

The order of this data package is as follows:

1. Chain-of-Custody/Lab Request
2. Copies of field COCs
3. Validation Report
4. Laboratory analysis

Comments:

2018-496

| TEST - Explosives | | YES | NO |
|--|--|-----|----|
| Samples collected from a WFO area? | | | X |
| Field Test for Explosives Results | | YES | NO |
| Spot test shows presence of explosives residues. If YES - Do not ship. | | X | |

| TEST - Chemical Preservation | | YES | NO |
|--|--|-----|----|
| Samples are chemically preserved? | | X | |
| Field Team Member Statement | | YES | NO |
| Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship. | | | X |

| TEST - Field Screen | | | YES | NO |
|---|---|---|-----|----|
| The sample has field screening measurements of alpha activity and beta activity? | | | | X |
| Sample Activity (dpm/100cm ²) | Shipment Activity (dpm*g/100cm ²) | Sampled Location | YES | NO |
| Alpha detectable | Alpha >160,000 | TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49 | | X |
| Alpha > 125 | Alpha >1,250,000 | other locations | | |
| Beta > 1,500 | Beta >15,000,000 | any location | | |
| The sample Alpha >16,000,000 dpm*g/100cm ² or Beta > 160,000,000 dpm*g/100cm ² . If YES - Do not ship. | | | | |
| On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship. | | | | |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity. | | | | |

| TEST - Location | | YES | NO |
|--|--|-----|----|
| Prior analytical measurements of radioactive isotopes are available? | | X | |
| Sample Activity (pCi/g) | Shipment Activity (pCi) | YES | NO |
| <ul style="list-style-type: none"> Am-241 > 27 Cs-137 > 270 Pu-238 > 27 Pu-239/240 > 27 Th-228 > 27 U-234 > 270 U-238 > 270 H-3 > 27,000,000 | <ul style="list-style-type: none"> Am-241 > 270,000 Cs-137 > 270,000 Pu-238 > 270,000 Pu-239/240 > 270,000 Th-228 > 270,000 U-234 > 1,600,000,000 U-238 > unlimited H-3 > 27,000,000,000 | | X |
| Am-241, Pu-238, Pu-239/240, or Th 228 > 27,000,000 pCi; or Cs-137 > 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship. | | | X |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes. | | | X |

| TEST - AK | | YES | NO | NA |
|--|--|-----|----|----|
| The shippers documented knowledge of the sample positively identifies appropriate labeling. | | | | X |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, and the sample is submitted to ARS or RP for hazard classification analysis. | | | | X |

| HOLD SAMPLES FOR ANALYSIS | |
|--|--|
| The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7] | |

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

| Hazard Assessment Completed By: | Date/Time |
|---------------------------------|-----------|
| (Printed Name) Melissa Montoya | 10/18/17 |
| (Signature) | 3:00 |

| Hazard Assessment Reviewed By: | Date/Time |
|--------------------------------|-----------|
| (Printed Name) S. Sherwood | 10/18/17 |
| (Signature) | 3:00 |

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147564

WORK ORDER:

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---------------------------------|---------------|--------------|----------------------|---------------|-----------------|
| Date Collected (MM/DD/YYYY): | 10-17-17 | OK | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | 1139 | | MEDIA: | | |
| PRS ID: | NA | | SAMPLE TECH CODE: | GSP | |
| LOCATION ID: | R-52 S1 | | FIELD PREP: | F | |
| LOCATION TYPE: | NA | | FIELD QC TYPE: | REG | |
| TOP DEPTH: | | | 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- GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP- NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

TV 10-17-17

| | | | |
|----------------------------------|-----------|------------------|-------------------------|
| Sample Time | HH:MM | Dissolved Oxygen | Flow (ln gpm) |
| Oxidation-Reduction Potential | pH | | Specific Conductance |
| Temperature | Turbidity | | |

COLLECTED BY (PRINT): A. Vigil, D. Hughes

| | | | |
|--|-------------------------------|---|-------------------------------|
| RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) Tanya Vander Vis | Date/Time 10-17-17 1430 | RECEIVED BY MATT ENGLERT (Printed Name) M. Englert (Signature) M. Englert | Date/Time 10-17-17 1430 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147565

WORK ORDER:

| | <u>AS PLANNED</u> | <u>AS COLLECTED</u> | | <u>AS PLANNED</u> | <u>AS COLLECTED</u> |
|---------------------------------|-----------------------|---------------------|----------------------|-----------------------|---------------------|
| Date Collected (MM/DD/YYYY): | 10-17-17 | OK | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | 1323 | | MEDIA: | | |
| PRS ID: | NA | | SAMPLE TECH CODE: | GSP | |
| LOCATION ID: | R-52 S2 | | FIELD PREP: | F | |
| LOCATION TYPE: | NA | | FIELD QC TYPE: | REG | |
| TOP DEPTH: | | | 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- GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP- NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM _____ Dissolved Oxygen _____ Flow (in gpm) _____
 Oxidation-Reduction _____ pH _____ Specific _____
 Potential _____ Turbidity _____ Conductance _____
 Temperature _____

COLLECTED BY (PRINT): A. Vigil, D. Hughes

| | | | |
|--|-------------------------------|--|-------------------------------|
| RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) Tanya VanderVis | Date/Time 10-17-17 1430 | RECEIVED BY (Printed Name) Sherwood (Signature) Sherwood | Date/Time 10/17/17 1430 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147591

WORK ORDER:

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---------------------------------|--|--------------|----------------------|---------------|----------------------|
| Date Collected (MM/DD/YYYY): | 10-17-17 <u>1323</u> TV 10-17-17 | OK | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | <u>1323</u> | | MEDIA: | | |
| PRS ID: | NA | | SAMPLE TECH CODE: | GSP | |
| LOCATION ID: | R-52 S2 | | FIELD PREP: | UF | |
| LOCATION TYPE: | NA | | FIELD QC TYPE: | REG | |
| TOP DEPTH: | | | SAMPLE USAGE: | INV | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / <u>NA</u> |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------|-----------------------------|---|--------------|---------------|----------------------|
| NA | MSGP-Hg | 500 ML POLY | 1 | HNO3 | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

SAMPLE COMMENTS: Sampled with running diesel generator ~30 ft. away

LOCATION COMMENTS: none

FIELD PARAMETERS:

| | | | |
|-------------------------------|----------------|-----------|------------------|
| Sample Time | <u>1323</u> | HH:MM | Dissolved Oxygen |
| Oxidation-Reduction Potential | <u>182.3mV</u> | pH | <u>7.86</u> |
| Temperature | <u>21.1°C</u> | Turbidity | <u>0.09 NTU</u> |

6.71 mg/l

Flow (in gpm)

3.33

Specific
Conductance1240 $\mu S/cm$

COLLECTED BY (PRINT): A. Vigil, D. Hughes

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11508**EVENT NAME:** Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1**SAMPLE ID:** CAPA-18-147591**WORK ORDER:**

| | | | |
|--|--------------------------------------|--|--------------------------------------|
| RELINQUISHED BY (Printed Name) Tanya VanderVort (Signature) <i>Tanya VanderVort</i> | Date/Time 10-17-17 1430 | RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i> | Date/Time 10/17/17 1430 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147616

WORK ORDER:

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected (MM/DD/YYYY): | 10-17-17 | OK | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | 1323 | | MEDIA: | | |
| PRS ID: | NA | | SAMPLE TECH CODE: | DC | |
| LOCATION ID: | R-52 S2 | | FIELD PREP: | UF | |
| LOCATION TYPE: | NA | | FIELD QC TYPE: | FTB | |
| TOP DEPTH: | | | SAMPLE USAGE: | QC | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|-------------------|-----------------------------|------------|--------------|---------------|----------------------|
| NA | WSP-8260B- VOA | 40 ML SEPTUM AMBER GLASS | 2 1A.V. | HCL | Y | NA |

SAMPLE COMMENTS:

10/17/17

LOCATION COMMENTS:

FIELD PARAMETERS:

TV 10-17-17

| | | | | | | |
|----------------------------------|-------|-------|------------------|-------|-------------------------|-------|
| Sample Time | _____ | HH:MM | Dissolved Oxygen | _____ | Flow (in gpm) | _____ |
| Oxidation-Reduction Potential | _____ | | pH | _____ | Specific Conductance | _____ |
| Temperature | _____ | | Turbidity | _____ | | |

COLLECTED BY (PRINT):

D. Hughes, A. Vigil

| | | | |
|---|-------------------------------|--|-------------------------------|
| RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) <i>Tanya Vander Vis</i> | Date/Time 10-17-17 1430 | RECEIVED BY (Printed Name) <i>Sherwood</i> (Signature) <i>Sherwood</i> | Date/Time 10/17/17 1430 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147686

WORK ORDER:

| | <u>AS PLANNED</u> | <u>AS COLLECTED</u> | | <u>AS PLANNED</u> | <u>AS COLLECTED</u> |
|---------------------------------|-----------------------|---------------------|----------------------|-----------------------|---------------------|
| Date Collected (MM/DD/YYYY): | 10/17/17 | OK | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | 0845 | | MEDIA: | DEOK | |
| PRS ID: | OK | | SAMPLE TECH CODE: | DC | |
| LOCATION ID: | R-52 S2 | | FIELD PREP: | UF | |
| LOCATION TYPE: | OK | | FIELD QC TYPE: | PEB | |
| TOP DEPTH: | ↓ | | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | ↓ | ↓ | EXCAVATED: | | YES / NO / (NA) |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------------------------|-----------------------------|-----------------------|--------------|---------------|----------------------|
| NA | WSP-8082-PCB | 1 LITER AMBER GLASS | 2 2AN- 10/17/17 | ICE | Y | NA |
| | WSP-8260B- VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C- SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8330B-NMED HEXP | 1 LITER AMBER GLASS | 2 2AN- 10/17/17 | ICE | | |
| | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP- GENINORG+PerChlorat e | 1 LITER POLY | 1 | ICE | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP- NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| ↓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11508**EVENT NAME:** Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1**SAMPLE ID:** CAPA-18-147686**WORK ORDER:****SAMPLE COMMENTS:****LOCATION COMMENTS:****FIELD PARAMETERS:**

Sample Time _____ HH:MM _____ Dissolved Oxygen _____ Flow (in gpm) _____
Oxidation-Reduction _____ pH _____ Specific _____
Potential _____ Conductance _____
Temperature _____ Turbidity _____

TV 10-17-17

COLLECTED BY (PRINT): A. Stanfield, T. Bonham

| | | | |
|--|--------------------------------------|--|--------------------------------------|
| RELINQUISHED BY (Printed Name) Allisyn Stanfield (Signature) <i>Allisyn Stanfield</i> | Date/Time 10/17/17 1430 | RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i> | Date/Time 10/17/17 1430 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147590

WORK ORDER:

| | <u>AS PLANNED</u> | <u>AS COLLECTED</u> | | <u>AS PLANNED</u> | <u>AS COLLECTED</u> |
|---------------------------------|-----------------------|---------------------|----------------------|-----------------------|---------------------|
| Date Collected (MM/DD/YYYY): | 10-17-17 | OK | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | 1129 | | MEDIA: | | |
| PRS ID: | NA | | SAMPLE TECH CODE: | GSP | |
| LOCATION ID: | R-52 S1 | | FIELD PREP: | UF | |
| LOCATION TYPE: | NA | | FIELD QC TYPE: | REG | |
| TOP DEPTH: | | | SAMPLE USAGE: | INV | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO (NA) |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------|-----------------------------|---|--------------|---------------|----------------------|
| NA | MSGP-Hg | 500 ML POLY | 1 | HNO3 | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

SAMPLE COMMENTS: sampled running diesel generator ~35 ft. away

LOCATION COMMENTS:
none

FIELD PARAMETERS:

| | | | | | | |
|-------------------------------|---------|-------|------------------|-----------|----------------------|------------------|
| Sample Time | 1139 | HH:MM | Dissolved Oxygen | 7.21 mg/l | Flow (in gpm) | 3.33 |
| Oxidation-Reduction Potential | 173.3mV | | pH | 7.90 | Specific Conductance | 140.0 μ S/cm |
| Temperature | 21.2°C | | Turbidity | 1.64 NTU | | |

COLLECTED BY (PRINT):
A. Vigil, D. Hughes

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11508**EVENT NAME:** Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1**SAMPLE ID:** CAPA-18-147590**WORK ORDER:**

| | | | |
|---|-------------------------------|--|-------------------------------|
| RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i> | Date/Time 10-17-17 1430 | RECEIVED BY MAT ENGLERT (Printed Name) (Signature) <i>M. Englert</i> | Date/Time 10-17-17 1430 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147615

WORK ORDER:

| | <u>AS PLANNED</u> | <u>AS COLLECTED</u> | | <u>AS PLANNED</u> | <u>AS COLLECTED</u> |
|---------------------------------|-----------------------|---------------------|----------------------|-----------------------|---------------------|
| Date Collected (MM/DD/YYYY): | 10-17-17 | OK | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | 1139 | | MEDIA: | | |
| PRS ID: | NA | | SAMPLE TECH CODE: | TV 10-17-17 GSP DC | |
| LOCATION ID: | R-52 S1 | | FIELD PREP: | UF | |
| LOCATION TYPE: | NA | | FIELD QC TYPE: | FTB | |
| TOP DEPTH: | | | SAMPLE USAGE: | QC | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|-------------------|-----------------------------|---------|--------------|---------------|----------------------|
| NA | WSP-8260B- VOA | 40 ML SEPTUM AMBER GLASS | 2 AV | HCL | Y | NA |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM Dissolved Oxygen _____ Flow (in gpm) _____
Oxidation-Reduction Potential _____ pH _____ Specific Conductance _____
Temperature _____ Turbidity _____

COLLECTED BY (PRINT): A. Vigil, D. Hughes

| | | | |
|---|-------------------------------|---|-------------------------------|
| RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i> | Date/Time 10-17-17 1430 | RECEIVED BY MATT EUGLERT (Printed Name) (Signature) <i>M. Euglert</i> | Date/Time 10-17-17 1430 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 10/05/2017

DATA VALIDATION REPORT

Chain Of Custody No. 2018-496

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|--------|-------------------|-----------------|------------------|-------------|--------------|------------------|
| 435560 | EPA:120.1 | 2 | | | | |
| 435560 | EPA:150.1 | 2 | | | | |
| 435560 | EPA:160.1 | 2 | | | | |
| 435560 | EPA:170.0 | 4 | | 2 | | |
| 435560 | EPA:245.2 | 4 | | | | |
| 435560 | EPA:300.0 | 2 | | | | |
| 435560 | EPA:310.1 | 2 | | | | |
| 435560 | EPA:335.4 | 2 | | | | |
| 435560 | EPA:350.1 | 2 | | | | |
| 435560 | EPA:351.2 | 2 | | | | |
| 435560 | EPA:353.2 | 2 | | | | |
| 435560 | EPA:365.4 | 2 | | | | |
| 435560 | EPA:900 | 2 | | | | |
| 435560 | EPA:901.1 | 2 | | | | |
| 435560 | EPA:905.0 | 2 | | | | |
| 435560 | HASL-300:AM-241 | 2 | | | | |
| 435560 | HASL-300:ISOPU | 2 | | | | |
| 435560 | HASL-300:ISOU | 2 | | | | |
| 435560 | SM:A2340B | 2 | | | | |
| 435560 | SW-846:6010C | 2 | | | | |
| 435560 | SW-846:6020 | 2 | | | | |
| 435560 | SW-846:6850 | 2 | | | | |
| 435560 | SW-846:8082 | | | | | |
| 435560 | SW-846:8260B | 2 | | 2 | | |
| 435560 | SW-846:8270D | 2 | | | | |
| 435560 | SW-846:8330B | | | | | |
| 435560 | SW-846:9060 | 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 |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 435560 | EPA:120.1 | 1713570 | 1713570 | 2 | | | | | | | | | | 1 | | | 2 | | | | |
| 435560 | EPA:150.1 | 1713318 | 1713318 | 2 | | | | | | | | | | 1 | | | 2 | | | | |
| 435560 | EPA:160.1 | 1711941 | 1711941 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 435560 | EPA:170.0 | NA | NA | 4 | | 2 | | | | | | | | | | | | | | | |
| 435560 | EPA:245.2 | 1716207 | 1716206 | 4 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 435560 | EPA:300.0 | 1711177 | 1711177 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 435560 | EPA:310.1 | 1713308 | 1713308 | 2 | | | | | | 1 | | | | 1 | | | 1 | | | | |
| 435560 | EPA:335.4 | 1711659 | 1711658 | 2 | | | | | 1 | 2 | | | | 1 | | | 2 | | | | |
| 435560 | EPA:350.1 | 1712962 | 1712955 | 2 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 435560 | EPA:351.2 | 1712660 | 1712656 | 2 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 435560 | EPA:353.2 | 1711717 | 1711717 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 435560 | EPA:365.4 | 1712663 | 1712662 | 2 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 435560 | EPA:900 | 1714187 | 1714187 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | 1 | | | | |
| 435560 | EPA:900 | 1717894 | 1717894 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | 1 | | | | |
| 435560 | EPA:901.1 | 1711850 | 1711850 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 435560 | EPA:905.0 | 1714181 | 1714181 | 2 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 435560 | HASL-300:AM-241 | 1711133 | 1711133 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 435560 | HASL-300:ISOPU | 1711134 | 1711134 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 435560 | HASL-300:ISOU | 1711135 | 1711135 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 435560 | SM:A2340B | 1719308 | 1719308 | 2 | | | | | | | | | | | | | | | | | |
| 435560 | SW-846:6010C | 1711147 | 1711146 | 2 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 435560 | SW-846:6020 | 1711153 | 1711152 | 2 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 435560 | SW-846:6850 | 1711756 | 1711753 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 435560 | SW-846:8082 | 1716000 | 1715999 | | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 435560 | SW-846:8260B | 1714198 | 1714198 | 2 | | 2 | | | 1 | | | | | 2 | | | | | | | |
| 435560 | SW-846:8270D | 1711736 | 1711735 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 435560 | SW-846:8330B | 1711725 | 1711724 | | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 435560 | SW-846:9060 | 1711615 | 1711615 | 2 | | | | | 1 | | | | | 1 | | | 1 | | | | |

2. Distribution Of Analytes In EDD.

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 | CAMO-18-147637 | 1203906356 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203906355 | LCS | 0 | 0 | 1 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | WST15-17-148253 | 1203906357 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-18-147634 | 1203905767 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-18-147637 | 1203905766 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203905765 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CTUA-17-142763 | 1203902620 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203902618 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203902617 | MB | 1 | 0 | 0 | 0 |
| EPA:170.0 | VOC | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:170.0 | VOC | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:170.0 | VOC | CAPA-18-147590 | 435560002 | REG | 1 | 0 | 0 | 0 |
| EPA:170.0 | VOC | CAPA-18-147591 | 435560005 | REG | 1 | 0 | 0 | 0 |
| EPA:170.0 | VOC | CAPA-18-147615 | 435560003 | FTB | 1 | 0 | 0 | 0 |
| EPA:170.0 | VOC | CAPA-18-147616 | 435560006 | FTB | 1 | 0 | 0 | 0 |
| EPA:170.0 | VOC | CAPA-18-147686 | 435560009 | PEB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-18-147644 | 1203913011 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-18-147644 | 1203913013 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAPA-18-147590 | 435560002 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAPA-18-147591 | 435560005 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203913010 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203913009 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-18-147644 | 1203900745 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203900744 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203900743 | MB | 4 | 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:310.1 | GENERAL CHEMISTRY | CAMO-18-147637 | 1203905732 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-18-147637 | 1203905734 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203905729 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | INORGANIC | CAMO-18-147649 | 1203901817 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | INORGANIC | CAMO-18-147649 | 1203901819 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | INORGANIC | CAPA-18-147590 | 1203901818 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | INORGANIC | CAPA-18-147590 | 1203901820 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | INORGANIC | CAPA-18-147590 | 435560002 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | INORGANIC | CAPA-18-147591 | 435560005 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | INORGANIC | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:335.4 | INORGANIC | LCS | 1203901816 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | INORGANIC | MB | 1203901815 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203904838 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203904837 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MSGP-17-131990 | 1203904839 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MSGP-17-131990 | 1203904841 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-18-147649 | 1203904070 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-18-147649 | 1203904071 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-18-147590 | 435560002 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-18-147591 | 435560005 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203904067 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203904066 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203901941 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203901940 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | WST15-18-148144 | 1203901942 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-18-147634 | 1203904076 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-18-147634 | 1203904077 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 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:365.4 | GENERAL CHEMISTRY | LCS | 1203904075 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203904074 | MB | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CAMO-18-147649 | 1203917215 | DUP | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CAMO-18-147649 | 1203917216 | MS | 0 | 0 | 1 | 0 |
| EPA:900 | RAD | CAMO-18-147649 | 1203917217 | MSD | 0 | 0 | 1 | 0 |
| EPA:900 | RAD | CAMO-18-147684 | 1203908000 | DUP | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CAMO-18-147684 | 1203908001 | MS | 0 | 0 | 1 | 0 |
| EPA:900 | RAD | CAMO-18-147684 | 1203908002 | MSD | 0 | 0 | 1 | 0 |
| EPA:900 | RAD | CAPA-18-147590 | 435560002 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAPA-18-147591 | 435560005 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAPA-18-147686 | 435560008 | PEB | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | LCS | 1203908003 | LCS | 0 | 0 | 1 | 0 |
| EPA:900 | RAD | LCS | 1203917218 | LCS | 0 | 0 | 1 | 0 |
| EPA:900 | RAD | MB | 1203907999 | MB | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | MB | 1203917214 | MB | 1 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAMO-18-147652 | 1203902341 | DUP | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAPA-18-147590 | 435560002 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAPA-18-147591 | 435560005 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAPA-18-147686 | 435560008 | PEB | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | LCS | 1203902342 | LCS | 0 | 0 | 3 | 0 |
| EPA:901.1 | RAD | MB | 1203902340 | MB | 5 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAPA-18-147590 | 435560002 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAPA-18-147591 | 1203907991 | DUP | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAPA-18-147591 | 1203907992 | MS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | CAPA-18-147591 | 435560005 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | LCS | 1203907993 | LCS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | MB | 1203907990 | MB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAMO-18-147652 | 1203900608 | DUP | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAPA-18-147590 | 435560002 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAPA-18-147591 | 435560005 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | LCS | 1203900609 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:AM-241 | RAD | MB | 1203900607 | MB | 1 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAMO-18-147652 | 1203900611 | DUP | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAPA-18-147590 | 435560002 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAPA-18-147591 | 435560005 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAPA-18-147686 | 435560008 | PEB | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | LCS | 1203900612 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOPU | RAD | MB | 1203900610 | MB | 2 | 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 |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| HASL-300:ISOU | RAD | CAMO-18-147652 | 1203900614 | DUP | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAPA-18-147590 | 435560002 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAPA-18-147591 | 435560005 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAPA-18-147686 | 435560008 | PEB | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | LCS | 1203900615 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOU | RAD | MB | 1203900613 | MB | 3 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-18-147644 | 1203900634 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-18-147644 | 1203900635 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | CAPA-18-147564 | 435560001 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAPA-18-147565 | 435560004 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAPA-18-147686 | 435560008 | PEB | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203900633 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203900632 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-18-147564 | 1203900649 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-18-147564 | 1203900650 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | CAPA-18-147564 | 435560001 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-18-147565 | 435560004 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-18-147686 | 435560008 | PEB | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203900648 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203900647 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-18-147634 | 1203902044 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-18-147634 | 1203902045 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAPA-18-147564 | 435560001 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAPA-18-147565 | 435560004 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203902043 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203902042 | MB | 1 | 0 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAPA-18-147686 | 1203912462 | MS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | CAPA-18-147686 | 1203912463 | MSD | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | CAPA-18-147686 | 435560007 | PEB | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203912461 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203912460 | MB | 8 | 2 | 0 | 0 |
| SW-846:8260B | VOC | CAPA-18-147590 | 435560002 | REG | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAPA-18-147591 | 435560005 | REG | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAPA-18-147615 | 435560003 | FTB | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAPA-18-147616 | 435560006 | FTB | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAPA-18-147686 | 435560008 | PEB | 80 | 3 | 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-846:8260B | VOC | LCS | 1203908044 | LCS | 0 | 3 | 70 | 0 |
| SW-846:8260B | VOC | LCS | 1203908045 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203908042 | MB | 80 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CAMO-18-147679 | 1203901988 | MS | 0 | 6 | 76 | 0 |
| SW-846:8270D | SVOC | CAMO-18-147679 | 1203901989 | MSD | 0 | 6 | 76 | 0 |
| SW-846:8270D | SVOC | CAPA-18-147590 | 435560002 | REG | 80 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAPA-18-147591 | 435560005 | REG | 80 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAPA-18-147686 | 435560008 | PEB | 80 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203901987 | LCS | 0 | 6 | 76 | 0 |
| SW-846:8270D | SVOC | MB | 1203901986 | MB | 80 | 6 | 0 | 0 |
| SW-846:8330B | LCMS/MS HIGH | CAPA-18-147686 | 435560009 | PEB | 20 | 1 | 0 | 0 |
| SW-846:8330B | LCMS/MS HIGH | LCS | 1203901964 | LCS | 0 | 1 | 20 | 0 |
| SW-846:8330B | LCMS/MS HIGH | MB | 1203901963 | MB | 20 | 1 | 0 | 0 |
| SW-846:8330B | LCMS/MS HIGH | VS-HE-4-17-144559 | 1203901965 | MS | 0 | 1 | 20 | 0 |
| SW-846:8330B | LCMS/MS HIGH | VS-HE-4-17-144559 | 1203901966 | MSD | 0 | 1 | 20 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAPA-18-147590 | 435560002 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAPA-18-147591 | 435560005 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAPA-18-147598 | 1203905562 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAPA-18-147686 | 435560008 | PEB | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203905560 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203905559 | 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 | 1203900632 | METHOD BLANK | SW-846:6010C | W | Sodium | 180 | J | ug/L | 300 |
| MB | 1203904074 | METHOD BLANK | EPA:365.4 | W | Total Phosphate as Phosphorus | 0.036 | J | mg/L | 0.050 |
| MB | 1203904837 | METHOD BLANK | EPA:350.1 | W | Ammonia as Nitrogen | 0.0354 | J | mg/L | 0.050 |
| CAPA-18-147615 | 435560003 | TRIP BLANK | EPA:170.0 | W | Temperature | 3 | | Deg C | |
| CAPA-18-147616 | 435560006 | TRIP BLANK | EPA:170.0 | W | Temperature | 3 | | Deg C | |

| 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 |
|-----------------|------------|--------------|-------------------|-------------------------------|------------------|-----------------|------------|---------------|---------------------|-------------|----------------------------|----------------------------|-------------|
| CAPA-18-147565 | 1203904837 | METHOD BLANK | EPA:350.1 | Ammonia as Nitrogen | 0.0354 | mg/L | 0.056 | | 0.050 | Y | 5 | 100 | Y |
| CAPA-18-147686 | 1203904837 | METHOD BLANK | EPA:350.1 | Ammonia as Nitrogen | 0.0354 | mg/L | 0.0798 | | 0.050 | Y | 5 | 100 | Y |
| CAPA-18-147564 | 1203904074 | METHOD BLANK | EPA:365.4 | Total Phosphate as Phosphorus | 0.036 | mg/L | 0.0804 | | 0.050 | Y | 5 | 100 | Y |
| CAPA-18-147565 | 1203904074 | METHOD BLANK | EPA:365.4 | Total Phosphate as Phosphorus | 0.036 | mg/L | 0.0837 | | 0.050 | Y | 5 | 100 | Y |
| CAPA-18-147686 | 1203904074 | METHOD BLANK | EPA:365.4 | Total Phosphate as Phosphorus | 0.036 | mg/L | 0.0648 | | 0.050 | Y | 5 | 100 | Y |

6. Any surrogate recoveries outside the control limits?

| Field Sample ID | Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Spike Recovery | Upper Limit | Lower Limit | Rejection Limit |
|-----------------|---------------|-------------------|----------------|-----------------|---------------|----------------|-------------|-------------|-----------------|
| MB | 1203912460 | SW-846:8082 | 4cmx | 1716000 | 11-07-2017 | 32 | 122 | 33 | 10 |

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

DATA VALIDATION REPORT

| 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 |
|-----------------|------------------|-------------------|-------------------|-------------------------|-----------------|---------------|---------------|-------------------|--------------------|----------------|----------------|-----------------|-----|-----------|
| MSGP-17-131990 | 1203904841 | | EPA:350.1 | Ammonia as Nitrogen | 1712955 | 10-27-2017 | W | 121 | | 110 | 90 | 10 | | |
| CAMO-18-147649 | 1203904071 | | EPA:351.2 | Total Kjeldahl Nitrogen | 1712656 | 10-25-2017 | W | 83.9 | | 110 | 90 | 10 | | |

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

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|----------------|----------|-------------------|--------------------------|------------|------------|---------------|--------------------|---------------------|-------------|-------------|-----------------------|-----------------------|-----|-----------|
| 1203908044 | | SW-846:8260B | Acetone | 1714198 | 10-30-2017 | W | 46 | | 157 | 48 | | 10 | | |
| 1203908044 | | SW-846:8260B | Butanone[2-] | 1714198 | 10-30-2017 | W | 51 | | 138 | 55 | | 10 | | |
| 1203901987 | | SW-846:8270D | Dichlorobenzidine[3,3'-] | 1711735 | 10-24-2017 | W | 129 | | 127 | 43 | | | | |

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.

DATA VALIDATION REPORT

13. Display Flagged Data.

| 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-52 S1 | 2018-496 | CAPA-18-147564 | REG | INIT | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | | U | I4 | N | 0.0804 | mg/L | 0.0804 | mg/L | | | W | 10/17/2017 | 1712663 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147565 | REG | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | | U | I4 | N | 0.056 | mg/L | 0.056 | mg/L | | | W | 10/17/2017 | 1712962 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147565 | REG | INIT | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | | U | I4 | N | 0.0837 | mg/L | 0.0837 | mg/L | | | W | 10/17/2017 | 1712663 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | VOC | SW-846:8260B | Acetone | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | 1714198 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | -0.0095 | pCi/L | -0.0095 | pCi/L | 0.0416 | 0.00823 | W | 10/17/2017 | 1711133 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | VOC | SW-846:8260B | Butanone[2-] | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | 1714198 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -1.06 | pCi/L | -1.06 | pCi/L | 4.16 | 1.21 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | 1.23 | pCi/L | 1.23 | pCi/L | 5.36 | 1.16 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | 0.369 | pCi/L | 0.369 | pCi/L | 2.78 | 0.706 | W | 10/17/2017 | 1717894 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | -1.27 | pCi/L | -1.27 | pCi/L | 8.18 | 2.54 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | 0.00565 | pCi/L | 0.00565 | pCi/L | 0.0326 | 0.00498 | W | 10/17/2017 | 1711134 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -0.0207 | pCi/L | -0.0207 | pCi/L | 0.0423 | 0.00941 | W | 10/17/2017 | 1711134 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | -14.6 | pCi/L | -14.6 | pCi/L | 65.9 | 15.8 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | 0.16 | pCi/L | 0.16 | pCi/L | 4.85 | 1.16 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147590 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | -0.0931 | pCi/L | -0.0931 | pCi/L | 0.477 | 0.118 | W | 10/17/2017 | 1714181 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | VOC | SW-846:8260B | Acetone | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | 1714198 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | 0.00441 | pCi/L | 0.00441 | pCi/L | 0.0386 | 0.00623 | W | 10/17/2017 | 1711133 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | VOC | SW-846:8260B | Butanone[2-] | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | 1714198 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | 3.49 | pCi/L | 3.49 | pCi/L | 6.75 | 1.59 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | -1.09 | pCi/L | -1.09 | pCi/L | 4.24 | 1.19 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | -1.08 | pCi/L | -1.08 | pCi/L | 7.88 | 2.17 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | 0.0106 | pCi/L | 0.0106 | pCi/L | 0.0368 | 0.00766 | W | 10/17/2017 | 1711134 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -0.0361 | pCi/L | -0.0361 | pCi/L | 0.0478 | 0.0129 | W | 10/17/2017 | 1711134 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | -19.9 | pCi/L | -19.9 | pCi/L | 61.7 | 17.9 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | -0.91 | pCi/L | -0.91 | pCi/L | 5.68 | 1.55 | W | 10/17/2017 | 1711850 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147591 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | -0.00159 | pCi/L | -0.00159 | pCi/L | 0.457 | 0.121 | W | 10/17/2017 | 1714181 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147615 | FTB | INIT | VOC | SW-846:8260B | Acetone | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | 1714198 | VAL | Y | |
| R-52 S1 | 2018-496 | CAPA-18-147615 | FTB | INIT | VOC | SW-846:8260B | Butanone[2-] | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | 1714198 | VAL | Y | |
| R-52 S2 | 2018-496 | CAPA-18-147616 | FTB | INIT | VOC | SW-846:8260B | Acetone | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | 1714198 | 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-52 S2 | 2018-496 | CAPA-18-147616 | FTB | INIT | VOC | SW-846:8260B | Butanone[2-] | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | | 1714198 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | VOC | SW-846:8260B | Acetone | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | | 1714198 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | 0.0125 | pCi/L | 0.0125 | pCi/L | 0.0366 | 0.00591 | W | 10/17/2017 | | 1711133 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | | U | I4 | N | 0.0798 | mg/L | 0.0798 | mg/L | | | W | 10/17/2017 | | 1712962 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | VOC | SW-846:8260B | Butanone[2-] | U | UJ | V12a | N | 1.50 | ug/L | 1.50 | ug/L | | | W | 10/17/2017 | | 1714198 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -1.56 | pCi/L | -1.56 | pCi/L | 5.12 | 1.48 | W | 10/17/2017 | | 1711850 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | 1.56 | pCi/L | 1.56 | pCi/L | 6.50 | 1.47 | W | 10/17/2017 | | 1711850 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | 1.39 | pCi/L | 1.39 | pCi/L | 2.20 | 0.718 | W | 10/17/2017 | | 1717894 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:900 | Gross beta | U | U | R5 | N | 1.29 | pCi/L | 1.29 | pCi/L | 1.98 | 0.609 | W | 10/17/2017 | | 1714187 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | -0.765 | pCi/L | -0.765 | pCi/L | 8.72 | 2.75 | W | 10/17/2017 | | 1711850 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | 0.00000000702 | pCi/L | 0.00000000702 | pCi/L | 0.0384 | 0.014 | W | 10/17/2017 | | 1711134 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -0.0133 | pCi/L | -0.0133 | pCi/L | 0.0498 | 0.0121 | W | 10/17/2017 | | 1711134 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | 18.1 | pCi/L | 18.1 | pCi/L | 86.5 | 21.9 | W | 10/17/2017 | | 1711850 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | 0.398 | pCi/L | 0.398 | pCi/L | 5.99 | 1.46 | W | 10/17/2017 | | 1711850 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | 0.363 | pCi/L | 0.363 | pCi/L | 0.443 | 0.141 | W | 10/17/2017 | | 1714181 | VAL | Y |
| R-52 S2 | 2018-496 | CAPA-18-147686 | PEB | INIT | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | | U | I4 | N | 0.0648 | mg/L | 0.0648 | mg/L | | | W | 10/17/2017 | | 1712663 | VAL | Y |

Reason Code

Description

| | |
|-------|---|
| I4 | the sample result is =<5x the concentration of related analyte in the method blank. |
| 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. |
| V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|

DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAPA-18-147564 | R-52 S1 | REG | EPA:120.1 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:150.1 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:160.1 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:170.0 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:245.2 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:300.0 | 0 | 4 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:310.1 | 0 | 2 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:350.1 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:353.2 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | EPA:365.4 | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | SM:A2340B | 0 | 1 |
| CAPA-18-147564 | R-52 S1 | REG | SW-846:6010C | 0 | 17 |
| CAPA-18-147564 | R-52 S1 | REG | SW-846:6020 | 0 | 11 |
| CAPA-18-147564 | R-52 S1 | REG | SW-846:6850 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:120.1 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:150.1 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:160.1 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:170.0 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:245.2 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:300.0 | 0 | 4 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:310.1 | 0 | 2 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:350.1 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:353.2 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | EPA:365.4 | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | SM:A2340B | 0 | 1 |
| CAPA-18-147565 | R-52 S2 | REG | SW-846:6010C | 0 | 17 |
| CAPA-18-147565 | R-52 S2 | REG | SW-846:6020 | 0 | 11 |
| CAPA-18-147565 | R-52 S2 | REG | SW-846:6850 | 0 | 1 |
| CAPA-18-147590 | R-52 S1 | REG | EPA:170.0 | 0 | 1 |
| CAPA-18-147590 | R-52 S1 | REG | EPA:245.2 | 0 | 1 |
| CAPA-18-147590 | R-52 S1 | REG | EPA:335.4 | 0 | 1 |
| CAPA-18-147590 | R-52 S1 | REG | EPA:351.2 | 0 | 1 |
| CAPA-18-147590 | R-52 S1 | REG | EPA:900 | 0 | 2 |
| CAPA-18-147590 | R-52 S1 | REG | EPA:901.1 | 0 | 5 |
| CAPA-18-147590 | R-52 S1 | REG | EPA:905.0 | 0 | 1 |
| CAPA-18-147590 | R-52 S1 | REG | HASL-300:AM-241 | 0 | 1 |
| CAPA-18-147590 | R-52 S1 | REG | HASL-300:ISOPU | 0 | 2 |

DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAPA-18-147590 | R-52 S1 | REG | HASL-300:ISOU | 0 | 3 |
| CAPA-18-147590 | R-52 S1 | REG | SW-846:8260B | 0 | 80 |
| CAPA-18-147590 | R-52 S1 | REG | SW-846:8270D | 0 | 80 |
| CAPA-18-147590 | R-52 S1 | REG | SW-846:9060 | 0 | 1 |
| CAPA-18-147591 | R-52 S2 | REG | EPA:170.0 | 0 | 1 |
| CAPA-18-147591 | R-52 S2 | REG | EPA:245.2 | 0 | 1 |
| CAPA-18-147591 | R-52 S2 | REG | EPA:335.4 | 0 | 1 |
| CAPA-18-147591 | R-52 S2 | REG | EPA:351.2 | 0 | 1 |
| CAPA-18-147591 | R-52 S2 | REG | EPA:900 | 0 | 2 |
| CAPA-18-147591 | R-52 S2 | REG | EPA:901.1 | 0 | 5 |
| CAPA-18-147591 | R-52 S2 | REG | EPA:905.0 | 0 | 1 |
| CAPA-18-147591 | R-52 S2 | REG | HASL-300:AM-241 | 0 | 1 |
| CAPA-18-147591 | R-52 S2 | REG | HASL-300:ISOPU | 0 | 2 |
| CAPA-18-147591 | R-52 S2 | REG | HASL-300:ISOU | 0 | 3 |
| CAPA-18-147591 | R-52 S2 | REG | SW-846:8260B | 0 | 80 |
| CAPA-18-147591 | R-52 S2 | REG | SW-846:8270D | 0 | 80 |
| CAPA-18-147591 | R-52 S2 | REG | SW-846:9060 | 0 | 1 |
| CAPA-18-147615 | R-52 S1 | FTB | EPA:170.0 | 0 | 1 |
| CAPA-18-147615 | R-52 S1 | FTB | SW-846:8260B | 0 | 80 |
| CAPA-18-147616 | R-52 S2 | FTB | EPA:170.0 | 0 | 1 |
| CAPA-18-147616 | R-52 S2 | FTB | SW-846:8260B | 0 | 80 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:120.1 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:150.1 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:160.1 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:170.0 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:245.2 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:300.0 | 0 | 4 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:310.1 | 0 | 2 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:335.4 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:350.1 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:351.2 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:353.2 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:365.4 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:900 | 0 | 2 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:901.1 | 0 | 5 |
| CAPA-18-147686 | R-52 S2 | PEB | EPA:905.0 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | HASL-300:AM-241 | 0 | 1 |

DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAPA-18-147686 | R-52 S2 | PEB | HASL-300:ISOPU | 0 | 2 |
| CAPA-18-147686 | R-52 S2 | PEB | HASL-300:ISOU | 0 | 3 |
| CAPA-18-147686 | R-52 S2 | PEB | SM:A2340B | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:6010C | 0 | 17 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:6020 | 0 | 11 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:6850 | 0 | 1 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:8082 | 0 | 8 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:8260B | 0 | 80 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:8270D | 0 | 80 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:8330B | 0 | 20 |
| CAPA-18-147686 | R-52 S2 | PEB | SW-846:9060 | 0 | 1 |

November 13, 2017

Ms. Nita Patel
Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico 87545

Re: LANL- WQH Water Samples
Work Order: 435560
SDG: 2018-496

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on October 19, 2017, and analyzed for Explosives by LCMSMS, GC Semivolatile PCB, GC/MS Semivolatile, GC/MS Volatile, 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,



Katrina Hiott for
Valerie Davis
Project Manager

Chain of Custody: 2018-496
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 435560
SDG: 2018-496

Table of Contents

| | |
|--|-----|
| Case Narrative..... | 1 |
| Chain of Custody and Supporting Documentation..... | 5 |
| Data Review Qualifier Flag Definition Sheet..... | 11 |
| Volatile Analysis..... | 14 |
| Case Narrative..... | 15 |
| Sample Data Summary..... | 20 |
| Quality Control Summary..... | 36 |
| Quality Control Data..... | 54 |
| Semi-Volatile Analysis..... | 76 |
| Case Narrative..... | 77 |
| Sample Data Summary..... | 83 |
| Quality Control Summary..... | 93 |
| Quality Control Data..... | 108 |
| Perchlorates by LCMSMS Analysis..... | 121 |
| Case Narrative..... | 122 |
| Sample Data Summary..... | 128 |
| Quality Control Summary..... | 132 |
| Quality Control Data..... | 135 |
| Explosives by LCMSMS Analysis..... | 141 |
| Case Narrative..... | 142 |

| | |
|------------------------------|-----|
| Sample Data Summary..... | 147 |
| Quality Control Summary..... | 150 |
| Quality Control Data..... | 154 |
| PCB Analysis..... | 169 |
| Case Narrative..... | 170 |
| Sample Data Summary..... | 175 |
| Quality Control Summary..... | 177 |
| Quality Control Data..... | 183 |
| Metals Analysis..... | 188 |
| Case Narrative..... | 189 |
| Sample Data Summary..... | 195 |
| Quality Control Summary..... | 207 |
| General Chem Analysis..... | 221 |
| Case Narrative..... | 222 |
| Sample Data Summary..... | 253 |
| Quality Control Summary..... | 262 |
| Radiological Analysis..... | 269 |
| Case Narrative..... | 270 |
| Sample Data Summary..... | 286 |
| Quality Control Summary..... | 293 |

Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 435560
SDG # : 2018-496**

November 13, 2017

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 October 19, 2017 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 temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

| <u>Laboratory ID</u> | <u>Client ID</u> |
|-----------------------------|-------------------------|
| 435560001 | CAPA-18-147564 |
| 435560002 | CAPA-18-147590 |
| 435560003 | CAPA-18-147615 |
| 435560004 | CAPA-18-147565 |
| 435560005 | CAPA-18-147591 |
| 435560006 | CAPA-18-147616 |
| 435560007 | CAPA-18-147686 |
| 435560008 | CAPA-18-147686 |
| 435560009 | CAPA-18-147686 |

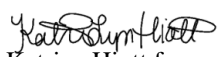
Case Narrative

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: Explosives by LCMSMS, GC Semivolatile PCB, GC/MS Semivolatile, GC/MS Volatile, 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.


