



AGRICULTURE & PRIORITY POLLUTANTS LABORATORIES

A METIRI GROUP COMPANY

908 N. Temperance Ave., Clovis, CA 93611 - Phone 559-275-2175 - www.applinc.com

NELAP Certification Number: CA00046

DoD-ELAP Certification Number 4064.01

State Certification Number:

April 11, 2023

Watson Tanji
AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

RE: Red Hill AFFF Assessment Sampling
23C0207

Enclosed are the results of analyses for samples received by our laboratory on 3/24/2023. If you have any questions concerning this report, please feel free to contact me.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. These test results meet all requirements of NELAC and DoD QSM. Release of the hard copy has been authorized by the Laboratory Manager or designee, as verified by the following signature.

Sincerely,

Karen Volpendesta
Project Manager

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AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

Work Order Case Narrative

A revised Chain of Custody was received by email on March 23, 2023.

Analysis Case Narrative

EPA 1633: Manual integrations were performed for this method in accordance with APPL's SOP. Chromatograms after manual integration are enclosed for specific samples and analytes. Abbreviated flags for technical justification are listed on the chromatogram.

Eleven analytes recovered above the upper control limit in the BCC0442-MRL1. Samples were reextracted and this data set was excluded.

The analyte PFOS recovered above the upper control limits in the BCD0035-MRL1. No sample volume remains for re-extraction.

Samples in this Report

| Lab ID | Sample | Matrix | Date Sampled | Date Received |
|------------|-----------------------------|--------|------------------|---------------|
| 23C0207-01 | AF-RHMW225401-WGN01B-2303W3 | Water | 03/22/2023 10:15 | 03/24/2023 |

AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

Sample Results

Sample: AF-RHMW225401-WGN01B-2303W3
23C0207-01 (Water)

Per- and Polyfluoroalkyl Substances

| Analyte | Result /Qual | LOQ | LOD | DL | Units | Date Analyzed | DF | Method | Prep Batch |
|-----------------------|--------------|------|--------|-------|-------|---------------|----|----------|------------|
| PFBA | 0.84 J | 1.4 | 0.70 | 0.18 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFPEA | 1.5 | 0.70 | 0.35 | 0.057 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFHXA | 1.1 | 0.35 | 0.18 | 0.048 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFHPA | 0.91 | 0.35 | 0.18 | 0.036 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFOA | 1.0 | 0.35 | 0.26 | 0.13 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFNA | 0.12 J IR2, | 0.35 | 0.18 | 0.072 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFDA | 0.18 U | 0.35 | 0.18 | 0.089 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFUnA | 0.26 U | 0.35 | 0.26 | 0.14 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFDOA | 0.18 U | 0.35 | 0.18 | 0.098 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFTRDA | 0.26 U | 0.35 | 0.26 | 0.18 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFTEDA | 0.26 U | 0.35 | 0.26 | 0.17 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFBS | 0.76 | 0.35 | 0.18 | 0.032 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFPEs | 0.15 J | 0.35 | 0.18 | 0.055 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFHXS | 1.4 | 0.35 | 0.18 | 0.028 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFHPS | 0.18 U | 0.35 | 0.18 | 0.045 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFOS | 1.5 | 0.35 | 0.18 | 0.056 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFNS | 0.18 U | 0.35 | 0.18 | 0.11 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFDS | 0.26 U | 0.35 | 0.26 | 0.13 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFDOS | 0.18 U | 0.35 | 0.18 | 0.11 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 4:2FTS | 0.70 U | 1.4 | 0.70 | 0.26 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 6:2FTS | 0.70 U | 1.4 | 0.70 | 0.28 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 8:2FTS | 0.70 U | 1.4 | 0.70 | 0.072 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFOSA | 0.18 U | 0.35 | 0.18 | 0.092 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| NMeFOSA | 0.70 U | 1.4 | 0.70 | 0.42 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| NEtFOSA | 0.70 U | 1.4 | 0.70 | 0.36 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| NMeFOSAA | 0.18 U | 0.35 | 0.18 | 0.093 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| NEtFOSAA | 0.18 U | 0.35 | 0.18 | 0.10 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| NMeFOSE | 1.1 U | 1.4 | 1.1 | 0.89 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| NEtFOSE | 1.1 U | 1.4 | 1.1 | 0.92 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| HFPO-DA | 0.35 U | 0.70 | 0.35 | 0.15 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| ADONA | 0.35 U | 0.70 | 0.35 | 0.11 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFEESA | 0.35 U | 0.70 | 0.35 | 0.096 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFMPA | 0.35 U | 0.70 | 0.35 | 0.047 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| PFMBA | 0.35 U | 0.70 | 0.35 | 0.080 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| NFDHA | 0.35 U | 0.70 | 0.35 | 0.26 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 9CL-PF3ONS | 0.35 U | 0.70 | 0.35 | 0.18 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 11CL-PF3OUDS | 0.35 U | 0.70 | 0.35 | 0.18 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 3:3FTCA | 0.70 U | 1.4 | 0.70 | 0.51 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 5:3FTCA | 0.70 U | 1.4 | 0.70 | 0.39 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| 7:3FTCA | 0.70 U | 1.4 | 0.70 | 0.49 | ng/L | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C4-PFBA | 90.0% | | 10-130 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C5-PFPEA | 82.4% | | 35-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C5-PFHXA | 91.2% | | 55-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C4-PFHPA | 89.5% | | 55-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |

