



AGRICULTURE & PRIORITY POLLUTANTS LABORATORIES

A METIRI GROUP COMPANY

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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
23C0204

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 11:17

Work Order Case Narrative

The samples were received in good condition at 10.1 degrees C. Authorization to proceed with analysis was received by email on March, 27, 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 reextraction.

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
23C0204-01	AF-RHMW16-WGN01LF-2303W3	Water	03/20/2023 12:00	03/24/2023
23C0204-02	AF-RHMW12A-WGN01LF-2303W3	Water	03/20/2023 09:30	03/24/2023
23C0204-03	AF-RHMW12A-WGFD01LF-2303W3	Water	03/20/2023 09:30	03/24/2023
23C0204-04	AF-RHMW06-WGN01LF-2303W3	Water	03/20/2023 12:10	03/24/2023
23C0204-05	AF-RHMW04-WGN01LF-2303W3	Water	03/20/2023 10:20	03/24/2023

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Sample Results

Sample: AF-RHMW16-WGN01LF-2303W3
23C0204-01 (Water)

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	0.71 U	1.4	0.71	0.19	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEA	0.36 U	0.71	0.36	0.058	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXA	0.18 U	0.36	0.18	0.049	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPA	0.18 U	0.36	0.18	0.036	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOA	0.27 U	0.36	0.27	0.14	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNA	0.18 U	0.36	0.18	0.073	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDA	0.18 U	0.36	0.18	0.090	ng/L	04/07/23	1	EPA 1633	BCD0035
PFUnA	0.27 U	0.36	0.27	0.14	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDOA	0.18 U	0.36	0.18	0.099	ng/L	04/07/23	1	EPA 1633	BCD0035
PFTRDA	0.27 U	0.36	0.27	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
PFTEDA	0.27 U	0.36	0.27	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
PFBS	0.18 U	0.36	0.18	0.033	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEs	0.18 U	0.36	0.18	0.056	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXS	0.18 U	0.36	0.18	0.028	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPS	0.18 U	0.36	0.18	0.046	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOS	0.28 J	0.36	0.18	0.057	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNS	0.18 U	0.36	0.18	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDS	0.27 U	0.36	0.27	0.13	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDOS	0.18 U	0.36	0.18	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
4:2FTS	0.71 U	1.4	0.71	0.26	ng/L	04/07/23	1	EPA 1633	BCD0035
6:2FTS	0.71 U	1.4	0.71	0.28	ng/L	04/07/23	1	EPA 1633	BCD0035
8:2FTS	0.71 U	1.4	0.71	0.073	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOSA	0.15 J	0.36	0.18	0.093	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSA	0.71 U	1.4	0.71	0.42	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSA	0.71 U	1.4	0.71	0.37	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSAA	0.18 U	0.36	0.18	0.094	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSAA	0.18 U	0.36	0.18	0.10	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSE	1.1 U	1.4	1.1	0.90	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSE	1.1 U	1.4	1.1	0.93	ng/L	04/07/23	1	EPA 1633	BCD0035
HFPO-DA	0.36 U	0.71	0.36	0.16	ng/L	04/07/23	1	EPA 1633	BCD0035
ADONA	0.36 U	0.71	0.36	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFEESA	0.36 U	0.71	0.36	0.097	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMPA	0.36 U	0.71	0.36	0.048	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMBA	0.36 U	0.71	0.36	0.081	ng/L	04/07/23	1	EPA 1633	BCD0035
NFDHA	0.36 U	0.71	0.36	0.27	ng/L	04/07/23	1	EPA 1633	BCD0035
9CL-PF3ONS	0.36 U	0.71	0.36	0.19	ng/L	04/07/23	1	EPA 1633	BCD0035
11CL-PF3OUDS	0.36 U	0.71	0.36	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
3:3FTCA	0.71 U	1.4	0.71	0.51	ng/L	04/07/23	1	EPA 1633	BCD0035
5:3FTCA	0.71 U	1.4	0.71	0.39	ng/L	04/07/23	1	EPA 1633	BCD0035
7:3FTCA	0.71 U	1.4	0.71	0.49	ng/L	04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFBA	101%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFPEA	127%		35-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFHXA	127%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFHPA	131%		55-150			04/07/23	1	EPA 1633	BCD0035