Katrina Hiott for
Valerie Davis
Project Manager

List of current GEL Certifications as of 13 November 2017

| State | Certification |
|--------------------------|------------------------------|
| Alaska | UST-0110 |
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California | 2940 |
| Colorado | SC00012 |
| Connecticut | PH-0169 |
| Delaware | SC00012 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330-15-00283, P330-15-00253 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC00012 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas NELAP | E-10332 |
| Kentucky SDWA | 90129 |
| Kentucky Wastewater | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA170010 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Michigan | 9976 |
| Mississippi | SC00012 |
| Nebraska | NE-OS-26-13 |
| Nevada | SC000122018-1 |
| New Hampshire NELAP | 205415 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| North Dakota | R-158 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68-00485 |
| Puerto Rico | SC00012 |
| S.Carolina Radchem | 10120002 |
| South Carolina Chemistry | 10120001 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235-17-12 |
| Utah NELAP | SC000122017-24 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780 |
| West Virginia | 997404 |

Chain of Custody and Supporting Documentation

COC:

| | | | |
|--|--|-----|-------|
| 2018-496 TEST - Explosives | | YES | NO |
| Samples collected from a WFO area? | | | X |
| Field Test for Explosives Results | | YES | NO NA |
| Spot test shows presence of explosives residues. If YES - Do not ship. | | | X |

| | | | |
|--|--|-----|-------|
| TEST - Chemical Preservation | | YES | NO |
| Samples are chemically preserved? | | X | |
| Field Team Member Statement | | YES | NO NA |
| Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship. | | | X |

| | | | | |
|---|---|---|-----|-------|
| TEST - Field Screen | | | YES | NO |
| The sample has field screening measurements of alpha activity and beta activity? | | | | X |
| Sample Activity (dpm/100cm ²) | Shipment Activity (dpm*g/100cm ²) | Sampled Location | YES | NO NA |
| Alpha detectable | Alpha >160,000 | TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49 | | X |
| Alpha > 125 | Alpha >1,250,000 | other locations | | |
| Beta > 1,500 | Beta >15,000,000 | any location | | |
| The sample Alpha >16,000,000 dpm*g/100cm ² or Beta > 160,000,000 dpm*g/100cm ² . If YES - Do not ship. | | | | |
| On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship. | | | | |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity. | | | | |

| | | | |
|--|--|-----|-------|
| TEST - Location | | YES | NO |
| Prior analytical measurements of radioactive isotopes are available? | | X | |
| Sample Activity (pCi/g) | Shipment Activity (pCi) | YES | NO NA |
| <ul style="list-style-type: none"> Am-241 > 27 Cs-137 > 270 Pu-238 > 27 Pu-239/240 > 27 Th-228 > 27 U-234 > 270 U-238 > 270 H-3 > 27,000,000 | <ul style="list-style-type: none"> Am-241 > 270,000 Cs-137 > 270,000 Pu-238 > 270,000 Pu-239/240 > 270,000 Th-228 > 270,000 U-234 > 1,600,000,000 U-238 > unlimited H-3 > 27,000,000,000 | | X |
| Am-241, Pu-238, Pu-239/240, or Th 228 > 27,000,000 pCi; or Cs-137 > 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship. | | | X |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes. | | | X |

| | | | |
|--|-----|----|----|
| TEST - AK | YES | NO | NA |
| The shippers documented knowledge of the sample positively identifies appropriate labeling. | | | X |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, and the sample is submitted to ARS or RP for hazard classification analysis. | | | X |

| |
|--|
| HOLD SAMPLES FOR ANALYSIS |
| The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7] |

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

| | |
|---------------------------------|-----------|
| Hazard Assessment Completed By: | Date/Time |
| (Printed Name) McLess, Monty | 10/18/17 |
| (Signature) | 3:00 |

| | |
|--------------------------------|-----------|
| Hazard Assessment Reviewed By: | Date/Time |
| (Printed Name) Sherwood | 10/18/17 |
| (Signature) | 3:00 |

SAMPLE RECEIPT & REVIEW FORM

| | | | |
|--|---|--|--|
| Client: <u>FSHC</u> | | SDG/AR/COC/Work Order: <u>43550</u> | |
| Received By: <u>ZKW</u> | | Date Received: <u>10/19/17</u> | |
| Carrier and Tracking Number | | Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other | |
| | | <u>59081782 9802-4C</u> <u>59081782 9787-3C</u> <u>59081782 9798-3C</u> <u>59081782 9813-3C</u> <u>59081782 9765-204 (chem)</u> <u>59081782 9754-21C (chem)</u> <u>59081782 9726-3C</u> | |
| 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. | |
| Shipped as a DOT Hazardous? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Hazard Class Shipped: _____ UN#: _____ | |
| COC/Samples marked or classified as radioactive? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 _____ Rad 2 _____ Rad 3 _____ | |
| Is package, COC, and/or Samples marked HAZ? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | If yes, select Hazards below, and contact the GEL Safety Group. PCB's _____ Flammable _____ Foreign Soil _____ RCRA _____ Asbestos _____ Beryllium _____ Other: _____ | |

| Sample Receipt Criteria | Yes | NA | N | 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: Seals broken _____ Damaged container _____ Leaking container _____ Other (describe) _____ |
| 2 Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Preservation Method: Wet Ice _____ Ice Packs <input checked="" type="checkbox"/> Dry ice <input type="checkbox"/> None <input type="checkbox"/> Other: _____ *all temperatures are recorded in Celsius TEMP: <u>See Above</u> |
| 4 Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): _____ |
| 5 Sample containers intact and sealed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken _____ Damaged container _____ Leaking container _____ Other (describe) _____ |
| 6 Samples requiring chemical preservation at proper pH? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____ |
| 7 Do any samples require Volatile Analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No _____ N/A _____ (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No _____ N/A _____ Sample ID's and containers affected: _____ |
| 8 Samples received within holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | ID's and tests affected: _____ |
| 9 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: _____ |
| 10 Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: _____ |
| 11 Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: _____ |
| 12 Are sample containers identifiable as GEL provided? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 13 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials

B. Knott

Date

10/19/17

Page

6 of 1

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

SHIP DATE: 18OCT17
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2916

KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

SHIP DATE: 18OCT17
ACTWGT: 44.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

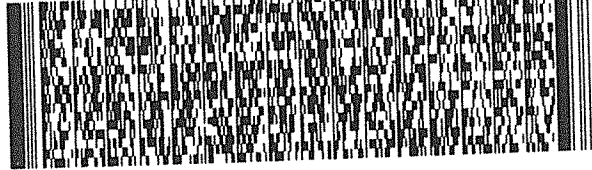
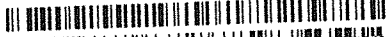
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

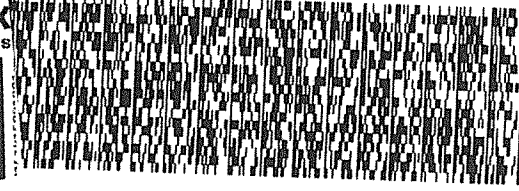
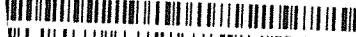
CHARLESTON SC 29407

(843) 666-8171

REF: 21PDASRGW04BAGWS0



FedEx
Express



FedEx



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TRK# 5908 1782 9754
0201
MASTER

X7 RBWA

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5908 1782 9754

29407 7 RBWA
CHS

SC-US

THU - 19 OCT 10:30A
PRIORITY OVERNIGHT

294

SC-US C



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: 18OCT17
ACTWGT: 26.0 LB MAN
CAD: 0014176/CAFE2916

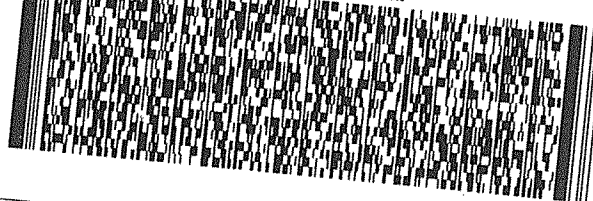
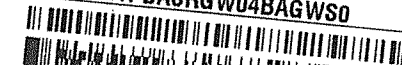
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PDASRGW04BAGWS0



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Express



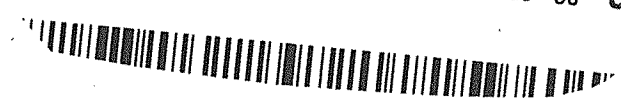
2 of 3
MPS# 5908 1782 9765
0263
Vistr# 5908 1782 9754

X7 RBWA

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PRIORITY OVERNIGHT

29407

SC-US CHS



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 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 identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration 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.

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-496
Work Order #: 435560**

Method/Analysis Information

Procedure: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW-846:8260B

Analytical Batch Number: 1714198

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560003 | CAPA-18-147615 |
| 435560005 | CAPA-18-147591 |
| 435560006 | CAPA-18-147616 |
| 435560008 | CAPA-18-147686 |
| 1203908042 | Method Blank (MB) |
| 1203908044 | Laboratory Control Sample (LCS) |
| 1203908045 | Laboratory Control Sample (LCS) |
| 1203908048 | 435630002(CAPA-18-147586) Post Spike (PS) |
| 1203908049 | 435630002(CAPA-18-147586) Post Spike (PS) |
| 1203908050 | 435630002(CAPA-18-147586) Post Spike Duplicate (PSD) |
| 1203908051 | 435630002(CAPA-18-147586) Post Spike Duplicate (PSD) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

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-038 REV# 26.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an

industry shortage.

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information

Blank (MB) Statement

Target analytes were detected in the blank 1203908042 (MB) below the reporting limit.

Surrogate Recoveries

Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS/and or LCSD (See Below) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported.

| Sample | Analyte | Value |
|------------------|------------|----------------|
| 1203908044 (LCS) | 2-Butanone | 51* (55%-138%) |
| | Acetone | 46* (48%-157%) |

QC Sample Designation

Sample 435630002 (CAPA-18-147586) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the required acceptance limits.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications

All samples in this SDG met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or 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.

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information

Manual Integrations

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment

Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually 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 of each electronic package will indicate the reviewer name associated with the generation of the data and package. 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.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|----------------------|---|-----------------------------|------------------|---------------------------------|-----------------------|
| VOA6.I | Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler | HP6890N/HP5975 | DB-624 | J&W, 60m x 0.25mm x 1.4um | Trap 10 |

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: 2018-496 GEL Work Order: 435560

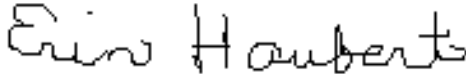
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- B The target analyte was detected in the associated blank.
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC 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: Erin Haubert

Date: 11 NOV 2017

Title: Data Validator

Sample Data Summary

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496

Lab Sample ID: 435560002

Date Collected: 10/17/2017 11:39

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 12:53

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 12:53

Data File: 103017V6\6F109.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496

Lab Sample ID: 435560002

Date Collected: 10/17/2017 11:39

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 12:53

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 12:53

Data File: 103017V6\6F109.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-496

Lab Sample ID: 435560002

Date Collected: 10/17/2017 11:39

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-147590

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 12:53

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 12:53

Data File: 103017V6\6F109.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 50.1 | 50.0 | ug/L 100 | (71%-134%) |
| Bromofluorobenzene | 49.3 | 50.0 | ug/L 99 | (70%-131%) |
| Toluene-d8 | 47.6 | 50.0 | ug/L 95 | (74%-124%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---------|---------------------------------------|-------|-----------|-------|-----|------|
| | unknown | 3.688 | 6.4 | ug/L | 0 | J |

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496

Lab Sample ID: 435560003

Date Collected: 10/17/2017 11:39

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-147615

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 13:21

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 13:21

Data File: 103017V6\6F110.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-496

Lab Sample ID: 435560003

Date Collected: 10/17/2017 11:39

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 13:21

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 13:21

Data File: 103017V6\6F110.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/17/2017 11:39 | Matrix: | W |
| Lab Sample ID: | 435560003 | Date Received: | 10/19/2017 08:55 | | |
| | | Client: | ARSL004 | Project: | ESHL00114 |
| Client ID: | CAPA-18-147615 | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 13:21 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 13:21 | | | | |
| Data File: | 103017V6\6F110.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 49.2 | 50.0 | ug/L 98 | (71%-134%) |
| Bromofluorobenzene | 49.3 | 50.0 | ug/L 99 | (70%-131%) |
| Toluene-d8 | 47.3 | 50.0 | ug/L 95 | (74%-124%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---------|---------------------------------------|------|-----------|-------|-----|------|
| | unknown | 3.68 | 5.77 | ug/L | 0 | J |

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496

Lab Sample ID: 435560005

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 13:50

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 13:50

Data File: 103017V6\6F111.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-496

Lab Sample ID: 435560005

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client ID: CAPA-18-147591

Batch ID: 1714198

Run Date: 10/30/2017 13:50

Prep Date: 10/30/2017 13:50

Data File: 103017V6\6F111.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-496

Lab Sample ID: 435560005

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-18-147591

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 13:50

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 13:50

Column: DB-624

Data File: 103017V6\6F111.D

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 50.3 | 50.0 | ug/L 101 | (71%-134%) |
| Bromofluorobenzene | 49.2 | 50.0 | ug/L 98 | (70%-131%) |
| Toluene-d8 | 48.9 | 50.0 | ug/L 98 | (74%-124%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---------|---------------------------------------|------|-----------|-------|-----|------|
| | unknown | 3.68 | 6.34 | ug/L | 0 | J |

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496

Lab Sample ID: 435560006

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 14:18

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 14:18

Data File: 103017V6\6F112.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496

Lab Sample ID: 435560006

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client ID: CAPA-18-147616

Batch ID: 1714198

Run Date: 10/30/2017 14:18

Prep Date: 10/30/2017 14:18

Data File: 103017V6\6F112.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-496

Lab Sample ID: 435560006

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 14:18

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 14:18

Data File: 103017V6\6F112.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 50.1 | 50.0 | ug/L 100 | (71%-134%) |
| Bromofluorobenzene | 50.0 | 50.0 | ug/L 100 | (70%-131%) |
| Toluene-d8 | 48.1 | 50.0 | ug/L 96 | (74%-124%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---------|---------------------------------------|-------|-----------|-------|-----|------|
| | unknown | 3.592 | 5.67 | ug/L | 0 | J |

Volatile
Certificate of Analysis
Sample Summary

| | | |
|------------------------------------|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 08:45 | Matrix: W |
| Lab Sample ID: 435560008 | Date Received: 10/19/2017 08:55 | |
| Client Sample: VOA/SVOA | Client: ARSL004 | Project: ESHL00114 |
| Client ID: CAPA-18-147686 | Method: SW-846:8260B | SOP Ref: GL-OA-E-038 |
| Batch ID: 1714198 | Inst: VOA6.I | Dilution: 1 |
| Run Date: 10/30/2017 14:46 | Analyst: JP1 | Purge Vol: 5 mL |
| Prep Date: 10/30/2017 14:46 | | |
| Data File: 103017V6\6F113.D | Column: DB-624 | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/17/2017 08:45 | Matrix: | W |
| Lab Sample ID: | 435560008 | Date Received: | 10/19/2017 08:55 | | |
| Client Sample: | VOA/SVOA | Client: | ARSL004 | Project: | ESHL00114 |
| Client ID: | CAPA-18-147686 | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 14:46 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 14:46 | | | | |
| Data File: | 103017V6\6F113.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

| | | | | | |
|-----------------------|-------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/17/2017 08:45 | Matrix: | W |
| Lab Sample ID: | 435560008 | Date Received: | 10/19/2017 08:55 | | |
| Client Sample: | VOA/SVOA | Client: | ARSL004 | Project: | ESHL00114 |
| Client ID: | CAPA-18-147686 | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 14:46 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 14:46 | | | | |
| Data File: | 103017V6\6F113.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 50.6 | 50.0 | ug/L 101 | (71%-134%) |
| Bromofluorobenzene | 50.0 | 50.0 | ug/L 100 | (70%-131%) |
| Toluene-d8 | 48.8 | 50.0 | ug/L 98 | (74%-124%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---------|---------------------------------------|-------|-----------|-------|-----|------|
| | unknown | 3.688 | 5 | ug/L | 0 | J |

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-496**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|------------|-----------------------|---------------|-------------|-------------|
| 1203908044 | LCS for batch 1714198 | 100 | 97 | 99 |
| 1203908045 | LCS for batch 1714198 | 100 | 95 | 98 |
| 1203908042 | MB for batch 1714198 | 100 | 98 | 101 |
| 435560002 | CAPA-18-147590 | 100 | 95 | 99 |
| 435560003 | CAPA-18-147615 | 98 | 95 | 99 |
| 435560005 | CAPA-18-147591 | 101 | 98 | 98 |
| 435560006 | CAPA-18-147616 | 100 | 96 | 100 |
| 435560008 | CAPA-18-147686 | 101 | 98 | 100 |
| 1203908048 | CAPA-18-147586PS | 107 | 95 | 98 |
| 1203908050 | CAPA-18-147586PSD | 102 | 94 | 97 |
| 1203908049 | CAPA-18-147586PS | 102 | 94 | 96 |
| 1203908051 | CAPA-18-147586PSD | 106 | 95 | 99 |

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4 (71%-134%)

TOL = Toluene-d8 (74%-124%)

BFB = Bromofluorobenzene (70%-131%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714198

Matrix: WATER

Lab Sample ID 1203908044

Instrument: VOA6.I

Analysis Date: 10/30/2017 10:04

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|-------------|--------------------------------|----------------------|----------------------|---------------------|---------------|----------------------|
| 179601-23-1 | LCS m,p-Xylenes | 100 | 0.0 | 96.6 | 97 | 71-127 |
| 75-05-8 | LCS Acetonitrile | 1250 | 0.0 | 1190 | 95 | 61-125 |
| 67-64-1 | LCS Acetone | 250 | 0.0 | 115 | 46 * | 48-157 |
| 74-88-4 | LCS Iodomethane | 250 | 0.0 | 250 | 100 | 72-128 |
| 75-15-0 | LCS Carbon disulfide | 250 | 0.0 | 272 | 109 | 69-138 |
| 108-05-4 | LCS Vinyl acetate | 250 | 0.0 | 247 | 99 | 67-125 |
| 78-93-3 | LCS 2-Butanone | 250 | 0.0 | 128 | 51 * | 55-138 |
| 108-10-1 | LCS 4-Methyl-2-pentanone | 250 | 0.0 | 235 | 94 | 66-124 |
| 591-78-6 | LCS 2-Hexanone | 250 | 0.0 | 189 | 75 | 56-140 |
| 75-71-8 | LCS Dichlorodifluoromethane | 50.0 | 0.0 | 44.5 | 89 | 40-160 |
| 74-87-3 | LCS Chloromethane | 50.0 | 0.0 | 43.8 | 88 | 58-135 |
| 75-01-4 | LCS Vinyl chloride | 50.0 | 0.0 | 45.5 | 91 | 65-137 |
| 74-83-9 | LCS Bromomethane | 50.0 | 0.0 | 43.7 | 87 | 63-137 |
| 75-00-3 | LCS Chloroethane | 50.0 | 0.0 | 48.1 | 96 | 69-129 |
| 75-69-4 | LCS Trichlorofluoromethane | 50.0 | 0.0 | 50.8 | 102 | 69-138 |
| 60-29-7 | LCS Ethyl ether | 50.0 | 0.0 | 46.2 | 92 | 72-125 |
| 75-35-4 | LCS 1,1-Dichloroethylene | 50.0 | 0.0 | 53.6 | 107 | 66-126 |
| 75-09-2 | LCS Methylene chloride | 50.0 | 0.0 | 50.3 | 101 | 68-119 |
| 1634-04-4 | LCS tert-Butyl methyl ether | 50.0 | 0.0 | 51.6 | 103 | 76-128 |
| 156-60-5 | LCS trans-1,2-Dichloroethylene | 50.0 | 0.0 | 53.2 | 106 | 71-124 |
| 75-34-3 | LCS 1,1-Dichloroethane | 50.0 | 0.0 | 51.8 | 104 | 73-123 |
| 156-59-2 | LCS cis-1,2-Dichloroethylene | 50.0 | 0.0 | 51.8 | 104 | 75-123 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714198

Matrix: WATER

Lab Sample ID 1203908044

Instrument: VOA6.I

Analysis Date: 10/30/2017 10:04

Dilution: 1

Analyst: JPI

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|------------|---------------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|
| 594-20-7 | LCS 2,2-Dichloropropane | 50.0 | 0.0 | 56.1 | 112 | 72-138 |
| 74-97-5 | LCS Bromochloromethane | 50.0 | 0.0 | 51.0 | 102 | 76-125 |
| 67-66-3 | LCS Chloroform | 50.0 | 0.0 | 50.8 | 102 | 76-123 |
| 71-55-6 | LCS 1,1,1-Trichloroethane | 50.0 | 0.0 | 53.9 | 108 | 74-136 |
| 563-58-6 | LCS 1,1-Dichloropropene | 50.0 | 0.0 | 52.0 | 104 | 72-129 |
| 56-23-5 | LCS Carbon tetrachloride | 50.0 | 0.0 | 56.7 | 113 | 72-140 |
| 107-06-2 | LCS 1,2-Dichloroethane | 50.0 | 0.0 | 50.2 | 100 | 74-122 |
| 71-43-2 | LCS Benzene | 50.0 | 0.0 | 50.0 | 100 | 72-121 |
| 79-01-6 | LCS Trichloroethylene | 50.0 | 0.0 | 52.3 | 105 | 74-125 |
| 78-87-5 | LCS 1,2-Dichloropropane | 50.0 | 0.0 | 49.8 | 100 | 73-121 |
| 74-95-3 | LCS Dibromomethane | 50.0 | 0.0 | 50.5 | 101 | 78-123 |
| 75-27-4 | LCS Bromodichloromethane | 50.0 | 0.0 | 54.7 | 109 | 77-131 |
| 10061-01-5 | LCS cis-1,3-Dichloropropylene | 50.0 | 0.0 | 54.2 | 108 | 78-131 |
| 108-88-3 | LCS Toluene | 50.0 | 0.0 | 48.4 | 97 | 71-121 |
| 10061-02-6 | LCS trans-1,3-Dichloropropylene | 50.0 | 0.0 | 55.4 | 111 | 78-131 |
| 79-00-5 | LCS 1,1,2-Trichloroethane | 50.0 | 0.0 | 50.0 | 100 | 74-118 |
| 142-28-9 | LCS 1,3-Dichloropropane | 50.0 | 0.0 | 47.0 | 94 | 74-118 |
| 127-18-4 | LCS Tetrachloroethylene | 50.0 | 0.0 | 50.5 | 101 | 69-129 |
| 124-48-1 | LCS Dibromochloromethane | 50.0 | 0.0 | 48.6 | 97 | 76-137 |
| 106-93-4 | LCS 1,2-Dibromoethane | 50.0 | 0.0 | 52.4 | 105 | 78-122 |
| 108-90-7 | LCS Chlorobenzene | 50.0 | 0.0 | 48.3 | 97 | 74-120 |
| 100-41-4 | LCS Ethylbenzene | 50.0 | 0.0 | 49.3 | 99 | 73-125 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714198

Matrix: WATER

Lab Sample ID 1203908044

Instrument: VOA6.I

Analysis Date: 10/30/2017 10:04

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|---------------------------------|----------------------|----------------------|---------------------|---------------|-------------------|
| 95-47-6 | LCS o-Xylene | 50.0 | 0.0 | 48.7 | 97 | 74-126 |
| 100-42-5 | LCS Styrene | 50.0 | 0.0 | 51.7 | 103 | 72-130 |
| 75-25-2 | LCS Bromoform | 50.0 | 0.0 | 48.9 | 98 | 72-136 |
| 98-82-8 | LCS Isopropylbenzene | 50.0 | 0.0 | 49.8 | 100 | 70-130 |
| 79-34-5 | LCS 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 50.4 | 101 | 70-126 |
| 96-18-4 | LCS 1,2,3-Trichloropropane | 50.0 | 0.0 | 50.6 | 101 | 74-122 |
| 108-86-1 | LCS Bromobenzene | 50.0 | 0.0 | 48.1 | 96 | 74-120 |
| 103-65-1 | LCS n-Propylbenzene | 50.0 | 0.0 | 49.2 | 98 | 67-128 |
| 108-67-8 | LCS 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 50.4 | 101 | 70-129 |
| 95-49-8 | LCS 2-Chlorotoluene | 50.0 | 0.0 | 48.3 | 97 | 71-124 |
| 106-43-4 | LCS 4-Chlorotoluene | 50.0 | 0.0 | 48.3 | 97 | 69-125 |
| 98-06-6 | LCS tert-Butylbenzene | 50.0 | 0.0 | 50.3 | 101 | 72-130 |
| 95-63-6 | LCS 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 50.3 | 101 | 70-126 |
| 135-98-8 | LCS sec-Butylbenzene | 50.0 | 0.0 | 50.4 | 101 | 70-131 |
| 99-87-6 | LCS 4-Isopropyltoluene | 50.0 | 0.0 | 50.1 | 100 | 71-131 |
| 541-73-1 | LCS 1,3-Dichlorobenzene | 50.0 | 0.0 | 48.3 | 97 | 72-121 |
| 106-46-7 | LCS 1,4-Dichlorobenzene | 50.0 | 0.0 | 47.7 | 95 | 71-120 |
| 104-51-8 | LCS n-Butylbenzene | 50.0 | 0.0 | 50.9 | 102 | 68-134 |
| 96-12-8 | LCS 1,2-Dibromo-3-chloropropane | 50.0 | 0.0 | 50.2 | 100 | 68-141 |
| 87-68-3 | LCS Hexachlorobutadiene | 50.0 | 0.0 | 51.5 | 103 | 72-136 |
| 91-20-3 | LCS Naphthalene | 50.0 | 0.0 | 54.6 | 109 | 72-132 |
| 87-61-6 | LCS 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 50.7 | 101 | 70-130 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714198

Matrix: WATER

Lab Sample ID 1203908044

Instrument: VOA6.I

Analysis Date: 10/30/2017 10:04

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|-------------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|
| 120-82-1 | LCS 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 51.8 | 104 | 71-129 |
| 630-20-6 | LCS 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 53.6 | 107 | 79-127 |
| 95-50-1 | LCS 1,2-Dichlorobenzene | 50.0 | 0.0 | 47.7 | 95 | 74-120 |
| 71-36-3 | LCS n-Butyl alcohol | 5000 | 0.0 | 5540 | 111 | 63-138 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714198

Matrix: WATER

Lab Sample ID 1203908045

Instrument: VOA6.I

Analysis Date: 10/30/2017 11:29

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|------------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|
| 107-02-8 | LCS Acrolein | 250 | 0.0 | 265 | 106 | 60-140 |
| 76-13-1 | LCS Trichlorotrifluoroethane | 250 | 0.0 | 264 | 106 | 61-148 |
| 107-05-1 | LCS Allyl chloride | 250 | 0.0 | 251 | 100 | 59-125 |
| 107-13-1 | LCS Acrylonitrile | 250 | 0.0 | 260 | 104 | 65-122 |
| 107-12-0 | LCS Propionitrile | 250 | 0.0 | 248 | 99 | 64-124 |
| 126-98-7 | LCS Methacrylonitrile | 250 | 0.0 | 256 | 103 | 64-126 |
| 80-62-6 | LCS Methyl methacrylate | 250 | 0.0 | 261 | 104 | 69-127 |
| 97-63-2 | LCS Ethyl methacrylate | 250 | 0.0 | 250 | 100 | 66-130 |
| 78-83-1 | LCS Isobutyl alcohol | 2500 | 0.0 | 2530 | 101 | 65-135 |
| 126-99-8 | LCS 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 49.2 | 98 | 66-147 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-496

Sample Type: Post Spike

Client ID: CAPA-18-147586PS

Matrix: W

Lab Sample ID 1203908048

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:29

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|-------------|-------------------------------|----------------------|----------------------|---------------------|---------------|----------------------|
| 179601-23-1 | PS m,p-Xylenes | 100 | 0.00 U | 86.2 | 86 | 59-132 |
| 75-05-8 | PS Acetonitrile | 1250 | 0.00 U | 1170 | 94 | 56-131 |
| 67-64-1 | PS Acetone | 250 | 0.00 U | 120 | 48 | 25-155 |
| 74-88-4 | PS Iodomethane | 250 | 0.00 U | 236 | 94 | 66-133 |
| 75-15-0 | PS Carbon disulfide | 250 | 0.00 U | 241 | 96 | 61-141 |
| 108-05-4 | PS Vinyl acetate | 250 | 0.00 U | 212 | 85 | 48-133 |
| 78-93-3 | PS 2-Butanone | 250 | 0.00 U | 149 | 60 | 25-143 |
| 108-10-1 | PS 4-Methyl-2-pentanone | 250 | 0.00 U | 228 | 91 | 61-127 |
| 591-78-6 | PS 2-Hexanone | 250 | 0.00 U | 169 | 68 | 33-138 |
| 75-71-8 | PS Dichlorodifluoromethane | 50.0 | 0.00 U | 43.3 | 87 | 33-164 |
| 74-87-3 | PS Chloromethane | 50.0 | 0.00 U | 36.6 | 73 | 53-139 |
| 75-01-4 | PS Vinyl chloride | 50.0 | 0.00 U | 36.9 | 74 | 58-140 |
| 74-83-9 | PS Bromomethane | 50.0 | 0.00 U | 44.7 | 89 | 59-146 |
| 75-00-3 | PS Chloroethane | 50.0 | 0.00 U | 43.6 | 87 | 65-129 |
| 75-69-4 | PS Trichlorofluoromethane | 50.0 | 0.00 U | 46.6 | 93 | 65-141 |
| 60-29-7 | PS Ethyl ether | 50.0 | 0.00 U | 44.1 | 88 | 69-127 |
| 75-35-4 | PS 1,1-Dichloroethylene | 50.0 | 0.00 U | 49.2 | 98 | 59-130 |
| 75-09-2 | PS Methylene chloride | 50.0 | 0.00 U | 49.3 | 99 | 62-123 |
| 1634-04-4 | PS tert-Butyl methyl ether | 50.0 | 0.00 U | 50.0 | 100 | 69-132 |
| 156-60-5 | PS trans-1,2-Dichloroethylene | 50.0 | 0.00 U | 49.1 | 98 | 65-127 |
| 75-34-3 | PS 1,1-Dichloroethane | 50.0 | 0.00 U | 48.3 | 97 | 67-127 |
| 156-59-2 | PS cis-1,2-Dichloroethylene | 50.0 | 0.00 U | 49.0 | 98 | 69-127 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-496

Sample Type: Post Spike

Client ID: CAPA-18-147586PS

Matrix: W

Lab Sample ID 1203908048

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:29

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|------------|--------------------------------|----------------------|----------------------|---------------------|---------------|----------------------|
| 594-20-7 | PS 2,2-Dichloropropane | 50.0 | 0.00 U | 49.1 | 98 | 66-137 |
| 74-97-5 | PS Bromochloromethane | 50.0 | 0.00 U | 50.2 | 100 | 71-130 |
| 67-66-3 | PS Chloroform | 50.0 | 0.00 U | 49.2 | 98 | 71-129 |
| 71-55-6 | PS 1,1,1-Trichloroethane | 50.0 | 0.00 U | 50.0 | 100 | 69-139 |
| 563-58-6 | PS 1,1-Dichloropropene | 50.0 | 0.00 U | 45.4 | 91 | 67-130 |
| 56-23-5 | PS Carbon tetrachloride | 50.0 | 0.00 U | 52.3 | 105 | 66-143 |
| 107-06-2 | PS 1,2-Dichloroethane | 50.0 | 0.00 U | 51.9 | 104 | 69-130 |
| 71-43-2 | PS Benzene | 50.0 | 0.00 U | 45.1 | 90 | 66-125 |
| 79-01-6 | PS Trichloroethylene | 50.0 | 0.00 U | 47.8 | 96 | 65-131 |
| 78-87-5 | PS 1,2-Dichloropropane | 50.0 | 0.00 U | 46.6 | 93 | 67-127 |
| 74-95-3 | PS Dibromomethane | 50.0 | 0.00 U | 50.2 | 100 | 72-129 |
| 75-27-4 | PS Bromodichloromethane | 50.0 | 0.00 U | 53.6 | 107 | 70-138 |
| 10061-01-5 | PS cis-1,3-Dichloropropylene | 50.0 | 0.00 U | 49.7 | 99 | 70-134 |
| 108-88-3 | PS Toluene | 50.0 | 0.00 U | 43.4 | 87 | 60-126 |
| 10061-02-6 | PS trans-1,3-Dichloropropylene | 50.0 | 0.00 U | 51.9 | 104 | 69-135 |
| 79-00-5 | PS 1,1,2-Trichloroethane | 50.0 | 0.00 U | 48.5 | 97 | 66-125 |
| 142-28-9 | PS 1,3-Dichloropropane | 50.0 | 0.00 U | 46.0 | 92 | 67-124 |
| 127-18-4 | PS Tetrachloroethylene | 50.0 | 0.00 U | 44.1 | 88 | 60-130 |
| 124-48-1 | PS Dibromochloromethane | 50.0 | 0.00 U | 47.1 | 94 | 68-143 |
| 106-93-4 | PS 1,2-Dibromoethane | 50.0 | 0.00 U | 51.1 | 102 | 71-127 |
| 108-90-7 | PS Chlorobenzene | 50.0 | 0.00 U | 44.3 | 89 | 64-124 |
| 100-41-4 | PS Ethylbenzene | 50.0 | 0.00 U | 44.3 | 89 | 61-130 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2018-496

Sample Type: Post Spike

Client ID: CAPA-18-147586PS

Matrix: W

Lab Sample ID 1203908048

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:29

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|--------------------------------|----------------------|----------------------|---------------------|---------------|-------------------|
| 95-47-6 | PS o-Xylene | 50.0 | 0.00 U | 44.4 | 89 | 62-131 |
| 100-42-5 | PS Styrene | 50.0 | 0.00 U | 47.2 | 94 | 59-135 |
| 75-25-2 | PS Bromoform | 50.0 | 0.00 U | 47.0 | 94 | 64-138 |
| 98-82-8 | PS Isopropylbenzene | 50.0 | 0.00 U | 42.8 | 86 | 55-133 |
| 79-34-5 | PS 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 U | 47.4 | 95 | 62-129 |
| 96-18-4 | PS 1,2,3-Trichloropropane | 50.0 | 0.00 U | 50.1 | 100 | 70-124 |
| 108-86-1 | PS Bromobenzene | 50.0 | 0.00 U | 44.7 | 89 | 62-124 |
| 103-65-1 | PS n-Propylbenzene | 50.0 | 0.00 U | 42.1 | 84 | 50-133 |
| 108-67-8 | PS 1,3,5-Trimethylbenzene | 50.0 | 0.00 U | 43.6 | 87 | 53-135 |
| 95-49-8 | PS 2-Chlorotoluene | 50.0 | 0.00 U | 42.3 | 85 | 56-128 |
| 106-43-4 | PS 4-Chlorotoluene | 50.0 | 0.00 U | 43.0 | 86 | 53-130 |
| 98-06-6 | PS tert-Butylbenzene | 50.0 | 0.00 U | 43.3 | 87 | 55-135 |
| 95-63-6 | PS 1,2,4-Trimethylbenzene | 50.0 | 0.00 U | 44.0 | 88 | 53-132 |
| 135-98-8 | PS sec-Butylbenzene | 50.0 | 0.00 U | 43.0 | 86 | 50-138 |
| 99-87-6 | PS 4-Isopropyltoluene | 50.0 | 0.00 U | 43.8 | 88 | 49-138 |
| 541-73-1 | PS 1,3-Dichlorobenzene | 50.0 | 0.00 U | 43.0 | 86 | 56-126 |
| 106-46-7 | PS 1,4-Dichlorobenzene | 50.0 | 0.00 U | 42.1 | 84 | 55-125 |
| 104-51-8 | PS n-Butylbenzene | 50.0 | 0.00 U | 42.1 | 84 | 43-142 |
| 96-12-8 | PS 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 U | 46.2 | 92 | 62-141 |
| 87-68-3 | PS Hexachlorobutadiene | 50.0 | 0.00 U | 43.7 | 87 | 40-147 |
| 91-20-3 | PS Naphthalene | 50.0 | 0.00 U | 50.0 | 100 | 62-134 |
| 87-61-6 | PS 1,2,3-Trichlorobenzene | 50.0 | 0.00 U | 44.5 | 89 | 52-135 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2018-496

Sample Type: Post Spike

Client ID: CAPA-18-147586PS

Matrix: W

Lab Sample ID 1203908048

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:29

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|------------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|
| 120-82-1 | PS 1,2,4-Trichlorobenzene | 50.0 | 0.00 U | 43.3 | 87 | 50-133 |
| 630-20-6 | PS 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 U | 50.4 | 101 | 71-133 |
| 95-50-1 | PS 1,2-Dichlorobenzene | 50.0 | 0.00 U | 43.5 | 87 | 60-125 |
| 71-36-3 | PS n-Butyl alcohol | 5000 | 0.00 U | 5280 | 106 | 60-140 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2018-496

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147586PSD

Matrix: W

Lab Sample ID 1203908050

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:57

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|-------------|--------------------------------|----------------------|----------------------|---------------------|---------------|-------------------|----------|-------------------|
| 179601-23-1 | PSD m,p-Xylenes | 100 | 0.00 U | 83.6 | 84 | 59-132 | 3 | 0-20 |
| 75-05-8 | PSD Acetonitrile | 1250 | 0.00 U | 1150 | 92 | 56-131 | 2 | 0-20 |
| 67-64-1 | PSD Acetone | 250 | 0.00 U | 115 | 46 | 25-155 | 5 | 0-20 |
| 74-88-4 | PSD Iodomethane | 250 | 0.00 U | 231 | 93 | 66-133 | 2 | 0-20 |
| 75-15-0 | PSD Carbon disulfide | 250 | 0.00 U | 240 | 96 | 61-141 | 0 | 0-20 |
| 108-05-4 | PSD Vinyl acetate | 250 | 0.00 U | 205 | 82 | 48-133 | 3 | 0-20 |
| 78-93-3 | PSD 2-Butanone | 250 | 0.00 U | 143 | 57 | 25-143 | 4 | 0-20 |
| 108-10-1 | PSD 4-Methyl-2-pentanone | 250 | 0.00 U | 220 | 88 | 61-127 | 3 | 0-20 |
| 591-78-6 | PSD 2-Hexanone | 250 | 0.00 U | 162 | 65 | 33-138 | 4 | 0-20 |
| 75-71-8 | PSD Dichlorodifluoromethane | 50.0 | 0.00 U | 42.5 | 85 | 33-164 | 2 | 0-20 |
| 74-87-3 | PSD Chloromethane | 50.0 | 0.00 U | 38.5 | 77 | 53-139 | 5 | 0-20 |
| 75-01-4 | PSD Vinyl chloride | 50.0 | 0.00 U | 38.7 | 77 | 58-140 | 5 | 0-20 |
| 74-83-9 | PSD Bromomethane | 50.0 | 0.00 U | 44.8 | 90 | 59-146 | 0 | 0-20 |
| 75-00-3 | PSD Chloroethane | 50.0 | 0.00 U | 43.2 | 86 | 65-129 | 1 | 0-20 |
| 75-69-4 | PSD Trichlorofluoromethane | 50.0 | 0.00 U | 46.2 | 92 | 65-141 | 1 | 0-20 |
| 60-29-7 | PSD Ethyl ether | 50.0 | 0.00 U | 42.9 | 86 | 69-127 | 3 | 0-20 |
| 75-35-4 | PSD 1,1-Dichloroethylene | 50.0 | 0.00 U | 48.3 | 97 | 59-130 | 2 | 0-20 |
| 75-09-2 | PSD Methylene chloride | 50.0 | 0.00 U | 47.5 | 95 | 62-123 | 4 | 0-20 |
| 1634-04-4 | PSD tert-Butyl methyl ether | 50.0 | 0.00 U | 48.6 | 97 | 69-132 | 3 | 0-20 |
| 156-60-5 | PSD trans-1,2-Dichloroethylene | 50.0 | 0.00 U | 48.2 | 96 | 65-127 | 2 | 0-20 |
| 75-34-3 | PSD 1,1-Dichloroethane | 50.0 | 0.00 U | 47.4 | 95 | 67-127 | 2 | 0-20 |
| 156-59-2 | PSD cis-1,2-Dichloroethylene | 50.0 | 0.00 U | 47.7 | 95 | 69-127 | 3 | 0-20 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2018-496

