 48.6          |          | 97.3              | 80-120                  | MS        |
|                  | Arsenic        | ug/L         | 50                | 53.2          |          | 106               | 80-120                  | MS        |
|                  | Cadmium        | ug/L         | 50                | 52            |          | 104               | 80-120                  | MS        |
|                  | Chromium       | ug/L         | 50                | 51.1          |          | 102               | 80-120                  | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2015-2084

Contract: ESHL00114

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203382648       | Mercury        | ug/L         | 2                 | 1.97          |          | 98.7              | 85-115                  | AV        |

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2015-2084

Client ID: CASA-15-102647L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 379011002

Serial Dilution ID: 1203371770

| <u>Analyte</u> | <u>Initial Value</u><br>ug/L | <u>C</u> | <u>Serial Value</u><br>ug/L | <u>C</u> | <u>% Difference</u> | <u>Qual</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|----------------|------------------------------|----------|-----------------------------|----------|---------------------|-------------|-------------------------|-----------|
| Aluminum       | 68                           | U        | 340                         | U        |                     |             |                         | P         |
| Barium         | 43.4                         |          | 43                          |          | 1.11                |             |                         | P         |
| Beryllium      | 1                            | U        | 5                           | U        |                     |             |                         | P         |
| Boron          | 32.1                         | J        | 75                          | U        | 100                 |             |                         | P         |
| Calcium        | 24500                        |          | 24200                       |          | 1.37                |             | 10                      | P         |
| Cobalt         | 1                            | U        | 5                           | U        |                     |             |                         | P         |
| Copper         | 3                            | U        | 15                          | U        |                     |             |                         | P         |
| Iron           | 30                           | U        | 150                         | U        |                     |             |                         | P         |
| Magnesium      | 6920                         |          | 6720                        |          | 2.93                |             | 10                      | P         |
| Manganese      | 2                            | U        | 10                          | U        |                     |             |                         | P         |
| Potassium      | 1550                         |          | 1420                        |          | 8.37                |             |                         | P         |
| Silica         | 75900                        |          | 75100                       |          | 1.05                |             | 10                      | P         |
| Sodium         | 12300                        |          | 12000                       |          | 1.92                |             | 10                      | P         |
| Strontium      | 89.7                         |          | 89.4                        |          | .313                |             | 10                      | P         |
| Tin            | 2.73                         | J        | 12.5                        | U        | 100                 |             |                         | P         |
| Vanadium       | 7.35                         |          | 6.97                        | J        | 5.16                |             |                         | P         |
| Zinc           | 7.9                          | J        | 16.5                        | U        | 100                 |             |                         | P         |

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2015-2084

Client ID: CASA-15-102647L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 379011002

Serial Dilution ID: 1203371804

| <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        | 2.5                               | J        | 8.5                              | U        | 100                     |             |                             | MS        |
| Cadmium        | .11                               | U        | .55                              | U        |                         |             |                             | MS        |
| Chromium       | 20.8                              |          | 20.6                             | J        | .952                    |             |                             | MS        |
| Lead           | .5                                | U        | 2.5                              | U        |                         |             |                             | MS        |
| Molybdenum     | 1.68                              |          | 1.94                             | J        | 15.6                    |             |                             | MS        |
| Nickel         | .5                                | U        | 2.5                              | U        |                         |             |                             | MS        |
| Selenium       | 2.27                              | J        | 7.5                              | U        | 100                     |             |                             | MS        |
| Silver         | .2                                | U        | 1                                | U        |                         |             |                             | MS        |
| Thallium       | .45                               | U        | 2.25                             | U        |                         |             |                             | MS        |
| Uranium        | .687                              |          | .575                             | J        | 16.3                    |             |                             | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A



## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2015-2084 **Client ID:** WTESR-15-97804L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 379110004 **Serial Dilution ID:** 1203382653

| <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

# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2015-2084  
Work Order #: 379019**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1500166

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019001        | CAMO-15-102580                                   |
| 379019003        | CAMO-15-102558                                   |
| 379019005        | CAMO-15-102581                                   |
| 379019007        | CAMO-15-102584                                   |
| 379019009        | CAMO-15-102585                                   |
| 1203373633       | Method Blank (MB)                                |
| 1203373634       | Laboratory Control Sample (LCS)                  |
| 1203373636       | 378720001(CAMO-15-102573) Sample Duplicate (DUP) |
| 1203373638       | 378720001(CAMO-15-102573) Post Spike (PS)        |

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-093 REV# 13.

**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 Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

**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.

**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**

Sample 378720001 (CAMO-15-102573) was selected for QC analysis.

**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 Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**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**

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.

**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**

|                          |                          |                |           |
|--------------------------|--------------------------|----------------|-----------|
| <b>Product:</b>          | <b>Cyanide and Total</b> |                |           |
| <b>Analytical Batch:</b> | 1498741                  | <b>Method:</b> | WSP-CN(T) |
| <b>Prep Batch :</b>      | 1498740                  | <b>Method:</b> | EPA 335.4 |

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019001        | CAMO-15-102580                                   |
| 379019003        | CAMO-15-102558                                   |
| 379019005        | CAMO-15-102581                                   |
| 379019007        | CAMO-15-102584                                   |
| 379019009        | CAMO-15-102585                                   |
| 1203369923       | Method Blank (MB)                                |
| 1203369924       | Laboratory Control Sample (LCS)                  |
| 1203371911       | 379019001(CAMO-15-102580) Sample Duplicate (DUP) |
| 1203371912       | 379019001(CAMO-15-102580) Matrix Spike (MS)      |

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-095 REV# 17.

### **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 Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

### **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**

Sample 379019001 (CAMO-15-102580) was selected for QC analysis.

**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 Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**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**

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.

**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:** 1500059

**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>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203373268       | Method Blank (MB)                                |
| 1203373269       | Laboratory Control Sample (LCS)                  |
| 1203373270       | 379011002(CASA-15-102647) Sample Duplicate (DUP) |
| 1203373271       | 379011002(CASA-15-102647) Post Spike (PS)        |

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# 24.

### **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**

Sample 379011002 (CASA-15-102647) was selected for QC analysis.

**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 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**

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.

**Manual Integrations**

Samples 1203373270 (CASA-15-102647DUP), 1203373271 (CASA-15-102647PS), 379019002 (CAMO-15-102604), 379019004 (CAMO-15-102559), 379019006 (CAMO-15-102605), 379019008 (CAMO-15-102608) and 379019010 (CAMO-15-102609) were manually integrated to correctly position the baseline as set in the calibration standards.

**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:** Ammonia Nitrogen  
**Analytical Batch:** 1499451 **Method:** NH3  
**Prep Batch :** 1499449 **Method:** EPA 350.1 Prep

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203371692       | Method Blank (MB)                                |
| 1203371693       | Laboratory Control Sample (LCS)                  |
| 1203371696       | 379011002(CASA-15-102647) Sample Duplicate (DUP) |
| 1203371697       | 379011002(CASA-15-102647) Matrix Spike (MS)      |

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-106 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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

### **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.

### **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**

Sample 379011002 (CASA-15-102647) was selected for QC analysis.

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

The MS/PS recoveries for this sample set were 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 Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

Sample1203371692 (MB) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

**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.

**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**

|                          |                                |                |                |
|--------------------------|--------------------------------|----------------|----------------|
| <b>Product:</b>          | <b>Total Kjeldahl Nitrogen</b> |                |                |
| <b>Analytical Batch:</b> | 1499653                        | <b>Method:</b> | TKN            |
| <b>Prep Batch :</b>      | 1499651                        | <b>Method:</b> | EPA 351.2 Prep |

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019001        | CAMO-15-102580                                   |
| 379019003        | CAMO-15-102558                                   |
| 379019005        | CAMO-15-102581                                   |
| 379019007        | CAMO-15-102584                                   |
| 379019009        | CAMO-15-102585                                   |
| 1203372229       | Method Blank (MB)                                |
| 1203372230       | Laboratory Control Sample (LCS)                  |
| 1203372231       | 379011001(CASA-15-102633) Sample Duplicate (DUP) |
| 1203372232       | 379011001(CASA-15-102633) Matrix Spike (MS)      |

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-104 REV# 14.

### **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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

### **Calibration Verification Information**

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

### **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**

Sample 379011001 (CASA-15-102633) was selected for QC analysis.

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

The matrix spike recovered outside of the established acceptance limits due to matrix interference.

| Analyte                  | Sample                        | Value          |
|--------------------------|-------------------------------|----------------|
| Nitrogen, Total Kjeldahl | 1203372232 (CASA-15-102633MS) | 61* (90%-110%) |

**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 Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**

The following samples in this sample group were diluted due to matrix interference. 1203372231 (CASA-15-102633DUP), 1203372232 (CASA-15-102633MS), 379019003 (CAMO-15-102558) and 379019005 (CAMO-15-102581).

| Analyte                  | 379019 |     |
|--------------------------|--------|-----|
|                          | 003    | 005 |
| Nitrogen, Total Kjeldahl | 5X     | 5X  |

**Sample Re-analysis**

Samples 1203372231 (CASA-15-102633DUP), 1203372232 (CASA-15-102633MS), 379019003

(CAMO-15-102558), 379019005 (CAMO-15-102581) and 379019007 (CAMO-15-102584) were re-analyzed to verify the results.

### **Miscellaneous Information**

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

A data exception report (DER) 1438618 was generated for sample 1203372232 (CASA-15-102633MS) in this SDG/batch.

#### **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:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1499212

**Method:** NO3NO2

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203371095       | Method Blank (MB)                                |
| 1203371096       | Laboratory Control Sample (LCS)                  |
| 1203372742       | 379011002(CASA-15-102647) Sample Duplicate (DUP) |
| 1203372743       | 379011002(CASA-15-102647) Post Spike (PS)        |

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-128 REV# 8.

### **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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

### **Calibration Verification Information**

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

### **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**

Sample 379011002 (CASA-15-102647) was selected for QC analysis.

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

The MS/PS recoveries for this sample set were 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 Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**

The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203372742 (CASA-15-102647DUP) and 1203372743 (CASA-15-102647PS).

**Sample Re-analysis**

Samples 1203371095 (MB) and 1203371096 (LCS) were re-analyzed to verify the results.

**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.

**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**

|                          |                         |                |                                |
|--------------------------|-------------------------|----------------|--------------------------------|
| <b>Product:</b>          | <b>Total Phosphorus</b> |                |                                |
| <b>Analytical Batch:</b> | 1499655                 | <b>Method:</b> | EPA 365.4 Phosphorus, Total in |
| <b>Prep Batch :</b>      | 1499654                 | <b>Method:</b> | EPA 365.4 Prep                 |

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203372233       | Method Blank (MB)                                |
| 1203372234       | Laboratory Control Sample (LCS)                  |
| 1203372235       | 379011002(CASA-15-102647) Sample Duplicate (DUP) |
| 1203375689       | 379148002(CASA-15-102650) Sample Duplicate (DUP) |
| 1203372236       | 379011002(CASA-15-102647) Matrix Spike (MS)      |
| 1203375690       | 379148002(CASA-15-102650) Matrix Spike (MS)      |

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-103 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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

### **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**

Samples 379011002 (CASA-15-102647) and 379148002 (CASA-15-102650) were selected for QC analysis.

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

The MS/PS recoveries for this sample set were 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 Preservation/Integrity**

All the samples from this sample group met the preservation and integrity requirements of the method.

**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**

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.

**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 and Total Dissolved

**Analytical Batch:** 1499735

**Method:** TDS

### **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>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203372377       | Method Blank (MB)                                |
| 1203372378       | Laboratory Control Sample (LCS)                  |
| 1203372379       | 379019002(CAMO-15-102604) 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-001 REV# 15.

### **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**

Sample 379019002 (CAMO-15-102604) was selected for QC analysis.

**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.

**Sample Aliquot**

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

**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.

**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:** Specific Conductivity

**Analytical Batch:** 1499837

**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>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203372695       | Laboratory Control Sample (LCS)                  |
| 1203372696       | 379011002(CASA-15-102647) 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# 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 Titration and Ion analysis was performed on a ManSci PC-Titrate TitrSip System.

### **Initial Standardization**

The titrant was properly standardized

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

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Sample 379011002 (CASA-15-102647) was selected for QC analysis.

### **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**

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.

#### **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:** 1499835    **Method:** 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>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203372686       | Laboratory Control Sample (LCS)                  |
| 1203372687       | 379011002(CASA-15-102647) Sample Duplicate (DUP) |
| 1203372688       | 379019002(CAMO-15-102604) 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# 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 Titration and Ion analysis was performed on a ManSci PC-Titrate TitrSip System.

### **Initial Standardization**

The titrant was properly standardized

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

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Samples 379011002 (CASA-15-102647) and 379019002 (CAMO-15-102604) were selected for QC analysis.

**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**

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

| Sample                     | Analyte | Value  |
|----------------------------|---------|--|
| 379019002 (CAMO-15-102604) |         | Received 11-AUG-15, out of holding 06-AUG-15 |
| 379019004 (CAMO-15-102559) |         | Received 11-AUG-15, out of holding 06-AUG-15 |
| 379019006 (CAMO-15-102605) |         | Received 11-AUG-15, out of holding 06-AUG-15 |
| 379019008 (CAMO-15-102608) |         | Received 11-AUG-15, out of holding 06-AUG-15 |
| 379019010 (CAMO-15-102609) |         | Received 11-AUG-15, out of holding 06-AUG-15 |

**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 data exception report (DER) 1440339 was generated for samples 379019002 (CAMO-15-102604), 379019004 (CAMO-15-102559), 379019006 (CAMO-15-102605), 379019008 (CAMO-15-102608) and 379019010 (CAMO-15-102609) in this SDG/batch.

**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:** 1499840      **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>                                 |
|------------------|--|
| 379019002        | CAMO-15-102604                                   |
| 379019004        | CAMO-15-102559                                   |
| 379019006        | CAMO-15-102605                                   |
| 379019008        | CAMO-15-102608                                   |
| 379019010        | CAMO-15-102609                                   |
| 1203372710       | Method Blank (MB)                                |
| 1203372712       | Laboratory Control Sample (LCS)                  |
| 1203372714       | 379011002(CASA-15-102647) Sample Duplicate (DUP) |
| 1203372716       | 379011002(CASA-15-102647) Matrix Spike (MS)      |

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# 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 Titration and Ion 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**

Sample 379011002 (CASA-15-102647) was selected for QC analysis.