AECOM Honolulu
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Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

Sample Results
 (Continued)

Sample: AF-RHMW225401-WGN01B-2303W3 (Continued)
23C0207-01 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

| Analyte | Result /Qual | LOQ | LOD | DL | Units | Date Analyzed | DF | Method | Prep Batch |
|-------------------------|--------------|-----|--------|----|-------|---------------|----|----------|------------|
| Surrogate: 13C8-PFOA | 99.4% | | 60-140 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C9-PFNA | 93.8% | | 55-140 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C6-PFDA | 110% | | 50-140 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C7-PFUnA | 128% | | 30-140 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C2-PFDOA | 120% | | 10-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C2-PFTEDA | 114% | | 10-130 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C3-PFBS | 115% | | 55-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C3-PFHXS | 98.9% | | 55-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C8-PFOS | 88.6% | | 45-140 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C2-4:2FTS | 159% | | 60-200 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C2-6:2FTS | 131% | | 60-200 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C2-8:2FTS | 137% | | 50-200 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C8-PFOA | 73.2% | | 30-130 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: D3-NMEFOA | 49.9% | | 15-130 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: D5-NETFOA | 55.9% | | 10-130 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: D3-NMEFOSAA | 111% | | 45-200 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: D5-NETFOSAA | 138% | | 10-200 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: D7-NMEFOSE | 57.6% | | 10-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: D9-NETFOSE | 61.6% | | 10-150 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |
| Surrogate: 13C3-HFPO-DA | 86.4% | | 25-160 | | | 04/07/23 | 1 | EPA 1633 | BCD0035 |

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

PREPARATION BATCH SUMMARY

EPA 1633

Laboratory: APPL, LLC

Client: AECOM

Batch: BCD0035 Batch Matrix: Water Preparation: EPA 1633

| SAMPLE NAME | LAB SAMPLE ID | DATE PREPARED | INITIAL VOL./WEIGHT mL | FINAL VOL. mL |
|-----------------------------|---------------|----------------|---------------------------|------------------|
| AF-RHMW225401-WGN01B-2303W3 | 23C0207-01RE2 | 04/04/23 12:20 | 568.31 | 2.00 |
| Blank | BCD0035-BLK1 | 04/04/23 12:20 | 500.00 | 2.00 |
| LCS | BCD0035-BS1 | 04/04/23 12:20 | 500.00 | 2.00 |
| MRL Check | BCD0035-MRL1 | 04/04/23 12:20 | 500.00 | 2.00 |

| | | |
|--|---|----------------------------|
| AECOM Honolulu 1001 Bishop Street, Suite 1600 Honolulu, HI 96813 | Project: Red Hill AFFF Assessment Sampling Project Number: Red Hill AFFF Assessment Sampling / 60697810 Project Manager: Watson Tanji | Reported: 04/11/2023 13:30 |
|--|---|----------------------------|

Quality Control

Per- and Polyfluoroalkyl Substances

| Analyte | Result/Qual | LOQ | LOD | MDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---------|-------------|-----|-----|-----|-------------|---------------|------|-------------|-----|-----------|
|---------|-------------|-----|-----|-----|-------------|---------------|------|-------------|-----|-----------|