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147586PSD

Matrix: W

Lab Sample ID 1203908050

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:57

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|------------|---------------------------------|----------------------|----------------------|---------------------|---------------|-------------------|----------|-------------------|
| 594-20-7 | PSD 2,2-Dichloropropane | 50.0 | 0.00 U | 48.1 | 96 | 66-137 | 2 | 0-20 |
| 74-97-5 | PSD Bromochloromethane | 50.0 | 0.00 U | 47.3 | 95 | 71-130 | 6 | 0-20 |
| 67-66-3 | PSD Chloroform | 50.0 | 0.00 U | 47.9 | 96 | 71-129 | 3 | 0-20 |
| 71-55-6 | PSD 1,1,1-Trichloroethane | 50.0 | 0.00 U | 48.5 | 97 | 69-139 | 3 | 0-20 |
| 563-58-6 | PSD 1,1-Dichloropropene | 50.0 | 0.00 U | 45.3 | 91 | 67-130 | 0 | 0-20 |
| 56-23-5 | PSD Carbon tetrachloride | 50.0 | 0.00 U | 51.1 | 102 | 66-143 | 2 | 0-20 |
| 107-06-2 | PSD 1,2-Dichloroethane | 50.0 | 0.00 U | 49.5 | 99 | 69-130 | 5 | 0-20 |
| 71-43-2 | PSD Benzene | 50.0 | 0.00 U | 44.5 | 89 | 66-125 | 1 | 0-20 |
| 79-01-6 | PSD Trichloroethylene | 50.0 | 0.00 U | 46.5 | 93 | 65-131 | 3 | 0-20 |
| 78-87-5 | PSD 1,2-Dichloropropane | 50.0 | 0.00 U | 45.9 | 92 | 67-127 | 2 | 0-20 |
| 74-95-3 | PSD Dibromomethane | 50.0 | 0.00 U | 47.6 | 95 | 72-129 | 5 | 0-20 |
| 75-27-4 | PSD Bromodichloromethane | 50.0 | 0.00 U | 51.3 | 103 | 70-138 | 4 | 0-20 |
| 10061-01-5 | PSD cis-1,3-Dichloropropylene | 50.0 | 0.00 U | 47.8 | 96 | 70-134 | 4 | 0-20 |
| 108-88-3 | PSD Toluene | 50.0 | 0.00 U | 42.6 | 85 | 60-126 | 2 | 0-20 |
| 10061-02-6 | PSD trans-1,3-Dichloropropylene | 50.0 | 0.00 U | 49.7 | 99 | 69-135 | 4 | 0-20 |
| 79-00-5 | PSD 1,1,2-Trichloroethane | 50.0 | 0.00 U | 46.0 | 92 | 66-125 | 5 | 0-20 |
| 142-28-9 | PSD 1,3-Dichloropropane | 50.0 | 0.00 U | 44.6 | 89 | 67-124 | 3 | 0-20 |
| 127-18-4 | PSD Tetrachloroethylene | 50.0 | 0.00 U | 43.3 | 87 | 60-130 | 2 | 0-20 |
| 124-48-1 | PSD Dibromochloromethane | 50.0 | 0.00 U | 45.5 | 91 | 68-143 | 3 | 0-20 |
| 106-93-4 | PSD 1,2-Dibromoethane | 50.0 | 0.00 U | 48.9 | 98 | 71-127 | 4 | 0-20 |
| 108-90-7 | PSD Chlorobenzene | 50.0 | 0.00 U | 43.1 | 86 | 64-124 | 3 | 0-20 |
| 100-41-4 | PSD Ethylbenzene | 50.0 | 0.00 U | 43.0 | 86 | 61-130 | 3 | 0-20 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2018-496

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147586PSD

Matrix: W

Lab Sample ID 1203908050

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:57

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|----------|---------------------------------|----------------------|----------------------|---------------------|---------------|-------------------|----------|-------------------|
| 95-47-6 | PSD o-Xylene | 50.0 | 0.00 U | 43.0 | 86 | 62-131 | 3 | 0-20 |
| 100-42-5 | PSD Styrene | 50.0 | 0.00 U | 45.7 | 91 | 59-135 | 3 | 0-20 |
| 75-25-2 | PSD Bromoform | 50.0 | 0.00 U | 44.9 | 90 | 64-138 | 5 | 0-20 |
| 98-82-8 | PSD Isopropylbenzene | 50.0 | 0.00 U | 42.1 | 84 | 55-133 | 2 | 0-20 |
| 79-34-5 | PSD 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 U | 46.2 | 92 | 62-129 | 3 | 0-20 |
| 96-18-4 | PSD 1,2,3-Trichloropropane | 50.0 | 0.00 U | 47.6 | 95 | 70-124 | 5 | 0-20 |
| 108-86-1 | PSD Bromobenzene | 50.0 | 0.00 U | 42.5 | 85 | 62-124 | 5 | 0-20 |
| 103-65-1 | PSD n-Propylbenzene | 50.0 | 0.00 U | 40.7 | 81 | 50-133 | 3 | 0-20 |
| 108-67-8 | PSD 1,3,5-Trimethylbenzene | 50.0 | 0.00 U | 42.3 | 85 | 53-135 | 3 | 0-20 |
| 95-49-8 | PSD 2-Chlorotoluene | 50.0 | 0.00 U | 41.1 | 82 | 56-128 | 3 | 0-20 |
| 106-43-4 | PSD 4-Chlorotoluene | 50.0 | 0.00 U | 41.3 | 83 | 53-130 | 4 | 0-20 |
| 98-06-6 | PSD tert-Butylbenzene | 50.0 | 0.00 U | 41.9 | 84 | 55-135 | 3 | 0-20 |
| 95-63-6 | PSD 1,2,4-Trimethylbenzene | 50.0 | 0.00 U | 42.5 | 85 | 53-132 | 3 | 0-20 |
| 135-98-8 | PSD sec-Butylbenzene | 50.0 | 0.00 U | 41.7 | 83 | 50-138 | 3 | 0-20 |
| 99-87-6 | PSD 4-Isopropyltoluene | 50.0 | 0.00 U | 42.4 | 85 | 49-138 | 3 | 0-20 |
| 541-73-1 | PSD 1,3-Dichlorobenzene | 50.0 | 0.00 U | 41.1 | 82 | 56-126 | 4 | 0-20 |
| 106-46-7 | PSD 1,4-Dichlorobenzene | 50.0 | 0.00 U | 40.2 | 80 | 55-125 | 5 | 0-20 |
| 104-51-8 | PSD n-Butylbenzene | 50.0 | 0.00 U | 40.2 | 80 | 43-142 | 5 | 0-20 |
| 96-12-8 | PSD 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 U | 44.7 | 89 | 62-141 | 3 | 0-20 |
| 87-68-3 | PSD Hexachlorobutadiene | 50.0 | 0.00 U | 40.4 | 81 | 40-147 | 8 | 0-20 |
| 91-20-3 | PSD Naphthalene | 50.0 | 0.00 U | 47.7 | 95 | 62-134 | 5 | 0-20 |
| 87-61-6 | PSD 1,2,3-Trichlorobenzene | 50.0 | 0.00 U | 42.5 | 85 | 52-135 | 5 | 0-20 |

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2018-496

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147586PSD

Matrix: W

Lab Sample ID 1203908050

Instrument: VOA6.I

Analysis Date: 10/30/2017 19:57

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|----------|-------------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|----------|----------------------|
| 120-82-1 | PSD 1,2,4-Trichlorobenzene | 50.0 | 0.00 U | 41.0 | 82 | 50-133 | 5 | 0-20 |
| 630-20-6 | PSD 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 U | 49.0 | 98 | 71-133 | 3 | 0-20 |
| 95-50-1 | PSD 1,2-Dichlorobenzene | 50.0 | 0.00 U | 42.3 | 85 | 60-125 | 3 | 0-20 |
| 71-36-3 | PSD n-Butyl alcohol | 5000 | 0.00 U | 5180 | 104 | 60-140 | 2 | 0-20 |

Volatile

Page 1 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-496

Sample Type: Post Spike

Client ID: CAPA-18-147586PS

Matrix: W

Lab Sample ID 1203908049

Instrument: VOA6.I

Analysis Date: 10/30/2017 20:25

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|-----------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|
| 107-02-8 | PS Acrolein | 250 | 0.00 U | 240 | 96 | 49-141 |
| 76-13-1 | PS Trichlorotrifluoroethane | 250 | 0.00 U | 273 | 109 | 57-149 |
| 107-05-1 | PS Allyl chloride | 250 | 0.00 U | 251 | 101 | 54-128 |
| 107-13-1 | PS Acrylonitrile | 250 | 0.00 U | 256 | 102 | 59-129 |
| 107-12-0 | PS Propionitrile | 250 | 0.00 U | 241 | 97 | 58-131 |
| 126-98-7 | PS Methacrylonitrile | 250 | 0.00 U | 254 | 102 | 59-134 |
| 80-62-6 | PS Methyl methacrylate | 250 | 0.00 U | 250 | 100 | 62-135 |
| 97-63-2 | PS Ethyl methacrylate | 250 | 0.00 U | 239 | 96 | 60-136 |
| 78-83-1 | PS Isobutyl alcohol | 2500 | 0.00 U | 2390 | 96 | 60-143 |
| 126-99-8 | PS 2-Chloro-1,3-butadiene | 50.0 | 0.00 U | 49.2 | 98 | 63-146 |

Volatile

Page 2 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-496

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147586PSD

Matrix: W

Lab Sample ID 1203908051

Instrument: VOA6.I

Analysis Date: 10/30/2017 20:53

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1714198

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|----------|------------------------------|----------------------|----------------------|---------------------|---------------|-------------------|----------|-------------------|
| 107-02-8 | PSD Acrolein | 250 | 0.00 U | 264 | 106 | 49-141 | 10 | 0-20 |
| 76-13-1 | PSD Trichlorotrifluoroethane | 250 | 0.00 U | 265 | 106 | 57-149 | 3 | 0-20 |
| 107-05-1 | PSD Allyl chloride | 250 | 0.00 U | 244 | 98 | 54-128 | 3 | 0-20 |
| 107-13-1 | PSD Acrylonitrile | 250 | 0.00 U | 272 | 109 | 59-129 | 6 | 0-20 |
| 107-12-0 | PSD Propionitrile | 250 | 0.00 U | 261 | 104 | 58-131 | 8 | 0-20 |
| 126-98-7 | PSD Methacrylonitrile | 250 | 0.00 U | 264 | 106 | 59-134 | 4 | 0-20 |
| 80-62-6 | PSD Methyl methacrylate | 250 | 0.00 U | 261 | 104 | 62-135 | 4 | 0-20 |
| 97-63-2 | PSD Ethyl methacrylate | 250 | 0.00 U | 243 | 97 | 60-136 | 1 | 0-20 |
| 78-83-1 | PSD Isobutyl alcohol | 2500 | 0.00 U | 2650 | 106 | 60-143 | 10 | 0-20 |
| 126-99-8 | PSD 2-Chloro-1,3-butadiene | 50.0 | 0.00 U | 47.6 | 95 | 63-146 | 3 | 0-20 |

Method Blank Summary

Page 1 of 1

| | | | | | |
|-----------------------|-----------------------------|-----------------------|-------------------------|-------------------|---------------------------|
| SDG Number: | 2018-496 | Client: | ARSL004 | Matrix: | WATER |
| Client ID: | MB for batch 1714198 | Instrument ID: | VOA6.I | Data File: | 103017V6\6F108BA.D |
| Lab Sample ID: | 1203908042 | Prep Date: | 10/30/2017 12:25 | Analyzed: | 10/30/17 12:25 |
| Column: | DB-624 | | | | |

This method blank applies to the following samples and quality control samples:

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|--------------------------|---------------|--------------------|---------------|---------------|
| 01 LCS for batch 1714198 | 1203908044 | 103017V6\6F103LA.D | 10/30/17 | 1004 |
| 02 LCS for batch 1714198 | 1203908045 | 103017V6\6F106LA.D | 10/30/17 | 1129 |
| 03 CAPA-18-147590 | 435560002 | 103017V6\6F109.D | 10/30/17 | 1253 |
| 04 CAPA-18-147615 | 435560003 | 103017V6\6F110.D | 10/30/17 | 1321 |
| 05 CAPA-18-147591 | 435560005 | 103017V6\6F111.D | 10/30/17 | 1350 |
| 06 CAPA-18-147616 | 435560006 | 103017V6\6F112.D | 10/30/17 | 1418 |
| 07 CAPA-18-147686 | 435560008 | 103017V6\6F113.D | 10/30/17 | 1446 |
| 08 CAPA-18-147586PS | 1203908048 | 103017V6\6F123.D | 10/30/17 | 1929 |
| 09 CAPA-18-147586PSD | 1203908050 | 103017V6\6F124.D | 10/30/17 | 1957 |
| 10 CAPA-18-147586PS | 1203908049 | 103017V6\6F125.D | 10/30/17 | 2025 |
| 11 CAPA-18-147586PSD | 1203908051 | 103017V6\6F126.D | 10/30/17 | 2053 |

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-496

Lab Sample ID: 1203908042

Client Sample: QC for batch 1714198

Client ID: MB for batch 1714198

Batch ID: 1714198

Run Date: 10/30/2017 12:25

Prep Date: 10/30/2017 12:25

Data File: 103017V6\6F108BA.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | J | 0.350 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-496

Matrix: WATER

Lab Sample ID: 1203908042

Client Sample: QC for batch 1714198

Client: ARSL004

Project: QC

Client ID: MB for batch 1714198

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 12:25

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 12:25

Data File: 103017V6\6F108BA.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | J | 0.440 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

| | | |
|--|-----------------------------|-----------------------------|
| SDG Number: 2018-496 | Matrix: WATER | |
| Lab Sample ID: 1203908042 | | |
| Client Sample: QC for batch 1714198 | Client: ARSL004 | Project: QC |
| Client ID: MB for batch 1714198 | Method: SW-846:8260B | SOP Ref: GL-OA-E-038 |
| Batch ID: 1714198 | Inst: VOA6.I | Dilution: 1 |
| Run Date: 10/30/2017 12:25 | Analyst: JP1 | Purge Vol: 5 mL |
| Prep Date: 10/30/2017 12:25 | | |
| Data File: 103017V6\6F108BA.D | Column: DB-624 | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 50.0 | 50.0 | ug/L 100 | (71%-134%) |
| Bromofluorobenzene | 50.4 | 50.0 | ug/L 101 | (70%-131%) |
| Toluene-d8 | 49.0 | 50.0 | ug/L 98 | (74%-124%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---------------------------------------|----|-----------|-------|-----|------|
| No Tentatively Identified Compounds Found | | | | ug/L | | |

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-496

Matrix: WATER

Lab Sample ID: 1203908044

Client Sample: QC for batch 1714198

Client: ARSL004

Project: QC

Client ID: LCS for batch 1714198

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 10:04

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 10:04

Data File: 103017V6\6F103LA.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 53.6 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 53.9 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 50.4 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 50.0 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 51.8 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 53.6 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 52.0 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | B | 50.7 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.6 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 51.8 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 50.3 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 50.2 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 52.4 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 47.7 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 50.2 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 49.8 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 50.4 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 48.3 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 47.0 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 47.7 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 56.1 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 128 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 48.3 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 189 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 48.3 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 50.1 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 235 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 115 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1190 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 50.0 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 48.1 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 51.0 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 54.7 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 48.9 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496
Lab Sample ID: 1203908044
Client Sample: QC for batch 1714198
Client ID: LCS for batch 1714198
Batch ID: 1714198
Run Date: 10/30/2017 10:04
Prep Date: 10/30/2017 10:04
Data File: 103017V6\6F103LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | | 43.7 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 272 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 56.7 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 48.3 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 48.1 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 50.8 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 43.8 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 48.6 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 50.5 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 44.5 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 46.2 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 49.3 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | B | 51.5 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 250 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 49.8 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 50.3 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | | 54.6 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 51.7 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 50.5 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 48.4 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 52.3 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | | 247 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 45.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 51.8 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 54.2 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 96.6 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5540 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 49.2 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 48.7 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 50.4 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | |
|-----------------------|------------------------------|-------------------|---------------------|
| SDG Number: | 2018-496 | Matrix: | WATER |
| Lab Sample ID: | 1203908044 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 |
| Client ID: | LCS for batch 1714198 | Method: | SW-846:8260B |
| Batch ID: | 1714198 | Inst: | VOA6.I |
| Run Date: | 10/30/2017 10:04 | Analyst: | JP1 |
| Prep Date: | 10/30/2017 10:04 | Purge Vol: | 5 mL |
| Data File: | 103017V6\6F103LA.D | Column: | DB-624 |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | | 51.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 50.3 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 53.2 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 55.4 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 50.1 | 50.0 | 100 | (71%-134%) |
| Bromofluorobenzene | 49.7 | 50.0 | 99 | (70%-131%) |
| Toluene-d8 | 48.6 | 50.0 | 97 | (74%-124%) |

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-496

Lab Sample ID: 1203908045

Client Sample: QC for batch 1714198

Client ID: LCS for batch 1714198

Batch ID: 1714198

Run Date: 10/30/2017 11:29

Prep Date: 10/30/2017 11:29

Data File: 103017V6\6F106LA.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 49.2 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 265 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 260 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 251 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-496

Matrix: WATER

Lab Sample ID: 1203908045

Client Sample: QC for batch 1714198

Client: ARSL004

Project: QC

Client ID: LCS for batch 1714198

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1714198

Inst: VOA6.I

Dilution: 1

Run Date: 10/30/2017 11:29

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 10/30/2017 11:29

Data File: 103017V6\6F106LA.D

Column: DB-624

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 250 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2530 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 256 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 261 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | | 248 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 264 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | |
|-----------------------|------------------------------|-------------------|---------------------|
| SDG Number: | 2018-496 | Matrix: | WATER |
| Lab Sample ID: | 1203908045 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 |
| Client ID: | LCS for batch 1714198 | Method: | SW-846:8260B |
| Batch ID: | 1714198 | Inst: | VOA6.I |
| Run Date: | 10/30/2017 11:29 | Analyst: | JP1 |
| Prep Date: | 10/30/2017 11:29 | Purge Vol: | 5 mL |
| Data File: | 103017V6\6F106LA.D | Column: | DB-624 |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 49.8 | 50.0 | ug/L | 100 | (71%-134%) |
| Bromofluorobenzene | 49.1 | 50.0 | ug/L | 98 | (70%-131%) |
| Toluene-d8 | 47.5 | 50.0 | ug/L | 95 | (74%-124%) |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908048 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PS | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 19:29 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 19:29 | | | | |
| Data File: | 103017V6\6F123.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 50.4 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 50.0 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 47.4 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 48.5 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 48.3 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 49.2 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 45.4 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | B | 44.5 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.1 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 43.3 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 44.0 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 46.2 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 51.1 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 43.5 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 51.9 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 46.6 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 43.6 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 43.0 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 46.0 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 42.1 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 49.1 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 149 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 42.3 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 169 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 43.0 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 43.8 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 228 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 120 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1170 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 45.1 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 44.7 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 50.2 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 53.6 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 47.0 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908048 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PS | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 19:29 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 19:29 | | | | |
| Data File: | 103017V6\6F123.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | | 44.7 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 241 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 52.3 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 44.3 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 43.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 49.2 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 36.6 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 47.1 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 50.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 43.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 44.1 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 44.3 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | B | 43.7 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 236 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 42.8 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 49.3 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | | 50.0 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 47.2 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 44.1 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 43.4 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 47.8 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 46.6 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | | 212 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 36.9 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 49.0 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 49.7 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 86.2 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5280 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 42.1 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 42.1 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 44.4 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 43.0 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/18/2017 12:25 | Matrix: W |
| Lab Sample ID: 1203908048 | Date Received: 10/20/2017 08:55 | |
| Client Sample: QC for batch 1714198 | Client: ARSL004 | Project: QC |
| Client ID: CAPA-18-147586PS | Method: SW-846:8260B | SOP Ref: GL-OA-E-038 |
| Batch ID: 1714198 | Inst: VOA6.I | Dilution: 1 |
| Run Date: 10/30/2017 19:29 | Analyst: JP1 | Purge Vol: 5 mL |
| Prep Date: 10/30/2017 19:29 | | |
| Data File: 103017V6\6F123.D | Column: DB-624 | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | | 50.0 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 43.3 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 49.1 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 51.9 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 53.7 | 50.0 | 107 | (71%-134%) |
| Bromofluorobenzene | 49.0 | 50.0 | 98 | (70%-131%) |
| Toluene-d8 | 47.6 | 50.0 | 95 | (74%-124%) |

Volatile
Certificate of Analysis
Sample Summary

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908049 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PS | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 20:25 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 20:25 | | | | |
| Data File: | 103017V6\6F125.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 49.2 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 240 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 256 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 251 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908049 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PS | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 20:25 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 20:25 | | | | |
| Data File: | 103017V6\6F125.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 239 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2390 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 254 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 250 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | | 241 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 273 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/18/2017 12:25 | Matrix: W |
| Lab Sample ID: 1203908049 | Date Received: 10/20/2017 08:55 | |
| Client Sample: QC for batch 1714198 | Client: ARSL004 | Project: QC |
| Client ID: CAPA-18-147586PS | Method: SW-846:8260B | SOP Ref: GL-OA-E-038 |
| Batch ID: 1714198 | Inst: VOA6.I | Dilution: 1 |
| Run Date: 10/30/2017 20:25 | Analyst: JP1 | Purge Vol: 5 mL |
| Prep Date: 10/30/2017 20:25 | | |
| Data File: 103017V6\6F125.D | Column: DB-624 | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 51.1 | 50.0 | 102 | (71%-134%) |
| Bromofluorobenzene | 48.0 | 50.0 | 96 | (70%-131%) |
| Toluene-d8 | 47.1 | 50.0 | 94 | (74%-124%) |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908050 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PSD | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 19:57 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 19:57 | | | | |
| Data File: | 103017V6\6F124.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 49.0 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 48.5 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 46.2 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 46.0 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 47.4 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 48.3 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 45.3 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | B | 42.5 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 47.6 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 41.0 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 42.5 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 44.7 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 48.9 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 42.3 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 49.5 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 45.9 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 42.3 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 41.1 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 44.6 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 40.2 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 48.1 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 143 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 41.1 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 162 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 41.3 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 42.4 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 220 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 115 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1150 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 44.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 42.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 47.3 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 51.3 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 44.9 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908050 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PSD | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 19:57 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 19:57 | | | | |
| Data File: | 103017V6\6F124.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | | 44.8 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 240 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 51.1 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 43.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 43.2 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 47.9 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 38.5 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 45.5 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 47.6 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 42.5 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 42.9 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 43.0 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | B | 40.4 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 231 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 42.1 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 47.5 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | | 47.7 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | U | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 45.7 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 43.3 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 42.6 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 46.5 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 46.2 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | | 205 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 38.7 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 47.7 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 47.8 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 83.6 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5180 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 40.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 40.7 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 43.0 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 41.7 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/18/2017 12:25 | Matrix: W |
| Lab Sample ID: 1203908050 | Date Received: 10/20/2017 08:55 | |
| Client Sample: QC for batch 1714198 | Client: ARSL004 | Project: QC |
| Client ID: CAPA-18-147586PSD | Method: SW-846:8260B | SOP Ref: GL-OA-E-038 |
| Batch ID: 1714198 | Inst: VOA6.I | Dilution: 1 |
| Run Date: 10/30/2017 19:57 | Analyst: JP1 | Purge Vol: 5 mL |
| Prep Date: 10/30/2017 19:57 | | |
| Data File: 103017V6\6F124.D | Column: DB-624 | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | | 48.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 41.9 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 48.2 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 49.7 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 50.8 | 50.0 | 102 | (71%-134%) |
| Bromofluorobenzene | 48.5 | 50.0 | 97 | (70%-131%) |
| Toluene-d8 | 47.2 | 50.0 | 94 | (74%-124%) |

Volatile
Certificate of Analysis
Sample Summary

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908051 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PSD | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 20:53 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 20:53 | | | | |
| Data File: | 103017V6\6F126.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|-----------------------------|-----------|--------|-------|---------|---------|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 47.6 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 264 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 272 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 244 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 0.300 | ug/L | 0.300 | 1.00 |

Volatile
Certificate of Analysis
Sample Summary

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/18/2017 12:25 | Matrix: W |
| Lab Sample ID: 1203908051 | Date Received: 10/20/2017 08:55 | |
| Client Sample: QC for batch 1714198 | Client: ARSL004 | Project: QC |
| Client ID: CAPA-18-147586PSD | Method: SW-846:8260B | SOP Ref: GL-OA-E-038 |
| Batch ID: 1714198 | Inst: VOA6.I | Dilution: 1 |
| Run Date: 10/30/2017 20:53 | Analyst: JP1 | Purge Vol: 5 mL |
| Prep Date: 10/30/2017 20:53 | | |
| Data File: 103017V6\6F126.D | Column: DB-624 | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-------------|---------------------------|-----------|--------|-------|---------|---------|
| 74-83-9 | Bromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 243 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2650 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 264 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 261 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | | 261 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 265 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Volatile
Certificate of Analysis
Sample Summary**

| | | | | | |
|-----------------------|-----------------------------|------------------------|-------------------------|-------------------|--------------------|
| SDG Number: | 2018-496 | Date Collected: | 10/18/2017 12:25 | Matrix: | W |
| Lab Sample ID: | 1203908051 | Date Received: | 10/20/2017 08:55 | | |
| Client Sample: | QC for batch 1714198 | Client: | ARSL004 | Project: | QC |
| Client ID: | CAPA-18-147586PSD | Method: | SW-846:8260B | SOP Ref: | GL-OA-E-038 |
| Batch ID: | 1714198 | Inst: | VOA6.I | Dilution: | 1 |
| Run Date: | 10/30/2017 20:53 | Analyst: | JP1 | Purge Vol: | 5 mL |
| Prep Date: | 10/30/2017 20:53 | | | | |
| Data File: | 103017V6\6F126.D | Column: | DB-624 | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------------|-----------|--------|-------|---------|---------|
| 1634-04-4 | tert-Butyl methyl ether | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | 52.8 | 50.0 | 106 | (71%-134%) |
| Bromofluorobenzene | 49.3 | 50.0 | 99 | (70%-131%) |
| Toluene-d8 | 47.3 | 50.0 | 95 | (74%-124%) |

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-496
Work Order #: 435560**

Method/Analysis Information

| | |
|--------------------------|---|
| Procedure: | Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1711736 |
| Prep Batch Number: | 1711735 |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| | |
|------------------|--|
| Sample ID | Client ID |
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203901986 | Method Blank (MB) |
| 1203901987 | Laboratory Control Sample (LCS) |
| 1203901988 | 435566004(CAMO-18-147679) Matrix Spike (MS) |
| 1203901989 | 435566004(CAMO-18-147679) 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-009 REV# 39.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

CCV Requirements

All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for samples 435560002 (CAPA-18-147590), 435560005 (CAPA-18-147591) and 435560008 (CAPA-18-147686) and the associated QC. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. If required, a CRDL was analyzed after the CCVs to demonstrate that there is adequate sensitivity to detect the failed compounds at the applicable lower quantitation limit.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG in this batch met the acceptance criteria.

Surrogate Recoveries

All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) did not meet spike recovery acceptance criteria. Since the target analytes were not detected in the associated samples above the reporting limits, the positive bias had no adverse impact on the data.

| Sample | Analyte | Value |
|------------------|------------------------|-----------------|
| 1203901987 (LCS) | 3,3'-Dichlorobenzidine | 129* (43%-127%) |

QC Sample Designation

Sample 435566004 (CAMO-18-147679) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS or MSD (See Below) recovered spiked analytes outside of the established acceptance limits. Because the recoveries were biased high and the target analytes were not detected in the associated samples above the reporting limit, the data were reported.

| Sample | Analyte | Value |
|-------------------------------|------------------------|-----------------|
| 1203901988 (CAMO-18-147679MS) | 3,3'-Dichlorobenzidine | 129* (34%-124%) |

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) between the MS and MSD (See Below) did not meet acceptance limits. As the individual MS and MSD recoveries were within the acceptance limits, the failures had no adverse impact on the reported sample data.

| Sample | Analyte | Value |
|---|-----------|------------------|
| 1203901988MS and 1203901989MSD (CAMO-18-147679) | Benzidine | RPD 41* (0%-30%) |

Internal Standard (ISTD) Acceptance

The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

Technical Information:**Holding Time Specifications**

All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or 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. All reported compound mass spectra met the detection specifications in the method.

Sample Dilutions

The samples in this SDG in this batch did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

Miscellaneous Information:**Manual Integrations**

Manual integrations were not required on samples in this batch in this SDG for detected target analytes or surrogates.

TIC Comment

Tentatively identified compounds (TIC) were requested for samples 435560002 (CAPA-18-147590), 435560005 (CAPA-18-147591) and 435560008 (CAPA-18-147686) in this SDG in this batch.

Additional Comments

Additional comments were not required for the SDG associated samples in this batch.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually 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 of each electronic package will indicate the reviewer name associated with the generation of the data and package. 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.

System Configuration

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|----------------------|--|-----------------------------|------------------|--|
| MSD3.I | Agilent 7890A/5975C GC/MS w/ 7683 Autosampler | HP7890A/HP5975C | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

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: 2018-496 GEL Work Order: 435560

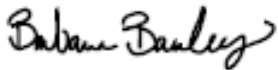
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- E Concentration of the target analyte exceeds the instrument calibration range
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC 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: Barbara Bailey

Date: 10 NOV 2017

Title: Data Validator

Sample Data Summary

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-496
Lab Sample ID: 435560002

Date Collected: 10/17/2017 11:39
Date Received: 10/19/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 970 mL
Column: DB-5ms

Matrix: W
Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

Client ID: CAPA-18-147590
Batch ID: 1711736
Run Date: 10/24/2017 16:39
Prep Date: 10/24/2017 06:59
Data File: s102417a.s\sj2416.D

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-----------|--------------------------------|-----------|--------|-------|---------|---------|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 122-66-7 | Azobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>1,2-Diphenylhydrazine</i> | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 123-91-1 | 1,4-Dioxane | U | 3.09 | ug/L | 3.09 | 10.3 |
| 90-12-0 | 1-Methylnaphthalene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 120-83-2 | 2,4-Dichlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 105-67-9 | 2,4-Dimethylphenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 51-28-5 | 2,4-Dinitrophenol | U | 5.15 | ug/L | 5.15 | 20.6 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-58-7 | 2-Chloronaphthalene | U | 0.423 | ug/L | 0.423 | 1.03 |
| 95-57-8 | 2-Chlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 88-75-5 | 2-Nitrophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 101-55-3 | 4-Bromophenylphenylether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 59-50-7 | Parachlorometa cresol | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>4-Chloro-3-methylphenol</i> | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 3.40 | ug/L | 3.40 | 10.3 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 100-02-7 | 4-Nitrophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 83-32-9 | Acenaphthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 208-96-8 | Acenaphthylene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 62-53-3 | Aniline | U | 4.33 | ug/L | 4.33 | 10.3 |
| 120-12-7 | Anthracene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 1912-24-9 | Atrazine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 92-87-5 | Benzidine | U | 4.02 | ug/L | 4.02 | 10.3 |
| 56-55-3 | Benzo(a)anthracene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 50-32-8 | Benzo(a)pyrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.309 | ug/L | 0.309 | 1.03 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-496

Lab Sample ID: 435560002

Date Collected: 10/17/2017 11:39

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1711736

Inst: MSD3.I

Dilution: 1

Run Date: 10/24/2017 16:39

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 10/24/2017 06:59

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s102417a.s\s3j2416.D

Column: DB-5ms

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|----------------------------------|-----------|--------|-------|---------|---------|
| 207-08-9 | Benzo(k)fluoranthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 65-85-0 | Benzoic acid | U | 6.19 | ug/L | 6.19 | 20.6 |
| 100-51-6 | Benzyl alcohol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 85-68-7 | Butylbenzylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 218-01-9 | Chrysene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 84-74-2 | Di-n-butylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 117-84-0 | Di-n-octylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 132-64-9 | Dibenzofuran | U | 3.09 | ug/L | 3.09 | 10.3 |
| 84-66-2 | Diethylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 131-11-3 | Dimethylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 88-85-7 | Dinoseb | U | 3.09 | ug/L | 3.09 | 10.3 |
| 122-39-4 | Diphenylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 206-44-0 | Fluoranthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 86-73-7 | Fluorene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 118-74-1 | Hexachlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 87-68-3 | Hexachlorobutadiene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 67-72-1 | Hexachloroethane | U | 3.09 | ug/L | 3.09 | 10.3 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 78-59-1 | Isophorone | U | 3.61 | ug/L | 3.61 | 10.3 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 55-18-5 | N-Nitrosodiethylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 621-64-7 | N-Nitrosodi--n-propylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>N-Nitrosodipropylamine</i> | | | | | |
| 930-55-2 | N-Nitrosopyrrolidine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-20-3 | Naphthalene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 98-95-3 | Nitrobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 608-93-5 | Pentachlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 87-86-5 | Pentachlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 85-01-8 | Phenanthrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 108-95-2 | Phenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 129-00-0 | Pyrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 110-86-1 | Pyridine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 3.09 | ug/L | 3.09 | 10.3 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 3.09 | ug/L | 3.09 | 10.3 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-496
Lab Sample ID: 435560002

Date Collected: 10/17/2017 11:39
Date Received: 10/19/2017 08:55

Matrix: W

Client ID: CAPA-18-147590

Client: ARSL004

Project: ESHL00114

Batch ID: 1711736

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Run Date: 10/24/2017 16:39

Inst: MSD3.I

Dilution: 1

Prep Date: 10/24/2017 06:59

Analyst: JLD1

Inj. Vol: 1 uL

Data File: s102417a.s\s3j2416.D

Aliquot: 970 mL

Final Volume: 1 mL

Column: DB-5ms

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------|-----------|--------|-------|---------|---------|
| 65794-96-9 | m,p-Cresols | U | 3.81 | ug/L | 3.81 | 10.3 |
| 99-09-2 | 3-Nitroaniline | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>m-Nitroaniline</i> | | | | | |
| 95-48-7 | o-Cresol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 88-74-4 | 2-Nitroaniline | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>o-Nitroaniline</i> | | | | | |
| 100-01-6 | 4-Nitroaniline | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>p-Nitroaniline</i> | | | | | |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 2,4,6-Tribromophenol | 71.0 | 103 | ug/L | 69 (32%-124%) |
| 2-Fluorobiphenyl | 37.5 | 51.5 | ug/L | 73 (32%-112%) |
| 2-Fluorophenol | 37.3 | 103 | ug/L | 36 (15%-88%) |
| Nitrobenzene-d5 | 41.4 | 51.5 | ug/L | 80 (36%-115%) |
| Phenol-d5 | 25.6 | 103 | ug/L | 25 (15%-91%) |
| p-Terphenyl-d14 | 43.8 | 51.5 | ug/L | 85 (36%-121%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|-------------|---------------------------------------|-------|-----------|-------|-----|------|
| 000067-66-3 | Trichloromethane | 2.222 | 73.2 | ug/L | 97 | NJ |
| 000056-23-5 | Carbon Tetrachloride | 2.462 | 6.61 | ug/L | 91 | NJ |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-496

Lab Sample ID: 435560005

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1711736

Inst: MSD3.I

Dilution: 1

Run Date: 10/24/2017 17:08

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 10/24/2017 06:59

Aliquot: 950 mL

Final Volume: 1 mL

Data File: s102417a.s\s3j2417.D

Column: DB-5ms

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-----------|--------------------------------|-----------|--------|-------|---------|---------|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 122-66-7 | Azobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| | <i>1,2-Diphenylhydrazine</i> | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 123-91-1 | 1,4-Dioxane | U | 3.16 | ug/L | 3.16 | 10.5 |
| 90-12-0 | 1-Methylnaphthalene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 120-83-2 | 2,4-Dichlorophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 105-67-9 | 2,4-Dimethylphenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 51-28-5 | 2,4-Dinitrophenol | U | 5.26 | ug/L | 5.26 | 21.1 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 91-58-7 | 2-Chloronaphthalene | U | 0.432 | ug/L | 0.432 | 1.05 |
| 95-57-8 | 2-Chlorophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 88-75-5 | 2-Nitrophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 101-55-3 | 4-Bromophenylphenylether | U | 3.16 | ug/L | 3.16 | 10.5 |
| 59-50-7 | Parachlorometa cresol | U | 3.16 | ug/L | 3.16 | 10.5 |
| | <i>4-Chloro-3-methylphenol</i> | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 3.47 | ug/L | 3.47 | 10.5 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 3.16 | ug/L | 3.16 | 10.5 |
| 100-02-7 | 4-Nitrophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 83-32-9 | Acenaphthene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 208-96-8 | Acenaphthylene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 62-53-3 | Aniline | U | 4.42 | ug/L | 4.42 | 10.5 |
| 120-12-7 | Anthracene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 1912-24-9 | Atrazine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 92-87-5 | Benzidine | U | 4.11 | ug/L | 4.11 | 10.5 |
| 56-55-3 | Benzo(a)anthracene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 50-32-8 | Benzo(a)pyrene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.316 | ug/L | 0.316 | 1.05 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-496

Lab Sample ID: 435560005

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1711736

Inst: MSD3.I

Dilution: 1

Run Date: 10/24/2017 17:08

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 10/24/2017 06:59

Aliquot: 950 mL

Final Volume: 1 mL

Data File: s102417a.s\s3j2417.D

Column: DB-5ms

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|----------------------------------|-----------|--------|-------|---------|---------|
| 207-08-9 | Benzo(k)fluoranthene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 65-85-0 | Benzoic acid | U | 6.32 | ug/L | 6.32 | 21.1 |
| 100-51-6 | Benzyl alcohol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 85-68-7 | Butylbenzylphthalate | U | 3.16 | ug/L | 3.16 | 10.5 |
| 218-01-9 | Chrysene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 84-74-2 | Di-n-butylphthalate | U | 3.16 | ug/L | 3.16 | 10.5 |
| 117-84-0 | Di-n-octylphthalate | U | 3.16 | ug/L | 3.16 | 10.5 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 132-64-9 | Dibenzofuran | U | 3.16 | ug/L | 3.16 | 10.5 |
| 84-66-2 | Diethylphthalate | U | 3.16 | ug/L | 3.16 | 10.5 |
| 131-11-3 | Dimethylphthalate | U | 3.16 | ug/L | 3.16 | 10.5 |
| 88-85-7 | Dinoseb | U | 3.16 | ug/L | 3.16 | 10.5 |
| 122-39-4 | Diphenylamine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 206-44-0 | Fluoranthene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 86-73-7 | Fluorene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 118-74-1 | Hexachlorobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 87-68-3 | Hexachlorobutadiene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 67-72-1 | Hexachloroethane | U | 3.16 | ug/L | 3.16 | 10.5 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 78-59-1 | Isophorone | U | 3.68 | ug/L | 3.68 | 10.5 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 55-18-5 | N-Nitrosodiethylamine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 621-64-7 | N-Nitrosodi--n-propylamine | U | 3.16 | ug/L | 3.16 | 10.5 |
| | <i>N-Nitrosodipropylamine</i> | | | | | |
| 930-55-2 | N-Nitrosopyrrolidine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 91-20-3 | Naphthalene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 98-95-3 | Nitrobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 608-93-5 | Pentachlorobenzene | U | 3.16 | ug/L | 3.16 | 10.5 |
| 87-86-5 | Pentachlorophenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 85-01-8 | Phenanthrene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 108-95-2 | Phenol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 129-00-0 | Pyrene | U | 0.316 | ug/L | 0.316 | 1.05 |
| 110-86-1 | Pyridine | U | 3.16 | ug/L | 3.16 | 10.5 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 3.16 | ug/L | 3.16 | 10.5 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 3.16 | ug/L | 3.16 | 10.5 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 3.16 | ug/L | 3.16 | 10.5 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 3.16 | ug/L | 3.16 | 10.5 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-496

Lab Sample ID: 435560005

Date Collected: 10/17/2017 13:23

Date Received: 10/19/2017 08:55

Matrix: W

Client ID: CAPA-18-147591

Batch ID: 1711736

Run Date: 10/24/2017 17:08

Prep Date: 10/24/2017 06:59

Data File: s102417a.s\s3j2417.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 950 mL

Column: DB-5ms

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------|-----------|--------|-------|---------|---------|
| 65794-96-9 | m,p-Cresols | U | 3.89 | ug/L | 3.89 | 10.5 |
| 99-09-2 | 3-Nitroaniline | U | 3.16 | ug/L | 3.16 | 10.5 |
| | <i>m-Nitroaniline</i> | | | | | |
| 95-48-7 | o-Cresol | U | 3.16 | ug/L | 3.16 | 10.5 |
| 88-74-4 | 2-Nitroaniline | U | 3.16 | ug/L | 3.16 | 10.5 |
| | <i>o-Nitroaniline</i> | | | | | |
| 100-01-6 | 4-Nitroaniline | U | 3.16 | ug/L | 3.16 | 10.5 |
| | <i>p-Nitroaniline</i> | | | | | |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|------|-----------|-------------------|
| 2,4,6-Tribromophenol | 68.3 | 105 | ug/L | 65 | (32%-124%) |
| 2-Fluorobiphenyl | 36.4 | 52.6 | ug/L | 69 | (32%-112%) |
| 2-Fluorophenol | 35.8 | 105 | ug/L | 34 | (15%-88%) |
| Nitrobenzene-d5 | 40.9 | 52.6 | ug/L | 78 | (36%-115%) |
| Phenol-d5 | 24.3 | 105 | ug/L | 23 | (15%-91%) |
| p-Terphenyl-d14 | 43.8 | 52.6 | ug/L | 83 | (36%-121%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|-------------|---------------------------------------|-------|-----------|-------|-----|------|
| 000067-66-3 | Trichloromethane | 2.211 | 71.6 | ug/L | 97 | NJ |
| 000076-02-8 | Trichloroacetyl chloride | 2.452 | 5.74 | ug/L | 90 | NJ |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-496
Lab Sample ID: 435560008
Client Sample: VOA/SVOA
Client ID: CAPA-18-147686
Batch ID: 1711736
Run Date: 10/24/2017 17:38
Prep Date: 10/24/2017 06:59
Data File: s102417a.s\sj2418.D

Date Collected: 10/17/2017 08:45
Date Received: 10/19/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 970 mL
Column: DB-5ms