**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 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**

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.

**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.



## GEL LABORATORIES LLC

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### Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-2084 GEL Work Order: 379019

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

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

#### 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: Thomas Lewis

Date: 03 SEP 2015

Title: Data Validator

# **Sample Data Summary**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102580  
Sample ID: 379019001  
Matrix: W  
Collect Date: 06-AUG-15 13:34  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                  | Qualifier | Result | DL    | RL    | Units | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|-------|----|---------|----------|------|---------|--------|
| Carbon Analysis                            |           |        |       |       |       |    |         |          |      |         |        |
| SW 9060 Total Organic Carbon "As Received" |           |        |       |       |       |    |         |          |      |         |        |
| Total Organic Carbon Average               | U         | ND     | 0.330 | 1.00  | mg/L  | 1  | TSM     | 08/15/15 | 0544 | 1500166 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1  | AXH3    | 08/12/15 | 1027 | 1498741 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | U         | ND     | 0.033 | 0.100 | mg/L  | 1  | KLP1    | 08/13/15 | 1244 | 1499653 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 08/12/15 | 0845 | 1498740    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | AXH3    | 08/13/15 | 1230 | 1499651    |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | SW846 9060  |                  |
| 2      | EPA 335.4   |                  |
| 3      | EPA 351.2   |                  |

Notes:

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102604  
Sample ID: 379019002  
Matrix: W  
Collect Date: 06-AUG-15 13:34  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                    | Qualifier | Result | DL    | RL    | Units    | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|----------|----|---------|----------|------|---------|--------|
| Ion Chromatography                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 300.0 Anions Liquid 28 day "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Bromide                                      | U         | ND     | 0.067 | 0.200 | mg/L     | 1  | MXL2    | 08/13/15 | 0256 | 1500059 | 1      |
| Chloride                                     |           | 2.29   | 0.067 | 0.200 | mg/L     | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.218  | 0.033 | 0.100 | mg/L     | 1  |         |          |      |         |        |
| Sulfate                                      |           | 3.32   | 0.133 | 0.400 | mg/L     | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |    |         |          |      |         |        |
| EPA 365.4 Phosphorus, Total in "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Phosphorus, Total as P                       | J         | 0.0319 | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/18/15 | 1338 | 1499655 | 2      |
| NH3 "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Ammonia                            |           | 0.0683 | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/13/15 | 1447 | 1499451 | 3      |
| NO3NO2 "As Received"                         |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 0.542  | 0.017 | 0.050 | mg/L     | 1  | AXH3    | 08/19/15 | 0904 | 1499212 | 4      |
| Solids Analysis                              |           |        |       |       |          |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 151    | 3.40  | 14.3  | mg/L     |    | MXB3    | 08/12/15 | 0854 | 1499735 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 62.2   | 0.725 | 1.00  | mg/L     |    | PXO1    | 08/13/15 | 1439 | 1499840 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 0.725 | 1.00  | mg/L     |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Conductivity                                 |           | 133    | 3.63  | 14.5  | umhos/cm | 1  | PXO1    | 08/12/15 | 1310 | 1499837 | 7      |
| PH "As Received"                             |           |        |       |       |          |    |         |          |      |         |        |
| pH at Temp 23.1C                             | H         | 7.87   | 0.010 | 0.100 | SU       | 1  | PXO1    | 08/12/15 | 1432 | 1499835 | 8      |

The following Prep Methods were performed:

| Method         | Description                              | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 350.1 Prep | EPA 350.1 Ammonia Nitrogen Prep          | AXH3    | 08/13/15 | 1059 | 1499449    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 08/17/15 | 1700 | 1499654    |

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102604  
Sample ID: 379019002

Project: ESHL00114  
Client ID: ARSL004

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The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | EPA 300.0   |                  |
| 2      | EPA 365.4   |                  |
| 3      | EPA 350.1   |                  |
| 4      | EPA 353.2   |                  |
| 5      | EPA 160.1   |                  |
| 6      | EPA 310.1   |                  |
| 7      | EPA 120.1   |                  |
| 8      | EPA 150.1   |                  |

**Notes:**

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102558  
Sample ID: 379019003  
Matrix: W  
Collect Date: 06-AUG-15 13:34  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                  | Qualifier | Result | DL    | RL    | Units | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|-------|----|---------|----------|------|---------|--------|
| Carbon Analysis                            |           |        |       |       |       |    |         |          |      |         |        |
| SW 9060 Total Organic Carbon "As Received" |           |        |       |       |       |    |         |          |      |         |        |
| Total Organic Carbon Average               | U         | ND     | 0.330 | 1.00  | mg/L  | 1  | TSM     | 08/15/15 | 0625 | 1500166 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1  | AXH3    | 08/12/15 | 1030 | 1498741 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | U         | ND     | 0.165 | 0.500 | mg/L  | 5  | KLP1    | 08/13/15 | 1327 | 1499653 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 08/12/15 | 0845 | 1498740    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | AXH3    | 08/13/15 | 1230 | 1499651    |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | SW846 9060  |                  |
| 2      | EPA 335.4   |                  |
| 3      | EPA 351.2   |                  |

Notes:

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102559  
Sample ID: 379019004  
Matrix: W  
Collect Date: 06-AUG-15 13:34  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                    | Qualifier | Result | DL    | RL    | Units    | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|----------|----|---------|----------|------|---------|--------|
| Ion Chromatography                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 300.0 Anions Liquid 28 day "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Bromide                                      | U         | ND     | 0.067 | 0.200 | mg/L     | 1  | MXL2    | 08/13/15 | 0328 | 1500059 | 1      |
| Chloride                                     |           | 2.30   | 0.067 | 0.200 | mg/L     | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.228  | 0.033 | 0.100 | mg/L     | 1  |         |          |      |         |        |
| Sulfate                                      |           | 3.33   | 0.133 | 0.400 | mg/L     | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |    |         |          |      |         |        |
| EPA 365.4 Phosphorus, Total in "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Phosphorus, Total as P                       | J         | 0.0241 | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/18/15 | 1339 | 1499655 | 2      |
| NH3 "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Ammonia                            | J         | 0.0447 | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/13/15 | 1448 | 1499451 | 3      |
| NO3NO2 "As Received"                         |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 0.553  | 0.017 | 0.050 | mg/L     | 1  | AXH3    | 08/19/15 | 0906 | 1499212 | 4      |
| Solids Analysis                              |           |        |       |       |          |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 149    | 3.40  | 14.3  | mg/L     |    | MXB3    | 08/12/15 | 0854 | 1499735 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 62.2   | 0.725 | 1.00  | mg/L     |    | PXO1    | 08/13/15 | 1442 | 1499840 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 0.725 | 1.00  | mg/L     |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Conductivity                                 |           | 134    | 3.63  | 14.5  | umhos/cm | 1  | PXO1    | 08/12/15 | 1313 | 1499837 | 7      |
| PH "As Received"                             |           |        |       |       |          |    |         |          |      |         |        |
| pH at Temp 23.1C                             | H         | 7.87   | 0.010 | 0.100 | SU       | 1  | PXO1    | 08/12/15 | 1445 | 1499835 | 8      |

The following Prep Methods were performed:

| Method         | Description                              | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 350.1 Prep | EPA 350.1 Ammonia Nitrogen Prep          | AXH3    | 08/13/15 | 1059 | 1499449    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 08/17/15 | 1700 | 1499654    |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102559  
Sample ID: 379019004

Project: ESHL00114  
Client ID: ARSL004

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | EPA 300.0   |                  |
| 2      | EPA 365.4   |                  |
| 3      | EPA 350.1   |                  |
| 4      | EPA 353.2   |                  |
| 5      | EPA 160.1   |                  |
| 6      | EPA 310.1   |                  |
| 7      | EPA 120.1   |                  |
| 8      | EPA 150.1   |                  |

**Notes:**



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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102581  
Sample ID: 379019005  
Matrix: W  
Collect Date: 06-AUG-15 15:00  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                  | Qualifier | Result | DL    | RL    | Units | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|-------|----|---------|----------|------|---------|--------|
| Carbon Analysis                            |           |        |       |       |       |    |         |          |      |         |        |
| SW 9060 Total Organic Carbon "As Received" |           |        |       |       |       |    |         |          |      |         |        |
| Total Organic Carbon Average               | U         | ND     | 0.330 | 1.00  | mg/L  | 1  | TSM     | 08/15/15 | 0707 | 1500166 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1  | AXH3    | 08/12/15 | 1031 | 1498741 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | U         | ND     | 0.165 | 0.500 | mg/L  | 5  | KLP1    | 08/13/15 | 1324 | 1499653 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 08/12/15 | 0845 | 1498740    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | AXH3    | 08/13/15 | 1230 | 1499651    |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | SW846 9060  |                  |
| 2      | EPA 335.4   |                  |
| 3      | EPA 351.2   |                  |

Notes:

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102605  
Sample ID: 379019006  
Matrix: W  
Collect Date: 06-AUG-15 15:00  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                    | Qualifier | Result | DL    | RL    | Units    | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|----------|----|---------|----------|------|---------|--------|
| Ion Chromatography                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 300.0 Anions Liquid 28 day "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Bromide                                      | U         | ND     | 0.067 | 0.200 | mg/L     | 1  | MXL2    | 08/13/15 | 0400 | 1500059 | 1      |
| Chloride                                     |           | 2.00   | 0.067 | 0.200 | mg/L     | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.195  | 0.033 | 0.100 | mg/L     | 1  |         |          |      |         |        |
| Sulfate                                      |           | 2.30   | 0.133 | 0.400 | mg/L     | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |    |         |          |      |         |        |
| EPA 365.4 Phosphorus, Total in "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Phosphorus, Total as P                       | J         | 0.0215 | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/18/15 | 1340 | 1499655 | 2      |
| NH3 "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Ammonia                            | J         | 0.032  | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/13/15 | 1449 | 1499451 | 3      |
| NO3NO2 "As Received"                         |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 0.356  | 0.017 | 0.050 | mg/L     | 1  | AXH3    | 08/19/15 | 0907 | 1499212 | 4      |
| Solids Analysis                              |           |        |       |       |          |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 143    | 3.40  | 14.3  | mg/L     |    | MXB3    | 08/12/15 | 0854 | 1499735 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 63.2   | 0.725 | 1.00  | mg/L     |    | PXO1    | 08/13/15 | 1445 | 1499840 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 0.725 | 1.00  | mg/L     |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Conductivity                                 |           | 131    | 3.63  | 14.5  | umhos/cm | 1  | PXO1    | 08/12/15 | 1314 | 1499837 | 7      |
| PH "As Received"                             |           |        |       |       |          |    |         |          |      |         |        |
| pH at Temp 23.3C                             | H         | 7.94   | 0.010 | 0.100 | SU       | 1  | PXO1    | 08/12/15 | 1450 | 1499835 | 8      |

The following Prep Methods were performed:

| Method         | Description                              | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 350.1 Prep | EPA 350.1 Ammonia Nitrogen Prep          | AXH3    | 08/13/15 | 1059 | 1499449    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 08/17/15 | 1700 | 1499654    |

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102605  
Sample ID: 379019006

Project: ESHL00114  
Client ID: ARSL004

---

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | EPA 300.0   |                  |
| 2      | EPA 365.4   |                  |
| 3      | EPA 350.1   |                  |
| 4      | EPA 353.2   |                  |
| 5      | EPA 160.1   |                  |
| 6      | EPA 310.1   |                  |
| 7      | EPA 120.1   |                  |
| 8      | EPA 150.1   |                  |

**Notes:**

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Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102584  
Sample ID: 379019007  
Matrix: W  
Collect Date: 06-AUG-15 11:21  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                  | Qualifier | Result | DL    | RL    | Units | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|-------|----|---------|----------|------|---------|--------|
| Carbon Analysis                            |           |        |       |       |       |    |         |          |      |         |        |
| SW 9060 Total Organic Carbon "As Received" |           |        |       |       |       |    |         |          |      |         |        |
| Total Organic Carbon Average               | U         | ND     | 0.330 | 1.00  | mg/L  | 1  | TSM     | 08/15/15 | 0748 | 1500166 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1  | AXH3    | 08/12/15 | 1032 | 1498741 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | U         | ND     | 0.033 | 0.100 | mg/L  | 1  | KLP1    | 08/13/15 | 1309 | 1499653 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 08/12/15 | 0845 | 1498740    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | AXH3    | 08/13/15 | 1230 | 1499651    |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | SW846 9060  |                  |
| 2      | EPA 335.4   |                  |
| 3      | EPA 351.2   |                  |

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Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102608  
Sample ID: 379019008  
Matrix: W  
Collect Date: 06-AUG-15 11:21  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                    | Qualifier | Result | DL    | RL    | Units    | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|----------|----|---------|----------|------|---------|--------|
| Ion Chromatography                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 300.0 Anions Liquid 28 day "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Bromide                                      | U         | ND     | 0.067 | 0.200 | mg/L     | 1  | MXL2    | 08/13/15 | 0432 | 1500059 | 1      |
| Chloride                                     |           | 2.42   | 0.067 | 0.200 | mg/L     | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.295  | 0.033 | 0.100 | mg/L     | 1  |         |          |      |         |        |
| Sulfate                                      |           | 3.56   | 0.133 | 0.400 | mg/L     | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |    |         |          |      |         |        |
| EPA 365.4 Phosphorus, Total in "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Phosphorus, Total as P                       |           | 0.0913 | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/18/15 | 1341 | 1499655 | 2      |
| NH3 "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Ammonia                            |           | 0.103  | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/13/15 | 1449 | 1499451 | 3      |
| NO3NO2 "As Received"                         |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 1.19   | 0.017 | 0.050 | mg/L     | 1  | AXH3    | 08/19/15 | 0913 | 1499212 | 4      |
| Solids Analysis                              |           |        |       |       |          |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 136    | 3.40  | 14.3  | mg/L     |    | MXB3    | 08/12/15 | 0854 | 1499735 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 55.3   | 0.725 | 1.00  | mg/L     |    | PXO1    | 08/13/15 | 1448 | 1499840 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 0.725 | 1.00  | mg/L     |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Conductivity                                 |           | 127    | 3.63  | 14.5  | umhos/cm | 1  | PXO1    | 08/12/15 | 1315 | 1499837 | 7      |
| PH "As Received"                             |           |        |       |       |          |    |         |          |      |         |        |
| pH at Temp 23.3C                             | H         | 7.93   | 0.010 | 0.100 | SU       | 1  | PXO1    | 08/12/15 | 1454 | 1499835 | 8      |