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Project Manager: Watson Tanji

Reported: 04/11/2023 11:17

Sample Results (Continued)

Sample: AF-RHMW16-WGN01LF-2303W3 (Continued)
23C0204-01 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	121%		60-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C9-PFNA	115%		55-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C6-PFDA	119%		50-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C7-PFUnA	131%		30-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFDOA	122%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFTEDA	120%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFBS	121%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFHXS	113%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOS	101%		45-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-4:2FTS	134%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-6:2FTS	124%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-8:2FTS	108%		50-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOA	95.6%		30-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOA	61.9%		15-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOA	64.0%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOSAA	105%		45-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOSAA	100%		10-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D7-NMEFOSE	64.2%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: D9-NETFOSE	81.5%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-HFPO-DA	137%		25-160			04/07/23	1	EPA 1633	BCD0035

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Reported: 04/11/2023 11:17

Sample Results (Continued)

**Sample: AF-RHMW12A-WGN01LF-2303W3
23C0204-02 (Water)**

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	1.4 J	1.5	0.73	0.19	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEA	4.7	0.73	0.37	0.060	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXA	1.4	0.37	0.18	0.050	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPA	0.35 J	0.37	0.18	0.038	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOA	0.27 U	0.37	0.27	0.14	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNA	0.18 U	0.37	0.18	0.075	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDA	0.18 U	0.37	0.18	0.093	ng/L	04/07/23	1	EPA 1633	BCD0035
PFUnA	0.27 U	0.37	0.27	0.15	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDOA	0.18 U	0.37	0.18	0.10	ng/L	04/07/23	1	EPA 1633	BCD0035
PFTRDA	0.27 U	0.37	0.27	0.19	ng/L	04/07/23	1	EPA 1633	BCD0035
PFTEDA	0.27 U	0.37	0.27	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
PFBS	0.18 U	0.37	0.18	0.034	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEs	0.18 U	0.37	0.18	0.057	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXS	0.18 U	0.37	0.18	0.029	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPS	0.18 U	0.37	0.18	0.047	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOS	0.95	0.37	0.18	0.058	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNS	0.18 U	0.37	0.18	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDS	0.27 U	0.37	0.27	0.14	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDOS	0.18 U	0.37	0.18	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
4:2FTS	0.73 U	1.5	0.73	0.27	ng/L	04/07/23	1	EPA 1633	BCD0035
6:2FTS	1.8	1.5	0.73	0.29	ng/L	04/07/23	1	EPA 1633	BCD0035
8:2FTS	0.73 U	1.5	0.73	0.075	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOSA	0.54	0.37	0.18	0.095	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSA	0.73 U	1.5	0.73	0.43	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSA	0.73 U	1.5	0.73	0.38	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSAA	0.18 U	0.37	0.18	0.097	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSAA	0.18 U	0.37	0.18	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSE	1.1 U	1.5	1.1	0.93	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSE	1.1 U	1.5	1.1	0.96	ng/L	04/07/23	1	EPA 1633	BCD0035
HFPO-DA	0.37 U	0.73	0.37	0.16	ng/L	04/07/23	1	EPA 1633	BCD0035
ADONA	0.37 U	0.73	0.37	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFEESA	0.37 U	0.73	0.37	0.10	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMPA	0.37 U	0.73	0.37	0.049	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMBA	0.37 U	0.73	0.37	0.083	ng/L	04/07/23	1	EPA 1633	BCD0035
NFDHA	0.37 U	0.73	0.37	0.28	ng/L	04/07/23	1	EPA 1633	BCD0035
9CL-PF3ONS	0.37 U	0.73	0.37	0.19	ng/L	04/07/23	1	EPA 1633	BCD0035
11CL-PF3OUDS	0.37 U	0.73	0.37	0.19	ng/L	04/07/23	1	EPA 1633	BCD0035
3:3FTCA	0.73 U	1.5	0.73	0.53	ng/L	04/07/23	1	EPA 1633	BCD0035
5:3FTCA	0.73 U	1.5	0.73	0.41	ng/L	04/07/23	1	EPA 1633	BCD0035
7:3FTCA	0.73 U	1.5	0.73	0.51	ng/L	04/07/23	1	EPA 1633	BCD0035
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Surrogate: 13C4-PFBA	95.0%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFPEA	95.5%		35-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFHXA	100%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFHPA	98.4%		55-150			04/07/23	1	EPA 1633	BCD0035