Matrix: W
Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-----------|--------------------------------|-----------|--------|-------|---------|---------|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 122-66-7 | Azobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>1,2-Diphenylhydrazine</i> | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 123-91-1 | 1,4-Dioxane | U | 3.09 | ug/L | 3.09 | 10.3 |
| 90-12-0 | 1-Methylnaphthalene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 120-83-2 | 2,4-Dichlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 105-67-9 | 2,4-Dimethylphenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 51-28-5 | 2,4-Dinitrophenol | U | 5.15 | ug/L | 5.15 | 20.6 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-58-7 | 2-Chloronaphthalene | U | 0.423 | ug/L | 0.423 | 1.03 |
| 95-57-8 | 2-Chlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 88-75-5 | 2-Nitrophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 101-55-3 | 4-Bromophenylphenylether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 59-50-7 | Parachlorometa cresol | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>4-Chloro-3-methylphenol</i> | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 3.40 | ug/L | 3.40 | 10.3 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 100-02-7 | 4-Nitrophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 83-32-9 | Acenaphthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 208-96-8 | Acenaphthylene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 62-53-3 | Aniline | U | 4.33 | ug/L | 4.33 | 10.3 |
| 120-12-7 | Anthracene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 1912-24-9 | Atrazine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 92-87-5 | Benzidine | U | 4.02 | ug/L | 4.02 | 10.3 |
| 56-55-3 | Benzo(a)anthracene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 50-32-8 | Benzo(a)pyrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.309 | ug/L | 0.309 | 1.03 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 08:45 | Matrix: W |
| Lab Sample ID: 435560008 | Date Received: 10/19/2017 08:55 | |
| Client Sample: VOA/SVOA | Client: ARSL004 | Project: ESHL00114 |
| Client ID: CAPA-18-147686 | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 17:38 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 970 mL | Final Volume: 1 mL |
| Data File: s102417a.s\s3j2418.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|----------------------------------|-----------|--------|-------|---------|---------|
| 207-08-9 | Benzo(k)fluoranthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 65-85-0 | Benzoic acid | U | 6.19 | ug/L | 6.19 | 20.6 |
| 100-51-6 | Benzyl alcohol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 85-68-7 | Butylbenzylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 218-01-9 | Chrysene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 84-74-2 | Di-n-butylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 117-84-0 | Di-n-octylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 132-64-9 | Dibenzofuran | U | 3.09 | ug/L | 3.09 | 10.3 |
| 84-66-2 | Diethylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 131-11-3 | Dimethylphthalate | U | 3.09 | ug/L | 3.09 | 10.3 |
| 88-85-7 | Dinoseb | U | 3.09 | ug/L | 3.09 | 10.3 |
| 122-39-4 | Diphenylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 206-44-0 | Fluoranthene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 86-73-7 | Fluorene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 118-74-1 | Hexachlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 87-68-3 | Hexachlorobutadiene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 67-72-1 | Hexachloroethane | U | 3.09 | ug/L | 3.09 | 10.3 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 78-59-1 | Isophorone | U | 3.61 | ug/L | 3.61 | 10.3 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 55-18-5 | N-Nitrosodiethylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 621-64-7 | N-Nitrosodi--n-propylamine | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>N-Nitrosodipropylamine</i> | | | | | |
| 930-55-2 | N-Nitrosopyrrolidine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 91-20-3 | Naphthalene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 98-95-3 | Nitrobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 608-93-5 | Pentachlorobenzene | U | 3.09 | ug/L | 3.09 | 10.3 |
| 87-86-5 | Pentachlorophenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 85-01-8 | Phenanthrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 108-95-2 | Phenol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 129-00-0 | Pyrene | U | 0.309 | ug/L | 0.309 | 1.03 |
| 110-86-1 | Pyridine | U | 3.09 | ug/L | 3.09 | 10.3 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 3.09 | ug/L | 3.09 | 10.3 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 3.09 | ug/L | 3.09 | 10.3 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 3.09 | ug/L | 3.09 | 10.3 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 08:45 | Matrix: W |
| Lab Sample ID: 435560008 | Date Received: 10/19/2017 08:55 | |
| Client Sample: VOA/SVOA | Client: ARSL004 | Project: ESHL00114 |
| Client ID: CAPA-18-147686 | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 17:38 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 970 mL | Final Volume: 1 mL |
| Data File: s102417a.s\s3j2418.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------|-----------|--------|-------|---------|---------|
| 65794-96-9 | m,p-Cresols | U | 3.81 | ug/L | 3.81 | 10.3 |
| 99-09-2 | 3-Nitroaniline | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>m-Nitroaniline</i> | | | | | |
| 95-48-7 | o-Cresol | U | 3.09 | ug/L | 3.09 | 10.3 |
| 88-74-4 | 2-Nitroaniline | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>o-Nitroaniline</i> | | | | | |
| 100-01-6 | 4-Nitroaniline | U | 3.09 | ug/L | 3.09 | 10.3 |
| | <i>p-Nitroaniline</i> | | | | | |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 2,4,6-Tribromophenol | 74.5 | 103 | ug/L | 72 (32%-124%) |
| 2-Fluorobiphenyl | 35.6 | 51.5 | ug/L | 69 (32%-112%) |
| 2-Fluorophenol | 37.7 | 103 | ug/L | 37 (15%-88%) |
| Nitrobenzene-d5 | 40.4 | 51.5 | ug/L | 78 (36%-115%) |
| Phenol-d5 | 26.2 | 103 | ug/L | 25 (15%-91%) |
| p-Terphenyl-d14 | 43.0 | 51.5 | ug/L | 83 (36%-121%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|-------------|---------------------------------------|-------|-----------|-------|-----|------|
| 000067-66-3 | Trichloromethane | 2.221 | 80.5 | ug/L | 97 | NJ |
| 000056-23-5 | Carbon Tetrachloride | 2.462 | 6.57 | ug/L | 90 | NJ |

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-496

Matrix Type: LIQUID

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|------------|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1203901986 | MB for batch 1711735 | 38 | 26 | 87 | 74 | 71 | 96 |
| 1203901987 | LCS for batch 1711735 | 41 | 28 | 74 | 78 | 89 | 88 |
| 435560002 | CAPA-18-147590 | 36 | 25 | 80 | 73 | 69 | 85 |
| 435560005 | CAPA-18-147591 | 34 | 23 | 78 | 69 | 65 | 83 |
| 435560008 | CAPA-18-147686 | 37 | 25 | 78 | 69 | 72 | 83 |
| 1203901988 | CAMO-18-147679MS | 49 | 40 | 70 | 73 | 94 | 87 |
| 1203901989 | CAMO-18-147679MSD | 44 | 35 | 66 | 64 | 81 | 78 |

Surrogate**Acceptance Limits**

| | | |
|-----|------------------------|------------|
| 2FP | = 2-Fluorophenol | (15%-88%) |
| PHL | = Phenol-d5 | (15%-91%) |
| NBZ | = Nitrobenzene-d5 | (36%-115%) |
| FBP | = 2-Fluorobiphenyl | (32%-112%) |
| TBP | = 2,4,6-Tribromophenol | (32%-124%) |
| TPH | = p-Terphenyl-d14 | (36%-121%) |

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1711735

Matrix: WATER

Lab Sample ID 1203901987

Instrument: MSD3.I

Analysis Date: 10/24/2017 16:09

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|------------|---|----------------------|----------------------|---------------------|---------------|----------------------|
| 62-75-9 | LCS N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 22.8 | 46 | 30-88 |
| 110-86-1 | LCS Pyridine | 50.0 | 0.0 | 23.7 | 47 | 27-89 |
| 62-53-3 | LCS Aniline | 50.0 | 0.0 | 36.6 | 73 | 49-112 |
| 108-95-2 | LCS Phenol | 50.0 | 0.0 | 14.5 | 29 | 16-82 |
| 111-44-4 | LCS bis(2-Chloroethyl) ether | 50.0 | 0.0 | 40.3 | 81 | 51-111 |
| 95-57-8 | LCS 2-Chlorophenol | 50.0 | 0.0 | 36.6 | 73 | 49-105 |
| 541-73-1 | LCS 1,3-Dichlorobenzene | 50.0 | 0.0 | 36.2 | 72 | 37-95 |
| 106-46-7 | LCS 1,4-Dichlorobenzene | 50.0 | 0.0 | 36.4 | 73 | 38-96 |
| 95-50-1 | LCS 1,2-Dichlorobenzene | 50.0 | 0.0 | 37.8 | 76 | 39-97 |
| 108-60-1 | LCS bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 43.5 | 87 | 44-123 |
| 100-51-6 | LCS Benzyl alcohol | 50.0 | 0.0 | 32.6 | 65 | 44-102 |
| 95-48-7 | LCS o-Cresol | 50.0 | 0.0 | 31.4 | 63 | 41-101 |
| 65794-96-9 | LCS m,p-Cresols | 50.0 | 0.0 | 32.6 | 65 | 43-102 |
| 621-64-7 | LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i> | 50.0 | 0.0 | 43.3 | 87 | 54-115 |
| 67-72-1 | LCS Hexachloroethane | 50.0 | 0.0 | 31.8 | 64 | 36-96 |
| 98-95-3 | LCS Nitrobenzene | 50.0 | 0.0 | 39.6 | 79 | 53-115 |
| 78-59-1 | LCS Isophorone | 50.0 | 0.0 | 40.7 | 81 | 56-117 |
| 88-75-5 | LCS 2-Nitrophenol | 50.0 | 0.0 | 39.6 | 79 | 51-113 |
| 105-67-9 | LCS 2,4-Dimethylphenol | 50.0 | 0.0 | 29.9 | 60 | 51-104 |
| 111-91-1 | LCS bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 39.7 | 79 | 55-114 |
| 120-83-2 | LCS 2,4-Dichlorophenol | 50.0 | 0.0 | 39.2 | 78 | 53-109 |
| 65-85-0 | LCS Benzoic acid | 100 | 0.0 | 27.5 | 28 | 21-74 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1711735

Matrix: WATER

Lab Sample ID 1203901987

Instrument: MSD3.I

Analysis Date: 10/24/2017 16:09

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|--|----------------------|----------------------|---------------------|---------------|----------------------|
| 106-47-8 | LCS 4-Chloroaniline | 50.0 | 0.0 | 50.0 | 100 | 65-136 |
| 87-68-3 | LCS Hexachlorobutadiene | 50.0 | 0.0 | 32.0 | 64 | 35-98 |
| 59-50-7 | LCS Parachlorometa cresol 4-Chloro-3-methylphenol | 50.0 | 0.0 | 40.4 | 81 | 55-115 |
| 91-57-6 | LCS 2-Methylnaphthalene | 50.0 | 0.0 | 38.6 | 77 | 42-103 |
| 91-20-3 | LCS Naphthalene | 50.0 | 0.0 | 38.6 | 77 | 44-102 |
| 90-12-0 | LCS 1-Methylnaphthalene | 50.0 | 0.0 | 39.1 | 78 | 45-108 |
| 77-47-4 | LCS Hexachlorocyclopentadiene | 50.0 | 0.0 | 26.6 | 53 | 34-89 |
| 88-06-2 | LCS 2,4,6-Trichlorophenol | 50.0 | 0.0 | 42.4 | 85 | 55-120 |
| 95-95-4 | LCS 2,4,5-Trichlorophenol | 50.0 | 0.0 | 42.0 | 84 | 55-116 |
| 91-58-7 | LCS 2-Chloronaphthalene | 50.0 | 0.0 | 42.4 | 85 | 44-107 |
| 88-74-4 | LCS 2-Nitroaniline o-Nitroaniline | 50.0 | 0.0 | 45.6 | 91 | 53-121 |
| 99-09-2 | LCS 3-Nitroaniline m-Nitroaniline | 50.0 | 0.0 | 58.7 | 117 | 61-139 |
| 131-11-3 | LCS Dimethylphthalate | 50.0 | 0.0 | 48.9 | 98 | 60-122 |
| 606-20-2 | LCS 2,6-Dinitrotoluene | 50.0 | 0.0 | 51.3 | 103 | 59-122 |
| 121-14-2 | LCS 2,4-Dinitrotoluene | 50.0 | 0.0 | 56.3 | 113 | 57-124 |
| 208-96-8 | LCS Acenaphthylene | 50.0 | 0.0 | 44.8 | 90 | 50-113 |
| 83-32-9 | LCS Acenaphthene | 50.0 | 0.0 | 44.9 | 90 | 49-112 |
| 51-28-5 | LCS 2,4-Dinitrophenol | 50.0 | 0.0 | 40.1 | 80 | 34-122 |
| 132-64-9 | LCS Dibenzofuran | 50.0 | 0.0 | 45.5 | 91 | 50-111 |
| 58-90-2 | LCS 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 39.9 | 80 | 54-122 |
| 84-66-2 | LCS Diethylphthalate | 50.0 | 0.0 | 51.2 | 102 | 57-122 |
| 100-02-7 | LCS 4-Nitrophenol | 50.0 | 0.0 | 15.5 | 31 | 15-137 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1711735

Matrix: WATER

Lab Sample ID 1203901987

Instrument: MSD3.I

Analysis Date: 10/24/2017 16:09

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|-----------|--|----------------------|----------------------|---------------------|---------------|----------------------|
| 86-73-7 | LCS Fluorene | 50.0 | 0.0 | 48.2 | 96 | 52-114 |
| 7005-72-3 | LCS 4-Chlorophenylphenylether | 50.0 | 0.0 | 49.5 | 99 | 52-121 |
| 100-01-6 | LCS 4-Nitroaniline <i>p-Nitroaniline</i> | 50.0 | 0.0 | 55.6 | 111 | 44-137 |
| 534-52-1 | LCS 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 43.8 | 88 | 45-124 |
| 122-39-4 | LCS Diphenylamine | 50.0 | 0.0 | 44.3 | 89 | 55-113 |
| 122-66-7 | LCS Azobenzene <i>1,2-Diphenylhydrazine</i> | 50.0 | 0.0 | 41.4 | 83 | 53-115 |
| 101-55-3 | LCS 4-Bromophenylphenylether | 50.0 | 0.0 | 43.3 | 87 | 54-116 |
| 118-74-1 | LCS Hexachlorobenzene | 50.0 | 0.0 | 42.4 | 85 | 54-115 |
| 87-86-5 | LCS Pentachlorophenol | 50.0 | 0.0 | 41.7 | 83 | 41-116 |
| 85-01-8 | LCS Phenanthrene | 50.0 | 0.0 | 46.9 | 94 | 55-110 |
| 120-12-7 | LCS Anthracene | 50.0 | 0.0 | 46.9 | 94 | 56-112 |
| 84-74-2 | LCS Di-n-butylphthalate | 50.0 | 0.0 | 50.5 | 101 | 57-123 |
| 206-44-0 | LCS Fluoranthene | 50.0 | 0.0 | 53.4 | 107 | 54-118 |
| 129-00-0 | LCS Pyrene | 50.0 | 0.0 | 43.8 | 88 | 49-121 |
| 85-68-7 | LCS Butylbenzylphthalate | 50.0 | 0.0 | 46.8 | 94 | 52-125 |
| 117-81-7 | LCS bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 44.4 | 89 | 52-125 |
| 56-55-3 | LCS Benzo(a)anthracene | 50.0 | 0.0 | 46.5 | 93 | 57-112 |
| 218-01-9 | LCS Chrysene | 50.0 | 0.0 | 46.0 | 92 | 58-117 |
| 117-84-0 | LCS Di-n-octylphthalate | 50.0 | 0.0 | 48.9 | 98 | 50-129 |
| 205-99-2 | LCS Benzo(b)fluoranthene | 50.0 | 0.0 | 46.5 | 93 | 41-118 |
| 207-08-9 | LCS Benzo(k)fluoranthene | 50.0 | 0.0 | 46.2 | 92 | 42-121 |
| 50-32-8 | LCS Benzo(a)pyrene | 50.0 | 0.0 | 46.0 | 92 | 40-118 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1711735

Matrix: WATER

Lab Sample ID 1203901987

Instrument: MSD3.I

Analysis Date: 10/24/2017 16:09

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|-----------|--------------------------------|----------------------|----------------------|---------------------|---------------|----------------------|
| 193-39-5 | LCS Indeno(1,2,3-cd)pyrene | 50.0 | 0.0 | 43.6 | 87 | 34-125 |
| 53-70-3 | LCS Dibenzo(a,h)anthracene | 50.0 | 0.0 | 41.2 | 82 | 38-129 |
| 191-24-2 | LCS Benzo(ghi)perylene | 50.0 | 0.0 | 39.6 | 79 | 33-131 |
| 123-91-1 | LCS 1,4-Dioxane | 50.0 | 0.0 | 25.9 | 52 | 38-78 |
| 930-55-2 | LCS N-Nitrosopyrrolidine | 50.0 | 0.0 | 42.1 | 84 | 54-113 |
| 95-94-3 | LCS 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 44.9 | 90 | 44-102 |
| 1912-24-9 | LCS Atrazine | 50.0 | 0.0 | 51.4 | 103 | 60-131 |
| 92-87-5 | LCS Benzidine | 100 | 0.0 | 139 | 139 | 20-144 |
| 91-94-1 | LCS 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 64.4 | 129 * | 43-127 |
| 120-82-1 | LCS 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 36.9 | 74 | 39-99 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike

Client ID: CAMO-18-147679MS

Matrix: W

Lab Sample ID 1203901988

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|------------|--|----------------------|----------------------|---------------------|---------------|----------------------|
| 62-75-9 | MS N-Methyl-N-nitrosomethylam | 116 | 0.00 U | 63.9 | 55 | 25-106 |
| 110-86-1 | MS Pyridine | 116 | 0.00 U | 56.5 | 49 | 24-93 |
| 62-53-3 | MS Aniline | 116 | 0.00 U | 79.1 | 68 | 37-113 |
| 108-95-2 | MS Phenol | 116 | 0.00 U | 49.1 | 42 | 23-82 |
| 111-44-4 | MS bis(2-Chloroethyl) ether | 116 | 0.00 U | 90.0 | 77 | 39-114 |
| 95-57-8 | MS 2-Chlorophenol | 116 | 0.00 U | 86.8 | 75 | 37-108 |
| 541-73-1 | MS 1,3-Dichlorobenzene | 116 | 0.00 U | 73.2 | 63 | 27-97 |
| 106-46-7 | MS 1,4-Dichlorobenzene | 116 | 0.00 U | 74.0 | 64 | 28-97 |
| 95-50-1 | MS 1,2-Dichlorobenzene | 116 | 0.00 U | 77.6 | 67 | 28-99 |
| 108-60-1 | MS bis(2-Chloro-1-methylethyl)et | 116 | 0.00 U | 95.8 | 82 | 32-127 |
| 100-51-6 | MS Benzyl alcohol | 116 | 0.00 U | 83.4 | 72 | 37-116 |
| 95-48-7 | MS o-Cresol | 116 | 0.00 U | 82.6 | 71 | 34-109 |
| 65794-96-9 | MS m,p-Cresols | 116 | 0.00 U | 88.5 | 76 | 36-120 |
| 621-64-7 | MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i> | 116 | 0.00 U | 101 | 87 | 42-118 |
| 67-72-1 | MS Hexachloroethane | 116 | 0.00 U | 66.5 | 57 | 29-94 |
| 98-95-3 | MS Nitrobenzene | 116 | 0.00 U | 91.0 | 78 | 38-123 |
| 78-59-1 | MS Isophorone | 116 | 0.00 U | 93.0 | 80 | 43-120 |
| 88-75-5 | MS 2-Nitrophenol | 116 | 0.00 U | 92.0 | 79 | 39-115 |
| 105-67-9 | MS 2,4-Dimethylphenol | 116 | 0.00 U | 74.1 | 64 | 39-107 |
| 111-91-1 | MS bis(2-Chloroethoxy)methane | 116 | 0.00 U | 92.4 | 79 | 42-118 |
| 120-83-2 | MS 2,4-Dichlorophenol | 116 | 0.00 U | 93.8 | 81 | 40-111 |
| 65-85-0 | MS Benzoic acid | 233 | 0.00 U | 87.1 | 37 | 17-95 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike

Client ID: CAMO-18-147679MS

Matrix: W

Lab Sample ID 1203901988

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|----------|----|--|-------------------------|-------------------------|---|------------------------|---------------|----------------------|
| 106-47-8 | MS | 4-Chloroaniline | 116 | 0.00 | U | 109 | 94 | 44-138 |
| 87-68-3 | MS | Hexachlorobutadiene | 116 | 0.00 | U | 73.8 | 64 | 26-98 |
| 59-50-7 | MS | Parachlorometa cresol 4-Chloro-3-methylphenol | 116 | 0.00 | U | 100 | 86 | 41-122 |
| 91-57-6 | MS | 2-Methylnaphthalene | 116 | 0.00 | U | 83.0 | 71 | 29-109 |
| 91-20-3 | MS | Naphthalene | 116 | 0.00 | U | 82.8 | 71 | 31-108 |
| 90-12-0 | MS | 1-Methylnaphthalene | 116 | 0.00 | U | 84.4 | 73 | 33-112 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 116 | 0.00 | U | 56.8 | 49 | 26-79 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 116 | 0.00 | U | 102 | 88 | 39-124 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 116 | 0.00 | U | 102 | 88 | 42-120 |
| 91-58-7 | MS | 2-Chloronaphthalene | 116 | 0.00 | U | 93.4 | 80 | 29-113 |
| 88-74-4 | MS | 2-Nitroaniline o-Nitroaniline | 116 | 0.00 | U | 106 | 91 | 41-121 |
| 99-09-2 | MS | 3-Nitroaniline m-Nitroaniline | 116 | 0.00 | U | 135 | 116 | 42-144 |
| 131-11-3 | MS | Dimethylphthalate | 116 | 0.00 | U | 115 | 99 | 45-128 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 116 | 0.00 | U | 121 | 104 | 46-124 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 116 | 0.00 | U | 132 | 114 | 45-125 |
| 208-96-8 | MS | Acenaphthylene | 116 | 0.00 | U | 103 | 88 | 35-120 |
| 83-32-9 | MS | Acenaphthene | 116 | 0.00 | U | 103 | 89 | 35-117 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 116 | 0.00 | U | 100 | 86 | 27-122 |
| 132-64-9 | MS | Dibenzofuran | 116 | 0.00 | U | 106 | 91 | 38-113 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 116 | 0.00 | U | 97.7 | 84 | 40-128 |
| 84-66-2 | MS | Diethylphthalate | 116 | 0.00 | U | 122 | 105 | 43-127 |
| 100-02-7 | MS | 4-Nitrophenol | 116 | 0.00 | U | 55.8 | 48 | 17-85 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike

Client ID: CAMO-18-147679MS

Matrix: W

Lab Sample ID 1203901988

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|-----------|----|--|-------------------------|-------------------------|---|------------------------|---------------|----------------------|
| 86-73-7 | MS | Fluorene | 116 | 0.00 | U | 110 | 95 | 39-117 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 116 | 0.00 | U | 113 | 97 | 39-121 |
| 100-01-6 | MS | 4-Nitroaniline <i>p</i> -Nitroaniline | 116 | 0.00 | U | 133 | 115 | 30-133 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 116 | 0.00 | U | 104 | 90 | 32-126 |
| 122-39-4 | MS | Diphenylamine | 116 | 0.00 | U | 102 | 87 | 37-118 |
| 122-66-7 | MS | Azobenzene <i>1,2-Diphenylhydrazine</i> | 116 | 0.00 | U | 92.6 | 80 | 38-120 |
| 101-55-3 | MS | 4-Bromophenylphenylether | 116 | 0.00 | U | 98.9 | 85 | 39-121 |
| 118-74-1 | MS | Hexachlorobenzene | 116 | 0.00 | U | 98.8 | 85 | 40-118 |
| 87-86-5 | MS | Pentachlorophenol | 116 | 0.00 | U | 103 | 89 | 35-121 |
| 85-01-8 | MS | Phenanthrene | 116 | 0.00 | U | 108 | 93 | 40-115 |
| 120-12-7 | MS | Anthracene | 116 | 0.00 | U | 106 | 92 | 38-120 |
| 84-74-2 | MS | Di-n-butylphthalate | 116 | 0.00 | U | 116 | 100 | 41-128 |
| 206-44-0 | MS | Fluoranthene | 116 | 0.00 | U | 125 | 107 | 41-119 |
| 129-00-0 | MS | Pyrene | 116 | 0.00 | U | 98.7 | 85 | 35-128 |
| 85-68-7 | MS | Butylbenzylphthalate | 116 | 0.00 | U | 108 | 93 | 40-129 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 116 | 0.00 | U | 104 | 89 | 38-131 |
| 56-55-3 | MS | Benzo(a)anthracene | 116 | 0.00 | U | 109 | 94 | 39-120 |
| 218-01-9 | MS | Chrysene | 116 | 0.00 | U | 108 | 93 | 41-124 |
| 117-84-0 | MS | Di-n-octylphthalate | 116 | 0.00 | U | 116 | 100 | 37-134 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 116 | 0.00 | U | 111 | 96 | 31-122 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 116 | 0.00 | U | 113 | 97 | 33-123 |
| 50-32-8 | MS | Benzo(a)pyrene | 116 | 0.00 | U | 108 | 93 | 32-118 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike

Client ID: CAMO-18-147679MS

Matrix: W

Lab Sample ID 1203901988

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|-----------|-------------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|
| 193-39-5 | MS Indeno(1,2,3-cd)pyrene | 116 | 0.00 U | 93.2 | 80 | 27-121 |
| 53-70-3 | MS Dibenzo(a,h)anthracene | 116 | 0.00 U | 88.6 | 76 | 30-125 |
| 191-24-2 | MS Benzo(ghi)perylene | 116 | 0.00 U | 83.2 | 72 | 24-126 |
| 123-91-1 | MS 1,4-Dioxane | 116 | 0.00 U | 67.9 | 58 | 24-110 |
| 930-55-2 | MS N-Nitrosopyrrolidine | 116 | 0.00 U | 103 | 89 | 47-119 |
| 95-94-3 | MS 1,2,4,5-Tetrachlorobenzene | 116 | 0.00 U | 96.5 | 83 | 32-101 |
| 1912-24-9 | MS Atrazine | 116 | 0.00 U | 117 | 100 | 42-129 |
| 92-87-5 | MS Benzidine | 233 | 0.00 U | 259 | 111 | 15-130 |
| 91-94-1 | MS 3,3'-Dichlorobenzidine | 116 | 0.00 U | 150 | 129 * | 34-124 |
| 120-82-1 | MS 1,2,4-Trichlorobenzene | 116 | 0.00 U | 76.0 | 65 | 26-102 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-147679MSD

Matrix: W

Lab Sample ID 1203901989

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits | |
|------------|---|-------------------------|-------------------------|------------------------|---------------|----------------------|----------|----------------------|------|
| 62-75-9 | MSD N-Methyl-N-nitrosomethylam | 116 | 0.00 | U | 59.5 | 51 | 25-106 | 7 | 0-30 |
| 110-86-1 | MSD Pyridine | 116 | 0.00 | U | 45.4 | 39 | 24-93 | 22 | 0-30 |
| 62-53-3 | MSD Aniline | 116 | 0.00 | U | 71.3 | 61 | 37-113 | 10 | 0-30 |
| 108-95-2 | MSD Phenol | 116 | 0.00 | U | 42.4 | 36 | 23-82 | 15 | 0-30 |
| 111-44-4 | MSD bis(2-Chloroethyl) ether | 116 | 0.00 | U | 85.4 | 73 | 39-114 | 5 | 0-30 |
| 95-57-8 | MSD 2-Chlorophenol | 116 | 0.00 | U | 80.9 | 70 | 37-108 | 7 | 0-30 |
| 541-73-1 | MSD 1,3-Dichlorobenzene | 116 | 0.00 | U | 67.3 | 58 | 27-97 | 8 | 0-30 |
| 106-46-7 | MSD 1,4-Dichlorobenzene | 116 | 0.00 | U | 67.6 | 58 | 28-97 | 9 | 0-30 |
| 95-50-1 | MSD 1,2-Dichlorobenzene | 116 | 0.00 | U | 70.9 | 61 | 28-99 | 9 | 0-30 |
| 108-60-1 | MSD bis(2-Chloro-1-methylethyl)et | 116 | 0.00 | U | 89.4 | 77 | 32-127 | 7 | 0-30 |
| 100-51-6 | MSD Benzyl alcohol | 116 | 0.00 | U | 76.0 | 65 | 37-116 | 9 | 0-30 |
| 95-48-7 | MSD o-Cresol | 116 | 0.00 | U | 74.2 | 64 | 34-109 | 11 | 0-30 |
| 65794-96-9 | MSD m,p-Cresols | 116 | 0.00 | U | 80.0 | 69 | 36-120 | 10 | 0-30 |
| 621-64-7 | MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i> | 116 | 0.00 | U | 92.6 | 80 | 42-118 | 9 | 0-30 |
| 67-72-1 | MSD Hexachloroethane | 116 | 0.00 | U | 60.1 | 52 | 29-94 | 10 | 0-30 |
| 98-95-3 | MSD Nitrobenzene | 116 | 0.00 | U | 85.0 | 73 | 38-123 | 7 | 0-30 |
| 78-59-1 | MSD Isophorone | 116 | 0.00 | U | 88.7 | 76 | 43-120 | 5 | 0-30 |
| 88-75-5 | MSD 2-Nitrophenol | 116 | 0.00 | U | 87.4 | 75 | 39-115 | 5 | 0-30 |
| 105-67-9 | MSD 2,4-Dimethylphenol | 116 | 0.00 | U | 67.3 | 58 | 39-107 | 10 | 0-30 |
| 111-91-1 | MSD bis(2-Chloroethoxy)methane | 116 | 0.00 | U | 86.3 | 74 | 42-118 | 7 | 0-30 |
| 120-83-2 | MSD 2,4-Dichlorophenol | 116 | 0.00 | U | 86.0 | 74 | 40-111 | 9 | 0-30 |
| 65-85-0 | MSD Benzoic acid | 233 | 0.00 | U | 77.6 | 33 | 17-95 | 12 | 0-30 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-147679MSD

Matrix: W

Lab Sample ID 1203901989

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|----------|--|----------------------|----------------------|---------------------|---------------|-------------------|----------|-------------------|
| 106-47-8 | MSD 4-Chloroaniline | 116 | 0.00 U | 99.3 | 85 | 44-138 | 10 | 0-30 |
| 87-68-3 | MSD Hexachlorobutadiene | 116 | 0.00 U | 68.3 | 59 | 26-98 | 8 | 0-30 |
| 59-50-7 | MSD Parachlorometa cresol 4-Chloro-3-methylphenol | 116 | 0.00 U | 91.0 | 78 | 41-122 | 9 | 0-30 |
| 91-57-6 | MSD 2-Methylnaphthalene | 116 | 0.00 U | 75.4 | 65 | 29-109 | 10 | 0-30 |
| 91-20-3 | MSD Naphthalene | 116 | 0.00 U | 76.5 | 66 | 31-108 | 8 | 0-30 |
| 90-12-0 | MSD 1-Methylnaphthalene | 116 | 0.00 U | 76.9 | 66 | 33-112 | 9 | 0-30 |
| 77-47-4 | MSD Hexachlorocyclopentadiene | 116 | 0.00 U | 49.8 | 43 | 26-79 | 13 | 0-30 |
| 88-06-2 | MSD 2,4,6-Trichlorophenol | 116 | 0.00 U | 93.8 | 81 | 39-124 | 9 | 0-30 |
| 95-95-4 | MSD 2,4,5-Trichlorophenol | 116 | 0.00 U | 93.0 | 80 | 42-120 | 9 | 0-30 |
| 91-58-7 | MSD 2-Chloronaphthalene | 116 | 0.00 U | 81.6 | 70 | 29-113 | 14 | 0-30 |
| 88-74-4 | MSD 2-Nitroaniline o-Nitroaniline | 116 | 0.00 U | 96.2 | 83 | 41-121 | 10 | 0-30 |
| 99-09-2 | MSD 3-Nitroaniline m-Nitroaniline | 116 | 0.00 U | 119 | 103 | 42-144 | 12 | 0-30 |
| 131-11-3 | MSD Dimethylphthalate | 116 | 0.00 U | 106 | 91 | 45-128 | 8 | 0-30 |
| 606-20-2 | MSD 2,6-Dinitrotoluene | 116 | 0.00 U | 110 | 94 | 46-124 | 10 | 0-30 |
| 121-14-2 | MSD 2,4-Dinitrotoluene | 116 | 0.00 U | 119 | 102 | 45-125 | 10 | 0-30 |
| 208-96-8 | MSD Acenaphthylene | 116 | 0.00 U | 91.2 | 78 | 35-120 | 12 | 0-30 |
| 83-32-9 | MSD Acenaphthene | 116 | 0.00 U | 90.8 | 78 | 35-117 | 13 | 0-30 |
| 51-28-5 | MSD 2,4-Dinitrophenol | 116 | 0.00 U | 89.7 | 77 | 27-122 | 11 | 0-30 |
| 132-64-9 | MSD Dibenzofuran | 116 | 0.00 U | 93.0 | 80 | 38-113 | 13 | 0-30 |
| 58-90-2 | MSD 2,3,4,6-Tetrachlorophenol | 116 | 0.00 U | 85.7 | 74 | 40-128 | 13 | 0-30 |
| 84-66-2 | MSD Diethylphthalate | 116 | 0.00 U | 110 | 94 | 43-127 | 11 | 0-30 |
| 100-02-7 | MSD 4-Nitrophenol | 116 | 0.00 U | 46.8 | 40 | 17-85 | 18 | 0-30 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-147679MSD

Matrix: W

Lab Sample ID 1203901989

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|-----------|--|----------------------|----------------------|---------------------|---------------|-------------------|----------|-------------------|
| 86-73-7 | MSD Fluorene | 116 | 0.00 U | 97.9 | 84 | 39-117 | 12 | 0-30 |
| 7005-72-3 | MSD 4-Chlorophenylphenylether | 116 | 0.00 U | 99.7 | 86 | 39-121 | 12 | 0-30 |
| 100-01-6 | MSD 4-Nitroaniline <i>p</i> -Nitroaniline | 116 | 0.00 U | 116 | 99 | 30-133 | 14 | 0-30 |
| 534-52-1 | MSD 2-Methyl-4,6-dinitrophenol | 116 | 0.00 U | 94.1 | 81 | 32-126 | 10 | 0-30 |
| 122-39-4 | MSD Diphenylamine | 116 | 0.00 U | 93.4 | 80 | 37-118 | 8 | 0-30 |
| 122-66-7 | MSD Azobenzene <i>1,2-Diphenylhydrazine</i> | 116 | 0.00 U | 84.6 | 73 | 38-120 | 9 | 0-30 |
| 101-55-3 | MSD 4-Bromophenylphenylether | 116 | 0.00 U | 88.6 | 76 | 39-121 | 11 | 0-30 |
| 118-74-1 | MSD Hexachlorobenzene | 116 | 0.00 U | 89.2 | 77 | 40-118 | 10 | 0-30 |
| 87-86-5 | MSD Pentachlorophenol | 116 | 0.00 U | 90.7 | 78 | 35-121 | 13 | 0-30 |
| 85-01-8 | MSD Phenanthrene | 116 | 0.00 U | 95.9 | 82 | 40-115 | 12 | 0-30 |
| 120-12-7 | MSD Anthracene | 116 | 0.00 U | 97.7 | 84 | 38-120 | 9 | 0-30 |
| 84-74-2 | MSD Di-n-butylphthalate | 116 | 0.00 U | 105 | 90 | 41-128 | 10 | 0-30 |
| 206-44-0 | MSD Fluoranthene | 116 | 0.00 U | 113 | 97 | 41-119 | 10 | 0-30 |
| 129-00-0 | MSD Pyrene | 116 | 0.00 U | 86.9 | 75 | 35-128 | 13 | 0-30 |
| 85-68-7 | MSD Butylbenzylphthalate | 116 | 0.00 U | 96.8 | 83 | 40-129 | 11 | 0-30 |
| 117-81-7 | MSD bis(2-Ethylhexyl)phthalate | 116 | 0.00 U | 94.4 | 81 | 38-131 | 9 | 0-30 |
| 56-55-3 | MSD Benzo(a)anthracene | 116 | 0.00 U | 98.9 | 85 | 39-120 | 10 | 0-30 |
| 218-01-9 | MSD Chrysene | 116 | 0.00 U | 98.0 | 84 | 41-124 | 10 | 0-30 |
| 117-84-0 | MSD Di-n-octylphthalate | 116 | 0.00 U | 107 | 92 | 37-134 | 8 | 0-30 |
| 205-99-2 | MSD Benzo(b)fluoranthene | 116 | 0.00 U | 98.2 | 84 | 31-122 | 12 | 0-30 |
| 207-08-9 | MSD Benzo(k)fluoranthene | 116 | 0.00 U | 99.7 | 86 | 33-123 | 12 | 0-30 |
| 50-32-8 | MSD Benzo(a)pyrene | 116 | 0.00 U | 97.0 | 83 | 32-118 | 11 | 0-30 |

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2018-496

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-147679MSD

Matrix: W

Lab Sample ID 1203901989

Instrument: MSD3.I

Analysis Date: 10/24/2017 19:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1711735

Inj. Vol: 1 uL

Batch ID: 1711736

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|-----------|--------------------------------|-------------------------|-------------------------|------------------------|---------------|----------------------|----------|----------------------|
| 193-39-5 | MSD Indeno(1,2,3-cd)pyrene | 116 | 0.00 U | 92.7 | 80 | 27-121 | 1 | 0-30 |
| 53-70-3 | MSD Dibenzo(a,h)anthracene | 116 | 0.00 U | 88.3 | 76 | 30-125 | 0 | 0-30 |
| 191-24-2 | MSD Benzo(ghi)perylene | 116 | 0.00 U | 84.4 | 73 | 24-126 | 1 | 0-30 |
| 123-91-1 | MSD 1,4-Dioxane | 116 | 0.00 U | 64.7 | 56 | 24-110 | 5 | 0-30 |
| 930-55-2 | MSD N-Nitrosopyrrolidine | 116 | 0.00 U | 92.9 | 80 | 47-119 | 11 | 0-30 |
| 95-94-3 | MSD 1,2,4,5-Tetrachlorobenzene | 116 | 0.00 U | 85.8 | 74 | 32-101 | 12 | 0-30 |
| 1912-24-9 | MSD Atrazine | 116 | 0.00 U | 107 | 92 | 42-129 | 8 | 0-30 |
| 92-87-5 | MSD Benzidine | 233 | 0.00 U | 170 | 73 | 15-130 | 41 * | 0-30 |
| 91-94-1 | MSD 3,3'-Dichlorobenzidine | 116 | 0.00 U | 134 | 115 | 34-124 | 11 | 0-30 |
| 120-82-1 | MSD 1,2,4-Trichlorobenzene | 116 | 0.00 U | 70.0 | 60 | 26-102 | 8 | 0-30 |

Method Blank Summary

Page 1 of 1

| | | | | | |
|----------------|----------------------|----------------|------------------|------------|----------------------|
| SDG Number: | 2018-496 | Client: | ARSL004 | Matrix: | WATER |
| Client ID: | MB for batch 1711735 | Instrument ID: | MSD3.I | Data File: | s102417a.s\s3j2414.D |
| Lab Sample ID: | 1203901986 | Prep Date: | 10/24/2017 06:59 | Analyzed: | 10/24/17 15:40 |
| Column: | DB-5ms | | | | |

This method blank applies to the following samples and quality control samples:

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|--------------------------|---------------|----------------------|---------------|---------------|
| 01 LCS for batch 1711735 | 1203901987 | s102417a.s\s3j2415.D | 10/24/17 | 1609 |
| 02 CAPA-18-147590 | 435560002 | s102417a.s\s3j2416.D | 10/24/17 | 1639 |
| 03 CAPA-18-147591 | 435560005 | s102417a.s\s3j2417.D | 10/24/17 | 1708 |
| 04 CAPA-18-147686 | 435560008 | s102417a.s\s3j2418.D | 10/24/17 | 1738 |
| 05 CAMO-18-147679MS | 1203901988 | s102417a.s\s3j2421.D | 10/24/17 | 1906 |
| 06 CAMO-18-147679MSD | 1203901989 | s102417a.s\s3j2422.D | 10/24/17 | 1936 |

Quality Control Data

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-496

Lab Sample ID: 1203901986

Client Sample: QC for batch 1711735

Client ID: MB for batch 1711735

Batch ID: 1711736

Run Date: 10/24/2017 15:40

Prep Date: 10/24/2017 06:59

Data File: s102417a.s\sj2414.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-----------|--------------------------------|-----------|--------|-------|---------|---------|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| | <i>1,2-Diphenylhydrazine</i> | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 3.00 | ug/L | 3.00 | 10.0 |
| 90-12-0 | 1-Methylnaphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 5.00 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 0.410 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 88-75-5 | 2-Nitrophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 3.00 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 3.00 | ug/L | 3.00 | 10.0 |
| | <i>4-Chloro-3-methylphenol</i> | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 3.30 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 3.00 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 83-32-9 | Acenaphthene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 208-96-8 | Acenaphthylene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 62-53-3 | Aniline | U | 4.20 | ug/L | 4.20 | 10.0 |
| 120-12-7 | Anthracene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 1912-24-9 | Atrazine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 3.90 | ug/L | 3.90 | 10.0 |
| 56-55-3 | Benzo(a)anthracene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 50-32-8 | Benzo(a)pyrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.300 | ug/L | 0.300 | 1.00 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-496