The following Prep Methods were performed:

| Method         | Description                              | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 350.1 Prep | EPA 350.1 Ammonia Nitrogen Prep          | AXH3    | 08/13/15 | 1059 | 1499449    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 08/17/15 | 1700 | 1499654    |

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102608  
Sample ID: 379019008

Project: ESHL00114  
Client ID: ARSL004

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | EPA 300.0   |                  |
| 2      | EPA 365.4   |                  |
| 3      | EPA 350.1   |                  |
| 4      | EPA 353.2   |                  |
| 5      | EPA 160.1   |                  |
| 6      | EPA 310.1   |                  |
| 7      | EPA 120.1   |                  |
| 8      | EPA 150.1   |                  |

**Notes:**

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102585  
Sample ID: 379019009  
Matrix: W  
Collect Date: 06-AUG-15 13:04  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                  | Qualifier | Result | DL    | RL    | Units | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|-------|----|---------|----------|------|---------|--------|
| Carbon Analysis                            |           |        |       |       |       |    |         |          |      |         |        |
| SW 9060 Total Organic Carbon "As Received" |           |        |       |       |       |    |         |          |      |         |        |
| Total Organic Carbon Average               | U         | ND     | 0.330 | 1.00  | mg/L  | 1  | TSM     | 08/15/15 | 0829 | 1500166 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1  | AXH3    | 08/12/15 | 1033 | 1498741 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | U         | ND     | 0.033 | 0.100 | mg/L  | 1  | KLP1    | 08/13/15 | 1252 | 1499653 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 08/12/15 | 0845 | 1498740    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | AXH3    | 08/13/15 | 1230 | 1499651    |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | SW846 9060  |                  |
| 2      | EPA 335.4   |                  |
| 3      | EPA 351.2   |                  |

Notes:

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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102609  
Sample ID: 379019010  
Matrix: W  
Collect Date: 06-AUG-15 13:04  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter                                    | Qualifier | Result | DL    | RL    | Units    | DF | Analyst | Date     | Time | Batch   | Method |
|--|-----------|--------|-------|-------|----------|----|---------|----------|------|---------|--------|
| Ion Chromatography                           |           |        |       |       |          |    |         |          |      |         |        |
| EPA 300.0 Anions Liquid 28 day "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Bromide                                      | U         | ND     | 0.067 | 0.200 | mg/L     | 1  | MXL2    | 08/13/15 | 0608 | 1500059 | 1      |
| Chloride                                     |           | 2.37   | 0.067 | 0.200 | mg/L     | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.357  | 0.033 | 0.100 | mg/L     | 1  |         |          |      |         |        |
| Sulfate                                      |           | 2.95   | 0.133 | 0.400 | mg/L     | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |    |         |          |      |         |        |
| EPA 365.4 Phosphorus, Total in "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Phosphorus, Total as P                       | U         | ND     | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/18/15 | 1346 | 1499655 | 2      |
| NH3 "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Ammonia                            | J         | 0.0267 | 0.017 | 0.050 | mg/L     | 1  | KLP1    | 08/13/15 | 1450 | 1499451 | 3      |
| NO3NO2 "As Received"                         |           |        |       |       |          |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 0.769  | 0.017 | 0.050 | mg/L     | 1  | AXH3    | 08/19/15 | 0914 | 1499212 | 4      |
| Solids Analysis                              |           |        |       |       |          |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 131    | 3.40  | 14.3  | mg/L     |    | MXB3    | 08/12/15 | 0854 | 1499735 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 61.2   | 0.725 | 1.00  | mg/L     |    | PXO1    | 08/13/15 | 1450 | 1499840 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 0.725 | 1.00  | mg/L     |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |    |         |          |      |         |        |
| Conductivity                                 |           | 134    | 3.63  | 14.5  | umhos/cm | 1  | PXO1    | 08/12/15 | 1317 | 1499837 | 7      |
| PH "As Received"                             |           |        |       |       |          |    |         |          |      |         |        |
| pH at Temp 23.2C                             | H         | 7.97   | 0.010 | 0.100 | SU       | 1  | PXO1    | 08/12/15 | 1458 | 1499835 | 8      |

The following Prep Methods were performed:

| Method         | Description                              | Analyst | Date     | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 350.1 Prep | EPA 350.1 Ammonia Nitrogen Prep          | AXH3    | 08/13/15 | 1059 | 1499449    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 08/17/15 | 1700 | 1499654    |



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## Certificate of Analysis

Report Date: September 3, 2015

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2015-2084

Client Sample ID: CAMO-15-102609  
Sample ID: 379019010

Project: ESHL00114  
Client ID: ARSL004

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1      | EPA 300.0   |                  |
| 2      | EPA 365.4   |                  |
| 3      | EPA 350.1   |                  |
| 4      | EPA 353.2   |                  |
| 5      | EPA 160.1   |                  |
| 6      | EPA 310.1   |                  |
| 7      | EPA 120.1   |                  |
| 8      | EPA 150.1   |                  |

**Notes:**

# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: September 3, 2015

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 379019

| Parmname                       | NOM       | Sample | Qual  | QC   | Units | RPD%  | REC%  | Range      | Anlst      | Date     | Time           |
|--------------------------------|-----------|--------|-------|------|-------|-------|-------|------------|------------|----------|----------------|
| <b>Carbon Analysis</b>         |           |        |       |      |       |       |       |            |            |          |                |
| Batch                          | 1500166   |        |       |      |       |       |       |            |            |          |                |
| QC1203373636                   | 378720001 | DUP    |       |      |       |       |       |            |            |          |                |
| Total Organic Carbon Average   |           | 1.01   |       | 1.00 | mg/L  | 0.597 | ^     | (+/-1.00)  | TSM        | 08/14/15 | 23:46          |
| QC1203373634                   | LCS       |        |       |      |       |       |       |            |            |          |                |
| Total Organic Carbon Average   | 10.0      |        |       | 9.96 | mg/L  |       |       | (85%-115%) |            | 08/14/15 | 22:10          |
| QC1203373633                   | MB        |        |       |      |       |       |       |            |            |          |                |
| Total Organic Carbon Average   |           |        | U     | ND   | mg/L  |       |       |            |            | 08/14/15 | 21:57          |
| QC1203373638                   | 378720001 | PS     |       |      |       |       |       |            |            |          |                |
| Total Organic Carbon Average   | 10.0      | 1.01   |       | 11.6 | mg/L  |       |       | (65%-120%) |            | 08/15/15 | 00:28          |
| <b>Flow Injection Analysis</b> |           |        |       |      |       |       |       |            |            |          |                |
| Batch                          | 1498741   |        |       |      |       |       |       |            |            |          |                |
| QC1203371911                   | 379019001 | DUP    |       |      |       |       |       |            |            |          |                |
| Cyanide, Total                 |           | U      | ND    | U    | ND    | ug/L  | N/A   |            | AXH3       | 08/12/15 | 10:28          |
| QC1203369924                   | LCS       |        |       |      |       |       |       |            |            |          |                |
| Cyanide, Total                 | 50.0      |        |       | 52.8 | ug/L  |       |       | (90%-110%) |            | 08/12/15 | 10:00          |
| QC1203369923                   | MB        |        |       |      |       |       |       |            |            |          |                |
| Cyanide, Total                 |           |        | U     | ND   | ug/L  |       |       |            |            | 08/12/15 | 09:56          |
| QC1203371912                   | 379019001 | MS     |       |      |       |       |       |            |            |          |                |
| Cyanide, Total                 | 100       | U      | ND    | 109  | ug/L  |       |       | (90%-110%) |            | 08/12/15 | 10:29          |
| <b>Ion Chromatography</b>      |           |        |       |      |       |       |       |            |            |          |                |
| Batch                          | 1500059   |        |       |      |       |       |       |            |            |          |                |
| QC1203373270                   | 379011002 | DUP    |       |      |       |       |       |            |            |          |                |
| Bromide                        |           | J      | 0.086 | J    | 0.091 | mg/L  | 5.65  | ^          | (+/-0.200) | MXL2     | 08/13/15 01:21 |
| Chloride                       |           |        | 5.15  |      | 5.13  | mg/L  | 0.389 |            | (0%-20%)   |          |                |
| Fluoride                       |           |        | 0.387 |      | 0.389 | mg/L  | 0.593 | ^          | (+/-0.100) |          |                |
| Sulfate                        |           |        | 13.1  |      | 13.1  | mg/L  | 0.451 |            | (0%-20%)   |          |                |
| QC1203373269                   | LCS       |        |       |      |       |       |       |            |            |          |                |
| Bromide                        | 1.25      |        |       | 1.26 | mg/L  |       |       | 100        | (90%-110%) | 08/13/15 | 00:17          |
| Chloride                       | 5.00      |        |       | 4.90 | mg/L  |       |       | 98         | (90%-110%) |          |                |

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## QC Summary

Workorder: 379019

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| Parmname                  | NOM       | Sample | Qual  | QC   | Units  | RPD% | REC% | Range      | Anlst | Date     | Time  |
|---------------------------|-----------|--------|-------|------|--------|------|------|------------|-------|----------|-------|
| <b>Ion Chromatography</b> |           |        |       |      |        |      |      |            |       |          |       |
| Batch                     | 1500059   |        |       |      |        |      |      |            |       |          |       |
| Fluoride                  | 2.50      |        |       | 2.57 | mg/L   |      | 103  | (90%-110%) |       |          |       |
| Sulfate                   | 10.0      |        |       | 10.3 | mg/L   |      | 103  | (90%-110%) | MXL2  | 08/13/15 | 00:17 |
| QC1203373268              | MB        |        |       |      |        |      |      |            |       |          |       |
| Bromide                   |           |        | U     | ND   | mg/L   |      |      |            |       | 08/12/15 | 23:45 |
| Chloride                  |           |        | U     | ND   | mg/L   |      |      |            |       |          |       |
| Fluoride                  |           |        | U     | ND   | mg/L   |      |      |            |       |          |       |
| Sulfate                   |           |        | U     | ND   | mg/L   |      |      |            |       |          |       |
| QC1203373271              | 379011002 | PS     |       |      |        |      |      |            |       |          |       |
| Bromide                   | 1.25      | J      | 0.086 | 1.37 | mg/L   |      | 103  | (90%-110%) |       | 08/13/15 | 01:53 |
| Chloride                  | 5.00      |        | 5.15  | 10.6 | mg/L   |      | 108  | (90%-110%) |       |          |       |
| Fluoride                  | 2.50      |        | 0.387 | 2.93 | mg/L   |      | 102  | (90%-110%) |       |          |       |
| Sulfate                   | 10.0      |        | 13.1  | 24.1 | mg/L   |      | 110  | (90%-110%) |       |          |       |
| <b>Nutrient Analysis</b>  |           |        |       |      |        |      |      |            |       |          |       |
| Batch                     | 1499212   |        |       |      |        |      |      |            |       |          |       |
| QC1203372742              | 379011002 | DUP    |       |      |        |      |      |            |       |          |       |
| Nitrogen, Nitrate/Nitrite |           |        | 5.65  | 5.55 | mg/L   | 1.79 |      | (0%-20%)   | AXH3  | 08/19/15 | 09:02 |
| QC1203371096              | LCS       |        |       |      |        |      |      |            |       |          |       |
| Nitrogen, Nitrate/Nitrite | 1.00      |        |       | 1.05 | mg/L   |      | 105  | (90%-110%) |       | 08/19/15 | 08:26 |
| QC1203371095              | MB        |        |       |      |        |      |      |            |       |          |       |
| Nitrogen, Nitrate/Nitrite |           |        | U     | ND   | mg/L   |      |      |            |       | 08/19/15 | 08:25 |
| QC1203372743              | 379011002 | PS     |       |      |        |      |      |            |       |          |       |
| Nitrogen, Nitrate/Nitrite | 1.00      |        | 1.13  | 2.13 | mg/L   |      | 100  | (90%-110%) |       | 08/19/15 | 09:03 |
| Batch                     | 1499451   |        |       |      |        |      |      |            |       |          |       |
| QC1203371696              | 379011002 | DUP    |       |      |        |      |      |            |       |          |       |
| Nitrogen, Ammonia         |           | U      | ND    | J    | 0.0284 | mg/L | 200  |            | KLP1  | 08/13/15 | 14:40 |
| QC1203371693              | LCS       |        |       |      |        |      |      |            |       |          |       |
| Nitrogen, Ammonia         | 1.00      |        |       | 1.10 | mg/L   |      | 110  | (90%-110%) |       | 08/13/15 | 14:34 |
| QC1203371692              | MB        |        |       |      |        |      |      |            |       |          |       |
| Nitrogen, Ammonia         |           |        | U     | ND   | mg/L   |      |      |            |       | 08/13/15 | 14:45 |