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Sample Results (Continued)

Sample: AF-RHMW12A-WGN01LF-2303W3 (Continued)
23C0204-02 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	102%		60-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C9-PFNA	104%		55-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C6-PFDA	106%		50-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C7-PFUnA	117%		30-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFDOA	108%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFTEDA	100%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFBS	127%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFHXS	111%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOS	92.1%		45-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-4:2FTS	134%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-6:2FTS	116%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-8:2FTS	108%		50-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOA	89.9%		30-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOA	43.6%		15-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOA	40.7%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOSAA	96.1%		45-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOSAA	113%		10-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D7-NMEFOSE	53.7%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: D9-NETFOSE	72.4%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-HFPO-DA	95.8%		25-160			04/07/23	1	EPA 1633	BCD0035

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Sample Results (Continued)

**Sample: AF-RHMW12A-WGFD01LF-2303W3
23C0204-03 (Water)**

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	1.3 J	1.6	0.80	0.21	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEA	4.7	0.80	0.40	0.065	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXA	1.3	0.40	0.20	0.055	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPA	0.35 J	0.40	0.20	0.041	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOA	0.30 U	0.40	0.30	0.15	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNA	0.20 U	0.40	0.20	0.082	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDA	0.20 U	0.40	0.20	0.10	ng/L	04/07/23	1	EPA 1633	BCD0035
PFUnA	0.30 U	0.40	0.30	0.16	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDOA	0.20 U	0.40	0.20	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFTRDA	0.30 U	0.40	0.30	0.20	ng/L	04/07/23	1	EPA 1633	BCD0035
PFTEDA	0.30 U	0.40	0.30	0.20	ng/L	04/07/23	1	EPA 1633	BCD0035
PFBS	0.20 U	0.40	0.20	0.037	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEs	0.20 U	0.40	0.20	0.063	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXS	0.20 U	0.40	0.20	0.032	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPS	0.20 U	0.40	0.20	0.051	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOS	0.20 U	0.40	0.20	0.063	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNS	0.20 U	0.40	0.20	0.12	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDS	0.30 U	0.40	0.30	0.15	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDOS	0.20 U	0.40	0.20	0.12	ng/L	04/07/23	1	EPA 1633	BCD0035
4:2FTS	0.80 U	1.6	0.80	0.29	ng/L	04/07/23	1	EPA 1633	BCD0035
6:2FTS	1.7	1.6	0.80	0.31	ng/L	04/07/23	1	EPA 1633	BCD0035
8:2FTS	0.80 U	1.6	0.80	0.082	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOSA	0.48	0.40	0.20	0.10	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSA	0.80 U	1.6	0.80	0.47	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSA	0.80 U	1.6	0.80	0.41	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSAA	0.20 U	0.40	0.20	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSAA	0.20 U	0.40	0.20	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSE	1.2 U	1.6	1.2	1.0	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSE	1.2 U	1.6	1.2	1.0	ng/L	04/07/23	1	EPA 1633	BCD0035
HFPO-DA	0.40 U	0.80	0.40	0.17	ng/L	04/07/23	1	EPA 1633	BCD0035
ADONA	0.40 U	0.80	0.40	0.12	ng/L	04/07/23	1	EPA 1633	BCD0035
PFEESA	0.40 U	0.80	0.40	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMPA	0.40 U	0.80	0.40	0.054	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMBA	0.40 U	0.80	0.40	0.091	ng/L	04/07/23	1	EPA 1633	BCD0035
NFDHA	0.40 U	0.80	0.40	0.30	ng/L	04/07/23	1	EPA 1633	BCD0035
9CL-PF3ONS	0.40 U	0.80	0.40	0.21	ng/L	04/07/23	1	EPA 1633	BCD0035
11CL-PF3OUDS	0.40 U	0.80	0.40	0.21	ng/L	04/07/23	1	EPA 1633	BCD0035
3:3FTCA	0.80 U	1.6	0.80	0.57	ng/L	04/07/23	1	EPA 1633	BCD0035
5:3FTCA	0.80 U	1.6	0.80	0.44	ng/L	04/07/23	1	EPA 1633	BCD0035
7:3FTCA	0.80 U	1.6	0.80	0.55	ng/L	04/07/23	1	EPA 1633	BCD0035
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Surrogate: 13C4-PFBA	98.8%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFPEA	108%		35-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFHXA	107%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFHPA	107%		55-150			04/07/23	1	EPA 1633	BCD0035