Matrix: WATER

Lab Sample ID: 1203901986

Client Sample: QC for batch 1711735

Client: ARSL004

Project: QC

Client ID: MB for batch 1711735

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1711736

Inst: MSD3.I

Dilution: 1

Run Date: 10/24/2017 15:40

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 10/24/2017 06:59

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s102417a.s\sj2414.D

Column: DB-5ms

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|----------------------------------|-----------|--------|-------|---------|---------|
| 207-08-9 | Benzo(k)fluoranthene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 65-85-0 | Benzoic acid | U | 6.00 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 3.00 | ug/L | 3.00 | 10.0 |
| 218-01-9 | Chrysene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 84-74-2 | Di-n-butylphthalate | U | 3.00 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 3.00 | ug/L | 3.00 | 10.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 132-64-9 | Dibenzofuran | U | 3.00 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 3.00 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 3.00 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 3.00 | ug/L | 3.00 | 10.0 |
| 122-39-4 | Diphenylamine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 206-44-0 | Fluoranthene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 86-73-7 | Fluorene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 118-74-1 | Hexachlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 3.00 | ug/L | 3.00 | 10.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 78-59-1 | Isophorone | U | 3.50 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine | U | 3.00 | ug/L | 3.00 | 10.0 |
| | <i>N-Nitrosodipropylamine</i> | | | | | |
| 930-55-2 | N-Nitrosopyrrolidine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 98-95-3 | Nitrobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 87-86-5 | Pentachlorophenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 85-01-8 | Phenanthrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 108-95-2 | Phenol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 129-00-0 | Pyrene | U | 0.300 | ug/L | 0.300 | 1.00 |
| 110-86-1 | Pyridine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 3.00 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 3.00 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 3.00 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 3.00 | ug/L | 3.00 | 10.0 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

| | |
|--|----------------------------------|
| SDG Number: 2018-496 | Matrix: WATER |
| Lab Sample ID: 1203901986 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 |
| Client ID: MB for batch 1711735 | Method: SW846 3510C/8270D |
| Batch ID: 1711736 | Inst: MSD3.I |
| Run Date: 10/24/2017 15:40 | Analyst: JLD1 |
| Prep Date: 10/24/2017 06:59 | Aliquot: 1000 mL |
| Data File: s102417a.s\3j2414.D | Column: DB-5ms |
| | Project: QC |
| | SOP Ref: GL-OA-E-009 |
| | Dilution: 1 |
| | Inj. Vol: 1 uL |
| | Final Volume: 1 mL |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------|-----------|--------|-------|---------|---------|
| 65794-96-9 | m,p-Cresols | U | 3.70 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline | U | 3.00 | ug/L | 3.00 | 10.0 |
| | <i>m-Nitroaniline</i> | | | | | |
| 95-48-7 | o-Cresol | U | 3.00 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline | U | 3.00 | ug/L | 3.00 | 10.0 |
| | <i>o-Nitroaniline</i> | | | | | |
| 100-01-6 | 4-Nitroaniline | U | 3.00 | ug/L | 3.00 | 10.0 |
| | <i>p-Nitroaniline</i> | | | | | |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 2,4,6-Tribromophenol | 70.7 | 100 | ug/L 71 | (32%-124%) |
| 2-Fluorobiphenyl | 36.8 | 50.0 | ug/L 74 | (32%-112%) |
| 2-Fluorophenol | 38.2 | 100 | ug/L 38 | (15%-88%) |
| Nitrobenzene-d5 | 43.6 | 50.0 | ug/L 87 | (36%-115%) |
| Phenol-d5 | 26.4 | 100 | ug/L 26 | (15%-91%) |
| p-Terphenyl-d14 | 47.8 | 50.0 | ug/L 96 | (36%-121%) |

Tentatively Identified Compound Summary

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|-------------|---------------------------------------|-------|-----------|-------|-----|------|
| | unknown | 2.114 | 4.59 | ug/L | 0 | J |
| 000067-66-3 | Trichloromethane | 2.216 | 90 | ug/L | 97 | NJ |
| 000056-23-5 | Carbon Tetrachloride | 2.451 | 7.5 | ug/L | 90 | NJ |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-496

Lab Sample ID: 1203901987

Client Sample: QC for batch 1711735

Client ID: LCS for batch 1711735

Batch ID: 1711736

Run Date: 10/24/2017 16:09

Prep Date: 10/24/2017 06:59

Data File: s102417a.s\sj2415.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-----------|--------------------------------|-----------|--------|-------|---------|---------|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 44.9 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 36.9 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 37.8 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 41.4 | ug/L | 3.00 | 10.0 |
| | <i>1,2-Diphenylhydrazine</i> | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 36.2 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 36.4 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 25.9 | ug/L | 3.00 | 10.0 |
| 90-12-0 | 1-Methylnaphthalene | | 39.1 | ug/L | 0.300 | 1.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 39.9 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 42.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 42.4 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 39.2 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 29.9 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 40.1 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 56.3 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 51.3 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 42.4 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 36.6 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 43.8 | ug/L | 3.00 | 10.0 |
| 91-57-6 | 2-Methylnaphthalene | | 38.6 | ug/L | 0.300 | 1.00 |
| 88-75-5 | 2-Nitrophenol | | 39.6 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 64.4 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 43.3 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 40.4 | ug/L | 3.00 | 10.0 |
| | <i>4-Chloro-3-methylphenol</i> | | | | | |
| 106-47-8 | 4-Chloroaniline | | 50.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 49.5 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | | 15.5 | ug/L | 3.00 | 10.0 |
| 83-32-9 | Acenaphthene | | 44.9 | ug/L | 0.300 | 1.00 |
| 208-96-8 | Acenaphthylene | | 44.8 | ug/L | 0.300 | 1.00 |
| 62-53-3 | Aniline | | 36.6 | ug/L | 4.20 | 10.0 |
| 120-12-7 | Anthracene | | 46.9 | ug/L | 0.300 | 1.00 |
| 1912-24-9 | Atrazine | | 51.4 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | E | 139 | ug/L | 3.90 | 10.0 |
| 56-55-3 | Benzo(a)anthracene | | 46.5 | ug/L | 0.300 | 1.00 |
| 50-32-8 | Benzo(a)pyrene | | 46.0 | ug/L | 0.300 | 1.00 |
| 205-99-2 | Benzo(b)fluoranthene | | 46.5 | ug/L | 0.300 | 1.00 |
| 191-24-2 | Benzo(ghi)perylene | | 39.6 | ug/L | 0.300 | 1.00 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-496

Lab Sample ID: 1203901987

Client Sample: QC for batch 1711735

Client ID: LCS for batch 1711735

Batch ID: 1711736

Run Date: 10/24/2017 16:09

Prep Date: 10/24/2017 06:59

Data File: s102417a.s\sj2415.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|----------------------------------|-----------|--------|-------|---------|---------|
| 207-08-9 | Benzo(k)fluoranthene | | 46.2 | ug/L | 0.300 | 1.00 |
| 65-85-0 | Benzoic acid | | 27.5 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 32.6 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 46.8 | ug/L | 3.00 | 10.0 |
| 218-01-9 | Chrysene | | 46.0 | ug/L | 0.300 | 1.00 |
| 84-74-2 | Di-n-butylphthalate | | 50.5 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 48.9 | ug/L | 3.00 | 10.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 41.2 | ug/L | 0.300 | 1.00 |
| 132-64-9 | Dibenzofuran | | 45.5 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 51.2 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 48.9 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 3.00 | ug/L | 3.00 | 10.0 |
| 122-39-4 | Diphenylamine | | 44.3 | ug/L | 3.00 | 10.0 |
| 206-44-0 | Fluoranthene | | 53.4 | ug/L | 0.300 | 1.00 |
| 86-73-7 | Fluorene | | 48.2 | ug/L | 0.300 | 1.00 |
| 118-74-1 | Hexachlorobenzene | | 42.4 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 32.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 26.6 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 31.8 | ug/L | 3.00 | 10.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 43.6 | ug/L | 0.300 | 1.00 |
| 78-59-1 | Isophorone | | 40.7 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 22.8 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 3.00 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine | | 43.3 | ug/L | 3.00 | 10.0 |
| | <i>N-Nitrosodipropylamine</i> | | | | | |
| 930-55-2 | N-Nitrosopyrrolidine | | 42.1 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 38.6 | ug/L | 0.300 | 1.00 |
| 98-95-3 | Nitrobenzene | | 39.6 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 3.00 | ug/L | 3.00 | 10.0 |
| 87-86-5 | Pentachlorophenol | | 41.7 | ug/L | 3.00 | 10.0 |
| 85-01-8 | Phenanthrene | | 46.9 | ug/L | 0.300 | 1.00 |
| 108-95-2 | Phenol | | 14.5 | ug/L | 3.00 | 10.0 |
| 129-00-0 | Pyrene | | 43.8 | ug/L | 0.300 | 1.00 |
| 110-86-1 | Pyridine | | 23.7 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 43.5 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 39.7 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 40.3 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 44.4 | ug/L | 3.00 | 10.0 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

| | |
|--|----------------------------------|
| SDG Number: 2018-496 | Matrix: WATER |
| Lab Sample ID: 1203901987 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 |
| Client ID: LCS for batch 1711735 | Method: SW846 3510C/8270D |
| Batch ID: 1711736 | Inst: MSD3.I |
| Run Date: 10/24/2017 16:09 | Analyst: JLD1 |
| Prep Date: 10/24/2017 06:59 | Aliquot: 1000 mL |
| Data File: s102417a.s\s3j2415.D | Column: DB-5ms |
| | Project: QC |
| | SOP Ref: GL-OA-E-009 |
| | Dilution: 1 |
| | Inj. Vol: 1 uL |
| | Final Volume: 1 mL |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------|-----------|--------|-------|---------|---------|
| 65794-96-9 | m,p-Cresols | | 32.6 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline | | 58.7 | ug/L | 3.00 | 10.0 |
| | <i>m-Nitroaniline</i> | | | | | |
| 95-48-7 | o-Cresol | | 31.4 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline | | 45.6 | ug/L | 3.00 | 10.0 |
| | <i>o-Nitroaniline</i> | | | | | |
| 100-01-6 | 4-Nitroaniline | | 55.6 | ug/L | 3.00 | 10.0 |
| | <i>p-Nitroaniline</i> | | | | | |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|------|-----------|-------------------|
| 2,4,6-Tribromophenol | 88.8 | 100 | ug/L | 89 | (32%-124%) |
| 2-Fluorobiphenyl | 39.2 | 50.0 | ug/L | 78 | (32%-112%) |
| 2-Fluorophenol | 40.6 | 100 | ug/L | 41 | (15%-88%) |
| Nitrobenzene-d5 | 37.1 | 50.0 | ug/L | 74 | (36%-115%) |
| Phenol-d5 | 27.6 | 100 | ug/L | 28 | (15%-91%) |
| p-Terphenyl-d14 | 44.2 | 50.0 | ug/L | 88 | (36%-121%) |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 12:54 | Matrix: W |
| Lab Sample ID: 1203901988 | Date Received: 10/19/2017 08:55 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 | Project: QC |
| Client ID: CAMO-18-147679MS | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 19:06 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 430 mL | Final Volume: 1 mL |
| Data File: s102417a.s\sj2421.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-----------|--------------------------------|-----------|--------|-------|---------|---------|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 96.5 | ug/L | 6.98 | 23.3 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 76.0 | ug/L | 6.98 | 23.3 |
| 95-50-1 | 1,2-Dichlorobenzene | | 77.6 | ug/L | 6.98 | 23.3 |
| 122-66-7 | Azobenzene | | 92.6 | ug/L | 6.98 | 23.3 |
| | <i>1,2-Diphenylhydrazine</i> | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 73.2 | ug/L | 6.98 | 23.3 |
| 106-46-7 | 1,4-Dichlorobenzene | | 74.0 | ug/L | 6.98 | 23.3 |
| 123-91-1 | 1,4-Dioxane | | 67.9 | ug/L | 6.98 | 23.3 |
| 90-12-0 | 1-Methylnaphthalene | | 84.4 | ug/L | 0.698 | 2.33 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 97.7 | ug/L | 6.98 | 23.3 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 102 | ug/L | 6.98 | 23.3 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 102 | ug/L | 6.98 | 23.3 |
| 120-83-2 | 2,4-Dichlorophenol | | 93.8 | ug/L | 6.98 | 23.3 |
| 105-67-9 | 2,4-Dimethylphenol | | 74.1 | ug/L | 6.98 | 23.3 |
| 51-28-5 | 2,4-Dinitrophenol | | 100 | ug/L | 11.6 | 46.5 |
| 121-14-2 | 2,4-Dinitrotoluene | | 132 | ug/L | 6.98 | 23.3 |
| 606-20-2 | 2,6-Dinitrotoluene | | 121 | ug/L | 6.98 | 23.3 |
| 91-58-7 | 2-Chloronaphthalene | | 93.4 | ug/L | 0.953 | 2.33 |
| 95-57-8 | 2-Chlorophenol | | 86.8 | ug/L | 6.98 | 23.3 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 104 | ug/L | 6.98 | 23.3 |
| 91-57-6 | 2-Methylnaphthalene | | 83.0 | ug/L | 0.698 | 2.33 |
| 88-75-5 | 2-Nitrophenol | | 92.0 | ug/L | 6.98 | 23.3 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 150 | ug/L | 6.98 | 23.3 |
| 101-55-3 | 4-Bromophenylphenylether | | 98.9 | ug/L | 6.98 | 23.3 |
| 59-50-7 | Parachlorometa cresol | | 100 | ug/L | 6.98 | 23.3 |
| | <i>4-Chloro-3-methylphenol</i> | | | | | |
| 106-47-8 | 4-Chloroaniline | | 109 | ug/L | 7.67 | 23.3 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 113 | ug/L | 6.98 | 23.3 |
| 100-02-7 | 4-Nitrophenol | | 55.8 | ug/L | 6.98 | 23.3 |
| 83-32-9 | Acenaphthene | | 103 | ug/L | 0.698 | 2.33 |
| 208-96-8 | Acenaphthylene | | 103 | ug/L | 0.698 | 2.33 |
| 62-53-3 | Aniline | | 79.1 | ug/L | 9.77 | 23.3 |
| 120-12-7 | Anthracene | | 106 | ug/L | 0.698 | 2.33 |
| 1912-24-9 | Atrazine | | 117 | ug/L | 6.98 | 23.3 |
| 92-87-5 | Benzidine | E | 259 | ug/L | 9.07 | 23.3 |
| 56-55-3 | Benzo(a)anthracene | | 109 | ug/L | 0.698 | 2.33 |
| 50-32-8 | Benzo(a)pyrene | | 108 | ug/L | 0.698 | 2.33 |
| 205-99-2 | Benzo(b)fluoranthene | | 111 | ug/L | 0.698 | 2.33 |
| 191-24-2 | Benzo(ghi)perylene | | 83.2 | ug/L | 0.698 | 2.33 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 12:54 | Matrix: W |
| Lab Sample ID: 1203901988 | Date Received: 10/19/2017 08:55 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 | Project: QC |
| Client ID: CAMO-18-147679MS | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 19:06 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 430 mL | Final Volume: 1 mL |
| Data File: s102417a.s\sj2421.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|----------------------------------|-----------|--------|-------|---------|---------|
| 207-08-9 | Benzo(k)fluoranthene | | 113 | ug/L | 0.698 | 2.33 |
| 65-85-0 | Benzoic acid | | 87.1 | ug/L | 14.0 | 46.5 |
| 100-51-6 | Benzyl alcohol | | 83.4 | ug/L | 6.98 | 23.3 |
| 85-68-7 | Butylbenzylphthalate | | 108 | ug/L | 6.98 | 23.3 |
| 218-01-9 | Chrysene | | 108 | ug/L | 0.698 | 2.33 |
| 84-74-2 | Di-n-butylphthalate | | 116 | ug/L | 6.98 | 23.3 |
| 117-84-0 | Di-n-octylphthalate | | 116 | ug/L | 6.98 | 23.3 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 88.6 | ug/L | 0.698 | 2.33 |
| 132-64-9 | Dibenzofuran | | 106 | ug/L | 6.98 | 23.3 |
| 84-66-2 | Diethylphthalate | | 122 | ug/L | 6.98 | 23.3 |
| 131-11-3 | Dimethylphthalate | | 115 | ug/L | 6.98 | 23.3 |
| 88-85-7 | Dinoseb | U | 6.98 | ug/L | 6.98 | 23.3 |
| 122-39-4 | Diphenylamine | | 102 | ug/L | 6.98 | 23.3 |
| 206-44-0 | Fluoranthene | | 125 | ug/L | 0.698 | 2.33 |
| 86-73-7 | Fluorene | | 110 | ug/L | 0.698 | 2.33 |
| 118-74-1 | Hexachlorobenzene | | 98.8 | ug/L | 6.98 | 23.3 |
| 87-68-3 | Hexachlorobutadiene | | 73.8 | ug/L | 6.98 | 23.3 |
| 77-47-4 | Hexachlorocyclopentadiene | | 56.8 | ug/L | 6.98 | 23.3 |
| 67-72-1 | Hexachloroethane | | 66.5 | ug/L | 6.98 | 23.3 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 93.2 | ug/L | 0.698 | 2.33 |
| 78-59-1 | Isophorone | | 93.0 | ug/L | 8.14 | 23.3 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 63.9 | ug/L | 6.98 | 23.3 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 6.98 | ug/L | 6.98 | 23.3 |
| 55-18-5 | N-Nitrosodiethylamine | U | 6.98 | ug/L | 6.98 | 23.3 |
| 621-64-7 | N-Nitrosodi--n-propylamine | | 101 | ug/L | 6.98 | 23.3 |
| | <i>N-Nitrosodipropylamine</i> | | | | | |
| 930-55-2 | N-Nitrosopyrrolidine | | 103 | ug/L | 6.98 | 23.3 |
| 91-20-3 | Naphthalene | | 82.8 | ug/L | 0.698 | 2.33 |
| 98-95-3 | Nitrobenzene | | 91.0 | ug/L | 6.98 | 23.3 |
| 608-93-5 | Pentachlorobenzene | U | 6.98 | ug/L | 6.98 | 23.3 |
| 87-86-5 | Pentachlorophenol | | 103 | ug/L | 6.98 | 23.3 |
| 85-01-8 | Phenanthrene | | 108 | ug/L | 0.698 | 2.33 |
| 108-95-2 | Phenol | | 49.1 | ug/L | 6.98 | 23.3 |
| 129-00-0 | Pyrene | | 98.7 | ug/L | 0.698 | 2.33 |
| 110-86-1 | Pyridine | | 56.5 | ug/L | 6.98 | 23.3 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 95.8 | ug/L | 6.98 | 23.3 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 92.4 | ug/L | 6.98 | 23.3 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 90.0 | ug/L | 6.98 | 23.3 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 104 | ug/L | 6.98 | 23.3 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 12:54 | Matrix: W |
| Lab Sample ID: 1203901988 | Date Received: 10/19/2017 08:55 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 | Project: QC |
| Client ID: CAMO-18-147679MS | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 19:06 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 430 mL | Final Volume: 1 mL |
| Data File: s102417a.s\3j2421.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------|-----------|--------|-------|---------|---------|
| 65794-96-9 | m,p-Cresols | | 88.5 | ug/L | 8.60 | 23.3 |
| 99-09-2 | 3-Nitroaniline | | 135 | ug/L | 6.98 | 23.3 |
| | <i>m-Nitroaniline</i> | | | | | |
| 95-48-7 | o-Cresol | | 82.6 | ug/L | 6.98 | 23.3 |
| 88-74-4 | 2-Nitroaniline | | 106 | ug/L | 6.98 | 23.3 |
| | <i>o-Nitroaniline</i> | | | | | |
| 100-01-6 | 4-Nitroaniline | | 133 | ug/L | 6.98 | 23.3 |
| | <i>p-Nitroaniline</i> | | | | | |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 2,4,6-Tribromophenol | 218 | 233 | ug/L | 94 (32%-124%) |
| 2-Fluorobiphenyl | 84.3 | 116 | ug/L | 73 (32%-112%) |
| 2-Fluorophenol | 114 | 233 | ug/L | 49 (15%-88%) |
| Nitrobenzene-d5 | 81.9 | 116 | ug/L | 70 (36%-115%) |
| Phenol-d5 | 93.9 | 233 | ug/L | 40 (15%-91%) |
| p-Terphenyl-d14 | 102 | 116 | ug/L | 87 (36%-121%) |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 12:54 | Matrix: W |
| Lab Sample ID: 1203901989 | Date Received: 10/19/2017 08:55 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 | Project: QC |
| Client ID: CAMO-18-147679MSD | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 19:36 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 430 mL | Final Volume: 1 mL |
| Data File: s102417a.s\sj2422.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|-----------|--------------------------------|-----------|--------|-------|---------|---------|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 85.8 | ug/L | 6.98 | 23.3 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 70.0 | ug/L | 6.98 | 23.3 |
| 95-50-1 | 1,2-Dichlorobenzene | | 70.9 | ug/L | 6.98 | 23.3 |
| 122-66-7 | Azobenzene | | 84.6 | ug/L | 6.98 | 23.3 |
| | <i>1,2-Diphenylhydrazine</i> | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 67.3 | ug/L | 6.98 | 23.3 |
| 106-46-7 | 1,4-Dichlorobenzene | | 67.6 | ug/L | 6.98 | 23.3 |
| 123-91-1 | 1,4-Dioxane | | 64.7 | ug/L | 6.98 | 23.3 |
| 90-12-0 | 1-Methylnaphthalene | | 76.9 | ug/L | 0.698 | 2.33 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 85.7 | ug/L | 6.98 | 23.3 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 93.0 | ug/L | 6.98 | 23.3 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 93.8 | ug/L | 6.98 | 23.3 |
| 120-83-2 | 2,4-Dichlorophenol | | 86.0 | ug/L | 6.98 | 23.3 |
| 105-67-9 | 2,4-Dimethylphenol | | 67.3 | ug/L | 6.98 | 23.3 |
| 51-28-5 | 2,4-Dinitrophenol | | 89.7 | ug/L | 11.6 | 46.5 |
| 121-14-2 | 2,4-Dinitrotoluene | | 119 | ug/L | 6.98 | 23.3 |
| 606-20-2 | 2,6-Dinitrotoluene | | 110 | ug/L | 6.98 | 23.3 |
| 91-58-7 | 2-Chloronaphthalene | | 81.6 | ug/L | 0.953 | 2.33 |
| 95-57-8 | 2-Chlorophenol | | 80.9 | ug/L | 6.98 | 23.3 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 94.1 | ug/L | 6.98 | 23.3 |
| 91-57-6 | 2-Methylnaphthalene | | 75.4 | ug/L | 0.698 | 2.33 |
| 88-75-5 | 2-Nitrophenol | | 87.4 | ug/L | 6.98 | 23.3 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 134 | ug/L | 6.98 | 23.3 |
| 101-55-3 | 4-Bromophenylphenylether | | 88.6 | ug/L | 6.98 | 23.3 |
| 59-50-7 | Parachlorometa cresol | | 91.0 | ug/L | 6.98 | 23.3 |
| | <i>4-Chloro-3-methylphenol</i> | | | | | |
| 106-47-8 | 4-Chloroaniline | | 99.3 | ug/L | 7.67 | 23.3 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 99.7 | ug/L | 6.98 | 23.3 |
| 100-02-7 | 4-Nitrophenol | | 46.8 | ug/L | 6.98 | 23.3 |
| 83-32-9 | Acenaphthene | | 90.8 | ug/L | 0.698 | 2.33 |
| 208-96-8 | Acenaphthylene | | 91.2 | ug/L | 0.698 | 2.33 |
| 62-53-3 | Aniline | | 71.3 | ug/L | 9.77 | 23.3 |
| 120-12-7 | Anthracene | | 97.7 | ug/L | 0.698 | 2.33 |
| 1912-24-9 | Atrazine | | 107 | ug/L | 6.98 | 23.3 |
| 92-87-5 | Benzidine | | 170 | ug/L | 9.07 | 23.3 |
| 56-55-3 | Benzo(a)anthracene | | 98.9 | ug/L | 0.698 | 2.33 |
| 50-32-8 | Benzo(a)pyrene | | 97.0 | ug/L | 0.698 | 2.33 |
| 205-99-2 | Benzo(b)fluoranthene | | 98.2 | ug/L | 0.698 | 2.33 |
| 191-24-2 | Benzo(ghi)perylene | | 84.4 | ug/L | 0.698 | 2.33 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 12:54 | Matrix: W |
| Lab Sample ID: 1203901989 | Date Received: 10/19/2017 08:55 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 | Project: QC |
| Client ID: CAMO-18-147679MSD | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 19:36 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 430 mL | Final Volume: 1 mL |
| Data File: s102417a.s\sj2422.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|----------|----------------------------------|-----------|--------|-------|---------|---------|
| 207-08-9 | Benzo(k)fluoranthene | | 99.7 | ug/L | 0.698 | 2.33 |
| 65-85-0 | Benzoic acid | | 77.6 | ug/L | 14.0 | 46.5 |
| 100-51-6 | Benzyl alcohol | | 76.0 | ug/L | 6.98 | 23.3 |
| 85-68-7 | Butylbenzylphthalate | | 96.8 | ug/L | 6.98 | 23.3 |
| 218-01-9 | Chrysene | | 98.0 | ug/L | 0.698 | 2.33 |
| 84-74-2 | Di-n-butylphthalate | | 105 | ug/L | 6.98 | 23.3 |
| 117-84-0 | Di-n-octylphthalate | | 107 | ug/L | 6.98 | 23.3 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 88.3 | ug/L | 0.698 | 2.33 |
| 132-64-9 | Dibenzofuran | | 93.0 | ug/L | 6.98 | 23.3 |
| 84-66-2 | Diethylphthalate | | 110 | ug/L | 6.98 | 23.3 |
| 131-11-3 | Dimethylphthalate | | 106 | ug/L | 6.98 | 23.3 |
| 88-85-7 | Dinoseb | U | 6.98 | ug/L | 6.98 | 23.3 |
| 122-39-4 | Diphenylamine | | 93.4 | ug/L | 6.98 | 23.3 |
| 206-44-0 | Fluoranthene | | 113 | ug/L | 0.698 | 2.33 |
| 86-73-7 | Fluorene | | 97.9 | ug/L | 0.698 | 2.33 |
| 118-74-1 | Hexachlorobenzene | | 89.2 | ug/L | 6.98 | 23.3 |
| 87-68-3 | Hexachlorobutadiene | | 68.3 | ug/L | 6.98 | 23.3 |
| 77-47-4 | Hexachlorocyclopentadiene | | 49.8 | ug/L | 6.98 | 23.3 |
| 67-72-1 | Hexachloroethane | | 60.1 | ug/L | 6.98 | 23.3 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 92.7 | ug/L | 0.698 | 2.33 |
| 78-59-1 | Isophorone | | 88.7 | ug/L | 8.14 | 23.3 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 59.5 | ug/L | 6.98 | 23.3 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 6.98 | ug/L | 6.98 | 23.3 |
| 55-18-5 | N-Nitrosodiethylamine | U | 6.98 | ug/L | 6.98 | 23.3 |
| 621-64-7 | N-Nitrosodi--n-propylamine | | 92.6 | ug/L | 6.98 | 23.3 |
| | <i>N-Nitrosodipropylamine</i> | | | | | |
| 930-55-2 | N-Nitrosopyrrolidine | | 92.9 | ug/L | 6.98 | 23.3 |
| 91-20-3 | Naphthalene | | 76.5 | ug/L | 0.698 | 2.33 |
| 98-95-3 | Nitrobenzene | | 85.0 | ug/L | 6.98 | 23.3 |
| 608-93-5 | Pentachlorobenzene | U | 6.98 | ug/L | 6.98 | 23.3 |
| 87-86-5 | Pentachlorophenol | | 90.7 | ug/L | 6.98 | 23.3 |
| 85-01-8 | Phenanthrene | | 95.9 | ug/L | 0.698 | 2.33 |
| 108-95-2 | Phenol | | 42.4 | ug/L | 6.98 | 23.3 |
| 129-00-0 | Pyrene | | 86.9 | ug/L | 0.698 | 2.33 |
| 110-86-1 | Pyridine | | 45.4 | ug/L | 6.98 | 23.3 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 89.4 | ug/L | 6.98 | 23.3 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 86.3 | ug/L | 6.98 | 23.3 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 85.4 | ug/L | 6.98 | 23.3 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 94.4 | ug/L | 6.98 | 23.3 |

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

| | | |
|--|---|-----------------------------|
| SDG Number: 2018-496 | Date Collected: 10/17/2017 12:54 | Matrix: W |
| Lab Sample ID: 1203901989 | Date Received: 10/19/2017 08:55 | |
| Client Sample: QC for batch 1711735 | Client: ARSL004 | Project: QC |
| Client ID: CAMO-18-147679MSD | Method: SW846 3510C/8270D | SOP Ref: GL-OA-E-009 |
| Batch ID: 1711736 | Inst: MSD3.I | Dilution: 1 |
| Run Date: 10/24/2017 19:36 | Analyst: JLD1 | Inj. Vol: 1 uL |
| Prep Date: 10/24/2017 06:59 | Aliquot: 430 mL | Final Volume: 1 mL |
| Data File: s102417a.s\3j2422.D | Column: DB-5ms | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|------------|-----------------------|-----------|--------|-------|---------|---------|
| 65794-96-9 | m,p-Cresols | | 80.0 | ug/L | 8.60 | 23.3 |
| 99-09-2 | 3-Nitroaniline | | 119 | ug/L | 6.98 | 23.3 |
| | <i>m-Nitroaniline</i> | | | | | |
| 95-48-7 | o-Cresol | | 74.2 | ug/L | 6.98 | 23.3 |
| 88-74-4 | 2-Nitroaniline | | 96.2 | ug/L | 6.98 | 23.3 |
| | <i>o-Nitroaniline</i> | | | | | |
| 100-01-6 | 4-Nitroaniline | | 116 | ug/L | 6.98 | 23.3 |
| | <i>p-Nitroaniline</i> | | | | | |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|------|-----------|-------------------|
| 2,4,6-Tribromophenol | 188 | 233 | ug/L | 81 | (32%-124%) |
| 2-Fluorobiphenyl | 74.9 | 116 | ug/L | 64 | (32%-112%) |
| 2-Fluorophenol | 102 | 233 | ug/L | 44 | (15%-88%) |
| Nitrobenzene-d5 | 77.2 | 116 | ug/L | 66 | (36%-115%) |
| Phenol-d5 | 80.6 | 233 | ug/L | 35 | (15%-91%) |
| p-Terphenyl-d14 | 90.7 | 116 | ug/L | 78 | (36%-121%) |

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-496
Work Order #: 435560**

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: | SW-846:6850 |
| Prep Method: | SW-846:6850 |
| Analytical Batch Number: | 1711756 |
| Prep Batch Number: | 1711753 |

Sample Analysis

| Sample ID | Client ID |
|------------------|--|
| 435560001 | 435560001 (CAPA-18-147564) |
| 435560004 | 435560004 (CAPA-18-147565) |
| 435560008 | 435560008 (CAPA-18-147686) |
| 1203902046 | Interference Check Sample (ICS) |
| 1203902042 | Method Blank (MB) |
| 1203902043 | Laboratory Control Sample (LCS) |
| 1203902044 | 435429001(CAMO-18-147634) Matrix Spike (MS) |
| 1203902045 | 435429001(CAMO-18-147634) 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# 14.

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.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

QC Sample Designation

Client sample 435429001 (CAMO-18-147634) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In sample 1203902045 (MSD) there was a low recovery of Perchlorate-101 at 59%. The acceptance range is 75-125%. The failure in the MSD was either due to the background concentration in the parent sample, 435429001 (CAMO-18-147634), or anomalies in the extraction process. The LCS and MS were within the acceptance ranges.

| Sample | Analyte | Value |
|--------------------------------|-----------------|----------------|
| 1203902045 (CAMO-18-147634MSD) | Perchlorate-101 | 59* (75%-125%) |

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal 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 DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

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 internally corrected for using Perchlorate-O (18).

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: 2018-496 GEL Work Order: 435560

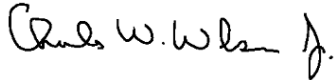
The Qualifiers in this report are defined as follows:

- * 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, MDC 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: Charles Wilson

Date: 25 OCT 2017

Title: Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147564Date Received: 19-OCT-17GEL Job No (SDG): 2018-496GEL Sample ID: 435560001Date Filtered: 23-OCT-17Injection 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 | 0.422 | ug/L | | 1 | 24-OCT-17 00:05 | per1023035a |
| | Perchlorate Isotope Ratio | | | 3.23 | | | 1 | 24-OCT-17 00:05 | per1023035a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.392 | ug/L | | 1 | 24-OCT-17 00:05 | per1023035a |
| | Perchlorate-O(18) | | | 0.402 | ug/L | | 1 | 24-OCT-17 00:05 | per1023035a |

^ 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: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147565Date Received: 19-OCT-17GEL Job No (SDG): 2018-496GEL Sample ID: 435560004Date Filtered: 23-OCT-17Injection 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 | 0.308 | ug/L | | 1 | 24-OCT-17 00:53 | per1023039a |
| | Perchlorate Isotope Ratio | | | 3.06 | | | 1 | 24-OCT-17 00:53 | per1023039a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.304 | ug/L | | 1 | 24-OCT-17 00:53 | per1023039a |
| | Perchlorate-O(18) | | | 0.388 | ug/L | | 1 | 24-OCT-17 00:53 | per1023039a |

^ 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: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147686Date Received: 19-OCT-17GEL Job No (SDG): 2018-496GEL Sample ID: 435560008Date Filtered: 23-OCT-17Injection Volume (uL): 20%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.050 | ug/L | U | 1 | 24-OCT-17 01:05 | per1023040a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 24-OCT-17 01:05 | per1023040a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.050 | ug/L | U | 1 | 24-OCT-17 01:05 | per1023040a |
| | Perchlorate-O(18) | | | 0.377 | ug/L | | 1 | 24-OCT-17 01:05 | per1023040a |

^ 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): 2018-496

Extract Batch Code: 1711753

Date Filtered: 23-OCT-17

Matrix: WATER

Sample ID: 1203902043

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---------------------------|-------|-------|-------|------|---|----------------|
| Perchlorate | 0.200 | .212 | ug/L | 106 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.22 | | | | - |
| Perchlorate-101 | 0.200 | .198 | ug/L | 99 | | 85 - 115 |
| Perchlorate-O(18) | | .413 | 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): 2018-496

Extract Batch Code: 1711753

Date Extracted: 23-OCT-17

GEL MS/PS ID: 1203902044

Client ID: CAMO-18-147634

GEL MSD/PSD ID: 1203902045

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 | 0.287 | ug/L | 0.494 | 103 | .489 | 101 | 1 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 2.79 | | 3.06 | | 3.45 | | 12 | | - |
| Perchlorate-101 | 0.200 | 0.310 | ug/L | 0.486 | 88 | .427 | 59 * | 13 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.408 | ug/L | 0.391 | | .408 | | 4 | | - |

^ 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: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 23-OCT-17GEL Job No (SDG): 2018-496GEL Sample ID: 1203902042Date Filtered: 23-OCT-17Injection Volume (uL): 20%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.050 | ug/L | U | 1 | 23-OCT-17 21:30 | per1023022a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 23-OCT-17 21:30 | per1023022a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.050 | ug/L | U | 1 | 23-OCT-17 21:30 | per1023022a |
| | Perchlorate-O(18) | | | 0.365 | ug/L | | 1 | 23-OCT-17 21:30 | per1023022a |

^ 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: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 23-OCT-17GEL Job No (SDG): 2018-496GEL Sample ID: 1203902043Date Filtered: 23-OCT-17Injection 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 | 0.212 | ug/L | | 1 | 23-OCT-17 22:18 | per1023026a |
| | Perchlorate Isotope Ratio | | | 3.22 | | | 1 | 23-OCT-17 22:18 | per1023026a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.198 | ug/L | J | 1 | 23-OCT-17 22:18 | per1023026a |
| | Perchlorate-O(18) | | | 0.413 | ug/L | | 1 | 23-OCT-17 22:18 | per1023026a |

^ 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: STORM WATERExtraction Batch ID: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-496GEL Sample ID: 1203902046Date Filtered: 23-OCT-17Injection 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 | 0.236 | ug/L | | 1 | 23-OCT-17 22:30 | per1023027a |
| | Perchlorate Isotope Ratio | | | 3.35 | | | 1 | 23-OCT-17 22:30 | per1023027a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.212 | ug/L | | 1 | 23-OCT-17 22:30 | per1023027a |
| | Perchlorate-O(18) | | | 0.415 | ug/L | | 1 | 23-OCT-17 22:30 | per1023027a |

^ 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: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147634MSDate Received: 18-OCT-17GEL Job No (SDG): 2018-496GEL Sample ID: 1203902044Date Filtered: 23-OCT-17Injection 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 | 0.494 | ug/L | | 1 | 23-OCT-17 23:29 | per1023032a |
| | Perchlorate Isotope Ratio | | | 3.06 | | | 1 | 23-OCT-17 23:29 | per1023032a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.486 | ug/L | | 1 | 23-OCT-17 23:29 | per1023032a |
| | Perchlorate-O(18) | | | 0.391 | ug/L | | 1 | 23-OCT-17 23:29 | per1023032a |

^ 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: 1711753Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147634MSDDate Received: 18-OCT-17GEL Job No (SDG): 2018-496GEL Sample ID: 1203902045Date Filtered: 23-OCT-17Injection 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 | 0.489 | ug/L | | 1 | 23-OCT-17 23:41 | per1023033a |
| | Perchlorate Isotope Ratio | | | 3.45 | | | 1 | 23-OCT-17 23:41 | per1023033a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.427 | ug/L | | 1 | 23-OCT-17 23:41 | per1023033a |
| | Perchlorate-O(18) | | | 0.408 | ug/L | | 1 | 23-OCT-17 23:41 | per1023033a |

^ 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 =

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

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-496
Work Order #: 435560**

Method/Analysis Information

Procedure: **The Processing, Extraction, and Analysis of Nitroaromatics, Nitroamines, and Nitrate Esters by SW-846 8330B**

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch
Number: 1711725

Prep Batch Number: 1711724

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8330B:

| Sample ID | Client ID |
|------------------|---|
| 435560009 | CAPA-18-147686 |
| 1203901963 | Method Blank (MB) |
| 1203901964 | Laboratory Control Sample (LCS) |
| 1203901965 | 435721001(VS-HE-4-17-144559) Matrix Spike (MS) |
| 1203901966 | 435721001(VS-HE-4-17-144559) Matrix Spike Duplicate (MSD) |

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-068 REV# 7.

Calibration Information

Initial Calibration

All initial calibration requirements for this analysis have been met for this SDG.

Calibration Verification Standard Requirements

All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

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

The MB analyzed with this SDG for this analysis met the acceptance criteria.

Surrogate Recoveries

All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 435721001 (VS-HE-4-17-144559) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS spike recoveries were within the established acceptance limits for this analysis.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD (See Below) were not within the acceptance limits. Since all other RPD values met acceptance criteria, the noted exceptions are attributed to vagaries in the extraction process. The data are reported.

| Sample | Analyte | Value |
|---|----------------------------|---------------------|
| 1203901965MS and 1203901966MSD (VS-HE-4-17-144559) | 2,4-Diamino-6-nitrotoluene | RPD 45* (0%-30%) |
| | 2,6-Diamino-4-nitrotoluene | RPD 72* (0%-30%) |
| | Nitrobenzene | RPD 35* (0%-30%) |
| | m-Nitrotoluene | RPD 34* (0%-30%) |

Internal Standard (ISTD) Acceptance

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

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. 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

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

Miscellaneous Information**Manual Integrations**

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

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct. Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data. Relative Retention Time (RRT) is used by the laboratory to establish peak identity. The RRT of each target analyte is calculated using the retention time of the corresponding internal standard. The RRT of each analyte in a sample must be within 0.1 of the analyte's calculated RRT in the ICV.

System Configuration

The laboratory utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC/MS/MS #3 or LC/MS/MS #4. The laboratory also utilizes a Shimadzu Nexera XC liquid chromatography instrument for Primary and/or Secondary analyte analysis. It is coupled with an Applied Biosystems 5500 Mass Spectrometer/ Mass Spectrometer, designated as LC/MS/MS #5. All are fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte 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 Explosives analysis was performed on a ABSciex 5500 LCMSMS.