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## QC Summary

Workorder: 379019

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| Parmname                          | NOM       | Sample | Qual   | QC    | Units | RPD% | REC%  | Range      | Anlst | Date     | Time  |
|-----------------------------------|-----------|--------|--------|-------|-------|------|-------|------------|-------|----------|-------|
| <b>Nutrient Analysis</b>          |           |        |        |       |       |      |       |            |       |          |       |
| Batch                             | 1499451   |        |        |       |       |      |       |            |       |          |       |
| QC1203371697                      | 379011002 | MS     |        |       |       |      |       |            |       |          |       |
| Nitrogen, Ammonia                 | 1.00      | U      | ND     | 1.10  | mg/L  |      | 109   | (90%-110%) | KLP1  | 08/13/15 | 14:41 |
| Batch                             | 1499653   |        |        |       |       |      |       |            |       |          |       |
| QC1203372231                      | 379011001 | DUP    |        |       |       |      |       |            |       |          |       |
| Nitrogen, Total Kjeldahl          |           | U      | ND     | ND    | mg/L  | N/A  |       |            | KLP1  | 08/13/15 | 13:25 |
| QC1203372230                      | LCS       |        |        |       |       |      |       |            |       |          |       |
| Nitrogen, Total Kjeldahl          | 1.00      |        |        | 0.921 | mg/L  |      | 92.1  | (90%-110%) |       | 08/13/15 | 12:40 |
| QC1203372229                      | MB        |        |        |       |       |      |       |            |       |          |       |
| Nitrogen, Total Kjeldahl          |           |        | U      | ND    | mg/L  |      |       |            |       | 08/13/15 | 12:39 |
| QC1203372232                      | 379011001 | MS     |        |       |       |      |       |            |       |          |       |
| Nitrogen, Total Kjeldahl          | 1.00      | U      | ND     | 0.610 | mg/L  |      | 61 *  | (90%-110%) |       | 08/13/15 | 13:22 |
| Batch                             | 1499655   |        |        |       |       |      |       |            |       |          |       |
| QC1203372235                      | 379011002 | DUP    |        |       |       |      |       |            |       |          |       |
| Phosphorus, Total as P            |           |        | 0.0553 | U     | ND    | mg/L | 146 ^ | (+/-0.050) | KLP1  | 08/18/15 | 13:36 |
| QC1203375689                      | 379148002 | DUP    |        |       |       |      |       |            |       |          |       |
| Phosphorus, Total as P            |           | U      | ND     | ND    | mg/L  | N/A  |       |            |       | 08/18/15 | 14:01 |
| QC1203372234                      | LCS       |        |        |       |       |      |       |            |       |          |       |
| Phosphorus, Total as P            | 1.00      |        |        | 1.09  | mg/L  |      | 109   | (83%-123%) |       | 08/18/15 | 13:34 |
| QC1203372233                      | MB        |        |        |       |       |      |       |            |       |          |       |
| Phosphorus, Total as P            |           |        | U      | ND    | mg/L  |      |       |            |       | 08/18/15 | 13:33 |
| QC1203372236                      | 379011002 | MS     |        |       |       |      |       |            |       |          |       |
| Phosphorus, Total as P            | 1.00      |        | 0.0553 | 1.27  | mg/L  |      | 121   | (59%-141%) |       | 08/18/15 | 13:36 |
| QC1203375690                      | 379148002 | MS     |        |       |       |      |       |            |       |          |       |
| Phosphorus, Total as P            | 1.00      | U      | ND     | 1.09  | mg/L  |      | 109   | (59%-141%) |       | 08/18/15 | 14:02 |
| <b>Solids Analysis</b>            |           |        |        |       |       |      |       |            |       |          |       |
| Batch                             | 1499735   |        |        |       |       |      |       |            |       |          |       |
| QC1203372379                      | 379019002 | DUP    |        |       |       |      |       |            |       |          |       |
| Total Dissolved Solids            |           |        | 151    | 149   | mg/L  | 2.84 |       | (0%-5%)    | MXB3  | 08/12/15 | 08:54 |
| QC1203372378                      | LCS       |        |        |       |       |      |       |            |       |          |       |
| Total Dissolved Solids            | 300       |        |        | 301   | mg/L  |      | 100   | (95%-105%) |       | 08/12/15 | 08:54 |
| QC1203372377                      | MB        |        |        |       |       |      |       |            |       |          |       |
| Total Dissolved Solids            |           |        | U      | ND    | mg/L  |      |       |            |       | 08/12/15 | 08:54 |
| <b>Titration and Ion Analysis</b> |           |        |        |       |       |      |       |            |       |          |       |

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## QC Summary

Workorder: 379019

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| Parmname                          | NOM       | Sample | Qual | QC   | Units    | RPD%     | REC%   | Range      | Anlst | Date     | Time  |
|-----------------------------------|-----------|--------|------|------|----------|----------|--------|------------|-------|----------|-------|
| <b>Titration and Ion Analysis</b> |           |        |      |      |          |          |        |            |       |          |       |
| Batch                             | 1499835   |        |      |      |          |          |        |            |       |          |       |
| QC1203372687                      | 379011002 | DUP    |      |      |          |          |        |            |       |          |       |
| pH                                |           | H      | 8.05 | H    | 8.04     | SU       | 0.0542 | (0%-5%)    | PXO1  | 08/12/15 | 13:49 |
| QC1203372688                      | 379019002 | DUP    |      |      |          |          |        |            |       |          |       |
| pH                                |           | H      | 7.87 | H    | 7.90     | SU       | 0.364  | (0%-5%)    |       | 08/12/15 | 14:37 |
| QC1203372686                      | LCS       |        |      |      |          |          |        |            |       |          |       |
| pH                                | 7.00      |        |      | 7.01 | SU       |          | 100    | (99%-101%) |       | 08/12/15 | 13:23 |
| Batch                             | 1499837   |        |      |      |          |          |        |            |       |          |       |
| QC1203372696                      | 379011002 | DUP    |      |      |          |          |        |            |       |          |       |
| Conductivity                      |           |        | 213  |      | 215      | umhos/cm | 0.913  | (0%-10%)   | PXO1  | 08/12/15 | 13:08 |
| QC1203372695                      | LCS       |        |      |      |          |          |        |            |       |          |       |
| Conductivity                      | 1410      |        |      | 1400 | umhos/cm |          | 99.3   | (95%-105%) |       | 08/12/15 | 13:05 |
| Batch                             | 1499840   |        |      |      |          |          |        |            |       |          |       |
| QC1203372714                      | 379011002 | DUP    |      |      |          |          |        |            |       |          |       |
| Alkalinity, Total as CaCO3        |           |        | 70.7 |      | 70.7     | mg/L     | 0      | (0%-20%)   | PXO1  | 08/13/15 | 14:31 |
| Carbonate alkalinity (CaCO3)      |           | U      | ND   | U    | ND       | mg/L     | N/A    |            |       |          |       |
| QC1203372712                      | LCS       |        |      |      |          |          |        |            |       |          |       |
| Alkalinity, Total as CaCO3        | 50.0      |        |      |      | 51.3     | mg/L     | 103    | (90%-110%) |       | 08/13/15 | 13:40 |
| QC1203372710                      | MB        |        |      |      |          |          |        |            |       |          |       |
| Alkalinity, Total as CaCO3        |           |        | U    |      | ND       | mg/L     |        |            |       | 08/13/15 | 13:40 |
| Carbonate alkalinity (CaCO3)      |           |        | U    |      | ND       | mg/L     |        |            |       |          |       |
| QC1203372716                      | 379011002 | MS     |      |      |          |          |        |            |       |          |       |
| Alkalinity, Total as CaCO3        | 50.0      |        | 70.7 |      | 121      | mg/L     | 101    | (80%-120%) |       | 08/13/15 | 14:33 |

- Notes:**
- < Result is less than value reported
  - > Result is greater than value reported
  - B The target analyte was detected in the associated blank.
  - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A RPD or %Recovery limits do not apply.
  - N1 See case narrative

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## QC Summary

Workorder: 379019

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| Parmname | NOM   | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|---|--------|------|----|-------|------|------|-------|-------|------|------|
| ND       | Analyte concentration is not detected above the detection limit   |        |      |    |       |      |      |       |       |      |      |
| NJ       | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  |        |      |    |       |      |      |       |       |      |      |
| Q        | One or more quality control criteria have not been met. Refer to the applicable narrative or DER.   |        |      |    |       |      |      |       |       |      |      |
| R        | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.   |        |      |    |       |      |      |       |       |      |      |
| 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  |        |      |    |       |      |      |       |       |      |      |
| 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  |        |      |    |       |      |      |       |       |      |      |
| e        | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |        |      |    |       |      |      |       |       |      |      |
| 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 or %RPD not applicable.

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

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

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

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

# Miscellaneous



| DATA EXCEPTION REPORT  |  |  |                             |
|--|--|--|-----------------------------|
| <b>Mo.Day Yr.</b><br>13-AUG-15   | <b>Division:</b><br>Industrial                   | <b>Quality Criteria:</b><br>Specifications   | <b>Type:</b><br>Process     |
| <b>Instrument Type:</b><br>LACHAT Flow Injection Analyzer  | <b>Test / Method:</b><br>EPA 351.2, EPA 351.2 SC | <b>Matrix Type:</b><br>Liquid  | <b>Client Code:</b><br>ESHL |
| <b>Batch ID:</b><br>1499653  | <b>Sample Numbers:</b><br>See Below              |  |                             |
| <b>Potentially affected work order(s)(SDG): 379011(2015-2090),379019(2015-2084),379146(2015-2126)</b><br><b>Application Issues:</b><br>Failed Recovery for MS/MSD, or PS/PSD |  |  |                             |
| <b>Specification and Requirements</b>  |  | <b>DER Disposition:</b>  |                             |
| <b>Exception Description:</b>  |  |  |                             |
| 1. Failed Recovery for MS/MSD, or PS/PSD:<br><br>QC 1203372232MS   |  | 1. The matrix spike recovered outside of the established acceptance limits due to matrix interference.<br>Nitrogen, Total Kjeldahl 1203372232 (CASA-15-102633MS) [61* (90%-110%)]. |                             |

**Originator's Name:**  
Kristen Mizzell 13-AUG-15

**Data Validator/Group Leader:**  
Aubrey Kingsbury 13-AUG-15

### DATA EXCEPTION REPORT

|   |                                     |  |                             |
|---|-------------------------------------|--|-----------------------------|
| <b>Mo.Day Yr.</b><br>19-AUG-15  | <b>Division:</b><br>Industrial      | <b>Quality Criteria:</b><br>Specifications   | <b>Type:</b><br>Process     |
| <b>Instrument Type:</b><br>PC-Titrate TitraSip System   | <b>Test / Method:</b><br>EPA 150.1  | <b>Matrix Type:</b><br>Liquid  | <b>Client Code:</b><br>ESHL |
| <b>Batch ID:</b><br>1499835   | <b>Sample Numbers:</b><br>See Below |  |                             |
| <b>Potentially affected work order(s)(SDG):</b> 379006(2015-2108),379010(2015-2089),379011(2015-2090),379012(2015-2087),379013(2015-2086),379017(2015-2088),379019(2015-2084),379136(2015-2127)<br><b>Application Issues:</b><br>Sample received out of holding |                                     |  |                             |
| <b>Specification and Requirements</b>   |                                     | <b>DER Disposition:</b>  |                             |
| <b>Exception Description:</b><br><br>1. Sample received out of holding:<br>379006 001,010<br>379010 001<br>379011 002,004<br>379012 001,003,005,007<br>379013 001<br>379017 006<br>379019 002,004,006,008,010<br>379136 001,003,005                             |                                     | 1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.<br><br>379006001 (WT_REF-15-102389) [See applicable report].<br>379006010 (WT_REF-15-102390) [See applicable report].<br>379010001 (Urban-15-102323) [See applicable report].<br>379011002 (CASA-15-102647) [See applicable report].<br>379011004 (CASA-15-102652) [See applicable report].<br>379012001 (Urban-15-102320) [See applicable report].<br>379012003 (Urban-15-102301) [See applicable report].<br>379012005 (Urban-15-102315) [See applicable report].<br>379012007 (Urban-15-102326) [See applicable report].<br>379013001 (WTRON-15-99483) [See applicable report].<br>379017006 (WTLAP-15-97588) [See applicable report].<br>379019002 (CAMO-15-102604) [See applicable report].<br>379019004 (CAMO-15-102559) [See applicable report].<br>379019006 (CAMO-15-102605) [See applicable report].<br>379019008 (CAMO-15-102608) [See applicable report].<br>379019010 (CAMO-15-102609) [See applicable report].<br>379136001 (Urban-15-102333) [See applicable report].<br>379136003 (Urban-15-102325) [See applicable report].<br>379136005 (Urban-15-102334) [See applicable report]. |                             |

**Originator's Name:**

Patrick Orgel 19-AUG-15

**Data Validator/Group Leader:**

Elzbieta Szulc 03-SEP-15

# **Radiological Analysis**

**Radiochemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2015-2084  
Work Order #: 379019**

**Method/Analysis Information**

**Product:** Alphaspec Am241 Liquid  
**Analytical Method:** DOE EML HASL-300, Am-05-RC Modified  
**Analytical Batch Number:** 1499559

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019001        | CAMO-15-102580                                   |
| 379019003        | CAMO-15-102558                                   |
| 379019005        | CAMO-15-102581                                   |
| 1203371986       | Method Blank (MB)                                |
| 1203371988       | Laboratory Control Sample (LCS)                  |
| 1203371987       | 379019001(CAMO-15-102580) 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-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in August 2015.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

Aliquots for samples 1203371986 (MB) and 1203371988 (LCS) were changed to 1.0 per client request.

**Designated QC**

The following sample was used for QC: 379019001 (CAMO-15-102580). The QC was from ARSL work order 379019.

#### **QC Information**

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

#### **CSU**

The blank result is less than 1.65 times the CSU.

#### **Technical Information:**

##### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

##### **Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

##### **Recounts**

None of the samples in this sample set were recounted.

#### **Miscellaneous Information:**

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

A data exception report (DER) 1444169 was generated for samples 1203371987 (CAMO-15-102580DUP), 379019001 (CAMO-15-102580) and 379019005 (CAMO-15-102581) in this SDG/batch. DER 1444169 was generated due to RDL less than MDA. 1. Samples 379019001, 379019005, 379215001, and 1203371987 did not meet the Am-241 detection limit due to the high standard deviation. 1. When a blank population is performed the MDC is greater than the RDL due to the high standard deviation. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDAs. Reporting results.

##### **Manual Integration**

No manual integrations were performed on data in this batch.

##### **Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

##### **Additional Comments**

The MDCs (and Lc if requested) are calculated using a blank population.

##### **Blank Decision Level**

The blank result is less than the decision level.

#### **Qualifier Information**

Manual qualifiers were not required.