Method: EPA 1633

Batch: BCD0035 - EPA 1633

| | ng/L | | | |
|-----------------------------|--------|------|------|---|
| Blank (BCD0035-BLK1) | | | | Prepared: 04/04/23 12:20 Analyzed: 04/07/23 17:34 |
| PFBA | 0.80 U | 1.6 | 0.80 | 0.21 |
| PFPEA | 0.40 U | 0.80 | 0.40 | 0.065 |
| PFHXA | 0.20 U | 0.40 | 0.20 | 0.055 |
| PFHPA | 0.20 U | 0.40 | 0.20 | 0.041 |
| PFOA | 0.30 U | 0.40 | 0.30 | 0.15 |
| PFNA | 0.20 U | 0.40 | 0.20 | 0.082 |
| PFDA | 0.20 U | 0.40 | 0.20 | 0.10 |
| PFUnA | 0.30 U | 0.40 | 0.30 | 0.16 |
| PFDOA | 0.20 U | 0.40 | 0.20 | 0.11 |
| PFTRDA | 0.30 U | 0.40 | 0.30 | 0.20 |
| PFTEDA | 0.30 U | 0.40 | 0.30 | 0.20 |
| PFBS | 0.20 U | 0.40 | 0.20 | 0.037 |
| PFPEs | 0.20 U | 0.40 | 0.20 | 0.063 |
| PFHXS | 0.20 U | 0.40 | 0.20 | 0.032 |
| PFHPS | 0.20 U | 0.40 | 0.20 | 0.051 |
| PFOS | 0.20 U | 0.40 | 0.20 | 0.064 |
| PFNS | 0.20 U | 0.40 | 0.20 | 0.12 |
| PFDS | 0.30 U | 0.40 | 0.30 | 0.15 |
| PFDOS | 0.20 U | 0.40 | 0.20 | 0.12 |
| 4:2FTS | 0.80 U | 1.6 | 0.80 | 0.29 |
| 6:2FTS | 0.80 U | 1.6 | 0.80 | 0.31 |
| 8:2FTS | 0.80 U | 1.6 | 0.80 | 0.082 |
| PFOSA | 0.20 U | 0.40 | 0.20 | 0.10 |
| NMeFOSA | 0.80 U | 1.6 | 0.80 | 0.47 |
| NEtFOSA | 0.80 U | 1.6 | 0.80 | 0.41 |
| NMeFOSAA | 0.20 U | 0.40 | 0.20 | 0.11 |
| NEtFOSAA | 0.20 U | 0.40 | 0.20 | 0.11 |
| NMeFOSE | 1.2 U | 1.6 | 1.2 | 1.0 |
| NEtFOSE | 1.2 U | 1.6 | 1.2 | 1.0 |
| HFPO-DA | 0.40 U | 0.80 | 0.40 | 0.17 |
| ADONA | 0.40 U | 0.80 | 0.40 | 0.12 |
| PFEESA | 0.40 U | 0.80 | 0.40 | 0.11 |
| PFMPA | 0.40 U | 0.80 | 0.40 | 0.054 |
| PFMBA | 0.40 U | 0.80 | 0.40 | 0.091 |
| NFDHA | 0.40 U | 0.80 | 0.40 | 0.30 |
| 9CL-PF3ONS | 0.40 U | 0.80 | 0.40 | 0.21 |
| 11CL-PF3OUDS | 0.40 U | 0.80 | 0.40 | 0.21 |
| 3:3FTCA | 0.80 U | 1.6 | 0.80 | 0.57 |
| 5:3FTCA | 0.80 U | 1.6 | 0.80 | 0.44 |
| 7:3FTCA | 0.80 U | 1.6 | 0.80 | 0.55 |

Surrogates

| | | | | |
|------------|------|------|-----|--------|
| 13C4-PFBA | 34.1 | 32.0 | 107 | 10-130 |
| 13C5-PFPEA | 20.5 | 16.0 | 128 | 35-150 |
| 13C5-PFHXA | 9.91 | 8.00 | 124 | 55-150 |

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document. No duplication of this report is allowed, except in its entirety.