The detection of the Primary and Secondary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

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: 2018-496 GEL Work Order: 435560

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
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC 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: 26 OCT 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-147686

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 435560009

Sample Amount 910 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1024018.wiff

Date Analyzed: 24-OCT-17 18:41

Dilution Factor: 2

Concentration Units: ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|-------------------|-----------------------------------|----------------|---|--------|-------|
| 118-96-7 | 2,4,6-Trinitrotoluene | .0879 | U | 0.0879 | 0.275 |
| <i>118-96-7</i> | <i>2,4,6-Trinitrotoluene</i> | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | .0879 | U | 0.0879 | 0.275 |
| <i>121-14-2</i> | <i>2,4-Dinitrotoluene</i> | | | | |
| 121-82-4 | RDX | .0879 | U | 0.0879 | 0.275 |
| <i>121-82-4</i> | <i>RDX</i> | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | .0879 | U | 0.0879 | 0.275 |
| <i>19406-51-0</i> | <i>4-Amino-2,6-dinitrotoluene</i> | | | | |
| 2691-41-0 | HMX | .0879 | U | 0.0879 | 0.275 |
| <i>2691-41-0</i> | <i>HMX</i> | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | .0879 | U | 0.0879 | 0.275 |
| <i>35572-78-2</i> | <i>2-Amino-4,6-dinitrotoluene</i> | | | | |
| 479-45-8 | Tetryl | .0879 | U | 0.0879 | 0.549 |
| <i>479-45-8</i> | <i>Tetryl</i> | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | .0879 | U | 0.0879 | 0.275 |
| <i>606-20-2</i> | <i>2,6-Dinitrotoluene</i> | | | | |
| 98-95-3 | Nitrobenzene | .0879 | U | 0.0879 | 0.275 |
| <i>98-95-3</i> | <i>Nitrobenzene</i> | | | | |
| 99-08-1 | m-Nitrotoluene | .0879 | U | 0.0879 | 0.275 |
| <i>99-08-1</i> | <i>m-Nitrotoluene</i> | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | .0879 | U | 0.0879 | 0.275 |
| <i>99-35-4</i> | <i>1,3,5-Trinitrobenzene</i> | | | | |
| 99-65-0 | m-Dinitrobenzene | .0879 | U | 0.0879 | 0.275 |
| <i>99-65-0</i> | <i>m-Dinitrobenzene</i> | | | | |
| 88-72-2 | o-Nitrotoluene | .0901 | U | 0.0901 | 0.275 |
| <i>88-72-2</i> | <i>o-Nitrotoluene</i> | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-18-147686

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 435560009

Sample Amount 910 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|-------------------|-----------------------------------|----------------|---|-------|-------|
| 78-11-5 | PETN | .11 | U | 0.110 | 0.549 |
| <i>78-11-5</i> | <i>PETN</i> | | | | |
| 99-99-0 | p-Nitrotoluene | .165 | U | 0.165 | 0.549 |
| <i>99-99-0</i> | <i>p-Nitrotoluene</i> | | | | |
| 3058-38-6 | TATB | .33 | U | 0.330 | 1.10 |
| <i>3058-38-6</i> | <i>TATB</i> | | | | |
| 618-87-1 | 3,5-Dinitroaniline | .33 | U | 0.330 | 1.10 |
| <i>618-87-1</i> | <i>3,5-Dinitroaniline</i> | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | .33 | U | 0.330 | 1.10 |
| <i>78-30-8</i> | <i>tris(o-cresyl) phosphate</i> | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | .549 | U | 0.549 | 2.75 |
| <i>59229-75-3</i> | <i>2,6-Diamino-4-nitrotoluene</i> | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | .549 | U | 0.549 | 2.75 |
| <i>6629-29-4</i> | <i>2,4-Diamino-6-nitrotoluene</i> | | | | |

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2018-496**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---------------|-----------------------|-----|-----------|-----|
| 435560009 | CAPA-18-147686 | 99 | 55 - 115 | |
| 1203901963 | MB for batch 1711724 | 98 | 55 - 115 | |
| 1203901964 | LCS for batch 1711724 | 88 | 55 - 115 | |
| 1203901965 | VS-HE-4-17-144559MS | 102 | 55 - 115 | |
| 1203901966 | VS-HE-4-17-144559MSD | 91 | 55 - 115 | |

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2018-496

Extract Batch Code: 1711724

Date Extracted: 23-OCT-17

GEL LCS ID: 1203901964

GEL LCSDUP ID:

Analysis Date/Time: 24-OCT-17 18:06

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec # | LCSD Conc | LCSD Rec # | RPD # | RPD | Recovery Limits |
|----------------------------|-------------|----------|-----------|-----------|------------|-------|-----|-----------------|
| 1,3,5-Trinitrobenzene | 5 | 4.48 | 90 | | | | | 70 - 110 |
| 2,4,6-Trinitrotoluene | 5 | 4.35 | 87 | | | | | 69 - 113 |
| 2,4-Diamino-6-nitrotoluene | 5 | 3.75 | 75 | | | | | 50 - 121 |
| 2,4-Dinitrotoluene | 5 | 4.2 | 84 | | | | | 71 - 110 |
| 2,6-Diamino-4-nitrotoluene | 5 | 4.48 | 90 | | | | | 53 - 127 |
| 2,6-Dinitrotoluene | 5 | 3.95 | 79 | | | | | 72 - 105 |
| 2-Amino-4,6-dinitrotoluene | 5 | 4.04 | 81 | | | | | 70 - 112 |
| 3,5-Dinitroaniline | 5 | 4.09 | 82 | | | | | 70 - 121 |
| 4-Amino-2,6-dinitrotoluene | 5 | 4.2 | 84 | | | | | 74 - 116 |
| HMX | 5 | 3.7 | 74 | | | | | 58 - 113 |
| Nitrobenzene | 5 | 4.23 | 85 | | | | | 64 - 115 |
| PETN | 5 | 3.69 | 74 | | | | | 57 - 126 |
| RDX | 5 | 4.25 | 85 | | | | | 64 - 117 |
| TATB | 2.5 | 2.56 | 102 | | | | | 47 - 135 |
| Tetryl | 5 | 4.76 | 95 | | | | | 55 - 122 |
| m-Dinitrobenzene | 5 | 4.73 | 95 | | | | | 74 - 117 |
| m-Nitrotoluene | 5 | 3.75 | 75 | | | | | 66 - 114 |
| o-Nitrotoluene | 5 | 3.56 | 71 | | | | | 64 - 115 |
| p-Nitrotoluene | 5 | 3.71 | 74 | | | | | 66 - 127 |
| tris(o-cresyl) phosphate | 5 | 3.18 | 64 | | | | | 43 - 104 |

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: VS-HE-4-17-144559

Lab Code: GEL

GEL Job No (SDG) 2018-496

Extract Batch Code: 1711724

Date Extracted: 23-OCT-17

GEL Spike ID: 1203901965

GEL SpikeDup ID: 1203901966

Analysis Date/Time: 24-OCT-17 21:02

MSD Analysis Date/Time: 24-OCT-17 21:37

Reporting Units: ug/L

QC Type: MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Rec Limits |
|----------------------------|-------------|-------------|---------|----------|----------|-----------|-------|-----------|------------|
| 1,3,5-Trinitrobenzene | 5.31915 | 0 | 5.01 | 94 | 4.66 | 85 | 7 | 30 | 67 - 111 |
| 2,4,6-Trinitrotoluene | 5.31915 | 0 | 4.99 | 94 | 5.2 | 95 | 4 | 30 | 66 - 112 |
| 2,4-Diamino-6-nitrotoluene | 5.31915 | 0 | 5.71 | 107 | 3.61 | 66 | 45 * | 30 | 50 - 121 |
| 2,4-Dinitrotoluene | 5.31915 | 0 | 5.2 | 98 | 5.11 | 93 | 2 | 30 | 69 - 113 |
| 2,6-Diamino-4-nitrotoluene | 5.31915 | 0 | 6.65 | 125 | 3.13 | 57 | 72 * | 30 | 53 - 127 |
| 2,6-Dinitrotoluene | 5.31915 | 0 | 4.79 | 90 | 4.64 | 84 | 3 | 30 | 70 - 106 |
| 2-Amino-4,6-dinitrotoluene | 5.31915 | 0 | 4.97 | 93 | 4.51 | 82 | 10 | 30 | 67 - 115 |
| 3,5-Dinitroaniline | 5.31915 | 0 | 4.85 | 91 | 5.01 | 91 | 3 | 30 | 70 - 121 |
| 4-Amino-2,6-dinitrotoluene | 5.31915 | 0 | 4.97 | 94 | 4.61 | 84 | 8 | 30 | 65 - 120 |
| HMX | 5.31915 | 0 | 4.38 | 82 | 4.97 | 90 | 13 | 30 | 44 - 128 |
| Nitrobenzene | 5.31915 | 0 | 5.58 | 105 | 3.92 | 71 | 35 * | 30 | 62 - 116 |
| PETN | 5.31915 | 0 | 5.09 | 96 | 4.78 | 87 | 6 | 30 | 51 - 131 |
| RDX | 5.31915 | 0 | 5.09 | 96 | 5.17 | 94 | 2 | 30 | 57 - 125 |
| TATB | 2.65957 | 0 | 2.96 | 111 | 2.83 | 103 | 4 | 30 | 38 - 149 |
| Tetryl | 5.31915 | 0 | 4.26 | 80 | 4.02 | 73 | 6 | 30 | 50 - 126 |
| m-Dinitrobenzene | 5.31915 | 0 | 5.38 | 101 | 5.04 | 92 | 6 | 30 | 74 - 117 |
| m-Nitrotoluene | 5.31915 | 0 | 4.92 | 92 | 3.51 | 64 | 34 * | 30 | 59 - 120 |
| o-Nitrotoluene | 5.31915 | 0 | 4.4 | 83 | 3.38 | 62 | 26 | 30 | 56 - 119 |
| p-Nitrotoluene | 5.31915 | 0 | 4.96 | 93 | 3.7 | 67 | 29 | 30 | 61 - 129 |
| tris(o-cresyl) phosphate | 5.31915 | 0 | 3.45 | 65 | 3.34 | 61 | 3 | 30 | 38 - 105 |

#Column to be used to flag recovery and RPD values with an asterisk

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1711724

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901963

Sample Amount 1000 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1024016.wiff

Date Analyzed: 24-OCT-17 17:31

Dilution Factor: 2

Concentration Units: ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|-------------------|-----------------------------------|----------------|---|-------|-------|
| 118-96-7 | 2,4,6-Trinitrotoluene | .08 | U | 0.080 | 0.250 |
| <i>118-96-7</i> | <i>2,4,6-Trinitrotoluene</i> | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | .08 | U | 0.080 | 0.250 |
| <i>121-14-2</i> | <i>2,4-Dinitrotoluene</i> | | | | |
| 121-82-4 | RDX | .08 | U | 0.080 | 0.250 |
| <i>121-82-4</i> | <i>RDX</i> | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | .08 | U | 0.080 | 0.250 |
| <i>19406-51-0</i> | <i>4-Amino-2,6-dinitrotoluene</i> | | | | |
| 2691-41-0 | HMX | .08 | U | 0.080 | 0.250 |
| <i>2691-41-0</i> | <i>HMX</i> | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | .08 | U | 0.080 | 0.250 |
| <i>35572-78-2</i> | <i>2-Amino-4,6-dinitrotoluene</i> | | | | |
| 479-45-8 | Tetryl | .08 | U | 0.080 | 0.500 |
| <i>479-45-8</i> | <i>Tetryl</i> | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | .08 | U | 0.080 | 0.250 |
| <i>606-20-2</i> | <i>2,6-Dinitrotoluene</i> | | | | |
| 98-95-3 | Nitrobenzene | .08 | U | 0.080 | 0.250 |
| <i>98-95-3</i> | <i>Nitrobenzene</i> | | | | |
| 99-08-1 | m-Nitrotoluene | .08 | U | 0.080 | 0.250 |
| <i>99-08-1</i> | <i>m-Nitrotoluene</i> | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | .08 | U | 0.080 | 0.250 |
| <i>99-35-4</i> | <i>1,3,5-Trinitrobenzene</i> | | | | |
| 99-65-0 | m-Dinitrobenzene | .08 | U | 0.080 | 0.250 |
| <i>99-65-0</i> | <i>m-Dinitrobenzene</i> | | | | |
| 88-72-2 | o-Nitrotoluene | .082 | U | 0.082 | 0.250 |
| <i>88-72-2</i> | <i>o-Nitrotoluene</i> | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1711724

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901963

Sample Amount 1000 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|-------------------|-----------------------------------|----------------|---|-------|-------|
| 78-11-5 | PETN | .1 | U | 0.100 | 0.500 |
| <i>78-11-5</i> | <i>PETN</i> | | | | |
| 99-99-0 | p-Nitrotoluene | .15 | U | 0.150 | 0.500 |
| <i>99-99-0</i> | <i>p-Nitrotoluene</i> | | | | |
| 3058-38-6 | TATB | .3 | U | 0.300 | 1.00 |
| <i>3058-38-6</i> | <i>TATB</i> | | | | |
| 618-87-1 | 3,5-Dinitroaniline | .3 | U | 0.300 | 1.00 |
| <i>618-87-1</i> | <i>3,5-Dinitroaniline</i> | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | .3 | U | 0.300 | 1.00 |
| <i>78-30-8</i> | <i>tris(o-cresyl) phosphate</i> | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | .5 | U | 0.500 | 2.50 |
| <i>59229-75-3</i> | <i>2,6-Diamino-4-nitrotoluene</i> | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | .5 | U | 0.500 | 2.50 |
| <i>6629-29-4</i> | <i>2,4-Diamino-6-nitrotoluene</i> | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1711724

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901964

Sample Amount 1000 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1024017.wiff

Date Analyzed: 24-OCT-17 18:06

Dilution Factor: 2

Concentration Units: ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|------------|----------------------------|----------------|---|-------|-------|
| 3058-38-6 | TATB | 2.56 | | 0.300 | 1.00 |
| 3058-38-6 | TATB | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 3.18 | | 0.300 | 1.00 |
| 78-30-8 | tris(o-cresyl) phosphate | | | | |
| 88-72-2 | o-Nitrotoluene | 3.56 | | 0.082 | 0.250 |
| 88-72-2 | o-Nitrotoluene | | | | |
| 78-11-5 | PETN | 3.69 | | 0.100 | 0.500 |
| 78-11-5 | PETN | | | | |
| 2691-41-0 | HMX | 3.7 | | 0.080 | 0.250 |
| 2691-41-0 | HMX | | | | |
| 99-99-0 | p-Nitrotoluene | 3.71 | | 0.150 | 0.500 |
| 99-99-0 | p-Nitrotoluene | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 3.75 | | 0.500 | 2.50 |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | | | | |
| 99-08-1 | m-Nitrotoluene | 3.75 | | 0.080 | 0.250 |
| 99-08-1 | m-Nitrotoluene | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 3.95 | | 0.080 | 0.250 |
| 606-20-2 | 2,6-Dinitrotoluene | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.04 | | 0.080 | 0.250 |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 4.09 | | 0.300 | 1.00 |
| 618-87-1 | 3,5-Dinitroaniline | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.2 | | 0.080 | 0.250 |
| 121-14-2 | 2,4-Dinitrotoluene | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.2 | | 0.080 | 0.250 |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1711724

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901964

Sample Amount 1000 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|-------------------|-----------------------------------|----------------|---|-------|-------|
| 98-95-3 | Nitrobenzene | 4.23 | | 0.080 | 0.250 |
| <i>98-95-3</i> | <i>Nitrobenzene</i> | | | | |
| 121-82-4 | RDX | 4.25 | | 0.080 | 0.250 |
| <i>121-82-4</i> | <i>RDX</i> | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.35 | | 0.080 | 0.250 |
| <i>118-96-7</i> | <i>2,4,6-Trinitrotoluene</i> | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.48 | | 0.500 | 2.50 |
| <i>59229-75-3</i> | <i>2,6-Diamino-4-nitrotoluene</i> | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.48 | | 0.080 | 0.250 |
| <i>99-35-4</i> | <i>1,3,5-Trinitrobenzene</i> | | | | |
| 99-65-0 | m-Dinitrobenzene | 4.73 | | 0.080 | 0.250 |
| <i>99-65-0</i> | <i>m-Dinitrobenzene</i> | | | | |
| 479-45-8 | Tetryl | 4.76 | | 0.080 | 0.500 |
| <i>479-45-8</i> | <i>Tetryl</i> | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: VS-HE-4-17-144559(435721001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901965

Sample Amount 940 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1024022.wiff

Date Analyzed: 24-OCT-17 21:02

Dilution Factor: 2

Concentration Units: ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|------------|----------------------------|----------------|---|--------|-------|
| 3058-38-6 | TATB | 2.96 | | 0.319 | 1.06 |
| 3058-38-6 | TATB | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 3.45 | | 0.319 | 1.06 |
| 78-30-8 | tris(o-cresyl) phosphate | | | | |
| 479-45-8 | Tetryl | 4.26 | | 0.0851 | 0.532 |
| 479-45-8 | Tetryl | | | | |
| 2691-41-0 | HMX | 4.38 | | 0.0851 | 0.266 |
| 2691-41-0 | HMX | | | | |
| 88-72-2 | o-Nitrotoluene | 4.4 | | 0.0872 | 0.266 |
| 88-72-2 | o-Nitrotoluene | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.79 | | 0.0851 | 0.266 |
| 606-20-2 | 2,6-Dinitrotoluene | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 4.85 | | 0.319 | 1.06 |
| 618-87-1 | 3,5-Dinitroaniline | | | | |
| 99-08-1 | m-Nitrotoluene | 4.92 | | 0.0851 | 0.266 |
| 99-08-1 | m-Nitrotoluene | | | | |
| 99-99-0 | p-Nitrotoluene | 4.96 | | 0.160 | 0.532 |
| 99-99-0 | p-Nitrotoluene | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.97 | | 0.0851 | 0.266 |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.97 | | 0.0851 | 0.266 |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.99 | | 0.0851 | 0.266 |
| 118-96-7 | 2,4,6-Trinitrotoluene | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 5.01 | | 0.0851 | 0.266 |
| 99-35-4 | 1,3,5-Trinitrobenzene | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: VS-HE-4-17-144559(435721001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901965

Sample Amount 940 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|-------------------|-----------------------------------|----------------|---|--------|-------|
| 121-82-4 | RDX | 5.09 | | 0.0851 | 0.266 |
| <i>121-82-4</i> | <i>RDX</i> | | | | |
| 78-11-5 | PETN | 5.09 | | 0.106 | 0.532 |
| <i>78-11-5</i> | <i>PETN</i> | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 5.2 | | 0.0851 | 0.266 |
| <i>121-14-2</i> | <i>2,4-Dinitrotoluene</i> | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.38 | | 0.0851 | 0.266 |
| <i>99-65-0</i> | <i>m-Dinitrobenzene</i> | | | | |
| 98-95-3 | Nitrobenzene | 5.58 | | 0.0851 | 0.266 |
| <i>98-95-3</i> | <i>Nitrobenzene</i> | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 5.71 | | 0.532 | 2.66 |
| <i>6629-29-4</i> | <i>2,4-Diamino-6-nitrotoluene</i> | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 6.65 | | 0.532 | 2.66 |
| <i>59229-75-3</i> | <i>2,6-Diamino-4-nitrotoluene</i> | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: VS-HE-4-17-144559(435721001MSD)MS

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901966

Sample Amount 910 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1024023.wiff

Date Analyzed: 24-OCT-17 21:37

Dilution Factor: 2

Concentration Units: ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|-------------------|-----------------------------------|----------------|---|--------|-------|
| 3058-38-6 | TATB | 2.83 | | 0.330 | 1.10 |
| <i>3058-38-6</i> | <i>TATB</i> | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 3.13 | | 0.549 | 2.75 |
| <i>59229-75-3</i> | <i>2,6-Diamino-4-nitrotoluene</i> | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 3.34 | | 0.330 | 1.10 |
| <i>78-30-8</i> | <i>tris(o-cresyl) phosphate</i> | | | | |
| 88-72-2 | o-Nitrotoluene | 3.38 | | 0.0901 | 0.275 |
| <i>88-72-2</i> | <i>o-Nitrotoluene</i> | | | | |
| 99-08-1 | m-Nitrotoluene | 3.51 | | 0.0879 | 0.275 |
| <i>99-08-1</i> | <i>m-Nitrotoluene</i> | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 3.61 | | 0.549 | 2.75 |
| <i>6629-29-4</i> | <i>2,4-Diamino-6-nitrotoluene</i> | | | | |
| 99-99-0 | p-Nitrotoluene | 3.7 | | 0.165 | 0.549 |
| <i>99-99-0</i> | <i>p-Nitrotoluene</i> | | | | |
| 98-95-3 | Nitrobenzene | 3.92 | | 0.0879 | 0.275 |
| <i>98-95-3</i> | <i>Nitrobenzene</i> | | | | |
| 479-45-8 | Tetryl | 4.02 | | 0.0879 | 0.549 |
| <i>479-45-8</i> | <i>Tetryl</i> | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.51 | | 0.0879 | 0.275 |
| <i>35572-78-2</i> | <i>2-Amino-4,6-dinitrotoluene</i> | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.61 | | 0.0879 | 0.275 |
| <i>19406-51-0</i> | <i>4-Amino-2,6-dinitrotoluene</i> | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.64 | | 0.0879 | 0.275 |
| <i>606-20-2</i> | <i>2,6-Dinitrotoluene</i> | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.66 | | 0.0879 | 0.275 |
| <i>99-35-4</i> | <i>1,3,5-Trinitrobenzene</i> | | | | |

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: VS-HE-4-17-144559(435721001MSD)MS

Lab Code: GEL

GEL Job No (SDG) 2018-496

Matrix: WATER

GEL Sample ID: 1203901966

Sample Amount 910 mL

Date Received: 19-OCT-17

Moisture: .

Extraction Batch ID: 1711724

Extraction Type Sol Exchange

Date Extracted: 23-OCT-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|------------------|------------------------------|----------------|---|--------|-------|
| 78-11-5 | PETN | 4.78 | | 0.110 | 0.549 |
| <i>78-11-5</i> | <i>PETN</i> | | | | |
| 2691-41-0 | HMX | 4.97 | | 0.0879 | 0.275 |
| <i>2691-41-0</i> | <i>HMX</i> | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 5.01 | | 0.330 | 1.10 |
| <i>618-87-1</i> | <i>3,5-Dinitroaniline</i> | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.04 | | 0.0879 | 0.275 |
| <i>99-65-0</i> | <i>m-Dinitrobenzene</i> | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 5.11 | | 0.0879 | 0.275 |
| <i>121-14-2</i> | <i>2,4-Dinitrotoluene</i> | | | | |
| 121-82-4 | RDX | 5.17 | | 0.0879 | 0.275 |
| <i>121-82-4</i> | <i>RDX</i> | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 5.2 | | 0.0879 | 0.275 |
| <i>118-96-7</i> | <i>2,4,6-Trinitrotoluene</i> | | | | |

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-496Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 24-OCT-17 08:44GEL Data File: EXP1024001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|----------------------------|------|--------------|
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| Picric acid | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| MNX | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| DNX | 0 | 0 |

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-496Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 24-OCT-17 09:19GEL Data File: EXP1024002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|----------------------------|------|--------------|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| Picric acid | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-496

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 24-OCT-17 14:00

GEL Data File: EXP1024010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|----------------------------|------|--------------|
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| Picric acid | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-496

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 24-OCT-17 16:21

GEL Data File: EXP1024014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|----------------------------|------|--------------|
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| Tetryl | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| Picric acid | 0 | 0 |
| RDX | 0 | 0 |

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-496

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 24-OCT-17 22:47

GEL Data File: EXP1024025.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|----------------------------|------|--------------|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| Picric acid | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-496

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 24-OCT-17 23:57

GEL Data File: EXP1024027.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|----------------------------|------|--------------|
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| Picric acid | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |

PCB Analysis

Case Narrative

**GC Semivolatile PCB
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-496
Work Order #: 435560**

Method/Analysis Information

| | |
|--------------------------|---|
| Procedure: | Analysis of The Analysis of Polychlorinated Biphenyls by GC/ECD by ECD |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1716000 |
| Prep Batch Number: | 1715999 |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| | |
|------------------|--|
| Sample ID | Client ID |
| 435560007 | CAPA-18-147686 |
| 1203912460 | Method Blank (MB) |
| 1203912461 | Laboratory Control Sample (LCS) |
| 1203912462 | 435560007(CAPA-18-147686) Matrix Spike (MS) |
| 1203912463 | 435560007(CAPA-18-147686) 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-040 REV# 24.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

Initial Calibration

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

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

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

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

The Method Blank (See Below) did not meet surrogate recovery acceptance criteria due to isolated extraction efficiency issue. All other QC samples met the acceptance criteria for the surrogate and spiked Aroclors.

| Sample | Analyte | Value |
|-----------------|---------|----------------|
| 1203912460 (MB) | 4cmx | 32* (33%-122%) |

Laboratory Control Sample (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS/LCSD) Recovery

The LCS/LCSD spike recoveries met the acceptance limits.

QC Sample Designation

Sample 435560007 (CAPA-18-147686) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS/MSD) Recovery Statement

The MS/MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the MS and MSD met the acceptance limits.

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All samples and QC in this batch were cleaned using alumina in order to remove oil and other high molecular weight interferences. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns.

Sample Dilutions

The samples in this SDG in this batch did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required for the samples in this SDG and reported in this batch.

Miscellaneous Information

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually 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.

Manual integrations

Manual integrations were not required for samples and QC samples associated with this SDG in this batch.

Additional Comments

The column 1 has been chosen as the primary column. The data are reported from the column 1 for all samples in this batch.

System Configuration

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|----------------------|--|-----------------------------|------------------------|----------------------------|
| ECD9A.I_1 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 1 | 30m x 0.25mm, 0.25um |
| ECD9A.I_2 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 2 | 30m x 0.25mm, 0.20um |

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: 2018-496 GEL Work Order: 435560

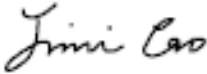
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC 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: Jimin Cao

Date: 09 NOV 2017

Title: Data Validator

Sample Data Summary

PCB
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2018-496
Lab Sample ID: 435560007
Client Sample: PCB
Client ID: CAPA-18-147686
Batch ID: 1716000
Run Date: 11/07/2017 16:11
Prep Date: 11/07/2017 05:00
Data File: 110717.S\E9k0752.D
 110717.S\E9k0752.D

Date Collected: 10/17/2017 08:45
Date Received: 10/19/2017 08:55
Client: ARSL004
Method: SW846 3535A/8082
Inst: ECD9A.I
Analyst: YS1
Aliquot: 1000 mL
Column: 1 RTX-CLPEST 1
 2 RTX-CLPEST 2

Matrix: W
Project: ESHL00114
SOP Ref: GL-OA-E-040
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|------------|--------------|-----------|--------|-------|---------|---------|--------|
| 12674-11-2 | Aroclor-1016 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 4cmx | 0.110 | 0.200 | ug/L 55 | (33%-122%) |
| Decachlorobiphenyl | 0.128 | 0.200 | ug/L 64 | (35%-138%) |

Quality Control Summary

PCB
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-496**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|------------|-----------------------|------------------|------------------|-----------------|-----------------|
| 1203912460 | MB for batch 1715999 | 32 * | 32 * | 44 | 35 |
| 1203912461 | LCS for batch 1715999 | 65 | 68 | 79 | 62 |
| 435560007 | CAPA-18-147686 | 55 | 58 | 64 | 51 |
| 1203912462 | CAPA-18-147686MS | 48 | 50 | 68 | 54 |
| 1203912463 | CAPA-18-147686MSD | 58 | 60 | 76 | 61 |

Surrogate**Acceptance Limits**

4CMX = 4cmx (33%-122%)

DCB = Decachlorobiphenyl (35%-138%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

PCB
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-496

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1715999

Matrix: WATER

Lab Sample ID 1203912461

Instrument: ECD9A.I

Analysis Date: 11/07/2017 15:59

Dilution: 1

Analyst: YS1

Prep Batch ID: 1715999

Inj. Vol: 1 uL

Batch ID: 1716000

| CAS No | | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|------------|-----|--------------|----------|-------------------------|-------------------------|------------------------|---------------|----------------------|
| 12674-11-2 | LCS | Aroclor-1016 | | 1.00 | 0.0 | 0.736 | 74 | 45-101 |
| 11096-82-5 | LCS | Aroclor-1260 | | 1.00 | 0.0 | 0.769 | 77 | 52-113 |

PCB
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2018-496

Sample Type: Matrix Spike

Client ID: CAPA-18-147686MS

Matrix: W

Lab Sample ID 1203912462

Instrument: ECD9A.I

Analysis Date: 11/07/2017 16:27

Dilution: 1

Analyst: YS1

Prep Batch ID: 1715999

Inj. Vol: 1 uL

Batch ID: 1716000

| CAS No | | | Parmname | | Amount Added ug/L | Sample Conc. ug/L | U | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|------------|----|--------------|----------|--|-------------------------|-------------------------|---|------------------------|---------------|----------------------|
| 12674-11-2 | MS | Aroclor-1016 | | | 1.00 | 0.00 | U | 0.554 | 55 | 26-110 |
| 11096-82-5 | MS | Aroclor-1260 | | | 1.00 | 0.00 | U | 0.546 | 55 | 30-127 |

PCB
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2018-496

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147686MSD

Matrix: W

Lab Sample ID 1203912463

Instrument: ECD9A.I

Analysis Date: 11/07/2017 16:43

Dilution: 1

Analyst: YS1

Prep Batch ID: 1715999

Inj. Vol: 1 uL

Batch ID: 1716000

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|------------|------------------|-------------------------|-------------------------|---|------------------------|---------------|----------------------|----------|----------------------|
| 12674-11-2 | MSD Aroclor-1016 | 1.00 | 0.00 | U | 0.657 | 66 | 26-110 | 17 | 0-27 |
| 11096-82-5 | MSD Aroclor-1260 | 1.00 | 0.00 | U | 0.668 | 67 | 30-127 | 20 | 0-29 |

Method Blank Summary

Page 1 of 1

| | | | | | |
|----------------|----------------------|----------------|------------------|------------|--------------------|
| SDG Number: | 2018-496 | Client: | ARSL004 | Matrix: | WATER |
| Client ID: | MB for batch 1715999 | Instrument ID: | ECD9A.I_1 | Data File: | 110717.S\E9k0750.D |
| Lab Sample ID: | 1203912460 | | ECD9A.I_2 | | 110717.S\E9k0750.D |
| Column: | RTX-CLPEST 1 | Prep Date: | 11/07/2017 05:00 | Analyzed: | 11/07/17 15:48 |
| | RTX-CLPEST 2 | | | | |

This method blank applies to the following samples and quality control samples:

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|--------------------------|---------------|--------------------|---------------|---------------|
| 01 LCS for batch 1715999 | 1203912461 | 110717.S\E9k0751.D | 11/07/17 | 1559 |
| 02 CAPA-18-147686 | 435560007 | 110717.S\E9k0752.D | 11/07/17 | 1611 |
| 03 CAPA-18-147686MS | 1203912462 | 110717.S\E9k0753.D | 11/07/17 | 1627 |
| 04 CAPA-18-147686MSD | 1203912463 | 110717.S\E9k0754.D | 11/07/17 | 1643 |

Quality Control Data

PCB
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2018-496
Lab Sample ID: 1203912460
Client Sample: QC for batch 1715999
Client ID: MB for batch 1715999
Batch ID: 1716000
Run Date: 11/07/2017 15:48
Prep Date: 11/07/2017 05:00
Data File: 110717.S\E9k0750.D
 110717.S\E9k0750.D

Client: ARSL004
Method: SW846 3535A/8082
Inst: ECD9A.I
Analyst: YS1
Aliquot: 1000 mL
Column: 1 RTX-CLPEST 1
 2 RTX-CLPEST 2

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-040
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|------------|--------------|-----------|--------|-------|---------|---------|--------|
| 12674-11-2 | Aroclor-1016 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 4cmx | 0.063 | 0.200 | ug/L 32 | * (33%-122%) |
| Decachlorobiphenyl | 0.0876 | 0.200 | ug/L 44 | (35%-138%) |

PCB
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2018-496
Lab Sample ID: 1203912461
Client Sample: QC for batch 1715999
Client ID: LCS for batch 1715999
Batch ID: 1716000
Run Date: 11/07/2017 15:59
Prep Date: 11/07/2017 05:00
Data File: 110717.S\E9k0751.D
110717.S\E9k0751.D

Client: ARSL004
Method: SW846 3535A/8082
Inst: ECD9A.I
Analyst: YS1
Aliquot: 1000 mL
Column: 1 RTX-CLPEST 1
2 RTX-CLPEST 2

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-040
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|------------|--------------|-----------|--------|-------|---------|---------|--------|
| 12674-11-2 | Aroclor-1016 | | 0.736 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.769 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 4cmx | 0.130 | 0.200 | ug/L 65 | (33%-122%) |
| Decachlorobiphenyl | 0.158 | 0.200 | ug/L 79 | (35%-138%) |

PCB
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2018-496
Lab Sample ID: 1203912462
Client Sample: QC for batch 1715999
Client ID: CAPA-18-147686MS
Batch ID: 1716000
Run Date: 11/07/2017 16:27
Prep Date: 11/07/2017 05:00
Data File: 110717.S\E9k0753.D
 110717.S\E9k0753.D

Date Collected: 10/17/2017 08:45
Date Received: 10/19/2017 08:55
Client: ARSL004
Method: SW846 3535A/8082
Inst: ECD9A.I
Analyst: YS1
Aliquot: 500 mL
Column: 1 RTX-CLPEST 1
 2 RTX-CLPEST 2

Matrix: W
Project: QC
SOP Ref: GL-OA-E-040
Dilution: 1
Inj. Vol: 1 uL
Final Volume: .5 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|------------|--------------|-----------|--------|-------|---------|---------|--------|
| 12674-11-2 | Aroclor-1016 | | 0.554 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.546 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 4cmx | 0.0951 | 0.200 | ug/L 48 | (33%-122%) |
| Decachlorobiphenyl | 0.137 | 0.200 | ug/L 68 | (35%-138%) |

PCB
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2018-496
Lab Sample ID: 1203912463
Client Sample: QC for batch 1715999
Client ID: CAPA-18-147686MSD
Batch ID: 1716000
Run Date: 11/07/2017 16:43
Prep Date: 11/07/2017 05:00
Data File: 110717.S\E9k0754.D
 110717.S\E9k0754.D

Date Collected: 10/17/2017 08:45
Date Received: 10/19/2017 08:55
Client: ARSL004
Method: SW846 3535A/8082
Inst: ECD9A.I
Analyst: YS1
Aliquot: 500 mL
Column: 1 RTX-CLPEST 1
 2 RTX-CLPEST 2

Matrix: W
Project: QC
SOP Ref: GL-OA-E-040
Dilution: 1
Inj. Vol: 1 uL
Final Volume: .5 mL

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|------------|--------------|-----------|--------|-------|---------|---------|--------|
| 12674-11-2 | Aroclor-1016 | | 0.657 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.668 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.0333 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|--------|---------|-----------|-------------------|
| 4cmx | 0.116 | 0.200 | ug/L 58 | (33%-122%) |
| Decachlorobiphenyl | 0.152 | 0.200 | ug/L 76 | (35%-138%) |

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-496
Work Order #: 435560

| Sample ID | Client ID |
|------------------|---|
| 435560001 | CAPA-18-147564 |
| 435560002 | CAPA-18-147590 |
| 435560004 | CAPA-18-147565 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203900632 | Method Blank (MB) ICP |
| 1203900633 | Laboratory Control Sample (LCS) |
| 1203900636 | 435566001(CAMO-18-147644L) Serial Dilution (SD) |
| 1203900634 | 435566001(CAMO-18-147644D) Sample Duplicate (DUP) |
| 1203900635 | 435566001(CAMO-18-147644S) Matrix Spike (MS) |
| 1203900647 | Method Blank (MB) ICP-MS |
| 1203900648 | Laboratory Control Sample (LCS) |
| 1203900651 | 435560001(CAPA-18-147564L) Serial Dilution (SD) |
| 1203900649 | 435560001(CAPA-18-147564D) Sample Duplicate (DUP) |
| 1203900650 | 435560001(CAPA-18-147564S) Matrix Spike (MS) |
| 1203913009 | Method Blank (MB) CVAA |
| 1203913010 | Laboratory Control Sample (LCS) |
| 1203913015 | 435566001(CAMO-18-147644L) Serial Dilution (SD) |
| 1203913011 | 435566001(CAMO-18-147644D) Sample Duplicate (DUP) |
| 1203913013 | 435566001(CAMO-18-147644S) Matrix Spike (MS) |

Sample Analysis

Samples 435560001,002,004,005 and 008 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

| | |
|---------------------------------------|--|
| Analytical Batch: | 1711147, 1711153, 1716207 and 1719308 |
| Prep Batch : | 1711146, 1711152 and 1716206 |
| Standard Operating Procedures: | GL-MA-E-013 REV# 30, GL-MA-E-006 REV# 14, GL-MA-E-014 REV# 32, GL-MA-E-010 REV# 36 and GL-GC-E-107 REV# 10 |
| Analytical Method: | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B |
| Prep Method : | 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 CaCO₃ 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 or 6010D 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. 435560001 (CAPA-18-147564), 435560004 (CAPA-18-147565) and 435560008 (CAPA-18-147686)-ICP.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

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: 435566001 (CAMO-18-147644)-ICP and CVAA and 435560001 (CAPA-18-147564)-ICP-MS.

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 were 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.

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: 2018-496 GEL Work Order: 435560

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, MDC 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: 15 NOV 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 435560001**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147564**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | 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 | 11/07/17 11:08 | 110717W1-9 | 1716207 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 435560001

BASIS: As Received

DATE COLLECTED 17-OCT-17

CLIENT ID: CAPA-18-147564

LEVEL: Low

DATE RECEIVED 19-OCT-17

MATRIX: W

%SOLIDS: 0

| CAS | 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 | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-36-0 | Antimony | 1 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-38-2 | Arsenic | 2 | ug/L | U | 2 | 5 | 5 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-39-3 | Barium | 29.2 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-41-7 | Beryllium | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-42-8 | Boron | 15 | ug/L | U | 15 | 50 | 50 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-43-9 | Cadmium | 0.30 | ug/L | U | 0.3 | 1 | 1 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-70-2 | Calcium | 12100 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-47-3 | Chromium | 3 | ug/L | U | 3 | 10 | 10 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-48-4 | Cobalt | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-50-8 | Copper | 3 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7439-89-6 | Iron | 30 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7439-92-1 | Lead | 0.50 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7439-95-4 | Magnesium | 3020 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7439-96-5 | Manganese | 2 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7439-98-7 | Molybdenum | 1.43 | ug/L | | 0.2 | 0.5 | 0.5 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-02-0 | Nickel | 0.60 | ug/L | U | 0.6 | 2 | 2 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-09-7 | Potassium | 1790 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7782-49-2 | Selenium | 2 | ug/L | U | 2 | 5 | 5 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7631-86-9 | Silica | 65900 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-22-4 | Silver | 0.30 | ug/L | U | 0.3 | 1 | 1 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-23-5 | Sodium | 12300 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 11/14/17 14:04 | 111417-2 | 1711147 |
| 7440-24-6 | Strontium | 46.2 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-28-0 | Thallium | 0.60 | ug/L | U | 0.6 | 2 | 2 | 1 | MS | PRB | 10/25/17 20:54 | 171025-4 | 1711153 |
| 7440-31-5 | Tin | 2.5 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-61-1 | Uranium | 0.382 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 10/26/17 09:53 | 171025-8 | 1711153 |
| 7440-62-2 | Vanadium | 6.16 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:02 | 111317-1 | 1711147 |
| 7440-66-6 | Zinc | 4.78 | ug/L | J | 3.3 | 10 | 10 | 1 | P | HSC | 11/15/17 11:25 | 111517-3 | 1711147 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 435560001**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147564**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
| | Hardness as CaCO3 | 42.6 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/15/17 14:17 | | 1719308 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1711147 | 1711146 | SW846 3005A | 50 | mL | 50 | mL | 10/19/17 | JXM8 |
| 1711153 | 1711152 | SW846 3005A | 50 | mL | 50 | mL | 10/19/17 | JXM8 |
| 1716207 | 1716206 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/06/17 | AXS5 |

***Analytical Methods:**

P SW846 3005A/6010C
MS SW846 3005A/6020A
AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 435560002**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147590**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | 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 | 11/07/17 11:10 | 110717W1-9 | 1716207 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1716207 | 1716206 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/06/17 | AXS5 |

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 435560004**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147565**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | 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 | 11/07/17 11:12 | 110717W1-9 | 1716207 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 435560004

BASIS: As Received

DATE COLLECTED 17-OCT-17

CLIENT ID: CAPA-18-147565

LEVEL: Low

DATE RECEIVED 19-OCT-17

MATRIX: W

%SOLIDS: 0

| CAS | 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 | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-36-0 | Antimony | 1 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-38-2 | Arsenic | 2 | ug/L | U | 2 | 5 | 5 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-39-3 | Barium | 27.8 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-41-7 | Beryllium | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-42-8 | Boron | 15 | ug/L | U | 15 | 50 | 50 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-43-9 | Cadmium | 0.30 | ug/L | U | 0.3 | 1 | 1 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-70-2 | Calcium | 10300 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-47-3 | Chromium | 3 | ug/L | U | 3 | 10 | 10 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-48-4 | Cobalt | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-50-8 | Copper | 3 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7439-89-6 | Iron | 30 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7439-92-1 | Lead | 0.50 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7439-95-4 | Magnesium | 2690 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7439-96-5 | Manganese | 2 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7439-98-7 | Molybdenum | 1.14 | ug/L | | 0.2 | 0.5 | 0.5 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-02-0 | Nickel | 0.60 | ug/L | U | 0.6 | 2 | 2 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-09-7 | Potassium | 1660 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7782-49-2 | Selenium | 2 | ug/L | U | 2 | 5 | 5 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7631-86-9 | Silica | 66200 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-22-4 | Silver | 0.30 | ug/L | U | 0.3 | 1 | 1 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-23-5 | Sodium | 11100 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 11/14/17 14:07 | 111417-2 | 1711147 |
| 7440-24-6 | Strontium | 41 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-28-0 | Thallium | 0.60 | ug/L | U | 0.6 | 2 | 2 | 1 | MS | PRB | 10/25/17 21:20 | 171025-4 | 1711153 |
| 7440-31-5 | Tin | 2.5 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-61-1 | Uranium | 0.317 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 10/26/17 10:07 | 171025-8 | 1711153 |
| 7440-62-2 | Vanadium | 5.97 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:05 | 111317-1 | 1711147 |
| 7440-66-6 | Zinc | 3.3 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 11/15/17 11:29 | 111517-3 | 1711147 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 435560004**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147565**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
| | Hardness as CaCO3 | 36.8 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/15/17 14:17 | | 1719308 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1711147 | 1711146 | SW846 3005A | 50 | mL | 50 | mL | 10/19/17 | JXM8 |
| 1711153 | 1711152 | SW846 3005A | 50 | mL | 50 | mL | 10/19/17 | JXM8 |
| 1716207 | 1716206 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/06/17 | AXS5 |

***Analytical Methods:**

P SW846 3005A/6010C
MS SW846 3005A/6020A
AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 435560005**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147591**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | 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 | 11/07/17 11:13 | 110717W1-9 | 1716207 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1716207 | 1716206 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/06/17 | AXS5 |

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 435560008**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147686**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | 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 | 11/07/17 11:15 | 110717W1-9 | 1716207 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 435560008