#### **Method/Analysis Information**

**Product:**

**ISOPU**

Analytical Method:

DOE EML HASL-300, Pu-11-RC Modified

Analytical Batch Number: 1499560

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019001        | CAMO-15-102580                                   |
| 379019003        | CAMO-15-102558                                   |
| 379019005        | CAMO-15-102581                                   |
| 1203371989       | Method Blank (MB)                                |
| 1203371991       | Laboratory Control Sample (LCS)                  |
| 1203371990       | 379019001(CAMO-15-102580) 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-RAD-A-011 REV# 25.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in August 2015.

##### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

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

##### **Blank Information**

Aliquots for samples 1203371989 (MB) and 1203371991 (LCS) were changed to 1.0 per client request.

##### **Designated QC**

The following sample was used for QC: 379019001 (CAMO-15-102580). The QC was from ARSL work order 379019.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **CSU**

The blank result is less than 1.65 times the CSU.

#### **Technical Information:**

##### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

##### **Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

#### **Recounts**

None of the samples in this sample set were recounted.

#### **Miscellaneous Information:**

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

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

#### **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

#### **Additional Comments**

The MDCs (and Lc if requested) are calculated using a blank population.

#### **Blank Decision Level**

The blank result is less than the decision level.

#### **Qualifier Information**

Manual qualifiers were not required.

#### **Method/Analysis Information**

##### **Product:**

**IsoU**

Analytical Method:

DOE EML HASL-300, U-02-RC Modified

Analytical Batch Number:

1499562

##### **Sample ID**

##### **Client ID**

379019001

CAMO-15-102580

379019003

CAMO-15-102558

379019005

CAMO-15-102581

1203371994

Method Blank (MB)

1203371996

Laboratory Control Sample (LCS)

1203371995

379019001(CAMO-15-102580) 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-RAD-A-011 REV# 25.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in August 2015.

#### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

#### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

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

#### **Blank Information**

Aliquots for samples 1203371994 (MB) and 1203371996 (LCS) were changed to 1.0 per client request.

#### **Designated QC**

The following sample was used for QC: 379019001 (CAMO-15-102580). The QC was from ARSL work order 379019.

#### **QC Information**

All of the QC samples met the required acceptance limits.

#### **CSU**

The U-233/234, U-235/236, and U-238 blank results are greater than 1.65 times the CSU but less than the MDC.

### **Technical Information:**

#### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

#### **Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

#### **Recounts**

None of the samples in this sample set were recounted.

### **Miscellaneous Information:**

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

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

#### **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

#### **Additional Comments**

The MDCs (and Lc if requested) are calculated using a blank population.



**Blank Decision Level**

The U-233/234, U-235/236, and U-238 blank results are greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Gammaspec

Analytical Method: EPA 901.1

Analytical Batch Number: 1499679

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--|
| 379019001        | CAMO-15-102580                                   |
| 379019003        | CAMO-15-102558                                   |
| 379019005        | CAMO-15-102581                                   |
| 1203372291       | Method Blank (MB)                                |
| 1203372293       | Laboratory Control Sample (LCS)                  |
| 1203372294       | 379019001(CAMO-15-102580) 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-RAD-A-013 REV# 25.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in July 2015, June 2015, October 2014 and September 2014.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 379019001 (CAMO-15-102580). The QC was from ARSL work order 379019.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank 1203372291 (MB) I-131 and K-40 results are greater than 1.65 times the CSU but less than the MDC.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Recounts**

None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**

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

**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

Additional comments were not required for this sample set.

**Blank Decision Level**

The blank 1203372291 (MB) I-131 and K-40 results are greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

|                          |  |
|--------------------------|--|
| <b>Product:</b>          | <b>GFPC, Sr90, liquid</b>                    |
| Analytical Method:       | EPA 905.0 Modified/DOE RP501 Rev. 1 Modified |
| Analytical Batch Number: | 1501028                                      |

|                  |                  |
|------------------|------------------|
| <b>Sample ID</b> | <b>Client ID</b> |
| 379019001        | CAMO-15-102580   |

|            |  |
|------------|--|
| 379019003  | CAMO-15-102558                                   |
| 379019005  | CAMO-15-102581                                   |
| 1203375951 | Method Blank (MB)                                |
| 1203375954 | Laboratory Control Sample (LCS)                  |
| 1203375952 | 379019005(CAMO-15-102581) Sample Duplicate (DUP) |
| 1203375953 | 379019005(CAMO-15-102581) Matrix Spike (MS)      |

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-RAD-A-004 REV# 17.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

#### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

#### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

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

#### **Blank Information**

Aliquots for samples 1203375951 (MB) and 1203375954 (LCS) were changed to 1.0 per client request.

#### **Designated QC**

The following sample was used for QC: 379019005 (CAMO-15-102581). The QC was from ARSL work order 379019.

#### **QC Information**

All of the QC samples met the required acceptance limits.

#### **CSU**

The blank result is less than 1.65 times the CSU.

### **Technical Information:**

#### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

#### **Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

#### **Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

#### **Recounts**

None of the samples in this sample set were recounted.

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

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

**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

The matrix spike, 1203375953 (CAMO-15-102581MS), aliquot was reduced to conserve sample volume.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

|                          |                      |
|--------------------------|----------------------|
| <b>Product:</b>          | <b>WSP-GrossA/B</b>  |
| Analytical Method:       | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1501030              |

| <b>Sample ID</b> | <b>Client ID</b>                                       |
|------------------|--|
| 379019001        | CAMO-15-102580   |
| 379019003        | CAMO-15-102558   |
| 379019005        | CAMO-15-102581   |
| 1203375955       | Method Blank (MB)                                      |
| 1203375959       | Laboratory Control Sample (LCS)                        |
| 1203375956       | 379019003(CAMO-15-102558) Sample Duplicate (DUP)       |
| 1203375957       | 379019003(CAMO-15-102558) Matrix Spike (MS)            |
| 1203375958       | 379019003(CAMO-15-102558) Matrix Spike Duplicate (MSD) |

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-RAD-A-001 REV# 18.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 379019003 (CAMO-15-102558). The QC was from ARSL work order 379019.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**

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

**Recounts**

Sample 1203375956 (CAMO-15-102558DUP) was recounted due to high MDC. The recount is reported.

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

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

**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

The matrix spike and matrix spike duplicate, 1203375957 (CAMO-15-102558MS) and 1203375958

(CAMO-15-102558MSD), aliquots were reduced to conserve sample volume.

#### **Blank Decision Level**

The blank, 1203375955 (MB), result is greater than the decision level but less than the MDC.

#### **Qualifier Information**

Manual qualifiers were not required.

#### **Method/Analysis Information**

|                          |                      |
|--------------------------|----------------------|
| <b>Product:</b>          | <b>WSP-GrossA/B</b>  |
| Analytical Method:       | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1504918              |

| <b>Sample ID</b> | <b>Client ID</b>                                       |
|------------------|--|
| 379019001        | CAMO-15-102580   |
| 379019003        | CAMO-15-102558   |
| 379019005        | CAMO-15-102581   |
| 1203386175       | Method Blank (MB)                                      |
| 1203386179       | Laboratory Control Sample (LCS)                        |
| 1203386176       | 379019001(CAMO-15-102580) Sample Duplicate (DUP)       |
| 1203386177       | 379019001(CAMO-15-102580) Matrix Spike (MS)            |
| 1203386178       | 379019001(CAMO-15-102580) Matrix Spike Duplicate (MSD) |

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-RAD-A-001 REV# 18.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

##### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

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

#### **Blank Information**

Aliquots for samples 1203386175 (MB) and 1203386179 (LCS) were changed to 1.0 per client request.

#### **Designated QC**

The following sample was used for QC: 379019001 (CAMO-15-102580). The QC was from ARSL work order 379019.

#### **QC Information**

All of the QC samples met the required acceptance limits.

#### **CSU**

The blank result is less than 1.65 times the CSU.

### **Technical Information:**

#### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

#### **Sample Re-prep/Re-analysis**

Samples were re-prepped for gross beta due to high relative percent difference/relative error ratio. The re-analysis is being reported.

#### **Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

#### **Gross Alpha/Beta Preparation Information**

None of the samples have been flamed.

#### **Recounts**

None of the samples in this sample set were recounted.

### **Miscellaneous Information:**

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

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

#### **Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

#### **Additional Comments**

The matrix spike and matrix spike duplicate, 1203386177 (CAMO-15-102580MS) and 1203386178 (CAMO-15-102580MSD), aliquots were reduced to conserve sample volume.

#### **Blank Decision Level**

The blank result is less than the decision level.

### **Qualifier Information**

Manual qualifiers were not required.

**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**

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-2084 GEL Work Order: 379019

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

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

#### **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: Kate Gellatly**

**Date: 04 SEP 2015**

**Title: Analyst I**

| DATA EXCEPTION REPORT  |   |  |                             |
|--|---|--|-----------------------------|
| <b>Mo.Day Yr.</b><br>31-AUG-15   | <b>Division:</b><br>Radiochemistry                              | <b>Quality Criteria:</b><br>Specifications   | <b>Type:</b><br>Process     |
| <b>Instrument Type:</b><br>ALPHA SPECTROMETER  | <b>Test / Method:</b><br>DOE EML HASL-300, Am-05-RC<br>Modified | <b>Matrix Type:</b><br>Liquid  | <b>Client Code:</b><br>ESHL |
| <b>Batch ID:</b><br>1499559  | <b>Sample Numbers:</b><br>See Below                             |  |                             |
| <b>Potentially affected work order(s)(SDG): 379019(2015-2084),379215(2015-2138),379330(2015-2152)</b><br><b>Application Issues:</b><br>RDL less than MDA |   |  |                             |
| <b>Specification and Requirements</b>  |   | <b>DER Disposition:</b>  |                             |
| <b>Exception Description:</b>  |   |  |                             |
| 1. Samples 379019001, 379019005, 379215001, and 1203371987 did not meet the Am-241 detection limit due to the high standard deviation.                   |   | 1. When a blank population is performed the MDC is greater than the RDL due to the high standard deviation. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDAs. Reporting results. |                             |

**Originator's Name:**

Melanie Aycock 31-AUG-15

**Data Validator/Group Leader:**

Jessica Davis 31-AUG-15

# **Sample Data Summary**

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: September 4, 2015

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-15-102580  
Sample ID: 379019001  
Matrix: W  
Collect Date: 06-AUG-15  
Receive Date: 11-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|-------------|-----|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|-------------|-----|----|-----|----|-------|----|---------|------|------|-------|------|

### Rad Alpha Spec Analysis

*Alphaspec Am241 Liquid "As Received"*

|                            |   |          |            |        |        |            |       |       |  |      |          |      |         |   |
|----------------------------|---|----------|------------|--------|--------|------------|-------|-------|--|------|----------|------|---------|---|
| Americium-241              | U | 0.0101   | +/-0.00534 | 0.0574 | 0.026  | +/-0.00535 | 0.050 | pCi/L |  | JXD2 | 08/29/15 | 1217 | 1499559 | 1 |
| <i>ISOPU "As Received"</i> |   |          |            |        |        |            |       |       |  |      |          |      |         |   |
| Plutonium-238              | U | -0.00801 | +/-0.00491 | 0.0333 | 0.0139 | +/-0.00491 | 0.050 | pCi/L |  | JXD2 | 08/29/15 | 1435 | 1499560 | 2 |
| Plutonium-239/240          | U | -0.00601 | +/-0.00448 | 0.0443 | 0.0194 | +/-0.00448 | 0.050 | pCi/L |  |      |          |      |         |   |
| <i>IsoU "As Received"</i>  |   |          |            |        |        |            |       |       |  |      |          |      |         |   |
| Uranium-234                |   | 0.503    | +/-0.0302  | 0.0788 | 0.037  | +/-0.0434  | 1.00  | pCi/L |  | JXD2 | 08/29/15 | 1703 | 1499562 | 3 |
| Uranium-235/236            |   | 0.0723   | +/-0.013   | 0.0523 | 0.0232 | +/-0.0137  | 1.00  | pCi/L |  |      |          |      |         |   |
| Uranium-238                |   | 0.319    | +/-0.0243  | 0.0494 | 0.0223 | +/-0.0313  | 0.500 | pCi/L |  |      |          |      |         |   |

### Rad Gamma Spec Analysis

*Gammaspex "As Received"*

|               |   |       |         |      |      |         |      |       |  |      |          |      |         |   |
|---------------|---|-------|---------|------|------|---------|------|-------|--|------|----------|------|---------|---|
| Cesium-137    | U | 0.845 | +/-1.76 | 6.47 | 2.94 | +/-1.77 | 8.00 | pCi/L |  | MJH1 | 08/19/15 | 0943 | 1499679 | 4 |
| Cobalt-60     | U | 1.61  | +/-1.21 | 5.49 | 2.32 | +/-1.27 | 8.00 | pCi/L |  |      |          |      |         |   |
| Neptunium-237 | U | -2.29 | +/-3.00 | 10.3 | 4.77 | +/-3.05 | 10.0 | pCi/L |  |      |          |      |         |   |
| Potassium-40  | U | -8.24 | +/-18.2 | 68.3 | 29.9 | +/-18.3 | 10.0 | pCi/L |  |      |          |      |         |   |
| Sodium-22     | U | 0.298 | +/-1.44 | 5.70 | 2.43 | +/-1.44 | 10.0 | pCi/L |  |      |          |      |         |   |

### Rad Gas Flow Proportional Counting

*GFPC, Sr90, liquid "As Received"*

|                                   |   |        |          |       |       |          |       |       |  |      |          |      |         |   |
|-----------------------------------|---|--------|----------|-------|-------|----------|-------|-------|--|------|----------|------|---------|---|
| Strontium-90                      | U | -0.186 | +/-0.128 | 0.475 | 0.222 | +/-0.128 | 0.500 | pCi/L |  | KSD1 | 08/31/15 | 0934 | 1501028 | 5 |
| <i>WSP-GrossA/B "As Received"</i> |   |        |          |       |       |          |       |       |  |      |          |      |         |   |
| Alpha                             | U | 0.708  | +/-0.822 | 3.00  | 1.20  | +/-0.824 | 3.00  | pCi/L |  | KXB2 | 09/01/15 | 0725 | 1501030 | 6 |
| Beta                              | U | 1.78   | +/-0.879 | 2.80  | 1.23  | +/-0.892 | 3.00  | pCi/L |  | KXB2 | 09/02/15 | 1641 | 1504918 | 7 |