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

Quality Control
 (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

| Analyte | Result/Qual | LOQ | LOD | MDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|-----------------------------|-------------|-----|-----|-----|---|---------------|------|-------------|-----|-----------|
| ng/L | | | | | | | | | | |
| Blank (BCD0035-BLK1) | | | | | Prepared: 04/04/23 12:20 Analyzed: 04/07/23 17:34 | | | | | |
| <i>Surrogates</i> | | | | | | | | | | |
| 13C4-PFHPA | 9.84 | | | | 8.00 | | 123 | 55-150 | | |
| 13C8-PFOA | 8.56 | | | | 8.00 | | 107 | 60-140 | | |
| 13C9-PFNA | 4.83 | | | | 4.00 | | 121 | 55-140 | | |
| 13C6-PFDA | 4.31 | | | | 4.00 | | 108 | 50-140 | | |
| 13C7-PFUnA | 4.49 | | | | 4.00 | | 112 | 30-140 | | |
| 13C2-PFDOA | 4.06 | | | | 4.00 | | 102 | 10-150 | | |
| 13C2-PFTEDA | 4.13 | | | | 4.00 | | 103 | 10-130 | | |
| 13C3-PFBS | 8.45 | | | | 8.00 | | 106 | 55-150 | | |
| 13C3-PFHXS | 8.37 | | | | 8.00 | | 105 | 55-150 | | |
| 13C8-PFOS | 7.83 | | | | 8.00 | | 97.9 | 45-140 | | |
| 13C2-4:2FTS | 18.4 | | | | 16.0 | | 115 | 60-200 | | |
| 13C2-6:2FTS | 17.9 | | | | 16.0 | | 112 | 60-200 | | |
| 13C2-8:2FTS | 17.6 | | | | 16.0 | | 110 | 50-200 | | |
| 13C8-PFOA | 7.69 | | | | 8.00 | | 96.2 | 30-130 | | |
| D3-NMEFOSA | 4.55 | | | | 8.00 | | 56.9 | 15-130 | | |
| D5-NETFOA | 4.86 | | | | 8.00 | | 60.8 | 10-130 | | |
| D3-NMEFOSAA | 16.0 | | | | 16.0 | | 100 | 45-200 | | |
| D5-NETFOSAA | 15.3 | | | | 16.0 | | 95.6 | 10-200 | | |
| D7-NMEFOSE | 58.2 | | | | 80.0 | | 72.8 | 10-150 | | |
| D9-NETFOSE | 67.4 | | | | 80.0 | | 84.2 | 10-150 | | |
| 13C3-HFPO-DA | 39.4 | | | | 32.0 | | 123 | 25-160 | | |

| | | | | | | | | | | |
|--------------------------|------|--|--|--|---|--|------|--------|--|--|
| ng/L | | | | | | | | | | |
| LCS (BCD0035-BS1) | | | | | Prepared: 04/04/23 12:20 Analyzed: 04/07/23 17:47 | | | | | |
| PFBA | 16.7 | | | | 16.0 | | 104 | 58-148 | | |
| PFPEA | 7.86 | | | | 8.00 | | 98.2 | 54-152 | | |
| PFHXA | 4.39 | | | | 4.00 | | 110 | 55-152 | | |
| PFHPA | 4.41 | | | | 4.00 | | 110 | 54-154 | | |
| PFOA | 3.99 | | | | 4.00 | | 99.9 | 52-161 | | |
| PFNA | 4.44 | | | | 4.00 | | 111 | 59-149 | | |
| PFDA | 3.74 | | | | 4.00 | | 93.4 | 52-147 | | |
| PFUnA | 3.83 | | | | 4.00 | | 95.8 | 48-159 | | |
| PFDOA | 4.66 | | | | 4.00 | | 116 | 64-142 | | |
| PFTRDA | 4.40 | | | | 4.00 | | 110 | 49-148 | | |
| PFTEDA | 4.22 | | | | 4.00 | | 105 | 47-161 | | |
| PFBS | 3.65 | | | | 3.54 | | 103 | 62-144 | | |
| PFPEA | 3.88 | | | | 3.76 | | 103 | 59-151 | | |
| PFHXS | 3.55 | | | | 3.66 | | 97.0 | 57-146 | | |
| PFHPS | 3.61 | | | | 3.82 | | 94.4 | 55-152 | | |
| PFOS | 3.54 | | | | 3.72 | | 95.2 | 58-149 | | |
| PFNS | 3.80 | | | | 3.84 | | 98.9 | 52-148 | | |
| PFDS | 3.83 | | | | 3.86 | | 99.3 | 51-147 | | |
| PFDOS | 3.78 | | | | 3.88 | | 97.5 | 36-145 | | |
| 4:2FTS | 14.1 | | | | 15.0 | | 94.2 | 67-146 | | |
| 6:2FTS | 16.4 | | | | 15.2 | | 108 | 61-151 | | |
| 8:2FTS | 17.3 | | | | 15.4 | | 112 | 63-152 | | |
| PFOSA | 4.20 | | | | 4.00 | | 105 | 61-148 | | |