BASIS: As Received

DATE COLLECTED 17-OCT-17

CLIENT ID: CAPA-18-147686

LEVEL: Low

DATE RECEIVED 19-OCT-17

MATRIX: W

%SOLIDS: 0

| CAS | 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 | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-36-0 | Antimony | 1 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-38-2 | Arsenic | 2 | ug/L | U | 2 | 5 | 5 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-39-3 | Barium | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-41-7 | Beryllium | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-42-8 | Boron | 15 | ug/L | U | 15 | 50 | 50 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-43-9 | Cadmium | 0.30 | ug/L | U | 0.3 | 1 | 1 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-70-2 | Calcium | 50 | ug/L | U | 50 | 200 | 200 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-47-3 | Chromium | 3 | ug/L | U | 3 | 10 | 10 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-48-4 | Cobalt | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-50-8 | Copper | 3 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7439-89-6 | Iron | 30 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7439-92-1 | Lead | 0.50 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7439-95-4 | Magnesium | 110 | ug/L | U | 110 | 300 | 300 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7439-96-5 | Manganese | 2 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7439-98-7 | Molybdenum | 0.20 | ug/L | U | 0.2 | 0.5 | 0.5 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-02-0 | Nickel | 0.60 | ug/L | U | 0.6 | 2 | 2 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-09-7 | Potassium | 71.5 | ug/L | J | 50 | 150 | 150 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7782-49-2 | Selenium | 2 | ug/L | U | 2 | 5 | 5 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7631-86-9 | Silica | 53 | ug/L | U | 53 | 213 | 213 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-22-4 | Silver | 0.30 | ug/L | U | 0.3 | 1 | 1 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-23-5 | Sodium | 100 | ug/L | U | 100 | 300 | 300 | 1 | P | HSC | 11/14/17 14:10 | 111417-2 | 1711147 |
| 7440-24-6 | Strontium | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-28-0 | Thallium | 0.60 | ug/L | U | 0.6 | 2 | 2 | 1 | MS | PRB | 10/25/17 21:23 | 171025-4 | 1711153 |
| 7440-31-5 | Tin | 2.5 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-61-1 | Uranium | 0.067 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 10/26/17 10:08 | 171025-8 | 1711153 |
| 7440-62-2 | Vanadium | 1 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/13/17 17:08 | 111317-1 | 1711147 |
| 7440-66-6 | Zinc | 3.3 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 11/15/17 11:32 | 111517-3 | 1711147 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-496**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 435560008**BASIS:** As Received**DATE COLLECTED** 17-OCT-17**CLIENT ID:** CAPA-18-147686**LEVEL:** Low**DATE RECEIVED** 19-OCT-17**MATRIX:** W**%SOLIDS:** 0

| CAS | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
| | Hardness as CaCO3 | 0.453 | mg/L | U | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/15/17 14:17 | | 1719308 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1711147 | 1711146 | SW846 3005A | 50 | mL | 50 | mL | 10/19/17 | JXM8 |
| 1711153 | 1711152 | SW846 3005A | 50 | mL | 50 | mL | 10/19/17 | JXM8 |
| 1716207 | 1716206 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/06/17 | AXS5 |

Analytical Methods:*P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2018-496
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> |
|------------------|----------------|---------------|--------------|--------------------------|------------------|-----------|------------|------------|
| 1203900632 | 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 | 180 | ug/L | +/-300 | J | 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 |
| 1203900647 | Antimony | 1 | ug/L | +/-3 | U | MS | 1 | 3 |
| | Arsenic | 2 | ug/L | +/-5 | U | MS | 2 | 5 |
| | Cadmium | 0.3 | ug/L | +/-1 | U | MS | 0.3 | 1 |
| | Chromium | 3 | ug/L | +/-10 | U | MS | 3 | 10 |
| | Lead | 0.5 | ug/L | +/-2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.2 | ug/L | +/-0.5 | U | MS | 0.2 | 0.5 |
| | Selenium | 2 | ug/L | +/-5 | U | MS | 2 | 5 |
| | Nickel | 0.6 | ug/L | +/-2 | U | MS | 0.6 | 2 |
| | Silver | 0.3 | ug/L | +/-1 | U | MS | 0.3 | 1 |
| | Thallium | 0.6 | ug/L | +/-2 | U | MS | 0.6 | 2 |
| | Uranium | 0.067 | ug/L | +/-0.2 | U | MS | 0.067 | 0.2 |
| 1203913009 | 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. 2018-496

Client ID: CAMO-18-147644S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 435566001

Spike ID: 1203900635

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance Limit</u> | <u>Spiked Result</u> | <u>C</u> | <u>Sample Result</u> | <u>C</u> | <u>Spike Added</u> | <u>% Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Aluminum | ug/L | 75-125 | 4770 | | 68 | U | 5000 | 94.4 | | P |
| Barium | ug/L | 75-125 | 510 | | 31.8 | | 500 | 95.7 | | P |
| Beryllium | ug/L | 75-125 | 483 | | 1 | U | 500 | 96.6 | | P |
| Boron | ug/L | 75-125 | 516 | | 18.1 | J | 500 | 99.6 | | P |
| Calcium | ug/L | 75-125 | 22600 | | 17400 | | 5000 | 104 | | P |
| Cobalt | ug/L | 75-125 | 486 | | 1 | U | 500 | 97.2 | | P |
| Copper | ug/L | 75-125 | 488 | | 3 | U | 500 | 97.7 | | P |
| Iron | ug/L | 75-125 | 4720 | | 30 | U | 5000 | 94.4 | | P |
| Magnesium | ug/L | 75-125 | 9180 | | 4210 | | 5000 | 99.4 | | P |
| Manganese | ug/L | 75-125 | 478 | | 2 | U | 500 | 95.6 | | P |
| Potassium | ug/L | 75-125 | 6370 | | 1550 | | 5000 | 96.4 | | P |
| Silica | ug/L | | 76600 | | 65600 | | 10700 | 103 | N/A | P |
| Sodium | ug/L | 75-125 | 17200 | | 12000 | | 5000 | 105 | | P |
| Strontium | ug/L | 75-125 | 518 | | 68.2 | | 500 | 90 | | P |
| Tin | ug/L | 75-125 | 488 | | 3.6 | J | 500 | 96.8 | | P |
| Vanadium | ug/L | 75-125 | 489 | | 5.65 | | 500 | 96.7 | | P |
| Zinc | ug/L | 75-125 | 449 | | 3.3 | U | 500 | 89.8 | | P |

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-496

Client ID: CAPA-18-147564S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 435560001

Spike ID: 1203900650

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance Limit</u> | <u>Spiked Result</u> | <u>C</u> | <u>Sample Result</u> | <u>C</u> | <u>Spike Added</u> | <u>% Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Antimony | ug/L | 75-125 | 48.3 | | 1 | U | 50 | 95.9 | | MS |
| Arsenic | ug/L | 75-125 | 48.7 | | 2 | U | 50 | 94 | | MS |
| Cadmium | ug/L | 75-125 | 49.8 | | 0.3 | U | 50 | 99.6 | | MS |
| Chromium | ug/L | 75-125 | 51.6 | | 3 | U | 50 | 97.6 | | MS |
| Lead | ug/L | 75-125 | 49.1 | | 0.5 | U | 50 | 98.2 | | MS |
| Molybdenum | ug/L | 75-125 | 52.5 | | 1.43 | | 50 | 102 | | MS |
| Nickel | ug/L | 75-125 | 48.1 | | 0.6 | U | 50 | 95.7 | | MS |
| Selenium | ug/L | 75-125 | 47.8 | | 2 | U | 50 | 94.2 | | MS |
| Silver | ug/L | 75-125 | 52 | | 0.3 | U | 50 | 104 | | MS |
| Thallium | ug/L | 75-125 | 46.8 | | 0.6 | U | 50 | 93.4 | | MS |
| Uranium | ug/L | 75-125 | 50 | | 0.382 | | 50 | 99.2 | | MS |

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-496 Client ID CAMO-18-147644S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 435566001 Spike ID: 1203913013

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance Limit</u> | <u>Spiked Result</u> | <u>C</u> | <u>Sample Result</u> | <u>C</u> | <u>Spike Added</u> | <u>% Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Mercury | ug/L | 75-125 | 2.08 | | 0.067 | U | 2 | 104 | | AV |

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-496

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-147644D

Matrix: WATER

Level: Low

Sample ID: 435566001

Duplicate ID: 1203900634

Percent Solids for Dup: N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|-----------|-------|------------------|---------------|---|------------------|---|------|------|----|
| Aluminum | ug/L | | 68 U | | 68 U | | | | P |
| Barium | ug/L | +/-20% | 31.8 | | 31.4 | | 1.21 | | P |
| Beryllium | ug/L | | 1 U | | 1 U | | | | P |
| Boron | ug/L | +/-50 | 18.1 J | | 17.7 J | | 2.31 | | P |
| Calcium | ug/L | +/-20% | 17400 | | 17000 | | 2.24 | | 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% | 4210 | | 4130 | | 1.95 | | P |
| Manganese | ug/L | | 2 U | | 2 U | | | | P |
| Potassium | ug/L | +/-20% | 1550 | | 1530 | | 1.51 | | P |
| Silica | ug/L | +/-20% | 65600 | | 64900 | | 1.09 | | P |
| Sodium | ug/L | +/-20% | 12000 | | 11400 | | 4.79 | | P |
| Strontium | ug/L | +/-20% | 68.2 | | 66.4 | | 2.78 | | P |
| Tin | ug/L | | 3.6 J | | 2.5 U | | 200 | | P |
| Vanadium | ug/L | +/-5 | 5.65 | | 5.38 | | 4.84 | | P |
| Zinc | ug/L | | 3.3 U | | 3.3 U | | | | P |

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-496

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-18-147564D

Matrix: WATER

Level: Low

Sample ID: 435560001

Duplicate ID: 1203900649

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 | | 2 U | | 2 U | | | | MS |
| Cadmium | ug/L | | 0.3 U | | 0.3 U | | | | MS |
| Chromium | ug/L | | 3 U | | 3 U | | | | MS |
| Lead | ug/L | | 0.5 U | | 0.5 U | | | | MS |
| Molybdenum | ug/L | +/- .5 | 1.43 | | 1.37 | | 4.93 | | MS |
| Nickel | ug/L | | 0.6 U | | 0.6 U | | | | MS |
| Selenium | ug/L | | 2 U | | 2 U | | | | MS |
| Silver | ug/L | | 0.3 U | | 0.3 U | | | | MS |
| Thallium | ug/L | | 0.6 U | | 0.6 U | | | | MS |
| Uranium | ug/L | +/- .2 | 0.382 | | 0.354 | | 7.61 | | MS |

*Analytical Methods:

MS SW846 3005A/6020A

Metals
–6–
Duplicate Sample Summary

SDG No.: 2018–496**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–18–147644D**Matrix:** WATER**Level:** Low**Sample ID:** 435566001**Duplicate ID:** 1203913011**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-496

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203900633 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 4850 | | 97 | 80-120 | P |
| | Barium | ug/L | 500 | 487 | | 97.4 | 80-120 | P |
| | Beryllium | ug/L | 500 | 482 | | 96.4 | 80-120 | P |
| | Boron | ug/L | 500 | 494 | | 98.9 | 80-120 | P |
| | Calcium | ug/L | 5000 | 4890 | | 97.8 | 80-120 | P |
| | Cobalt | ug/L | 500 | 501 | | 100 | 80-120 | P |
| | Copper | ug/L | 500 | 486 | | 97.1 | 80-120 | P |
| | Iron | ug/L | 5000 | 4770 | | 95.5 | 80-120 | P |
| | Magnesium | ug/L | 5000 | 5060 | | 101 | 80-120 | P |
| | Manganese | ug/L | 500 | 489 | | 97.9 | 80-120 | P |
| | Potassium | ug/L | 5000 | 4860 | | 97.2 | 80-120 | P |
| | Silica | ug/L | 10700 | 9840 | | 91.9 | 80-120 | P |
| | Sodium | ug/L | 5000 | 5450 | | 109 | 80-120 | P |
| | Strontium | ug/L | 500 | 456 | | 91.2 | 80-120 | P |
| | Tin | ug/L | 500 | 484 | | 96.8 | 80-120 | P |
| | Vanadium | ug/L | 500 | 485 | | 97.1 | 80-120 | P |
| | Zinc | ug/L | 500 | 446 | | 89.2 | 80-120 | P |

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-496

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203900648 | | | | | | | | |
| | Antimony | ug/L | 50 | 47.7 | | 95.4 | 80-120 | MS |
| | Arsenic | ug/L | 50 | 48.6 | | 97.3 | 80-120 | MS |
| | Cadmium | ug/L | 50 | 48.8 | | 97.7 | 80-120 | MS |
| | Chromium | ug/L | 50 | 47.3 | | 94.5 | 80-120 | MS |
| | Lead | ug/L | 50 | 50 | | 99.9 | 80-120 | MS |
| | Molybdenum | ug/L | 50 | 49 | | 98 | 80-120 | MS |
| | Nickel | ug/L | 50 | 46.8 | | 93.6 | 80-120 | MS |
| | Selenium | ug/L | 50 | 48.4 | | 96.8 | 80-120 | MS |
| | Silver | ug/L | 50 | 50.5 | | 101 | 80-120 | MS |
| | Thallium | ug/L | 50 | 47.5 | | 94.9 | 80-120 | MS |
| | Uranium | ug/L | 50 | 51.3 | | 103 | 80-120 | MS |

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-496

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203913010 | Mercury | ug/L | 2 | 2.07 | | 104 | 85-115 | AV |

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-496

Client ID: CAMO-18-147644L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 435566001

Serial Dilution ID: 1203900636

| <u>Analyte</u> | <u>Initial Value ug/L</u> | <u>C</u> | <u>Serial Value ug/L</u> | <u>C</u> | <u>% Difference</u> | <u>Qual</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 31.8 | | 31.9 | | .507 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 18.1 | J | 75 | U | 22.211 | | | P |
| Calcium | 17400 | | 17500 | | .396 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 4210 | | 4400 | | 4.546 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 1550 | | 1800 | | 15.922 | | | P |
| Silica | 65600 | | 64900 | | 1.074 | | 10 | P |
| Sodium | 12000 | | 12900 | | 8.124 | | 10 | P |
| Strontium | 68.2 | | 63.8 | | 6.494 | | 10 | P |
| Tin | 3.6 | J | 12.5 | U | 169.775 | | | P |
| Vanadium | 5.65 | | 8.13 | J | 43.823 | | | P |
| Zinc | 3.3 | U | 28.8 | J | | | | P |

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-496

Client ID: CAPA-18-147564L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 435560001

Serial Dilution ID: 1203900651

| <u>Analyte</u> | <u>Initial Value ug/L</u> | <u>C</u> | <u>Serial Value ug/L</u> | <u>C</u> | <u>% Difference</u> | <u>Qual</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 2 | U | 10 | U | | | | MS |
| Cadmium | .3 | U | 1.5 | U | | | | MS |
| Chromium | 3 | U | 15 | U | | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 1.43 | | 1.52 | J | 5.649 | | | MS |
| Nickel | .6 | U | 3 | U | | | | MS |
| Selenium | 2 | U | 10 | U | | | | MS |
| Silver | .3 | U | 1.5 | U | | | | MS |
| Thallium | .6 | U | 3 | U | | | | MS |
| Uranium | .382 | | .42 | J | 9.948 | | | MS |

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-496 **Client ID:** CAMO-18-147644L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 435566001 **Serial Dilution ID:** 1203913015

| <u>Analyte</u> | <u>Initial Value ug/L</u> | <u>C</u> | <u>Serial Value ug/L</u> | <u>C</u> | <u>% Difference</u> | <u>Qual</u> | <u>Acceptance 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 #: 2018-496
Work Order #: 435560**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1711615

Method: SW 9060 Total Organic Carbon

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW-846:9060:

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203905559 | Method Blank (MB) |
| 1203905560 | Laboratory Control Sample (LCS) |
| 1203905562 | 436027004(CAPA-18-147598) Sample Duplicate (DUP) |
| 1203905564 | 436027004(CAPA-18-147598) 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# 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 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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436027004 (CAPA-18-147598) 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 where applicable.

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**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: | Cyanide and Total | | |
| Analytical Batch: | 1711659 | Method: | WSP-CN(T) |
| Prep Batch : | 1711658 | Method: | EPA 335.4 |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4 1993:

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203901815 | Method Blank (MB) |
| 1203901816 | Laboratory Control Sample (LCS) |
| 1203901817 | 435429002(CAMO-18-147649) Sample Duplicate (DUP) |
| 1203901818 | 435560002(CAPA-18-147590) Sample Duplicate (DUP) |
| 1203901819 | 435429002(CAMO-18-147649) Matrix Spike (MS) |
| 1203901820 | 435560002(CAPA-18-147590) 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# 20.

Preparation/Analytical Method Verification

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

Calibration Information

The 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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 435429002 (CAMO-18-147649) and 435560002 (CAPA-18-147590) 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 where applicable.

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

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: 1711177

Method: WSP-ANIONS

Sample Analysis

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

| Sample ID | Client ID |
|------------------|--|
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203900743 | Method Blank (MB) |
| 1203900744 | Laboratory Control Sample (LCS) |
| 1203900745 | 435566001(CAMO-18-147644) Sample Duplicate (DUP) |
| 1203900746 | 435566001(CAMO-18-147644) 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# 25.

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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 435566001 (CAMO-18-147644) 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 where applicable.

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

Manual Integrations

Samples 1203900745 (CAMO-18-147644DUP), 435560001 (CAPA-18-147564), 435560004 (CAPA-18-147565) and 435560008 (CAPA-18-147686) 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: 1712962 **Method:** NH3
Prep Batch : 1712955 **Method:** EPA 350.1 Prep

Sample Analysis

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

| Sample ID | Client ID |
|------------------|--|
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203904837 | Method Blank (MB) |
| 1203904838 | Laboratory Control Sample (LCS) |
| 1203904839 | 435584003(NonSDG) Sample Duplicate (DUP) |
| 1203904841 | 435584003(NonSDG) 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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 435584003 (NonSDG) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

| Analyte | Sample | Value |
|-------------------|----------------------------------|-----------------|
| Nitrogen, Ammonia | 1203904841 (Non SDG 435584003MS) | 121* (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 samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

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: | Total Kjeldahl Nitrogen | | |
| Analytical Batch: | 1712660 | Method: | TKN |
| Prep Batch : | 1712656 | Method: | EPA 351.2 Prep |

Sample Analysis

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

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203904066 | Method Blank (MB) |
| 1203904067 | Laboratory Control Sample (LCS) |
| 1203904070 | 435429002(CAMO-18-147649) Sample Duplicate (DUP) |
| 1203904071 | 435429002(CAMO-18-147649) 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.

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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 435429002 (CAMO-18-147649) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

| Analyte | Sample | Value |
|--------------------------|-------------------------------|------------------|
| Nitrogen, Total Kjeldahl | 1203904071 (CAMO-18-147649MS) | 83.9* (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 samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203904070 (CAMO-18-147649DUP), 1203904071 (CAMO-18-147649MS), 435560002 (CAPA-18-147590), 435560005 (CAPA-18-147591) and 435560008 (CAPA-18-147686) were re-analyzed due to

CCB failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information

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: 1711717

Method: NO3NO2

Sample Analysis

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

| Sample ID | Client ID |
|------------------|---|
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203901940 | Method Blank (MB) |
| 1203901941 | Laboratory Control Sample (LCS) |
| 1203901942 | 435719001(WST15-18-148144) Sample Duplicate (DUP) |
| 1203901944 | 435719001(WST15-18-148144) 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# 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+ 8500 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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 435719001 (WST15-18-148144) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.

| Analyte | Sample | Value |
|---------------------------|--------------------------------|------------------|
| Nitrogen, Nitrate/Nitrite | 1203901944 (WST15-18-148144PS) | 85.8* (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 samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

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: | Total Phosphorus | | |
| Analytical Batch: | 1712663 | Method: | PO4 |
| Prep Batch : | 1712662 | Method: | EPA 365.4 Prep |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4 1974:

| | |
|------------------|--|
| Sample ID | Client ID |
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203904074 | Method Blank (MB) |
| 1203904075 | Laboratory Control Sample (LCS) |
| 1203904076 | 435429001(CAMO-18-147634) Sample Duplicate (DUP) |
| 1203904077 | 435429001(CAMO-18-147634) 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+ 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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 435429001 (CAMO-18-147634) 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 where applicable.

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

Sample1203904074 (MB) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information**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: 1711941

Method: TDS

Sample Analysis

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

| Sample ID | Client ID |
|------------------|--|
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203902617 | Method Blank (MB) |
| 1203902618 | Laboratory Control Sample (LCS) |
| 1203902620 | 435558001(CTUA-17-142763) 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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 435558001 (CTUA-17-142763) 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**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: 1713570

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

| Sample ID | Client ID |
|------------------|---|
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203906355 | Laboratory Control Sample (LCS) |
| 1203906356 | 435410001(CAMO-18-147637) Sample Duplicate (DUP) |
| 1203906357 | 435722001(WST15-17-148253) 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# 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 Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 435410001 (CAMO-18-147637) and 435722001 (WST15-17-148253) 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

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**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: 1713318 **Method:** PH

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1 1982:

| Sample ID | Client ID |
|------------------|--|
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203905765 | Laboratory Control Sample (LCS) |
| 1203905766 | 435410001(CAMO-18-147637) Sample Duplicate (DUP) |
| 1203905767 | 435429001(CAMO-18-147634) 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# 22.

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 Thermo Orion Star A111. Immediates

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 435410001 (CAMO-18-147637) and 435429001 (CAMO-18-147634) 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 |
|--------------------------------|---------|--|
| 1203905766 (CAMO-18-147637DUP) | pH | Received 18-OCT-17, out of holding 16-OCT-17 |
| 1203905767 (CAMO-18-147634DUP) | pH | Received 18-OCT-17, out of holding 16-OCT-17 |
| 435560001 (CAPA-18-147564) | pH | Received 19-OCT-17, out of holding 17-OCT-17 |
| 435560004 (CAPA-18-147565) | pH | Received 19-OCT-17, out of holding 17-OCT-17 |
| 435560008 (CAPA-18-147686) | pH | Received 19-OCT-17, out of holding 17-OCT-17 |

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**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:

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Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1713308 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

| Sample ID | Client ID |
|------------------|--|
| 435560001 | CAPA-18-147564 |
| 435560004 | CAPA-18-147565 |
| 435560008 | CAPA-18-147686 |
| 1203905729 | Laboratory Control Sample (LCS) |
| 1203905732 | 435410001(CAMO-18-147637) Sample Duplicate (DUP) |
| 1203905734 | 435410001(CAMO-18-147637) 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# 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 Titration and Ion analysis was performed on a Electronic bottle-top buret.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 435410001 (CAMO-18-147637) 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 where applicable.

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**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

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: 2018-496 GEL Work Order: 435560


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, MDC 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: Aubrey Kingsbury

Date: 10 NOV 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-496

Client Sample ID: CAPA-18-147564
Sample ID: 435560001
Matrix: W
Collect Date: 17-OCT-17 11:39
Receive Date: 19-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|----------|------|----|---------|----------|------|---------|--------|
| Ion Chromatography | | | | | | | | | | | | |
| WSP-ANIONS "As Received" | | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | | 1 | JXH5 | 10/19/17 | 2019 | 1711177 | 1 |
| Chloride | | 2.70 | 0.067 | 0.200 | mg/L | | 1 | | | | | |
| Fluoride | | 0.260 | 0.033 | 0.100 | mg/L | | 1 | | | | | |
| Sulfate | | 3.92 | 0.133 | 0.400 | mg/L | | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | | |
| NH3 "As Received" | | | | | | | | | | | | |
| Nitrogen, Ammonia | U | ND | 0.017 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 10/27/17 | 0843 | 1712962 | 2 |
| NO3NO2 "As Received" | | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.724 | 0.017 | 0.050 | mg/L | | 1 | KLP1 | 10/23/17 | 1027 | 1711717 | 3 |
| PO4 "As Received" | | | | | | | | | | | | |
| Phosphorus, Total as P | | 0.0804 | 0.020 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 10/26/17 | 1048 | 1712663 | 4 |
| Solids Analysis | | | | | | | | | | | | |
| TDS "As Received" | | | | | | | | | | | | |
| Total Dissolved Solids | | 381 | 3.40 | 14.3 | mg/L | | | KLP1 | 10/24/17 | 1520 | 1711941 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 62.3 | 1.45 | 4.00 | mg/L | | | RXB5 | 10/27/17 | 1639 | 1713308 | 6 |
| Carbonate alkalinity (CaCO3) | U | ND | 1.45 | 4.00 | mg/L | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | | |
| Conductivity | | 139 | 1.00 | 1.00 | umhos/cm | | 1 | VH1 | 11/07/17 | 1531 | 1713570 | 7 |
| PH "As Received" | | | | | | | | | | | | |
| pH at Temp 7.60C | H | 8.07 | 0.010 | 0.100 | SU | | 1 | RXB5 | 10/27/17 | 1638 | 1713318 | 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 | 10/26/17 | 1154 | 1712955 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 10/25/17 | 1300 | 1712662 |

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Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-496

Client Sample ID: CAPA-18-147564
Sample ID: 435560001

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time | Batch | Method |
|--|----------------|--------|----|----|-------|------------------|----|---------|------|------|-------|--------|
| The following Analytical Methods were performed: | | | | | | | | | | | | |
| Method | Description | | | | | Analyst Comments | | | | | | |
| 1 | EPA:300.0 | | | | | | | | | | | |
| 2 | EPA:350.1 | | | | | | | | | | | |
| 3 | EPA:353.2 | | | | | | | | | | | |
| 4 | EPA 365.4 1974 | | | | | | | | | | | |
| 5 | EPA:160.1 | | | | | | | | | | | |
| 6 | EPA:310.1 | | | | | | | | | | | |
| 7 | EPA:120.1 | | | | | | | | | | | |
| 8 | EPA 150.1 1982 | | | | | | | | | | | |

Notes:

Column headers are defined as follows:

| | |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor | Lc/LC: Critical Level |
| DL: Detection Limit | PF: Prep Factor |
| MDA: Minimum Detectable Activity | RL: Reporting Limit |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

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Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-496

Client Sample ID: CAPA-18-147590
Sample ID: 435560002
Matrix: W
Collect Date: 17-OCT-17 11:39
Receive Date: 19-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | 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 | 11/01/17 | 1339 | 1711615 | 1 |
| Flow Injection Analysis | | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1.00 | 1 | AXH3 | 10/23/17 | 1117 | 1711659 | 2 |
| Nutrient Analysis | | | | | | | | | | | | |
| TKN "As Received" | | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.148 | 0.033 | 0.100 | mg/L | 1.00 | 1 | KLP1 | 10/25/17 | 1325 | 1712660 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 10/23/17 | 1106 | 1711658 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 10/25/17 | 1200 | 1712656 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|----------------|------------------|
| 1 | SW-846:9060 | |
| 2 | EPA 335.4 1993 | |
| 3 | EPA:351.2 | |

Notes:

Column headers are defined as follows:

| | |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor | Lc/LC: Critical Level |
| DL: Detection Limit | PF: Prep Factor |
| MDA: Minimum Detectable Activity | RL: Reporting Limit |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

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Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-496

Client Sample ID: CAPA-18-147565
Sample ID: 435560004
Matrix: W
Collect Date: 17-OCT-17 13:23
Receive Date: 19-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|----------|------|----|---------|----------|------|---------|--------|
| Ion Chromatography | | | | | | | | | | | | |
| WSP-ANIONS "As Received" | | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | | 1 | JXH5 | 10/19/17 | 2048 | 1711177 | 1 |
| Chloride | | 2.12 | 0.067 | 0.200 | mg/L | | 1 | | | | | |
| Fluoride | | 0.237 | 0.033 | 0.100 | mg/L | | 1 | | | | | |
| Sulfate | | 2.37 | 0.133 | 0.400 | mg/L | | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | | |
| NH3 "As Received" | | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.056 | 0.017 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 10/27/17 | 0844 | 1712962 | 2 |
| NO3NO2 "As Received" | | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.368 | 0.017 | 0.050 | mg/L | | 1 | KLP1 | 10/23/17 | 1028 | 1711717 | 3 |
| PO4 "As Received" | | | | | | | | | | | | |
| Phosphorus, Total as P | | 0.0837 | 0.020 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 10/26/17 | 1049 | 1712663 | 4 |
| Solids Analysis | | | | | | | | | | | | |
| TDS "As Received" | | | | | | | | | | | | |
| Total Dissolved Solids | | 127 | 3.40 | 14.3 | mg/L | | | KLP1 | 10/24/17 | 1520 | 1711941 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 58.9 | 1.45 | 4.00 | mg/L | | | RXB5 | 10/27/17 | 1641 | 1713308 | 6 |
| Carbonate alkalinity (CaCO3) | U | ND | 1.45 | 4.00 | mg/L | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | | |
| Conductivity | | 137 | 1.00 | 1.00 | umhos/cm | | 1 | VH1 | 11/07/17 | 1533 | 1713570 | 7 |
| PH "As Received" | | | | | | | | | | | | |
| pH at Temp 8.70C | H | 7.99 | 0.010 | 0.100 | SU | | 1 | RXB5 | 10/27/17 | 1640 | 1713318 | 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 | 10/26/17 | 1154 | 1712955 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 10/25/17 | 1300 | 1712662 |

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Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-496

Client Sample ID: CAPA-18-147565
Sample ID: 435560004

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time | Batch | Method |
|--|----------------|--------|----|----|-------|------------------|----|---------|------|------|-------|--------|
| The following Analytical Methods were performed: | | | | | | | | | | | | |
| Method | Description | | | | | Analyst Comments | | | | | | |
| 1 | EPA:300.0 | | | | | | | | | | | |
| 2 | EPA:350.1 | | | | | | | | | | | |
| 3 | EPA:353.2 | | | | | | | | | | | |
| 4 | EPA 365.4 1974 | | | | | | | | | | | |
| 5 | EPA:160.1 | | | | | | | | | | | |
| 6 | EPA:310.1 | | | | | | | | | | | |
| 7 | EPA:120.1 | | | | | | | | | | | |
| 8 | EPA 150.1 1982 | | | | | | | | | | | |

Notes:

Column headers are defined as follows:

| | |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor | Lc/LC: Critical Level |
| DL: Detection Limit | PF: Prep Factor |
| MDA: Minimum Detectable Activity | RL: Reporting Limit |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-496

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147591

Project: ESHL00114

Sample ID: 435560005

Client ID: ARSL004

Matrix: W

Collect Date: 17-OCT-17 13:23

Receive Date: 19-OCT-17

Collector: Client

| Parameter | Qualifier | Result | DL | RL | Units | PF | 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 | 11/01/17 | 1426 | 1711615 | 1 |
| Flow Injection Analysis | | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1.00 | 1 | AXH3 | 10/23/17 | 1124 | 1711659 | 2 |
| Nutrient Analysis | | | | | | | | | | | | |
| TKN "As Received" | | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1.00 | 1 | KLP1 | 10/25/17 | 1326 | 1712660 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 10/23/17 | 1106 | 1711658 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 10/25/17 | 1200 | 1712656 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|----------------|------------------|
| 1 | SW-846:9060 | |
| 2 | EPA 335.4 1993 | |
| 3 | EPA:351.2 | |

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-496

Client Sample ID: CAPA-18-147686
Sample ID: 435560008
Matrix: W
Collect Date: 17-OCT-17 08:45
Receive Date: 19-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | 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 | 11/01/17 | 1513 | 1711615 | 1 |
| Flow Injection Analysis | | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1.00 | 1 | AXH3 | 10/23/17 | 1125 | 1711659 | 2 |
| Ion Chromatography | | | | | | | | | | | | |
| WSP-ANIONS "As Received" | | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | | 1 | JXH5 | 10/19/17 | 2117 | 1711177 | 3 |
| Chloride | J | 0.101 | 0.067 | 0.200 | mg/L | | 1 | | | | | |
| Fluoride | U | ND | 0.033 | 0.100 | mg/L | | 1 | | | | | |
| Sulfate | U | ND | 0.133 | 0.400 | mg/L | | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | | |
| NH3 "As Received" | | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.0798 | 0.017 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 10/27/17 | 0845 | 1712962 | 4 |
| NO3NO2 "As Received" | | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | J | 0.0389 | 0.017 | 0.050 | mg/L | | 1 | KLP1 | 10/23/17 | 1029 | 1711717 | 5 |
| PO4 "As Received" | | | | | | | | | | | | |
| Phosphorus, Total as P | | 0.0648 | 0.020 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 10/26/17 | 1050 | 1712663 | 6 |
| TKN "As Received" | | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1.00 | 1 | KLP1 | 10/25/17 | 1327 | 1712660 | 7 |
| Solids Analysis | | | | | | | | | | | | |
| TDS "As Received" | | | | | | | | | | | | |
| Total Dissolved Solids | U | ND | 3.40 | 14.3 | mg/L | | | KLP1 | 10/24/17 | 1520 | 1711941 | 8 |
| Titration and Ion Analysis | | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | U | ND | 1.45 | 4.00 | mg/L | | | RXB5 | 10/27/17 | 1642 | 1713308 | 9 |
| Carbonate alkalinity (CaCO3) | U | ND | 1.45 | 4.00 | mg/L | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | | |
| Conductivity | | 1.50 | 1.00 | 1.00 | umhos/cm | | 1 | VH1 | 11/07/17 | 1534 | 1713570 | 10 |
| PH "As Received" | | | | | | | | | | | | |
| pH at Temp 8.40C | H | 5.93 | 0.010 | 0.100 | SU | | 1 | RXB5 | 10/27/17 | 1641 | 1713318 | 11 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|--------|-------------|---------|------|------|------------|
|--------|-------------|---------|------|------|------------|

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Certificate of Analysis

Report Date: November 10, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-496

Client Sample ID: CAPA-18-147686
Sample ID: 435560008

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time Batch | Method |
|----------------|-----------|--------------------------------|----|------|----------|----|------|---------|---------|------------|--------|
| EPA 335.4 | EPA 335.4 | Total Cyanide | | AXH3 | 10/23/17 | | 1106 | | 1711658 | | |
| EPA 350.1 Prep | EPA 350.1 | Ammonia Nitrogen Prep | | AXH3 | 10/26/17 | | 1154 | | 1712955 | | |
| EPA 351.2 Prep | EPA 351.2 | Total Kjeldahl Nitrogen Prep | | KLP1 | 10/25/17 | | 1200 | | 1712656 | | |
| EPA 365.4 Prep | EPA 365.4 | Phosphorus, Total in liquid PR | | KLP1 | 10/25/17 | | 1300 | | 1712662 | | |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|----------------|------------------|
| 1 | SW-846:9060 | |
| 2 | EPA 335.4 1993 | |
| 3 | EPA:300.0 | |
| 4 | EPA:350.1 | |
| 5 | EPA:353.2 | |
| 6 | EPA 365.4 1974 | |
| 7 | EPA:351.2 | |
| 8 | EPA:160.1 | |
| 9 | EPA:310.1 | |
| 10 | EPA:120.1 | |
| 11 | EPA 150.1 1982 | |

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: November 10, 2017

Page 1 of 6

Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 435560

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------------|-----------|--------|-------|-------|-------|------|------|-----------|------------|----------|-------|
| Carbon Analysis | | | | | | | | | | | |
| Batch | 1711615 | | | | | | | | | | |
| QC1203905562 | 436027004 | DUP | | | | | | | | | |
| Total Organic Carbon Average | J | 0.426 | J | 0.368 | mg/L | 14.6 | ^ | (+/-1.00) | TSM | 11/02/17 | 04:31 |
| QC1203905560 | LCS | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | 10.3 | mg/L | | | 103 | (80%-120%) | 11/01/17 | 13:28 |
| QC1203905559 | MB | | | | | | | | | | |
| Total Organic Carbon Average | | | U | ND | mg/L | | | | | 11/01/17 | 13:16 |
| QC1203905564 | 436027004 | PS | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.426 | 11.2 | mg/L | | | 108 | (75%-125%) | 11/02/17 | 05:18 |
| Flow Injection Analysis | | | | | | | | | | | |
| Batch | 1711659 | | | | | | | | | | |
| QC1203901817 | 435429002 | DUP | | | | | | | | | |
| Cyanide, Total | U | ND | U | ND | ug/L | N/A | | | AXH3 | 10/23/17 | 11:13 |
| QC1203901818 | 435560002 | DUP | | | | | | | | | |
| Cyanide, Total | U | ND | U | ND | ug/L | N/A | | | | 10/23/17 | 11:18 |
| QC1203901816 | LCS | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | 47.3 | ug/L | | | 94.6 | (90%-110%) | 10/23/17 | 11:10 |
| QC1203901815 | MB | | | | | | | | | | |
| Cyanide, Total | | | U | ND | ug/L | | | | | 10/23/17 | 11:09 |
| QC1203901819 | 435429002 | MS | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | 96.4 | ug/L | | | 96.4 | (90%-110%) | 10/23/17 | 11:14 |
| QC1203901820 | 435560002 | MS | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | 102 | ug/L | | | 102 | (90%-110%) | 10/23/17 | 11:19 |

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QC Summary

Workorder: 435560

Page 2 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------|-----------|--------|-------|----|-------|------|--------|------------|-------|----------|-------|
| Ion Chromatography | | | | | | | | | | | |
| Batch | 1711177 | | | | | | | | | | |
| QC1203900745 | 435566001 | DUP | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | JXH5 | 10/19/17 | 22:14 |
| Chloride | | | 4.17 | | 4.16 | mg/L | 0.147 | (0%-20%) | | | |
| Fluoride | | | 0.366 | | 0.342 | mg/L | 6.74 ^ | (+/-0.100) | | | |
| Sulfate | | | 5.50 | | 5.47 | mg/L | 0.563 | (0%-20%) | | | |
| QC1203900744 | LCS | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.22 | mg/L | 97.9 | (80%-120%) | | 10/19/17 | 19:21 |
| Chloride | 5.00 | | | | 4.81 | mg/L | 96.2 | (80%-120%) | | | |
| Fluoride | 2.50 | | | | 2.50 | mg/L | 100 | (80%-120%) | | | |
| Sulfate | 10.0 | | | | 9.73 | mg/L | 97.3 | (80%-120%) | | | |
| QC1203900743 | MB | | | | | | | | | | |
| Bromide | | | U | | ND | mg/L | | | | 10/19/17 | 18:52 |
| Chloride | | | U | | ND | mg/L | | | | | |
| Fluoride | | | U | | ND | mg/L | | | | | |
| Sulfate | | | U | | ND | mg/L | | | | | |
| QC1203900746 | 435566001 | PS | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.26 | mg/L | 96.3 | (75%-125%) | | 10/19/17 | 22:43 |
| Chloride | 5.00 | | 4.17 | | 9.65 | mg/L | 110 | (75%-125%) | | | |

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QC Summary

Workorder: 435560

Page 3 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------|-----------|--------|--------|------|--------|------|--------|------------|-------|----------|-------|
| Ion Chromatography | | | | | | | | | | | |
| Batch | 1711177 | | | | | | | | | | |
| Fluoride | 2.50 | 0.366 | | 3.00 | mg/L | | 105 | (75%-125%) | JXH5 | 10/19/17 | 22:43 |
| Sulfate | 10.0 | 5.50 | | 16.0 | mg/L | | 104 | (75%-125%) | | | |
| Nutrient Analysis | | | | | | | | | | | |
| Batch | 1711717 | | | | | | | | | | |
| QC1203901942 | 435719001 | DUP | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | U | ND | U | ND | mg/L | N/A | | KLP1 | 10/23/17 | 10:53 |
| QC1203901941 | LCS | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 1.08 | mg/L | 108 | (90%-110%) | | 10/23/17 | 10:19 |
| QC1203901940 | MB | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | U | | ND | mg/L | | | | 10/23/17 | 10:18 |
| QC1203901944 | 435719001 | PS | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | U | ND | | 0.858 | mg/L | 85.8 * | (90%-110%) | | 10/23/17 | 10:54 |
| Batch | 1712660 | | | | | | | | | | |
| QC1203904070 | 435429002 | DUP | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | KLP1 | 10/25/17 | 13:23 |
| QC1203904067 | LCS | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.00 | mg/L | 100 | (90%-110%) | | 10/25/17 | 12:56 |
| QC1203904066 | MB | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | U | | ND | mg/L | | | | 10/25/17 | 12:55 |
| QC1203904071 | 435429002 | MS | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.839 | mg/L | 83.9 * | (90%-110%) | | 10/25/17 | 13:24 |
| Batch | 1712663 | | | | | | | | | | |
| QC1203904076 | 435429001 | DUP | | | | | | | | | |
| Phosphorus, Total as P | | | 0.0679 | | 0.0691 | mg/L | 1.75 ^ | (+/-0.050) | KLP1 | 10/26/17 | 10:46 |

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QC Summary

Workorder: 435560

Page 4 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------|-----------|--------|------|--------|-------|------|-------|------------|-------|----------|-------|
| Nutrient Analysis | | | | | | | | | | | |
| Batch | 1712663 | | | | | | | | | | |
| QC1203904075 | LCS | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | 1.12 | mg/L | | 112 | (80%-124%) | KLP1 | 10/26/17 | 10:44 |
| QC1203904074 | MB | | | | | | | | | | |
| Phosphorus, Total as P | | | J | 0.036 | mg/L | | | | | 10/26/17 | 11:09 |
| QC1203904077 | 435429001 | MS | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | 0.0679 | | 1.28 | mg/L | | 121 | (63%-139%) | | 10/26/17 | 10:47 |
| Batch | 1712962 | | | | | | | | | | |
| QC1203904839 | 435584003 | DUP | | | | | | | | | |
| Nitrogen, Ammonia | | 0.196 | | 0.173 | mg/L | 12.5 | ^ | (+/-0.050) | KLP1 | 10/27/17 | 08:53 |
| QC1203904838 | LCS | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | 0.980 | mg/L | | 98 | (90%-110%) | | 10/27/17 | 08:39 |
| QC1203904837 | MB | | | | | | | | | | |
| Nitrogen, Ammonia | | | J | 0.0354 | mg/L | | | | | 10/27/17 | 08:38 |
| QC1203904841 | 435584003 | MS | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | 0.196 | | 1.41 | mg/L | | 121 * | (90%-110%) | | 10/27/17 | 08:54 |
| Solids Analysis | | | | | | | | | | | |
| Batch | 1711941 | | | | | | | | | | |
| QC1203902620 | 435558001 | DUP | | | | | | | | | |
| Total Dissolved Solids | | 249 | | 260 | mg/L | 4.49 | | (0%-5%) | KLP1 | 10/24/17 | 15:20 |
| QC1203902618 | LCS | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | 293 | mg/L | | 97.6 | (95%-105%) | | 10/24/17 | 15:20 |
| QC1203902617 | MB | | | | | | | | | | |
| Total Dissolved Solids | | | U | ND | mg/L | | | | | 10/24/17 | 15:20 |

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QC Summary

Workorder: 435560

Page 5 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------------------|-----------|--------|------|------|----------|-------|------|------------|-------|----------|-------|
| Titration and Ion Analysis | | | | | | | | | | | |
| Batch | 1713308 | | | | | | | | | | |
| QC1203905732 | 435410001 | DUP | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 62.5 | | 62.3 | mg/L | 0.32 | | (0%-20%) | RXB5 | 10/27/17 | 16:26 |
| Carbonate alkalinity (CaCO3) | U | ND | U | ND | mg/L | N/A | | | | | |
| QC1203905729 | LCS | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 100 | | | 106 | mg/L | | 106 | (90%-110%) | | 10/27/17 | 16:07 |
| QC1203905734 | 435410001 | MS | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 100 | 62.5 | | 163 | mg/L | | 101 | (80%-120%) | | 10/27/17 | 16:27 |
| Batch | 1713318 | | | | | | | | | | |
| QC1203905766 | 435410001 | DUP | | | | | | | | | |
| pH | H | 7.50 | H | 7.51 | SU | 0.133 | | (0%-5%) | RXB5 | 10/27/17 | 16:24 |
| QC1203905767 | 435429001 | DUP | | | | | | | | | |
| pH | H | 8.12 | H | 8.15 | SU | 0.369 | | (0%-5%) | | 10/27/17 | 16:28 |
| QC1203905765 | LCS | | | | | | | | | | |
| pH | 7.00 | | | 7.01 | SU | | 100 | (99%-101%) | | 10/27/17 | 16:07 |
| Batch | 1713570 | | | | | | | | | | |
| QC1203906356 | 435410001 | DUP | | | | | | | | | |
| Conductivity | | 151 | | 152 | umhos/cm | 0.397 | | (0%-10%) | VH1 | 11/07/17 | 15:28 |
| QC1203906357 | 435722001 | DUP | | | | | | | | | |
| Conductivity | | 167 | | 166 | umhos/cm | 0.3 | | (0%-10%) | | 11/07/17 | 15:54 |
| QC1203906355 | LCS | | | | | | | | | | |
| Conductivity | 1410 | | | 1410 | umhos/cm | | 99.4 | (95%-105%) | | 11/07/17 | 15:19 |

Notes:

- < Result is less than value reported
- > Result is greater than value reported

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QC Summary

Workorder: 435560

Page 6 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|---|--------|------|----|-------|------|------|-------|-------|------|------|
| 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 | | | | | | | | | | |
| 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, MDC 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.