### The following Analytical Methods were performed

| Method | Description                                  |
|--------|--|
| 1      | DOE EML HASL-300, Am-05-RC Modified          |
| 2      | DOE EML HASL-300, Pu-11-RC Modified          |
| 3      | DOE EML HASL-300, U-02-RC Modified           |
| 4      | EPA 901.1                                    |
| 5      | EPA 905.0 Modified/DOE RP501 Rev. 1 Modified |
| 6      | EPA 900.0/SW846 9310                         |
| 7      | EPA 900.0/SW846 9310                         |

| Surrogate/Tracer Recovery | Test                                 | Batch ID | Recovery% | Acceptable Limits |
|---------------------------|--------------------------------------|----------|-----------|-------------------|
| Americium-243 Tracer      | Alphaspec Am241 Liquid "As Received" | 1499559  | 90.1      | (50%-105%)        |
| Plutonium-242 Tracer      | ISOPU "As Received"                  | 1499560  | 81.2      | (50%-105%)        |
| Uranium-232 Tracer        | IsoU "As Received"                   | 1499562  | 95.4      | (50%-105%)        |

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

## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: September 4, 2015

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-15-102580

Sample ID: 379019001

Project: ESHL00114

Client ID: ARSL004

| Parameter                 | Qualifier | Result                           | Uncertainty | MDC | Lc | TPU | RL | Units    | DF        | Analyst           | Date | Time | Batch | Mtd. |
|---------------------------|-----------|----------------------------------|-------------|-----|----|-----|----|----------|-----------|-------------------|------|------|-------|------|
| Surrogate/Tracer Recovery | Test      |                                  |             |     |    |     |    | Batch ID | Recovery% | Acceptable Limits |      |      |       |      |
| Strontium Carrier         |           | GFPC, Sr90, liquid "As Received" |             |     |    |     |    | 1501028  | 76.5      | (50%-105%)        |      |      |       |      |

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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## Certificate of Analysis

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Los Alamos, New Mexico 87545

Report Date: September 4, 2015

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-15-102558

Sample ID: 379019003

Matrix: W

Collect Date: 06-AUG-15

Receive Date: 11-AUG-15

Collector: Client

Project: ESHL00114

Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|-------------|-----|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|-------------|-----|----|-----|----|-------|----|---------|------|------|-------|------|

### Rad Alpha Spec Analysis

*Alphaspec Am241 Liquid "As Received"*

|               |   |          |            |        |        |            |       |       |  |      |          |      |         |   |
|---------------|---|----------|------------|--------|--------|------------|-------|-------|--|------|----------|------|---------|---|
| Americium-241 | U | -0.00356 | +/-0.00436 | 0.0507 | 0.0229 | +/-0.00436 | 0.050 | pCi/L |  | JXD2 | 08/29/15 | 1217 | 1499559 | 1 |
|---------------|---|----------|------------|--------|--------|------------|-------|-------|--|------|----------|------|---------|---|

*ISOPU "As Received"*

|               |   |          |           |        |        |           |       |       |  |      |          |      |         |   |
|---------------|---|----------|-----------|--------|--------|-----------|-------|-------|--|------|----------|------|---------|---|
| Plutonium-238 | U | 6.67E-10 | +/-0.0049 | 0.0332 | 0.0139 | +/-0.0049 | 0.050 | pCi/L |  | JXD2 | 08/29/15 | 1435 | 1499560 | 2 |
|---------------|---|----------|-----------|--------|--------|-----------|-------|-------|--|------|----------|------|---------|---|

|                   |   |          |            |        |        |            |       |       |  |  |  |  |  |  |
|-------------------|---|----------|------------|--------|--------|------------|-------|-------|--|--|--|--|--|--|
| Plutonium-239/240 | U | 1.67E-09 | +/-0.00693 | 0.0443 | 0.0194 | +/-0.00693 | 0.050 | pCi/L |  |  |  |  |  |  |
|-------------------|---|----------|------------|--------|--------|------------|-------|-------|--|--|--|--|--|--|

*IsoU "As Received"*

|             |  |       |           |       |        |           |      |       |  |      |          |      |         |   |
|-------------|--|-------|-----------|-------|--------|-----------|------|-------|--|------|----------|------|---------|---|
| Uranium-234 |  | 0.526 | +/-0.0327 | 0.087 | 0.0409 | +/-0.0465 | 1.00 | pCi/L |  | JXD2 | 08/29/15 | 1703 | 1499562 | 3 |
|-------------|--|-------|-----------|-------|--------|-----------|------|-------|--|------|----------|------|---------|---|

|                 |   |        |           |        |        |           |      |       |  |  |  |  |  |  |
|-----------------|---|--------|-----------|--------|--------|-----------|------|-------|--|--|--|--|--|--|
| Uranium-235/236 | U | 0.0435 | +/-0.0118 | 0.0577 | 0.0256 | +/-0.0122 | 1.00 | pCi/L |  |  |  |  |  |  |
|-----------------|---|--------|-----------|--------|--------|-----------|------|-------|--|--|--|--|--|--|

|             |  |       |           |        |        |           |       |       |  |  |  |  |  |  |
|-------------|--|-------|-----------|--------|--------|-----------|-------|-------|--|--|--|--|--|--|
| Uranium-238 |  | 0.317 | +/-0.0254 | 0.0545 | 0.0246 | +/-0.0322 | 0.500 | pCi/L |  |  |  |  |  |  |
|-------------|--|-------|-----------|--------|--------|-----------|-------|-------|--|--|--|--|--|--|

### Rad Gamma Spec Analysis

*Gammasespec "As Received"*

|            |   |       |         |      |      |         |      |       |  |      |          |      |         |   |
|------------|---|-------|---------|------|------|---------|------|-------|--|------|----------|------|---------|---|
| Cesium-137 | U | 0.696 | +/-1.57 | 5.91 | 2.64 | +/-1.58 | 8.00 | pCi/L |  | MJH1 | 08/19/15 | 0947 | 1499679 | 4 |
|------------|---|-------|---------|------|------|---------|------|-------|--|------|----------|------|---------|---|

|           |   |      |         |      |      |         |      |       |  |  |  |  |  |  |
|-----------|---|------|---------|------|------|---------|------|-------|--|--|--|--|--|--|
| Cobalt-60 | U | 1.59 | +/-1.58 | 6.76 | 2.91 | +/-1.63 | 8.00 | pCi/L |  |  |  |  |  |  |
|-----------|---|------|---------|------|------|---------|------|-------|--|--|--|--|--|--|

|               |   |      |         |      |      |         |      |       |  |  |  |  |  |  |
|---------------|---|------|---------|------|------|---------|------|-------|--|--|--|--|--|--|
| Neptunium-237 | U | 4.15 | +/-3.09 | 11.5 | 5.35 | +/-3.24 | 10.0 | pCi/L |  |  |  |  |  |  |
|---------------|---|------|---------|------|------|---------|------|-------|--|--|--|--|--|--|

|              |   |       |         |      |      |         |      |       |  |  |  |  |  |  |
|--------------|---|-------|---------|------|------|---------|------|-------|--|--|--|--|--|--|
| Potassium-40 | U | -10.4 | +/-19.9 | 77.2 | 33.9 | +/-20.1 | 10.0 | pCi/L |  |  |  |  |  |  |
|--------------|---|-------|---------|------|------|---------|------|-------|--|--|--|--|--|--|

|           |   |       |         |      |      |         |      |       |  |  |  |  |  |  |
|-----------|---|-------|---------|------|------|---------|------|-------|--|--|--|--|--|--|
| Sodium-22 | U | -1.69 | +/-1.56 | 5.30 | 2.19 | +/-1.61 | 10.0 | pCi/L |  |  |  |  |  |  |
|-----------|---|-------|---------|------|------|---------|------|-------|--|--|--|--|--|--|

### Rad Gas Flow Proportional Counting

*GFPC, Sr90, liquid "As Received"*

|              |   |       |          |       |       |          |       |       |  |      |          |      |         |   |
|--------------|---|-------|----------|-------|-------|----------|-------|-------|--|------|----------|------|---------|---|
| Strontium-90 | U | -0.17 | +/-0.118 | 0.439 | 0.205 | +/-0.118 | 0.500 | pCi/L |  | KSD1 | 08/31/15 | 0934 | 1501028 | 5 |
|--------------|---|-------|----------|-------|-------|----------|-------|-------|--|------|----------|------|---------|---|

*WSP-GrossA/B "As Received"*

|       |   |       |          |      |      |          |      |       |  |      |          |      |         |   |
|-------|---|-------|----------|------|------|----------|------|-------|--|------|----------|------|---------|---|
| Alpha | U | 0.166 | +/-0.719 | 2.83 | 1.14 | +/-0.719 | 3.00 | pCi/L |  | KXB2 | 09/01/15 | 0752 | 1501030 | 6 |
|-------|---|-------|----------|------|------|----------|------|-------|--|------|----------|------|---------|---|

|      |   |      |          |      |      |          |      |       |  |      |          |      |         |   |
|------|---|------|----------|------|------|----------|------|-------|--|------|----------|------|---------|---|
| Beta | U | 2.61 | +/-0.914 | 2.71 | 1.18 | +/-0.943 | 3.00 | pCi/L |  | KXB2 | 09/02/15 | 1642 | 1504918 | 7 |
|------|---|------|----------|------|------|----------|------|-------|--|------|----------|------|---------|---|

### The following Analytical Methods were performed

| Method | Description                                  |
|--------|--|
| 1      | DOE EML HASL-300, Am-05-RC Modified          |
| 2      | DOE EML HASL-300, Pu-11-RC Modified          |
| 3      | DOE EML HASL-300, U-02-RC Modified           |
| 4      | EPA 901.1                                    |
| 5      | EPA 905.0 Modified/DOE RP501 Rev. 1 Modified |
| 6      | EPA 900.0/SW846 9310                         |
| 7      | EPA 900.0/SW846 9310                         |

| Surrogate/Tracer     | Recovery | Test                                 | Batch ID | Recovery% | Acceptable Limits |
|----------------------|----------|--------------------------------------|----------|-----------|-------------------|
| Americium-243 Tracer |          | Alphaspec Am241 Liquid "As Received" | 1499559  | 93.2      | (50%-105%)        |
| Plutonium-242 Tracer |          | ISOPU "As Received"                  | 1499560  | 84.5      | (50%-105%)        |
| Uranium-232 Tracer   |          | IsoU "As Received"                   | 1499562  | 88.1      | (50%-105%)        |
| Strontium Carrier    |          | GFPC, Sr90, liquid "As Received"     | 1501028  | 72.8      | (50%-105%)        |

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## Certificate of Analysis

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Los Alamos, New Mexico 87545

Report Date: September 4, 2015

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-15-102558

Sample ID: 379019003

Project: ESHL00114

Client ID: ARSL004

| Parameter                 | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date     | Time      | Batch             | Mtd. |
|---------------------------|-----------|--------|-------------|-----|----|-----|----|-------|----|---------|----------|-----------|-------------------|------|
| Surrogate/Tracer Recovery |           | Test   |             |     |    |     |    |       |    |         | Batch ID | Recovery% | Acceptable Limits |      |

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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Los Alamos, New Mexico 87545

Report Date: September 4, 2015

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-15-102581

Sample ID: 379019005

Matrix: W

Collect Date: 06-AUG-15

Receive Date: 11-AUG-15

Collector: Client

Project: ESHL00114

Client ID: ARSL004

| Parameter                                   | Qualifier | Result   | Uncertainty | MDC    | Lc     | TPU        | RL    | Units | DF | Analyst | Date     | Time | Batch   | Mtd. |
|---|-----------|----------|-------------|--------|--------|------------|-------|-------|----|---------|----------|------|---------|------|
| <b>Rad Alpha Spec Analysis</b>              |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| <i>Alphaspec Am241 Liquid "As Received"</i> |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| Americium-241                               | U         | 1.31E-09 | +/-0.00619  | 0.0557 | 0.0252 | +/-0.00619 | 0.050 | pCi/L |    | JXD2    | 08/29/15 | 1217 | 1499559 | 1    |
| <i>ISOPU "As Received"</i>                  |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| Plutonium-238                               | U         | -0.0039  | +/-0.00552  | 0.0324 | 0.0136 | +/-0.00552 | 0.050 | pCi/L |    | JXD2    | 08/29/15 | 1435 | 1499560 | 2    |
| Plutonium-239/240                           | U         | -0.00195 | +/-0.00436  | 0.0431 | 0.0189 | +/-0.00436 | 0.050 | pCi/L |    |         |          |      |         |      |
| <i>IsoU "As Received"</i>                   |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| Uranium-234                                 |           | 0.647    | +/-0.0348   | 0.0809 | 0.038  | +/-0.0533  | 1.00  | pCi/L |    | JXD2    | 08/29/15 | 1703 | 1499562 | 3    |
| Uranium-235/236                             | U         | 0.0494   | +/-0.0115   | 0.0537 | 0.0238 | +/-0.0119  | 1.00  | pCi/L |    |         |          |      |         |      |
| Uranium-238                                 |           | 0.325    | +/-0.0246   | 0.0507 | 0.0229 | +/-0.0319  | 0.500 | pCi/L |    |         |          |      |         |      |
| <b>Rad Gamma Spec Analysis</b>              |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| <i>Gammasespec "As Received"</i>            |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| Cesium-137                                  | U         | -1.06    | +/-1.44     | 4.94   | 2.24   | +/-1.46    | 8.00  | pCi/L |    | MJH1    | 08/19/15 | 0947 | 1499679 | 4    |
| Cobalt-60                                   | U         | 0.595    | +/-1.40     | 5.03   | 2.18   | +/-1.41    | 8.00  | pCi/L |    |         |          |      |         |      |
| Neptunium-237                               | U         | -2.44    | +/-2.94     | 9.70   | 4.54   | +/-3.00    | 10.0  | pCi/L |    |         |          |      |         |      |
| Potassium-40                                | U         | 17.6     | +/-18.1     | 45.9   | 19.6   | +/-18.1    | 10.0  | pCi/L |    |         |          |      |         |      |
| Sodium-22                                   | U         | 0.0258   | +/-1.37     | 5.16   | 2.25   | +/-1.37    | 10.0  | pCi/L |    |         |          |      |         |      |
| <b>Rad Gas Flow Proportional Counting</b>   |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| <i>GFPC, Sr90, liquid "As Received"</i>     |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| Strontium-90                                | U         | -0.0584  | +/-0.133    | 0.484  | 0.224  | +/-0.133   | 0.500 | pCi/L |    | KSD1    | 08/31/15 | 0929 | 1501028 | 5    |
| <i>WSP-GrossA/B "As Received"</i>           |           |          |             |        |        |            |       |       |    |         |          |      |         |      |
| Alpha                                       | U         | -0.919   | +/-0.710    | 2.96   | 1.29   | +/-0.710   | 3.00  | pCi/L |    | KXB2    | 09/01/15 | 0801 | 1501030 | 6    |
| Beta  |           | 3.85     | +/-0.976    | 2.69   | 1.18   | +/-1.03    | 3.00  | pCi/L |    | KXB2    | 09/02/15 | 1642 | 1504918 | 7    |