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| | | |
|--|---|----------------------------|
| AECOM Honolulu 1001 Bishop Street, Suite 1600 Honolulu, HI 96813 | Project: Red Hill AFFF Assessment Sampling Project Number: Red Hill AFFF Assessment Sampling / 60697810 Project Manager: Watson Tanji | Reported: 04/11/2023 13:30 |
|--|---|----------------------------|

Quality Control
(Continued)

Per- and Polyfluoroalkyl Substances (Continued)

| Analyte | Result/Qual | LOQ | LOD | MDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|--------------------------|-------------|------|-----|-----|-------------|---|------|-------------|-----|-----------|
| LCS (BCD0035-BS1) | | ng/L | | | | | | | | |
| | | | | | | Prepared: 04/04/23 12:20 Analyzed: 04/07/23 17:47 | | | | |
| NMeFOSA | 17.7 | | | | 16.0 | | 111 | 63-145 | | |
| NETFOSA | 16.7 | | | | 16.0 | | 104 | 65-139 | | |
| NMeFOSAA | 3.95 | | | | 4.00 | | 98.9 | 58-144 | | |
| NETFOSAA | 4.20 | | | | 4.00 | | 105 | 59-146 | | |
| NMeFOSE | 15.9 | | | | 16.0 | | 99.4 | 71-136 | | |
| NETFOSE | 15.4 | | | | 16.0 | | 96.2 | 69-137 | | |
| HFPO-DA | 8.10 | | | | 8.00 | | 101 | 63-144 | | |
| ADONA | 8.22 | | | | 7.56 | | 109 | 68-146 | | |
| PFEESA | 7.19 | | | | 7.12 | | 101 | 56-151 | | |
| PFMPA | 7.40 | | | | 8.00 | | 92.5 | 51-145 | | |
| PFMBA | 7.36 | | | | 8.00 | | 92.0 | 55-148 | | |
| NFDHA | 8.02 | | | | 8.00 | | 100 | 48-161 | | |
| 9CL-PF3ONS | 7.72 | | | | 7.48 | | 103 | 56-156 | | |
| 11CL-PF3OUDS | 7.22 | | | | 7.56 | | 95.6 | 46-156 | | |
| 3:3FTCA | 13.9 | | | | 16.0 | | 87.0 | 62-129 | | |
| 5:3FTCA | 17.0 | | | | 16.0 | | 106 | 63-134 | | |
| 7:3FTCA | 14.6 | | | | 16.0 | | 91.4 | 50-138 | | |
| <hr/> | | | | | | | | | | |
| Surrogates | | | | | | | | | | |
| 13C4-PFBA | 33.0 | | | | 32.0 | | 103 | 10-130 | | |
| 13C5-PFPEA | 20.1 | | | | 16.0 | | 126 | 35-150 | | |
| 13C5-PFHXA | 9.65 | | | | 8.00 | | 121 | 55-150 | | |
| 13C4-PFHFA | 9.36 | | | | 8.00 | | 117 | 55-150 | | |
| 13C8-PFOA | 8.51 | | | | 8.00 | | 106 | 60-140 | | |
| 13C9-PFNA | 4.10 | | | | 4.00 | | 103 | 55-140 | | |
| 13C6-PFDA | 4.61 | | | | 4.00 | | 115 | 50-140 | | |
| 13C7-PFUnA | 4.98 | | | | 4.00 | | 125 | 30-140 | | |
| 13C2-PFDOA | 4.37 | | | | 4.00 | | 109 | 10-150 | | |
| 13C2-PFTEDA | 4.37 | | | | 4.00 | | 109 | 10-130 | | |
| 13C3-PFBS | 8.39 | | | | 8.00 | | 105 | 55-150 | | |
| 13C3-PFHXS | 8.28 | | | | 8.00 | | 104 | 55-150 | | |
| 13C8-PFOS | 8.06 | | | | 8.00 | | 101 | 45-140 | | |
| 13C2-4:2FTS | 17.4 | | | | 16.0 | | 109 | 60-200 | | |
| 13C2-6:2FTS | 17.1 | | | | 16.0 | | 107 | 60-200 | | |
| 13C2-8:2FTS | 16.2 | | | | 16.0 | | 101 | 50-200 | | |
| 13C8-PFOSA | 7.36 | | | | 8.00 | | 92.0 | 30-130 | | |
| D3-NMEFOSA | 3.79 | | | | 8.00 | | 47.4 | 15-130 | | |
| D5-NETFOSA | 3.92 | | | | 8.00 | | 49.0 | 10-130 | | |
| D3-NMEFOSAA | 15.3 | | | | 16.0 | | 95.3 | 45-200 | | |
| D5-NETFOSAA | 15.1 | | | | 16.0 | | 94.2 | 10-200 | | |
| D7-NMEFOSE | 56.9 | | | | 80.0 | | 71.1 | 10-150 | | |
| D9-NETFOSE | 63.8 | | | | 80.0 | | 79.7 | 10-150 | | |
| 13C3-HFPO-DA | 39.1 | | | | 32.0 | | 122 | 25-160 | | |