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-496
Work Order #: 435560**

Method/Analysis Information

Product: Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1711133

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203900607 | Method Blank (MB) |
| 1203900609 | Laboratory Control Sample (LCS) |
| 1203900608 | 435410002(CAMO-18-147652) 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# 26.

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 October 2017.

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 1203900607 (MB) and 1203900609 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 435410002 (CAMO-18-147652). The QC was from ARSL work order 435410.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

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

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

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

Recounts

Sample 435560002 (CAPA-18-147590) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information:**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

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: ISOPU
Analytical Method: HASL-300:ISOPU
Analytical Batch Number: 1711134

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203900610 | Method Blank (MB) |
| 1203900612 | Laboratory Control Sample (LCS) |
| 1203900611 | 435410002(CAMO-18-147652) 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# 26.

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 October 2017.

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 1203900610 (MB) and 1203900612 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

| Sample | Analyte | Value |
|-----------------|----------------|-------------------------|
| 1203900610 (MB) | Plutonium-238 | Blank result > 1.65 CSU |

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 435410002 (CAMO-18-147652). The QC was from ARSL work order 435410.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

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

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

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:**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

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:

IsoU

Analytical Method: HASL-300:ISOU

Analytical Batch Number: 1711135

| Sample ID | Client ID |
|------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203900613 | Method Blank (MB) |
| 1203900615 | Laboratory Control Sample (LCS) |
| 1203900614 | 435410002(CAMO-18-147652) 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# 26.

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 October 2017.

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 1203900613 (MB) and 1203900615 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

| Sample | Analyte | Value |
|-----------------|---------------------------------|-------------------------|
| 1203900613 (MB) | Uranium-233/234 and Uranium-238 | Blank result > 1.65 CSU |

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

| Sample | Analyte | Value |
|-----------------|-----------------|-------------------|
| 1203900613 (MB) | Uranium-233/234 | Blank result > DL |

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 435410002 (CAMO-18-147652). The QC was from ARSL work order 435410.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

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

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

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

Recounts

Sample 1203900613 (MB) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:

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

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **Gammaspec**

Analytical Method: EPA:901.1

Analytical Batch Number: 1711850

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203902340 | Method Blank (MB) |
| 1203902342 | Laboratory Control Sample (LCS) |
| 1203902341 | 435410002(CAMO-18-147652) 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# 27.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2017, January 2017, July 2017, November 2016 and September 2017.

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.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 435410002 (CAMO-18-147652). The QC was from ARSL work order

435410.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

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:

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.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1714181

| Sample ID | Client ID |
|------------------|--|
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203907990 | Method Blank (MB) |
| 1203907993 | Laboratory Control Sample (LCS) |
| 1203907991 | 435560005(CAPA-18-147591) Sample Duplicate (DUP) |
| 1203907992 | 435560005(CAPA-18-147591) 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# 19.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in April 2016.

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 1203907990 (MB) and 1203907993 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 435560005 (CAPA-18-147591). The QC was from ARSL work order 435560.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

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

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

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

Recounts

Sample 435560005 (CAPA-18-147591) was recounted due to results more negative than the three sigma TPU. The second count is reported. Sample 435560002 (CAPA-18-147590) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:**Sample-Specific MDA/MDC**

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

Additional Comments

The matrix spike, 1203907992 (CAPA-18-147591MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|--------------------------|----------------------|
| Product: | WSP-GrossA/B |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1714187 |

| | |
|------------------|--|
| Sample ID | Client ID |
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203907999 | Method Blank (MB) |
| 1203908003 | Laboratory Control Sample (LCS) |
| 1203908000 | 435566006(CAMO-18-147684) Sample Duplicate (DUP) |
| 1203908001 | 435566006(CAMO-18-147684) Matrix Spike (MS) |
| 1203908002 | 435566006(CAMO-18-147684) 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# 19.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 2016.

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 1203907999 (MB) and 1203908003 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 435566006 (CAMO-18-147684). The QC was from ARSL work order 435566.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between MS and MSD

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) met the duplication acceptance criteria.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

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

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

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

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:**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, 1203908001 (CAMO-18-147684MS) and 1203908002 (CAMO-18-147684MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|--------------------------|----------------------|
| Product: | WSP-GrossA/B |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1717894 |

| | |
|------------------|--|
| Sample ID | Client ID |
| 435560002 | CAPA-18-147590 |
| 435560005 | CAPA-18-147591 |
| 435560008 | CAPA-18-147686 |
| 1203917214 | Method Blank (MB) |
| 1203917218 | Laboratory Control Sample (LCS) |
| 1203917215 | 435429002(CAMO-18-147649) Sample Duplicate (DUP) |
| 1203917216 | 435429002(CAMO-18-147649) Matrix Spike (MS) |
| 1203917217 | 435429002(CAMO-18-147649) 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# 19.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 2016.

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 1203917214 (MB) and 1203917218 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

| Sample | Analyte | Value |
|-----------------|---------|-------------------------|
| 1203917214 (MB) | ALPHA | Blank result > 1.65 CSU |

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

| Sample | Analyte | Value |
|-----------------|---------|-------------------|
| 1203917214 (MB) | ALPHA | Blank result > DL |

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 435429002 (CAMO-18-147649). The QC was from ARSL work order 435429.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between MS and MSD

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) met the duplication acceptance criteria.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

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

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

Samples were reprepared due to low recovery. The re-analysis is being reported.

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 1203917217 (CAMO-18-147649MSD) was recounted due to low recovery. The recount is reported.

Sample 1203917215 (CAMO-18-147649DUP) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

Miscellaneous Information:**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, 1203917216 (CAMO-18-147649MS) and 1203917217 (CAMO-18-147649MSD), aliquots were reduced to conserve sample volume.

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: 2018-496 GEL Work Order: 435560

The Qualifiers in this report are defined as follows:

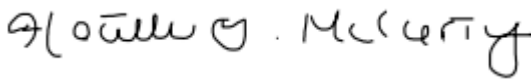
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

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: Heather McCarty

Date: 14 NOV 2017

Title: Analyst II

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-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Report Date: November 14, 2017

Client Sample ID: CAPA-18-147590
Sample ID: 435560002
Matrix: W
Collect Date: 17-OCT-17
Receive Date: 19-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | PF | DF | Analyst | Date | Time | Batch | Mtd. |
|---|-----------|---------|-------------|--------|--------|------------|-------|-------|----|----|---------|----------|------|---------|------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | | | | |
| <i>Alphaspec Am241 Liquid "As Received"</i> | | | | | | | | | | | | | | | |
| Americium-241 | U | -0.0095 | +/-0.00823 | 0.0416 | 0.0176 | +/-0.00823 | 0.050 | pCi/L | | | HAKB | 10/25/17 | 1207 | 1711133 | 1 |
| <i>ISOPU "As Received"</i> | | | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00565 | +/-0.00498 | 0.0326 | 0.0138 | +/-0.00499 | 0.050 | pCi/L | | | HAKB | 10/24/17 | 1010 | 1711134 | 2 |
| Plutonium-239/240 | U | -0.0207 | +/-0.00941 | 0.0423 | 0.0186 | +/-0.00941 | 0.050 | pCi/L | | | | | | | |
| <i>IsoU "As Received"</i> | | | | | | | | | | | | | | | |
| Uranium-234 | | 0.475 | +/-0.0408 | 0.0703 | 0.0306 | +/-0.0477 | 1.00 | pCi/L | | | HAKB | 10/24/17 | 1020 | 1711135 | 3 |
| Uranium-235/236 | | 0.127 | +/-0.0269 | 0.0748 | 0.0318 | +/-0.0277 | 1.00 | pCi/L | | | | | | | |
| Uranium-238 | | 0.315 | +/-0.034 | 0.068 | 0.0295 | +/-0.0378 | 0.500 | pCi/L | | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | | | | |
| <i>Gammasespec "As Received"</i> | | | | | | | | | | | | | | | |
| Cesium-137 | U | -1.06 | +/-1.21 | 4.16 | 1.76 | +/-1.23 | 8.00 | pCi/L | | | MXR1 | 11/03/17 | 1241 | 1711850 | 4 |
| Cobalt-60 | U | 1.23 | +/-1.16 | 5.36 | 2.21 | +/-1.20 | 8.00 | pCi/L | | | | | | | |
| Neptunium-237 | U | -1.27 | +/-2.54 | 8.18 | 3.67 | +/-2.56 | | pCi/L | | | | | | | |
| Potassium-40 | U | -14.6 | +/-15.8 | 65.9 | 28.2 | +/-16.1 | | pCi/L | | | | | | | |
| Sodium-22 | U | 0.160 | +/-1.16 | 4.85 | 1.97 | +/-1.16 | | pCi/L | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | | | |
| <i>GFPC, Sr90, liquid "As Received"</i> | | | | | | | | | | | | | | | |
| Strontium-90 | U | -0.0931 | +/-0.118 | 0.477 | 0.207 | +/-0.118 | 0.500 | pCi/L | | | LXB3 | 11/09/17 | 1525 | 1714181 | 5 |
| <i>WSP-GrossA/B "As Received"</i> | | | | | | | | | | | | | | | |
| Beta | | 3.75 | +/-0.666 | 1.91 | 0.895 | +/-0.737 | 3.00 | pCi/L | | | AXH4 | 11/08/17 | 1209 | 1714187 | 6 |
| Alpha | U | 0.369 | +/-0.706 | 2.78 | 1.02 | +/-0.707 | 3.00 | pCi/L | | | AXH4 | 11/11/17 | 1410 | 1717894 | 7 |

The following Analytical Methods were performed

| Method | Description |
|--------|----------------------|
| 1 | HASL-300:AM-241 |
| 2 | HASL-300:ISOPU |
| 3 | HASL-300:ISOU |
| 4 | EPA:901.1 |
| 5 | EPA:905.0 |
| 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" | 1711133 | 83.7 | (50%-105%) |
| Plutonium-242 Tracer | ISOPU "As Received" | 1711134 | 86.4 | (50%-105%) |
| Uranium-232 Tracer | IsoU "As Received" | 1711135 | 62.8 | (50%-105%) |

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147590

Sample ID: 435560002

Project: ESHL00114

Client ID: ARSL004

Report Date: November 14, 2017

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | PF | DF | Analyst | Date | Time | Batch | Mtd. |
|-------------------|-----------|----------------------------------|-------------|-----|----|-----|----|-------|----------|-----------|-------------------|------|------|-------|------|
| Surrogate/Tracer | Recovery | Test | | | | | | | Batch ID | Recovery% | Acceptable Limits | | | | |
| Strontium Carrier | | GFPC, Sr90, liquid "As Received" | | | | | | | 1714181 | 86.6 | (50%-105%) | | | | |

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147591

Sample ID: 435560005

Matrix: W

Collect Date: 17-OCT-17

Receive Date: 19-OCT-17

Collector: Client

Report Date: November 14, 2017

Project: ESHL00114

Client ID: ARSL004

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

Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

| | | | | | | | | | | | | | | | |
|---------------|---|---------|------------|--------|--------|------------|-------|-------|--|--|------|----------|------|---------|---|
| Americium-241 | U | 0.00441 | +/-0.00623 | 0.0386 | 0.0163 | +/-0.00624 | 0.050 | pCi/L | | | HAKB | 10/24/17 | 1011 | 1711133 | 1 |
|---------------|---|---------|------------|--------|--------|------------|-------|-------|--|--|------|----------|------|---------|---|

ISOPU "As Received"

| | | | | | | | | | | | | | | | |
|---------------|---|--------|------------|--------|--------|------------|-------|-------|--|--|------|----------|------|---------|---|
| Plutonium-238 | U | 0.0106 | +/-0.00766 | 0.0368 | 0.0155 | +/-0.00768 | 0.050 | pCi/L | | | HAKB | 10/24/17 | 1010 | 1711134 | 2 |
|---------------|---|--------|------------|--------|--------|------------|-------|-------|--|--|------|----------|------|---------|---|

| | | | | | | | | | | | | | | | |
|-------------------|---|---------|-----------|--------|-------|-----------|-------|-------|--|--|--|--|--|--|--|
| Plutonium-239/240 | U | -0.0361 | +/-0.0129 | 0.0478 | 0.021 | +/-0.0129 | 0.050 | pCi/L | | | | | | | |
|-------------------|---|---------|-----------|--------|-------|-----------|-------|-------|--|--|--|--|--|--|--|

IsoU "As Received"

| | | | | | | | | | | | | | | | |
|-------------|--|-------|----------|--------|--------|-----------|------|-------|--|--|------|----------|------|---------|---|
| Uranium-234 | | 0.364 | +/-0.031 | 0.0518 | 0.0226 | +/-0.0357 | 1.00 | pCi/L | | | HAKB | 10/24/17 | 1020 | 1711135 | 3 |
|-------------|--|-------|----------|--------|--------|-----------|------|-------|--|--|------|----------|------|---------|---|

| | | | | | | | | | | | | | | | |
|-----------------|--|-------|-----------|--------|--------|-----------|------|-------|--|--|--|--|--|--|--|
| Uranium-235/236 | | 0.106 | +/-0.0184 | 0.0551 | 0.0235 | +/-0.0191 | 1.00 | pCi/L | | | | | | | |
|-----------------|--|-------|-----------|--------|--------|-----------|------|-------|--|--|--|--|--|--|--|

| | | | | | | | | | | | | | | | |
|-------------|--|-------|-----------|--------|--------|-----------|-------|-------|--|--|--|--|--|--|--|
| Uranium-238 | | 0.176 | +/-0.0227 | 0.0501 | 0.0217 | +/-0.0243 | 0.500 | pCi/L | | | | | | | |
|-------------|--|-------|-----------|--------|--------|-----------|-------|-------|--|--|--|--|--|--|--|

Rad Gamma Spec Analysis

Gammasespec "As Received"

| | | | | | | | | | | | | | | | |
|------------|---|------|---------|------|------|---------|------|-------|--|--|------|----------|------|---------|---|
| Cesium-137 | U | 3.49 | +/-1.59 | 6.75 | 3.02 | +/-1.79 | 8.00 | pCi/L | | | MXR1 | 11/03/17 | 1242 | 1711850 | 4 |
|------------|---|------|---------|------|------|---------|------|-------|--|--|------|----------|------|---------|---|

| | | | | | | | | | | | | | | | |
|-----------|---|-------|---------|------|------|---------|------|-------|--|--|--|--|--|--|--|
| Cobalt-60 | U | -1.09 | +/-1.19 | 4.24 | 1.56 | +/-1.22 | 8.00 | pCi/L | | | | | | | |
|-----------|---|-------|---------|------|------|---------|------|-------|--|--|--|--|--|--|--|

| | | | | | | | | | | | | | | | |
|---------------|---|-------|---------|------|------|---------|--|-------|--|--|--|--|--|--|--|
| Neptunium-237 | U | -1.08 | +/-2.17 | 7.88 | 3.51 | +/-2.18 | | pCi/L | | | | | | | |
|---------------|---|-------|---------|------|------|---------|--|-------|--|--|--|--|--|--|--|

| | | | | | | | | | | | | | | | |
|--------------|---|-------|---------|------|------|---------|--|-------|--|--|--|--|--|--|--|
| Potassium-40 | U | -19.9 | +/-17.9 | 61.7 | 25.4 | +/-18.5 | | pCi/L | | | | | | | |
|--------------|---|-------|---------|------|------|---------|--|-------|--|--|--|--|--|--|--|

| | | | | | | | | | | | | | | | |
|-----------|---|-------|---------|------|------|---------|--|-------|--|--|--|--|--|--|--|
| Sodium-22 | U | -0.91 | +/-1.55 | 5.68 | 2.30 | +/-1.56 | | pCi/L | | | | | | | |
|-----------|---|-------|---------|------|------|---------|--|-------|--|--|--|--|--|--|--|

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

| | | | | | | | | | | | | | | | |
|--------------|---|----------|----------|-------|-------|----------|-------|-------|--|--|------|----------|------|---------|---|
| Strontium-90 | U | -0.00159 | +/-0.121 | 0.457 | 0.200 | +/-0.121 | 0.500 | pCi/L | | | LXB3 | 11/09/17 | 1525 | 1714181 | 5 |
|--------------|---|----------|----------|-------|-------|----------|-------|-------|--|--|------|----------|------|---------|---|

WSP-GrossA/B "As Received"

| | | | | | | | | | | | | | | | |
|------|--|------|----------|------|-------|----------|------|-------|--|--|------|----------|------|---------|---|
| Beta | | 3.21 | +/-0.625 | 1.79 | 0.836 | +/-0.679 | 3.00 | pCi/L | | | AXH4 | 11/08/17 | 1207 | 1714187 | 6 |
|------|--|------|----------|------|-------|----------|------|-------|--|--|------|----------|------|---------|---|

| | | | | | | | | | | | | | | | |
|-------|--|------|---------|------|------|---------|------|-------|--|--|------|----------|------|---------|---|
| Alpha | | 4.96 | +/-1.26 | 2.73 | 1.01 | +/-1.33 | 3.00 | pCi/L | | | AXH4 | 11/11/17 | 1410 | 1717894 | 7 |
|-------|--|------|---------|------|------|---------|------|-------|--|--|------|----------|------|---------|---|

The following Analytical Methods were performed

| Method | Description |
|--------|----------------------|
| 1 | HASL-300:AM-241 |
| 2 | HASL-300:ISOPU |
| 3 | HASL-300:ISOU |
| 4 | EPA:901.1 |
| 5 | EPA:905.0 |
| 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" | 1711133 | 83.8 | (50%-105%) |
| Plutonium-242 Tracer | | ISOPU "As Received" | 1711134 | 76 | (50%-105%) |
| Uranium-232 Tracer | | IsoU "As Received" | 1711135 | 72 | (50%-105%) |
| Strontium Carrier | | GFPC, Sr90, liquid "As Received" | 1714181 | 94.3 | (50%-105%) |

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147591

Sample ID: 435560005

Project: ESHL00114

Client ID: ARSL004

Report Date: November 14, 2017

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Certificate of Analysis

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147686

Sample ID: 435560008

Matrix: W

Collect Date: 17-OCT-17

Receive Date: 19-OCT-17

Collector: Client

Report Date: November 14, 2017

Project: ESHL00114

Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | PF | DF | Analyst | Date | Time | Batch | Mtd. |
|---|-----------|----------|-------------|--------|--------|------------|-------|-------|----|----|---------|----------|------|---------|------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | | | | |
| <i>Alphaspec Am241 Liquid "As Received"</i> | | | | | | | | | | | | | | | |
| Americium-241 | U | 0.0125 | +/-0.00591 | 0.0366 | 0.0155 | +/-0.00593 | 0.050 | pCi/L | | | HAKB | 10/24/17 | 1011 | 1711133 | 1 |
| <i>ISOPU "As Received"</i> | | | | | | | | | | | | | | | |
| Plutonium-238 | U | 7.02E-09 | +/-0.014 | 0.0384 | 0.0162 | +/-0.014 | 0.050 | pCi/L | | | HAKB | 10/24/17 | 1010 | 1711134 | 2 |
| Plutonium-239/240 | U | -0.0133 | +/-0.0121 | 0.0498 | 0.0219 | +/-0.0121 | 0.050 | pCi/L | | | | | | | |
| <i>IsoU "As Received"</i> | | | | | | | | | | | | | | | |
| Uranium-234 | | 0.159 | +/-0.0213 | 0.0535 | 0.0233 | +/-0.0227 | 1.00 | pCi/L | | | HAKB | 10/24/17 | 1020 | 1711135 | 3 |
| Uranium-235/236 | | 0.0718 | +/-0.0156 | 0.0569 | 0.0242 | +/-0.016 | 1.00 | pCi/L | | | | | | | |
| Uranium-238 | | 0.0682 | +/-0.0141 | 0.0517 | 0.0224 | +/-0.0145 | 0.500 | pCi/L | | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | | | | |
| <i>Gammasespec "As Received"</i> | | | | | | | | | | | | | | | |
| Cesium-137 | U | -1.56 | +/-1.48 | 5.12 | 2.22 | +/-1.53 | 8.00 | pCi/L | | | MXR1 | 11/03/17 | 1242 | 1711850 | 4 |
| Cobalt-60 | U | 1.56 | +/-1.47 | 6.50 | 2.72 | +/-1.51 | 8.00 | pCi/L | | | | | | | |
| Neptunium-237 | U | -0.765 | +/-2.75 | 8.72 | 3.92 | +/-2.76 | | pCi/L | | | | | | | |
| Potassium-40 | U | 18.1 | +/-21.9 | 86.5 | 38.0 | +/-22.3 | | pCi/L | | | | | | | |
| Sodium-22 | U | 0.398 | +/-1.46 | 5.99 | 2.49 | +/-1.47 | | pCi/L | | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | | | | |
| <i>GFPC, Sr90, liquid "As Received"</i> | | | | | | | | | | | | | | | |
| Strontium-90 | U | 0.363 | +/-0.141 | 0.443 | 0.200 | +/-0.144 | 0.500 | pCi/L | | | LXB3 | 11/09/17 | 0947 | 1714181 | 5 |
| <i>WSP-GrossA/B "As Received"</i> | | | | | | | | | | | | | | | |
| Beta | U | 1.29 | +/-0.609 | 1.98 | 0.931 | +/-0.619 | 3.00 | pCi/L | | | AXH4 | 11/08/17 | 1207 | 1714187 | 6 |
| Alpha | U | 1.39 | +/-0.718 | 2.20 | 0.827 | +/-0.728 | 3.00 | pCi/L | | | AXH4 | 11/11/17 | 1411 | 1717894 | 7 |

The following Analytical Methods were performed

| Method | Description |
|--------|----------------------|
| 1 | HASL-300:AM-241 |
| 2 | HASL-300:ISOPU |
| 3 | HASL-300:ISOU |
| 4 | EPA:901.1 |
| 5 | EPA:905.0 |
| 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" | 1711133 | 102 | (50%-105%) |
| Plutonium-242 Tracer | | ISOPU "As Received" | 1711134 | 72.6 | (50%-105%) |
| Uranium-232 Tracer | | IsoU "As Received" | 1711135 | 69.8 | (50%-105%) |
| Strontium Carrier | | GFPC, Sr90, liquid "As Received" | 1714181 | 89.2 | (50%-105%) |

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Certificate of Analysis

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147686

Sample ID: 435560008

Project: ESHL00114

Client ID: ARSL004

Report Date: November 14, 2017

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

Notes:

The MDC is a sample specific MDC.

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

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: November 14, 2017

Page 1 of 6

Client : Los Alamos National Laboratory
TA-00, SM1237, Rm104C

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 435560

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date | Time |
|------------------------|-----------|------------|------|------------|-------|-------|------|------------|-------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 1711133 | | | | | | | | | | |
| QC1203900608 | 435410002 | DUP | | | | | | | | | |
| Americium-241 | U | -0.00227 | U | 0.00197 | pCi/L | 0.151 | | (0-1) | HAKB | 10/24/17 | 10:11 |
| | Uncert: | +/-0.00752 | | +/-0.00653 | | | | | | | |
| | TPU: | +/-0.00752 | | +/-0.00653 | | | | | | | |
| **Americium-243 Tracer | 2.62 | 2.03 | | 2.25 | pCi/L | | 86 | (50%-105%) | | | |
| | Uncert: | +/-0.0778 | | +/-0.0719 | | | | | | | |
| | TPU: | +/-0.141 | | +/-0.134 | | | | | | | |
| QC1203900609 | LCS | | | | | | | | | | |
| Americium-241 | 1.97 | | | 1.99 | pCi/L | | 101 | (80%-120%) | HAKB | 10/24/17 | 10:11 |
| | Uncert: | | | +/-0.0568 | | | | | | | |
| | TPU: | | | +/-0.103 | | | | | | | |
| **Americium-243 Tracer | 2.10 | | | 1.87 | pCi/L | | 89.1 | (50%-105%) | | | |
| | Uncert: | | | +/-0.0581 | | | | | | | |
| | TPU: | | | +/-0.108 | | | | | | | |
| QC1203900607 | MB | | | | | | | | | | |
| Americium-241 | | | U | -0.0087 | pCi/L | | | | HAKB | 10/24/17 | 10:11 |
| | Uncert: | | | +/-0.00754 | | | | | | | |
| | TPU: | | | +/-0.00754 | | | | | | | |
| **Americium-243 Tracer | 2.10 | | | 1.53 | pCi/L | | 73.1 | (50%-105%) | | | |
| | Uncert: | | | +/-0.0675 | | | | | | | |
| | TPU: | | | +/-0.119 | | | | | | | |
| Batch | 1711134 | | | | | | | | | | |
| QC1203900611 | 435410002 | DUP | | | | | | | | | |
| Plutonium-238 | U | 0.0131 | U | 0.00216 | pCi/L | 0.457 | | (0-1) | HAKB | 10/24/17 | 10:10 |
| | Uncert: | +/-0.00814 | | +/-0.00374 | | | | | | | |
| | TPU: | +/-0.00817 | | +/-0.00374 | | | | | | | |
| Plutonium-239/240 | U | 0.0087 | U | -0.0173 | pCi/L | 0.802 | | (0-1) | | | |
| | Uncert: | +/-0.00754 | | +/-0.00864 | | | | | | | |
| | TPU: | +/-0.00755 | | +/-0.00864 | | | | | | | |
| **Plutonium-242 Tracer | 2.47 | 2.14 | | 1.82 | pCi/L | | 73.9 | (50%-105%) | | | |
| | Uncert: | +/-0.0736 | | +/-0.0732 | | | | | | | |
| | TPU: | +/-0.150 | | +/-0.150 | | | | | | | |
| QC1203900612 | LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.00954 | pCi/L | | | (80%-120%) | HAKB | 10/24/17 | 10:10 |
| | Uncert: | | | +/-0.00636 | | | | | | | |
| | TPU: | | | +/-0.00638 | | | | | | | |
| Plutonium-239/240 | 1.98 | | | 1.83 | pCi/L | | 92.5 | (80%-120%) | | | |
| | Uncert: | | | +/-0.0542 | | | | | | | |
| | TPU: | | | +/-0.110 | | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.71 | pCi/L | | 86.8 | (50%-105%) | | | |
| | Uncert: | | | +/-0.0562 | | | | | | | |
| | TPU: | | | +/-0.118 | | | | | | | |

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QC Summary

Workorder: 435560

Page 2 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date | Time |
|------------------------|---------------|-------------------|------|-------------------|-------|-------|------|------------|-------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 1711134 | | | | | | | | | | |
| QC1203900610 | MB | | | | | | | | | | |
| Plutonium-238 | | | U | 0.013 | pCi/L | | | | HAKB | 10/24/17 | 10:10 |
| | | | | Uncert: +/-0.0075 | | | | | | | |
| | | | | TPU: +/-0.00753 | | | | | | | |
| Plutonium-239/240 | | | U | 0.00 | pCi/L | | | | | | |
| | | | | Uncert: +/-0.0075 | | | | | | | |
| | | | | TPU: +/-0.0075 | | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.19 | pCi/L | | 60.3 | (50%-105%) | | | |
| | | | | Uncert: +/-0.066 | | | | | | | |
| | | | | TPU: +/-0.127 | | | | | | | |
| Batch | 1711135 | | | | | | | | | | |
| QC1203900614 | 435410002 DUP | | | | | | | | | | |
| Uranium-234 | | 0.384 | | 0.418 | pCi/L | 0.214 | | (0-1) | HAKB | 10/24/17 | 10:20 |
| | | Uncert: +/-0.0329 | | +/-0.036 | | | | | | | |
| | | TPU: +/-0.0379 | | +/-0.0416 | | | | | | | |
| Uranium-235/236 | | 0.146 | | 0.122 | pCi/L | 0.265 | | (0-1) | | | |
| | | Uncert: +/-0.0232 | | +/-0.0211 | | | | | | | |
| | | TPU: +/-0.0243 | | +/-0.0219 | | | | | | | |
| Uranium-238 | | 0.210 | | 0.240 | pCi/L | 0.258 | | (0-1) | | | |
| | | Uncert: +/-0.025 | | +/-0.0272 | | | | | | | |
| | | TPU: +/-0.027 | | +/-0.0296 | | | | | | | |
| **Uranium-232 Tracer | 2.62 | 1.93 | | 1.69 | pCi/L | | 64.5 | (50%-105%) | | | |
| | | Uncert: +/-0.0841 | | +/-0.0865 | | | | | | | |
| | | TPU: +/-0.154 | | +/-0.156 | | | | | | | |
| QC1203900615 | LCS | | | | | | | | | | |
| Uranium-234 | | | | 2.92 | pCi/L | | | | HAKB | 10/24/17 | 10:20 |
| | | Uncert: +/-0.0752 | | +/-0.0752 | | | | | | | |
| | | TPU: +/-0.160 | | +/-0.160 | | | | | | | |
| Uranium-235/236 | | | | 0.299 | pCi/L | | | | | | |
| | | Uncert: +/-0.0274 | | +/-0.0274 | | | | | | | |
| | | TPU: +/-0.031 | | +/-0.031 | | | | | | | |
| Uranium-238 | 2.70 | | | 3.03 | pCi/L | | 112 | (80%-120%) | | | |
| | | Uncert: +/-0.0763 | | +/-0.0763 | | | | | | | |
| | | TPU: +/-0.165 | | +/-0.165 | | | | | | | |
| **Uranium-232 Tracer | 2.10 | | | 1.53 | pCi/L | | 73 | (50%-105%) | | | |
| | | Uncert: +/-0.0649 | | +/-0.0649 | | | | | | | |
| | | TPU: +/-0.120 | | +/-0.120 | | | | | | | |
| QC1203900613 | MB | | | | | | | | | | |
| Uranium-234 | | | U | 0.0616 | pCi/L | | | | HAKB | 10/26/17 | 08:57 |
| | | Uncert: +/-0.0284 | | +/-0.0284 | | | | | | | |
| | | TPU: +/-0.0287 | | +/-0.0287 | | | | | | | |
| Uranium-235/236 | | | U | 0.0179 | pCi/L | | | | | | |
| | | Uncert: +/-0.0156 | | +/-0.0156 | | | | | | | |
| | | TPU: +/-0.0156 | | +/-0.0156 | | | | | | | |
| Uranium-238 | | | U | 0.0251 | pCi/L | | | | | | |
| | | Uncert: +/-0.0147 | | +/-0.0147 | | | | | | | |
| | | TPU: +/-0.0148 | | +/-0.0148 | | | | | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 435560

Page 3 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date | Time |
|---------------------|-----------|----------|------|----------|-------|-------|------|------------|-------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 1711135 | | | | | | | | | | |
| *Uranium-232 Tracer | 2.10 | | | 1.70 | pCi/L | | 81.1 | (50%-105%) | | | |
| | Uncert: | | | +/-0.106 | | | | | | | |
| | TPU: | | | +/-0.169 | | | | | | | |
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1711850 | | | | | | | | | | |
| QC1203902341 | 435410002 | DUP | | | | | | | | | |
| Cesium-137 | U | 0.321 | U | -0.252 | pCi/L | 0.106 | | (0-1) | MXR1 | 11/07/17 | 11:43 |
| | Uncert: | +/-1.15 | | +/-1.54 | | | | | | | |
| | TPU: | +/-1.15 | | +/-1.54 | | | | | | | |
| Cobalt-60 | U | 0.479 | U | -1.74 | pCi/L | 0.437 | | (0-1) | | | |
| | Uncert: | +/-0.935 | | +/-1.55 | | | | | | | |
| | TPU: | +/-0.941 | | +/-1.60 | | | | | | | |
| Neptunium-237 | U | -2.02 | U | 0.208 | pCi/L | 0.245 | | (0-1) | | | |
| | Uncert: | +/-2.10 | | +/-2.40 | | | | | | | |
| | TPU: | +/-2.15 | | +/-2.40 | | | | | | | |
| Potassium-40 | U | 10.7 | U | 20.6 | pCi/L | 0.107 | | (0-1) | | | |
| | Uncert: | +/-14.6 | | +/-31.7 | | | | | | | |
| | TPU: | +/-14.6 | | +/-31.7 | | | | | | | |
| Sodium-22 | U | 0.534 | U | -0.493 | pCi/L | 0.245 | | (0-1) | | | |
| | Uncert: | +/-1.00 | | +/-1.08 | | | | | | | |
| | TPU: | +/-1.01 | | +/-1.08 | | | | | | | |
| QC1203902342 | LCS | | | | | | | | | | |
| Americium-241 | 34300 | | | 37000 | pCi/L | | 108 | (80%-120%) | MXR1 | 11/03/17 | 15:07 |
| | Uncert: | | | +/-822 | | | | | | | |
| | TPU: | | | +/-1940 | | | | | | | |
| Cesium-137 | 13000 | | | 13400 | pCi/L | | 103 | (80%-120%) | | | |
| | Uncert: | | | +/-180 | | | | | | | |
| | TPU: | | | +/-587 | | | | | | | |
| Cobalt-60 | 11300 | | | 11700 | pCi/L | | 103 | (80%-120%) | | | |
| | Uncert: | | | +/-191 | | | | | | | |
| | TPU: | | | +/-557 | | | | | | | |
| Neptunium-237 | | | U | 74.3 | pCi/L | | | | | | |
| | Uncert: | | | +/-62.8 | | | | | | | |
| | TPU: | | | +/-65.2 | | | | | | | |
| Potassium-40 | | | U | 12.6 | pCi/L | | | | | | |
| | Uncert: | | | +/-95.7 | | | | | | | |
| | TPU: | | | +/-95.7 | | | | | | | |
| Sodium-22 | | | U | 5.12 | pCi/L | | | | | | |
| | Uncert: | | | +/-17.1 | | | | | | | |
| | TPU: | | | +/-17.1 | | | | | | | |
| QC1203902340 | MB | | | | | | | | | | |
| Cesium-137 | | | U | -1.1 | pCi/L | | | | MXR1 | 11/07/17 | 11:02 |
| | Uncert: | | | +/-1.11 | | | | | | | |
| | TPU: | | | +/-1.14 | | | | | | | |
| Cobalt-60 | | | U | 0.669 | pCi/L | | | | | | |
| | Uncert: | | | +/-1.21 | | | | | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 435560

Page 4 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date | Time |
|-----------------------|-----------|----------|----------|-----------|-------|-------|------|------------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1711850 | | | | | | | | | | |
| Neptunium-237 | TPU: | | | +/-1.22 | | | | | | | |
| | | | U | 0.0266 | pCi/L | | | | | | |
| | Uncert: | | | +/-2.12 | | | | | | | |
| Potassium-40 | TPU: | | | +/-2.12 | | | | | | | |
| | | | U | 2.19 | pCi/L | | | | | | |
| | Uncert: | | | +/-16.9 | | | | | | | |
| Sodium-22 | TPU: | | | +/-16.9 | | | | | | | |
| | | | U | -1.23 | pCi/L | | | | | | |
| | Uncert: | | | +/-0.990 | | | | | | | |
| | TPU: | | | +/-1.03 | | | | | | | |
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1714181 | | | | | | | | | | |
| QC1203907991 | 435560005 | DUP | | | | | | | | | |
| Strontium-90 | U | -0.00159 | U | 0.159 | pCi/L | 0.316 | | (0-1) | LXB3 | 11/09/17 | 11:11 |
| | Uncert: | +/-0.121 | | +/-0.132 | | | | | | | |
| | TPU: | +/-0.121 | | +/-0.133 | | | | | | | |
| **Strontium Carrier | 7.85 | 7.40 | | 6.70 | mg | | 85.4 | (50%-105%) | | | |
| QC1203907993 | LCS | | | | | | | | | | |
| Strontium-90 | 23.7 | | | 24.2 | pCi/L | | 102 | (80%-120%) | LXB3 | 11/09/17 | 11:12 |
| | Uncert: | | | +/-0.628 | | | | | | | |
| | TPU: | | | +/-2.04 | | | | | | | |
| **Strontium Carrier | 7.85 | | | 6.80 | mg | | 86.6 | (50%-105%) | | | |
| QC1203907990 | MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.029 | pCi/L | | | | LXB3 | 11/09/17 | 11:11 |
| | Uncert: | | | +/-0.0611 | | | | | | | |
| | TPU: | | | +/-0.0612 | | | | | | | |
| **Strontium Carrier | 7.85 | | | 7.20 | mg | | 91.7 | (50%-105%) | | | |
| QC1203907992 | 435560005 | MS | | | | | | | | | |
| Strontium-90 | 237 | U | -0.00159 | 219 | pCi/L | | 92.3 | (75%-125%) | LXB3 | 11/09/17 | 11:11 |
| | Uncert: | | +/-0.121 | +/-5.81 | | | | | | | |
| | TPU: | | +/-0.121 | +/-19.5 | | | | | | | |
| **Strontium Carrier | 7.85 | 7.40 | | 7.20 | mg | | 91.7 | (50%-105%) | | | |
| Batch | 1714187 | | | | | | | | | | |
| QC1203908000 | 435566006 | DUP | | | | | | | | | |
| Beta | | 2.50 | | 3.54 | pCi/L | 0.345 | | (0-1) | AXH4 | 11/08/17 | 12:08 |
| | Uncert: | +/-0.679 | | +/-0.737 | | | | | | | |
| | TPU: | +/-0.712 | | +/-0.796 | | | | | | | |
| QC1203908003 | LCS | | | | | | | | | | |
| Beta | 47.4 | | | 41.0 | pCi/L | | 86.4 | (80%-120%) | AXH4 | 11/08/17 | 12:08 |
| | Uncert: | | | +/-0.792 | | | | | | | |
| | TPU: | | | +/-3.48 | | | | | | | |
| QC1203907999 | MB | | | | | | | | | | |
| Beta | | | U | 0.0293 | pCi/L | | | | AXH4 | 11/08/17 | 12:15 |
| | Uncert: | | | +/-0.0943 | | | | | | | |
| | TPU: | | | +/-0.0943 | | | | | | | |

GEL LABORATORIES LLC

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

QC Summary

Workorder: 435560

Page 5 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date | Time |
|--------------|-----------|----------|----------|----------|-------|--------|------|------------|-------|----------|-------|
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1714187 | | | | | | | | | | |
| QC1203908001 | 435566006 | MS | | | | | | | | | |
| Beta | 1900 | 2.50 | | 1730 | pCi/L | | 90.9 | (75%-125%) | AXH4 | 11/08/17 | 12:08 |
| | Uncert: | +/-0.679 | | +/-33.1 | | | | | | | |
| | TPU: | +/-0.712 | | +/-147 | | | | | | | |
| QC1203908002 | 435566006 | MSD | | | | | | | | | |
| Beta | 1900 | 2.50 | | 1750 | pCi/L | 0.0486 | 92.4 | (0-1) | AXH4 | 11/08/17 | 12:08 |
| | Uncert: | +/-0.679 | | +/-32.5 | | | | | | | |
| | TPU: | +/-0.712 | | +/-148 | | | | | | | |
| Batch | 1717894 | | | | | | | | | | |
| QC1203917215 | 435429002 | DUP | | | | | | | | | |
| Alpha | U | 0.329 | U | 0.405 | pCi/L | 0.0299 | | (0-1) | AXH4 | 11/13/17 | 06:30 |
| | Uncert: | +/-0.698 | | +/-0.563 | | | | | | | |
| | TPU: | +/-0.698 | | +/-0.564 | | | | | | | |
| QC1203917218 | LCS | | | | | | | | | | |
| Alpha | 12.1 | | | 12.8 | pCi/L | | 106 | (80%-120%) | AXH4 | 11/11/17 | 14:12 |
| | Uncert: | | | +/-0.585 | | | | | | | |
| | TPU: | | | +/-1.21 | | | | | | | |
| QC1203917214 | MB | | | | | | | | | | |
| Alpha | | | U | 0.253 | pCi/L | | | | AXH4 | 11/11/17 | 14:11 |
| | Uncert: | | | +/-0.126 | | | | | | | |
| | TPU: | | | +/-0.128 | | | | | | | |
| QC1203917216 | 435429002 | MS | | | | | | | | | |
| Alpha | 483 | U | 0.329 | 478 | pCi/L | | 98.9 | (75%-125%) | AXH4 | 11/11/17 | 14:11 |
| | Uncert: | | +/-0.698 | +/-23.5 | | | | | | | |
| | TPU: | | +/-0.698 | +/-46.2 | | | | | | | |
| QC1203917217 | 435429002 | MSD | | | | | | | | | |
| Alpha | 483 | U | 0.329 | 472 | pCi/L | 0.0342 | 97.6 | (0-1) | AXH4 | 11/13/17 | 07:51 |
| | Uncert: | | +/-0.698 | +/-26.8 | | | | | | | |
| | TPU: | | +/-0.698 | +/-47.9 | | | | | | | |

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.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 435560

Page 6 of 6

| 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, MDC 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.