### The following Analytical Methods were performed

| Method | Description                                  |
|--------|--|
| 1      | DOE EML HASL-300, Am-05-RC Modified          |
| 2      | DOE EML HASL-300, Pu-11-RC Modified          |
| 3      | DOE EML HASL-300, U-02-RC Modified           |
| 4      | EPA 901.1                                    |
| 5      | EPA 905.0 Modified/DOE RP501 Rev. 1 Modified |
| 6      | EPA 900.0/SW846 9310                         |
| 7      | EPA 900.0/SW846 9310                         |

| Surrogate/Tracer     | Recovery | Test                                 | Batch ID | Recovery% | Acceptable Limits |
|----------------------|----------|--------------------------------------|----------|-----------|-------------------|
| Americium-243 Tracer |          | Alphaspec Am241 Liquid "As Received" | 1499559  | 81.2      | (50%-105%)        |
| Plutonium-242 Tracer |          | ISOPU "As Received"                  | 1499560  | 89.6      | (50%-105%)        |
| Uranium-232 Tracer   |          | IsoU "As Received"                   | 1499562  | 90.3      | (50%-105%)        |
| Strontium Carrier    |          | GFPC, Sr90, liquid "As Received"     | 1501028  | 76.5      | (50%-105%)        |



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Los Alamos, New Mexico 87545

Report Date: September 4, 2015

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-15-102581

Project: ESHL00114

Sample ID: 379019005

Client ID: ARSL004

| Parameter                 | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date     | Time      | Batch             | Mtd. |
|---------------------------|-----------|--------|-------------|-----|----|-----|----|-------|----|---------|----------|-----------|-------------------|------|
| Surrogate/Tracer Recovery |           | Test   |             |     |    |     |    |       |    |         | Batch ID | Recovery% | Acceptable Limits |      |

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

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## QC Summary

Report Date: September 4, 2015

Page 1 of 6

Client : Los Alamos National Laboratory  
TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 379019

| Parmname               | NOM       | Sample     | Qual | QC         | Units | RER   | REC% | Range      | Anlst | Date          | Time |
|------------------------|-----------|------------|------|------------|-------|-------|------|------------|-------|---------------|------|
| <b>Rad Alpha Spec</b>  |           |            |      |            |       |       |      |            |       |               |      |
| Batch                  | 1499559   |            |      |            |       |       |      |            |       |               |      |
| QC1203371987           | 379019001 | DUP        |      |            |       |       |      |            |       |               |      |
| Americium-241          | U         | 0.0101     | U    | 0.0346     | pCi/L | 0.668 |      | (0-1)      | JXD2  | 08/29/1512:16 |      |
|                        | Uncert:   | +/-0.00534 |      | +/-0.0129  |       |       |      |            |       |               |      |
|                        | TPU:      | +/-0.00535 |      | +/-0.013   |       |       |      |            |       |               |      |
| **Americium-243 Tracer | 2.67      | 2.41       |      | 2.18       | pCi/L |       | 81.5 | (50%-105%) |       |               |      |
|                        | Uncert:   | +/-0.0732  |      | +/-0.0879  |       |       |      |            |       |               |      |
|                        | TPU:      | +/-0.128   |      | +/-0.146   |       |       |      |            |       |               |      |
| QC1203371988           | LCS       |            |      |            |       |       |      |            |       |               |      |
| Americium-241          | 1.97      |            |      | 1.81       | pCi/L |       | 91.9 | (80%-120%) | JXD2  | 08/29/1512:16 |      |
|                        | Uncert:   |            |      | +/-0.0574  |       |       |      |            |       |               |      |
|                        | TPU:      |            |      | +/-0.0932  |       |       |      |            |       |               |      |
| **Americium-243 Tracer | 2.14      |            |      | 2.11       | pCi/L |       | 98.8 | (50%-105%) |       |               |      |
|                        | Uncert:   |            |      | +/-0.0619  |       |       |      |            |       |               |      |
|                        | TPU:      |            |      | +/-0.107   |       |       |      |            |       |               |      |
| QC1203371986           | MB        |            |      |            |       |       |      |            |       |               |      |
| Americium-241          |           |            | U    | 0.00691    | pCi/L |       |      |            | JXD2  | 08/29/1512:17 |      |
|                        | Uncert:   |            |      | +/-0.00459 |       |       |      |            |       |               |      |
|                        | TPU:      |            |      | +/-0.00459 |       |       |      |            |       |               |      |
| **Americium-243 Tracer | 2.14      |            |      | 2.05       | pCi/L |       | 95.8 | (50%-105%) |       |               |      |
|                        | Uncert:   |            |      | +/-0.0541  |       |       |      |            |       |               |      |
|                        | TPU:      |            |      | +/-0.0974  |       |       |      |            |       |               |      |
| Batch                  | 1499560   |            |      |            |       |       |      |            |       |               |      |
| QC1203371990           | 379019001 | DUP        |      |            |       |       |      |            |       |               |      |
| Plutonium-238          | U         | -0.00801   | U    | -0.00572   | pCi/L | 0.115 |      | (0-1)      | JXD2  | 08/29/1514:35 |      |
|                        | Uncert:   | +/-0.00491 |      | +/-0.00505 |       |       |      |            |       |               |      |
|                        | TPU:      | +/-0.00491 |      | +/-0.00505 |       |       |      |            |       |               |      |
| Plutonium-239/240      | U         | -0.00601   | U    | 0.00572    | pCi/L | 0.543 |      | (0-1)      |       |               |      |
|                        | Uncert:   | +/-0.00448 |      | +/-0.00632 |       |       |      |            |       |               |      |
|                        | TPU:      | +/-0.00448 |      | +/-0.00633 |       |       |      |            |       |               |      |
| **Plutonium-242 Tracer | 2.48      | 2.01       |      | 2.04       | pCi/L |       | 82.5 | (50%-105%) |       |               |      |
|                        | Uncert:   | +/-0.0708  |      | +/-0.0689  |       |       |      |            |       |               |      |
|                        | TPU:      | +/-0.122   |      | +/-0.120   |       |       |      |            |       |               |      |
| QC1203371991           | LCS       |            |      |            |       |       |      |            |       |               |      |
| Plutonium-238          |           |            | U    | 0.0111     | pCi/L |       |      | (80%-120%) | JXD2  | 08/29/1514:35 |      |
|                        | Uncert:   |            |      | +/-0.00479 |       |       |      |            |       |               |      |
|                        | TPU:      |            |      | +/-0.00481 |       |       |      |            |       |               |      |
| Plutonium-239/240      | 1.97      |            |      | 1.85       | pCi/L |       | 94   | (80%-120%) |       |               |      |
|                        | Uncert:   |            |      | +/-0.0506  |       |       |      |            |       |               |      |
|                        | TPU:      |            |      | +/-0.0875  |       |       |      |            |       |               |      |
| **Plutonium-242 Tracer | 1.98      |            |      | 1.86       | pCi/L |       | 94.1 | (50%-105%) |       |               |      |
|                        | Uncert:   |            |      | +/-0.0525  |       |       |      |            |       |               |      |
|                        | TPU:      |            |      | +/-0.0927  |       |       |      |            |       |               |      |

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## QC Summary

Workorder: 379019

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| Parmname               | NOM       | Sample             | Qual | QC                 | Units | RER    | REC% | Range      | Anlst | Date          | Time |
|------------------------|-----------|--------------------|------|--------------------|-------|--------|------|------------|-------|---------------|------|
| <b>Rad Alpha Spec</b>  |           |                    |      |                    |       |        |      |            |       |               |      |
| Batch                  | 1499560   |                    |      |                    |       |        |      |            |       |               |      |
| QC1203371989           | MB        |                    |      |                    |       |        |      |            |       |               |      |
| Plutonium-238          |           |                    | U    | 0.00506            | pCi/L |        |      |            | JXD2  | 08/29/1514:35 |      |
|                        |           |                    |      | Uncert: +/-0.00446 |       |        |      |            |       |               |      |
|                        |           |                    |      | TPU: +/-0.00447    |       |        |      |            |       |               |      |
| Plutonium-239/240      |           |                    | U    | -0.00337           | pCi/L |        |      |            |       |               |      |
|                        |           |                    |      | Uncert: +/-0.00533 |       |        |      |            |       |               |      |
|                        |           |                    |      | TPU: +/-0.00533    |       |        |      |            |       |               |      |
| **Plutonium-242 Tracer | 1.98      |                    |      | 1.64               | pCi/L |        | 82.9 | (50%-105%) |       |               |      |
|                        |           |                    |      | Uncert: +/-0.0581  |       |        |      |            |       |               |      |
|                        |           |                    |      | TPU: +/-0.0992     |       |        |      |            |       |               |      |
| Batch                  | 1499562   |                    |      |                    |       |        |      |            |       |               |      |
| QC1203371995           | 379019001 | DUP                |      |                    |       |        |      |            |       |               |      |
| Uranium-234            |           | 0.503              |      | 0.517              | pCi/L | 0.0772 |      | (0-1)      | JXD2  | 08/29/1517:03 |      |
|                        |           | Uncert: +/-0.0302  |      | +/-0.0304          |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.0434     |      | +/-0.0442          |       |        |      |            |       |               |      |
| Uranium-235/236        |           | 0.0723             |      | 0.061              | pCi/L | 0.211  |      | (0-1)      |       |               |      |
|                        |           | Uncert: +/-0.013   |      | +/-0.0123          |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.0137     |      | +/-0.0129          |       |        |      |            |       |               |      |
| Uranium-238            |           | 0.319              |      | 0.298              | pCi/L | 0.171  |      | (0-1)      |       |               |      |
|                        |           | Uncert: +/-0.0243  |      | +/-0.0231          |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.0313     |      | +/-0.0296          |       |        |      |            |       |               |      |
| **Uranium-232 Tracer   | 2.65      | 2.53               |      | 2.41               | pCi/L |        | 91.2 | (50%-105%) |       |               |      |
|                        |           | Uncert: +/-0.069   |      | +/-0.0695          |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.178      |      | +/-0.179           |       |        |      |            |       |               |      |
| QC1203371996           | LCS       |                    |      |                    |       |        |      |            |       |               |      |
| Uranium-234            |           |                    |      | 2.77               | pCi/L |        |      |            | JXD2  | 08/29/1517:03 |      |
|                        |           | Uncert: +/-0.0652  |      | +/-0.0652          |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.185      |      | +/-0.185           |       |        |      |            |       |               |      |
| Uranium-235/236        |           |                    |      | 0.201              | pCi/L |        |      |            |       |               |      |
|                        |           | Uncert: +/-0.0197  |      | +/-0.0197          |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.0234     |      | +/-0.0234          |       |        |      |            |       |               |      |
| Uranium-238            | 2.72      |                    |      | 2.84               | pCi/L |        | 104  | (80%-120%) |       |               |      |
|                        |           | Uncert: +/-0.066   |      | +/-0.066           |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.190      |      | +/-0.190           |       |        |      |            |       |               |      |
| **Uranium-232 Tracer   | 2.12      |                    |      | 1.89               | pCi/L |        | 89.1 | (50%-105%) |       |               |      |
|                        |           | Uncert: +/-0.058   |      | +/-0.058           |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.145      |      | +/-0.145           |       |        |      |            |       |               |      |
| QC1203371994           | MB        |                    |      |                    |       |        |      |            |       |               |      |
| Uranium-234            |           |                    | U    | 0.0589             | pCi/L |        |      |            | JXD2  | 08/29/1517:03 |      |
|                        |           | Uncert: +/-0.0104  |      | +/-0.0104          |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.0111     |      | +/-0.0111          |       |        |      |            |       |               |      |
| Uranium-235/236        |           |                    | U    | 0.0216             | pCi/L |        |      |            |       |               |      |
|                        |           | Uncert: +/-0.00811 |      | +/-0.00811         |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.00822    |      | +/-0.00822         |       |        |      |            |       |               |      |
| Uranium-238            |           |                    | U    | 0.0255             | pCi/L |        |      |            |       |               |      |
|                        |           | Uncert: +/-0.00746 |      | +/-0.00746         |       |        |      |            |       |               |      |
|                        |           | TPU: +/-0.00763    |      | +/-0.00763         |       |        |      |            |       |               |      |