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

Quality Control
 (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

| Analyte | Result/Qual | LOQ | LOD | MDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---------------------------------|---------------|------|-----|---|-------------|---------------|------|-------------|-----|-----------|
| MRL Check (BCD0035-MRL1) | | ng/L | | Prepared: 04/04/23 12:20 Analyzed: 04/07/23 18:00 | | | | | | |
| PFBA | 1.61 | | | | 1.60 | | 100 | 44-157 | | |
| PFPEA | 0.770 J | | | | 0.800 | | 96.2 | 57-148 | | |
| PFHXA | 0.458 | | | | 0.400 | | 114 | 62-149 | | |
| PFHPA | 0.413 | | | | 0.400 | | 103 | 56-150 | | |
| PFOA | 0.416 | | | | 0.400 | | 104 | 57-161 | | |
| PFNA | 0.433 | | | | 0.400 | | 108 | 53-157 | | |
| PFDA | 0.456 | | | | 0.400 | | 114 | 43-158 | | |
| PFUnA | 0.418 | | | | 0.400 | | 104 | 50-155 | | |
| PFDOA | 0.512 | | | | 0.400 | | 128 | 60-141 | | |
| PFTRDA | 0.428 | | | | 0.400 | | 107 | 52-140 | | |
| PFTEDA | 0.368 J | | | | 0.400 | | 91.9 | 52-156 | | |
| PFBS | 0.425 | | | | 0.354 | | 120 | 63-145 | | |
| PFPEs | 0.352 J | | | | 0.376 | | 93.6 | 58-144 | | |
| PFHXS | 0.574 | | | | 0.366 | | 157 | 44-158 | | |
| PFHPS | 0.417 | | | | 0.382 | | 109 | 51-150 | | |
| PFOS | 1.20 BS2, MI4 | | | | 0.372 | | 323 | 43-162 | | |
| PFNS | 0.341 J | | | | 0.384 | | 88.8 | 46-151 | | |
| PFDS | 0.330 J | | | | 0.386 | | 85.5 | 50-144 | | |
| PFDOS | 0.344 J | | | | 0.388 | | 88.7 | 30-138 | | |
| 4:2FTS | 1.49 J | | | | 1.50 | | 99.0 | 52-158 | | |
| 6:2FTS | 1.49 J | | | | 1.52 | | 97.9 | 48-158 | | |
| 8:2FTS | 1.30 J | | | | 1.54 | | 84.5 | 46-165 | | |
| PFOSA | 0.455 | | | | 0.400 | | 114 | 47-163 | | |
| NMeFOSA | 1.83 | | | | 1.60 | | 114 | 54-155 | | |
| NETFOSA | 1.64 | | | | 1.60 | | 103 | 49-156 | | |
| NMeFOSAA | 0.423 | | | | 0.400 | | 106 | 32-160 | | |
| NETFOSAA | 0.432 | | | | 0.400 | | 108 | 51-154 | | |
| NMeFOSE | 1.68 | | | | 1.60 | | 105 | 56-151 | | |
| NETFOSE | 1.55 J | | | | 1.60 | | 96.8 | 60-147 | | |
| HFPO-DA | 0.775 J | | | | 0.800 | | 96.8 | 58-154 | | |
| ADONA | 0.843 | | | | 0.756 | | 112 | 61-148 | | |
| PFEESA | 0.661 J | | | | 0.712 | | 92.8 | 56-144 | | |
| PFMPA | 0.742 J | | | | 0.800 | | 92.7 | 48-150 | | |
| PFMBA | 0.834 | | | | 0.800 | | 104 | 49-154 | | |
| NFDHA | 0.772 J | | | | 0.800 | | 96.6 | 47-160 | | |
| 9CL-PF3ONS | 0.799 J | | | | 0.748 | | 107 | 44-167 | | |
| 11CL-PF3OUDS | 0.732 J | | | | 0.756 | | 96.8 | 36-158 | | |
| 3:3FTCA | 1.50 J | | | | 1.60 | | 93.4 | 32-161 | | |
| 5:3FTCA | 1.32 J IR2, | | | | 1.60 | | 82.5 | 39-156 | | |
| 7:3FTCA | 1.58 J | | | | 1.60 | | 98.7 | 36-149 | | |
| Surrogates | | | | | | | | | | |
| 13C4-PFBA | 34.4 | | | | 32.0 | | 108 | 10-130 | | |
| 13C5-PFPEA | 20.0 | | | | 16.0 | | 125 | 35-150 | | |
| 13C5-PFHXA | 9.84 | | | | 8.00 | | 123 | 55-150 | | |
| 13C4-PFHPA | 10.1 | | | | 8.00 | | 126 | 55-150 | | |
| 13C8-PFOA | 8.45 | | | | 8.00 | | 106 | 60-140 | | |
| 13C9-PFNA | 4.15 | | | | 4.00 | | 104 | 55-140 | | |