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| Parmname            | NOM       | Sample  | Qual | QC        | Units | RER   | REC% | Range      | Anlst | Date     | Time  |
|---------------------|-----------|---------|------|-----------|-------|-------|------|------------|-------|----------|-------|
| Rad Alpha Spec      |           |         |      |           |       |       |      |            |       |          |       |
| Batch               | 1499562   |         |      |           |       |       |      |            |       |          |       |
| *Uranium-232 Tracer | 2.12      |         |      | 2.06      | pCi/L |       | 97.1 | (50%-105%) |       |          |       |
|                     | Uncert:   |         |      | +/-0.0596 |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-0.146  |       |       |      |            |       |          |       |
| Rad Gamma Spec      |           |         |      |           |       |       |      |            |       |          |       |
| Batch               | 1499679   |         |      |           |       |       |      |            |       |          |       |
| QC1203372294        | 379019001 | DUP     |      |           |       |       |      |            |       |          |       |
| Cesium-137          | U         | 0.845   | U    | 2.22      | pCi/L | 0.199 |      | (0-1)      | MJH1  | 08/19/15 | 11:54 |
|                     | Uncert:   | +/-1.76 |      | +/-1.61   |       |       |      |            |       |          |       |
|                     | TPU:      | +/-1.77 |      | +/-1.69   |       |       |      |            |       |          |       |
| Cobalt-60           | U         | 1.61    | U    | -0.323    | pCi/L | 0.312 |      | (0-1)      |       |          |       |
|                     | Uncert:   | +/-1.21 |      | +/-1.83   |       |       |      |            |       |          |       |
|                     | TPU:      | +/-1.27 |      | +/-1.83   |       |       |      |            |       |          |       |
| Neptunium-237       | U         | -2.29   | U    | -0.741    | pCi/L | 0.125 |      | (0-1)      |       |          |       |
|                     | Uncert:   | +/-3.00 |      | +/-3.13   |       |       |      |            |       |          |       |
|                     | TPU:      | +/-3.05 |      | +/-3.14   |       |       |      |            |       |          |       |
| Potassium-40        | U         | -8.24   | U    | -19       | pCi/L | 0.147 |      | (0-1)      |       |          |       |
|                     | Uncert:   | +/-18.2 |      | +/-17.9   |       |       |      |            |       |          |       |
|                     | TPU:      | +/-18.3 |      | +/-18.4   |       |       |      |            |       |          |       |
| Sodium-22           | U         | 0.298   | U    | -1.21     | pCi/L | 0.266 |      | (0-1)      |       |          |       |
|                     | Uncert:   | +/-1.44 |      | +/-1.36   |       |       |      |            |       |          |       |
|                     | TPU:      | +/-1.44 |      | +/-1.39   |       |       |      |            |       |          |       |
| QC1203372293        | LCS       |         |      |           |       |       |      |            |       |          |       |
| Americium-241       | 34400     |         |      | 36000     | pCi/L |       | 104  | (80%-120%) | MJH1  | 08/19/15 | 11:10 |
|                     | Uncert:   |         |      | +/-446    |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-1380   |       |       |      |            |       |          |       |
| Cesium-137          | 13700     |         |      | 14200     | pCi/L |       | 104  | (80%-120%) |       |          |       |
|                     | Uncert:   |         |      | +/-151    |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-600    |       |       |      |            |       |          |       |
| Cobalt-60           | 15100     |         |      | 15600     | pCi/L |       | 103  | (80%-120%) |       |          |       |
|                     | Uncert:   |         |      | +/-176    |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-660    |       |       |      |            |       |          |       |
| Neptunium-237       |           |         | U    | -23.6     | pCi/L |       |      |            |       |          |       |
|                     | Uncert:   |         |      | +/-65.9   |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-66.1   |       |       |      |            |       |          |       |
| Potassium-40        |           |         | U    | 288       | pCi/L |       |      |            |       |          |       |
|                     | Uncert:   |         |      | +/-190    |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-191    |       |       |      |            |       |          |       |
| Sodium-22           |           |         | U    | -6.44     | pCi/L |       |      |            |       |          |       |
|                     | Uncert:   |         |      | +/-20.2   |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-20.3   |       |       |      |            |       |          |       |
| QC1203372291        | MB        |         |      |           |       |       |      |            |       |          |       |
| Cesium-137          |           |         | U    | -2.26     | pCi/L |       |      |            | MJH1  | 08/19/15 | 11:27 |
|                     | Uncert:   |         |      | +/-1.57   |       |       |      |            |       |          |       |
|                     | TPU:      |         |      | +/-1.66   |       |       |      |            |       |          |       |
| Cobalt-60           |           |         | U    | -2.34     | pCi/L |       |      |            |       |          |       |
|                     | Uncert:   |         |      | +/-1.50   |       |       |      |            |       |          |       |

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| Parmname              | NOM       | Sample   | Qual     | QC        | Units | RER     | REC% | Range      | Anlst | Date          | Time |
|-----------------------|-----------|----------|----------|-----------|-------|---------|------|------------|-------|---------------|------|
| <b>Rad Gamma Spec</b> |           |          |          |           |       |         |      |            |       |               |      |
| Batch                 | 1499679   |          |          |           |       |         |      |            |       |               |      |
| Neptunium-237         | TPU:      |          |          | +/-1.60   |       |         |      |            |       |               |      |
|                       |           |          | U        | 4.63      | pCi/L |         |      |            |       |               |      |
|                       | Uncert:   |          |          | +/-2.83   |       |         |      |            |       |               |      |
| Potassium-40          | TPU:      |          |          | +/-3.03   |       |         |      |            |       |               |      |
|                       |           |          | U        | 42.1      | pCi/L |         |      |            |       |               |      |
|                       | Uncert:   |          |          | +/-16.4   |       |         |      |            |       |               |      |
| Sodium-22             | TPU:      |          |          | +/-19.2   |       |         |      |            |       |               |      |
|                       |           |          | U        | 0.395     | pCi/L |         |      |            |       |               |      |
|                       | Uncert:   |          |          | +/-1.10   |       |         |      |            |       |               |      |
|                       | TPU:      |          |          | +/-1.10   |       |         |      |            |       |               |      |
|                       |           |          |          |           |       |         |      |            |       |               |      |
|                       |           |          |          |           |       |         |      |            |       |               |      |
| <b>Rad Gas Flow</b>   |           |          |          |           |       |         |      |            |       |               |      |
| Batch                 | 1501028   |          |          |           |       |         |      |            |       |               |      |
| QC1203375952          | 379019005 | DUP      |          |           |       |         |      |            |       |               |      |
| Strontium-90          | U         | -0.0584  | U        | -0.0706   | pCi/L | 0.0224  |      | (0-1)      | KSD1  | 08/31/1509:34 |      |
|                       | Uncert:   | +/-0.133 |          | +/-0.138  |       |         |      |            |       |               |      |
|                       | TPU:      | +/-0.133 |          | +/-0.138  |       |         |      |            |       |               |      |
| **Strontium Carrier   | 8.10      | 6.20     |          | 5.70      | mg    |         | 70.4 | (50%-105%) |       |               |      |
| QC1203375954          | LCS       |          |          |           |       |         |      |            |       |               |      |
| Strontium-90          | 21.8      |          |          | 25.0      | pCi/L |         | 115  | (80%-120%) | KSD1  | 08/31/1509:29 |      |
|                       | Uncert:   |          |          | +/-0.629  |       |         |      |            |       |               |      |
|                       | TPU:      |          |          | +/-2.22   |       |         |      |            |       |               |      |
| **Strontium Carrier   | 8.10      |          |          | 5.60      | mg    |         | 69.1 | (50%-105%) |       |               |      |
| QC1203375951          | MB        |          |          |           |       |         |      |            |       |               |      |
| Strontium-90          |           |          | U        | -0.0303   | pCi/L |         |      |            | KSD1  | 08/31/1509:29 |      |
|                       | Uncert:   |          |          | +/-0.0966 |       |         |      |            |       |               |      |
|                       | TPU:      |          |          | +/-0.0966 |       |         |      |            |       |               |      |
| **Strontium Carrier   | 8.10      |          |          | 6.20      | mg    |         | 76.5 | (50%-105%) |       |               |      |
| QC1203375953          | 379019005 | MS       |          |           |       |         |      |            |       |               |      |
| Strontium-90          | 218       | U        | -0.0584  | 231       | pCi/L |         | 106  | (75%-125%) | KSD1  | 08/31/1509:29 |      |
|                       | Uncert:   |          | +/-0.133 | +/-5.48   |       |         |      |            |       |               |      |
|                       | TPU:      |          | +/-0.133 | +/-20.1   |       |         |      |            |       |               |      |
| **Strontium Carrier   | 8.10      | 6.20     |          | 6.80      | mg    |         | 84   | (50%-105%) |       |               |      |
| Batch                 | 1501030   |          |          |           |       |         |      |            |       |               |      |
| QC1203375956          | 379019003 | DUP      |          |           |       |         |      |            |       |               |      |
| Alpha                 | U         | 0.166    | U        | 0.176     | pCi/L | 0.00314 |      | (0-1)      | KXB2  | 09/02/1508:42 |      |
|                       | Uncert:   | +/-0.719 |          | +/-0.756  |       |         |      |            |       |               |      |
|                       | TPU:      | +/-0.719 |          | +/-0.756  |       |         |      |            |       |               |      |
| QC1203375959          | LCS       |          |          |           |       |         |      |            |       |               |      |
| Alpha                 | 12.0      |          |          | 11.8      | pCi/L |         | 98.1 | (80%-120%) | KXB2  | 08/31/1518:23 |      |
|                       | Uncert:   |          |          | +/-0.612  |       |         |      |            |       |               |      |
|                       | TPU:      |          |          | +/-1.17   |       |         |      |            |       |               |      |
| QC1203375955          | MB        |          |          |           |       |         |      |            |       |               |      |
| Alpha                 |           |          | U        | 0.134     | pCi/L |         |      |            | KXB2  | 09/01/1508:01 |      |
|                       | Uncert:   |          |          | +/-0.101  |       |         |      |            |       |               |      |
|                       | TPU:      |          |          | +/-0.102  |       |         |      |            |       |               |      |

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| Parmname            | NOM           | Sample | Qual     | QC       | Units | RER   | REC% | Range      | Anlst | Date          | Time |
|---------------------|---------------|--------|----------|----------|-------|-------|------|------------|-------|---------------|------|
| <b>Rad Gas Flow</b> |               |        |          |          |       |       |      |            |       |               |      |
| Batch               | 1501030       |        |          |          |       |       |      |            |       |               |      |
| QC1203375957        | 379019003 MS  |        |          |          |       |       |      |            |       |               |      |
| Alpha               | 240           | U      | 0.166    | 265      | pCi/L |       | 111  | (75%-125%) | KXB2  | 08/31/1518:23 |      |
|                     | Uncert:       |        | +/-0.719 | +/-13.6  |       |       |      |            |       |               |      |
|                     | TPU:          |        | +/-0.719 | +/-27.4  |       |       |      |            |       |               |      |
| QC1203375958        | 379019003 MSD |        |          |          |       |       |      |            |       |               |      |
| Alpha               | 240           | U      | 0.166    | 254      | pCi/L | 0.11  | 106  | (0-1)      | KXB2  | 08/31/1518:23 |      |
|                     | Uncert:       |        | +/-0.719 | +/-13.3  |       |       |      |            |       |               |      |
|                     | TPU:          |        | +/-0.719 | +/-25.1  |       |       |      |            |       |               |      |
| Batch               | 1504918       |        |          |          |       |       |      |            |       |               |      |
| QC1203386176        | 379019001 DUP |        |          |          |       |       |      |            |       |               |      |
| Beta                |               | U      | 1.78     | 2.91     | pCi/L | 0.305 |      | (0-1)      | KXB2  | 09/02/1516:41 |      |
|                     | Uncert:       |        | +/-0.879 | +/-0.923 |       |       |      |            |       |               |      |
|                     | TPU:          |        | +/-0.892 | +/-0.957 |       |       |      |            |       |               |      |
| QC1203386179        | LCS           |        |          |          |       |       |      |            |       |               |      |
| Beta                | 43.5          |        |          | 51.4     | pCi/L |       | 118  | (80%-120%) | KXB2  | 09/02/1516:41 |      |
|                     | Uncert:       |        |          | +/-0.992 |       |       |      |            |       |               |      |
|                     | TPU:          |        |          | +/-4.35  |       |       |      |            |       |               |      |
| QC1203386175        | MB            |        |          |          |       |       |      |            |       |               |      |
| Beta                |               |        | U        | 0.149    | pCi/L |       |      |            | KXB2  | 09/02/1516:42 |      |
|                     | Uncert:       |        |          | +/-0.117 |       |       |      |            |       |               |      |
|                     | TPU:          |        |          | +/-0.118 |       |       |      |            |       |               |      |
| QC1203386177        | 379019001 MS  |        |          |          |       |       |      |            |       |               |      |
| Beta                | 870           | U      | 1.78     | 984      | pCi/L |       | 113  | (75%-125%) | KXB2  | 09/02/1516:41 |      |
|                     | Uncert:       |        | +/-0.879 | +/-18.3  |       |       |      |            |       |               |      |
|                     | TPU:          |        | +/-0.892 | +/-83.2  |       |       |      |            |       |               |      |
| QC1203386178        | 379019001 MSD |        |          |          |       |       |      |            |       |               |      |
| Beta                | 870           | U      | 1.78     | 1040     | pCi/L | 0.152 | 119  | (0-1)      | KXB2  | 09/02/1516:41 |      |
|                     | Uncert:       |        | +/-0.879 | +/-18.9  |       |       |      |            |       |               |      |
|                     | TPU:          |        | +/-0.892 | +/-87.5  |       |       |      |            |       |               |      |

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

- \*\* Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.

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| Parmname | NOM  | Sample Qual | QC | Units | RER | REC% | Range | Anlst | Date | Time |
|----------|--|-------------|----|-------|-----|------|-------|-------|------|------|
| 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                                     |             |    |       |     |      |       |       |      |      |
| 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.   |             |    |       |     |      |       |       |      |      |
| UI       | Gamma Spectroscopy--Uncertain identification   |             |    |       |     |      |       |       |      |      |
| UJ       | Gamma Spectroscopy--Uncertain identification   |             |    |       |     |      |       |       |      |      |
| UL       | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.       |             |    |       |     |      |       |       |      |      |
| X        | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier                                     |             |    |       |     |      |       |       |      |      |
| Y        | Other specific qualifiers were required to properly define the results. Consult case narrative.                                |             |    |       |     |      |       |       |      |      |
| ^        | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |             |    |       |     |      |       |       |      |      |
| 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 or %RPD not applicable.

\*\* Indicates analyte is a surrogate/tracer compound.

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

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

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