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document. No duplication of this report is allowed, except in its entirety.

AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

Quality Control (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

| Analyte | Result/Qual | LOQ | LOD | MDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---------------------------------|-------------|-----|-----|-----|-------------|---------------|--------------------------|--------------------------|-----|-----------|
| ng/L | | | | | | | | | | |
| MRL Check (BCD0035-MRL1) | | | | | | | Prepared: 04/04/23 12:20 | Analyzed: 04/07/23 18:00 | | |
| Surrogates | | | | | | | | | | |
| 13C6-PFDA | 4.30 | | | | 4.00 | | 107 | 50-140 | | |
| 13C7-PFUnA | 4.41 | | | | 4.00 | | 110 | 30-140 | | |
| 13C2-PFDOA | 3.79 | | | | 4.00 | | 94.7 | 10-150 | | |
| 13C2-PFTEDA | 4.29 | | | | 4.00 | | 107 | 10-130 | | |
| 13C3-PFBS | 8.96 | | | | 8.00 | | 112 | 55-150 | | |
| 13C3-PFHXS | 9.04 | | | | 8.00 | | 113 | 55-150 | | |
| 13C8-PFOS | 8.16 | | | | 8.00 | | 102 | 45-140 | | |
| 13C2-4:2FTS | 21.9 | | | | 16.0 | | 137 | 60-200 | | |
| 13C2-6:2FTS | 19.2 | | | | 16.0 | | 120 | 60-200 | | |
| 13C2-8:2FTS | 17.7 | | | | 16.0 | | 111 | 50-200 | | |
| 13C8-PFOA | 7.73 | | | | 8.00 | | 96.6 | 30-130 | | |
| D3-NMEFOA | 4.08 | | | | 8.00 | | 51.1 | 15-130 | | |
| D5-NETFOA | 4.39 | | | | 8.00 | | 54.8 | 10-130 | | |
| D3-NMEFOSAA | 15.6 | | | | 16.0 | | 97.3 | 45-200 | | |
| D5-NETFOSAA | 15.7 | | | | 16.0 | | 97.8 | 10-200 | | |
| D7-NMEFOSE | 53.7 | | | | 80.0 | | 67.1 | 10-150 | | |
| D9-NETFOSE | 59.4 | | | | 80.0 | | 74.3 | 10-150 | | |
| 13C3-HFPO-DA | 39.1 | | | | 32.0 | | 122 | 25-160 | | |

AECOM Honolulu
 1001 Bishop Street, Suite 1600
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Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

Notes and Definitions

| Item | Definition |
|--|--|
| BS2 | Blank spike recovered above the upper control limit |
| CV2 | Calibration verification recovered above the upper control limit |
| IR1 | Ion ratio below the lower control limit |
| IR2 | Ion ratio above the upper control limit |
| IS1 | Internal standard recovered below the lower control limit |
| J | Estimated value |
| MI2 | Manual integration, non-target peak interference |
| MI4 | Manual integration, peak unsplit |
| S2 | Surrogate recovered above the upper control limit |
| U | Not detected |
| Dry | Sample results reported on a dry weight basis. |
| DF | Dilution Factor |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| RPD | Relative Percent Difference |
| %REC | Percent Recovery |
| Source | Sample that was matrix spiked or duplicated. |
| LOQ, Limit of Quantitation = Method Reporting Limit (MRL). | |

AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/11/2023 13:30



WORK ORDER

23C0207

Printed: 04/11/2023 1:30 pm

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Karen Volpendesta
PO Number: 150712

Report To:

AECOM Honolulu
Watson Tanji
1001 Bishop Street, Suite 1600
Honolulu, HI 96813
Phone: (808) 954-4512
Fax: (808) 523-8950

Invoice To:

AECOM Honolulu
Watson Tanji
1001 Bishop Street, Suite 1600
Honolulu, HI 96813
Phone: (808) 954-4512
Fax: (808) 523-8950

Date Received: 03/24/2023 09:45 AM
Date Due: 03/31/2023 (5.00 day TAT)

Logged In By: Megan Salata
Received By: Megan Salata

Analysis

Comments

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/11/2023 13:30

23C0207

Sample Receipt Log

Default Cooler

Samples Received at: **-0.3°C**

| | | | |
|--|-----|---|-----|
| Custody Seals | Yes | Were all containers sealed in separate bags? | Yes |
| Containers Intact | Yes | Did all containers arrive in good condition? | Yes |
| COC/Labels Agree | Yes | Correct containers/preserv. for tests indicated? | Yes |
| Preservation Confirmed | No | Sufficient volume sent for tests requested? | Yes |
| Received On Ice | Yes | Were bubbles absent in volatile samples? | No |
| Was a chain of custody received? | Yes | Sufficient remaining holding time for analyses? | Yes |
| COCs complete/signed in the appropriate places? | Yes | pH of non-VOA preserved containers documented? | No |
| Sample labels complete? Sample ID, date/time, etc. | Yes | Unpreserved vials received for VOA analysis? | No |
| Did all container labels agree with COCs? | Yes | If "yes", are unpreserved VOA vials noted on ARF? | No |



APPL, Inc.
908 N Temperance Ave
Clovis, CA 93611
www.applinc.com

ELECTRONIC CHAIN OF CUSTODY RECORD
Phone: (559) 275-2175
Fax: (559) 275-4422
coc@applinc.com C.O.C. 2303W3AFAL07

Report to: **AECOM** Invoice to: **AECOM**
 Company Name: **1001 Bishop St ste 1600** Phone: **808-954-4512 / 303-796-4624**
 Address: **Honolulu, HI 96813** Fax: _____
Watson Tanji / Katie Abbott
 Attn: **watson.tanji@aecom.com/katie.abbott@aecom.com**
 Email: _____

| Project Name/Number | Sampler (Print) | Sampler (Signature) | Location | Date Collected | Time Collected | Time Zone | No. of Containers | Matrix | | | Analysis Requested/Method Number | Date Shipped: |
|---|-----------------|---------------------|--------------|----------------|----------------|-----------|-------------------|-------------------------------------|--------------------------|--------------------------|----------------------------------|---|
| | | | | | | | | Ag | Sed. | Soil | | |
| CTO N6274223F0104 / 60697810 | Andy Young | <i>ASYS</i> | RHMWS2254-01 | 3/22/23 | 1015 | HST 2 | 2 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | PFAS EPA Draft 1633 | Carrier: United FedEx Waybill No. 9676 79610290167 Comments: EDMS upload database: JBPHE EDMS Coverage: AFFF Assessment Sampling GW |
| <i>[Large signature and scribbles across the table]</i> | | | | | | | | | | | | |

Shuttle Temperature: _____

Turnaround Requested, Check one
 Standard 2-3 wk One week 3 days 24/48 Hrs. Other: **5 day TAT**

Relinquished by sampler: **Andy Young** Date: **3/22/23** Time: **12:50**
 Relinquished by: *[Signature]* Date: _____ Time: _____

Sample Disposal: Return to client Disposal by Lab (30-day retention)
 Received by: _____ Date: **3/22/23** Time: **14:00**
 Received at lab by: _____ Date: _____ Time: _____

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.

CUSTODY SEAL

AFCOM (808) 521-3051

Initials

CA

Date

2/20/02