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

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Sample Results (Continued)

Sample: AF-RHMW12A-WGFD01LF-2303W3 (Continued)
23C0204-03 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	106%		60-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C9-PFNA	101%		55-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C6-PFDA	99.4%		50-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C7-PFUnA	102%		30-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFDOA	110%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFTEDA	98.2%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFBS	111%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFHXS	106%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOS	101%		45-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-4:2FTS	120%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-6:2FTS	112%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-8:2FTS	100%		50-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOA	95.5%		30-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOA	47.9%		15-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOA	46.3%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOSAA	97.8%		45-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOSAA	103%		10-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D7-NMEFOSE	60.1%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: D9-NETFOSE	74.4%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-HFPO-DA	105%		25-160			04/07/23	1	EPA 1633	BCD0035

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

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Sample Results (Continued)

**Sample: AF-RHMW06-WGN01LF-2303W3
23C0204-04 (Water)**

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	0.38 J	1.4	0.69	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEA	0.53 J	0.69	0.35	0.056	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXA	0.31 J	0.35	0.17	0.048	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPA	0.37 IR2	0.35	0.17	0.035	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOA	0.26 U	0.35	0.26	0.13	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNA	0.17 U	0.35	0.17	0.071	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDA	0.17 U	0.35	0.17	0.088	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	0.17 U	0.35	0.17	0.097	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	0.089 J	0.35	0.17	0.032	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEs	0.17 U	0.35	0.17	0.054	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXS	0.17 U	0.35	0.17	0.027	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPS	0.17 U	0.35	0.17	0.044	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOS	0.10 J	0.35	0.17	0.055	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNS	0.17 U	0.35	0.17	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	0.17 U	0.35	0.17	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
4:2FTS	0.69 U	1.4	0.69	0.25	ng/L	04/07/23	1	EPA 1633	BCD0035
6:2FTS	0.69 U	1.4	0.69	0.27	ng/L	04/07/23	1	EPA 1633	BCD0035
8:2FTS	0.69 U	1.4	0.69	0.071	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOSA	0.17 U	0.35	0.17	0.090	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSA	0.69 U	1.4	0.69	0.41	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSA	0.69 U	1.4	0.69	0.36	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSAA	0.17 U	0.35	0.17	0.091	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSAA	0.17 U	0.35	0.17	0.099	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSE	1.0 U	1.4	1.0	0.87	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSE	1.0 U	1.4	1.0	0.91	ng/L	04/07/23	1	EPA 1633	BCD0035
HFPO-DA	0.35 U	0.69	0.35	0.15	ng/L	04/07/23	1	EPA 1633	BCD0035
ADONA	0.35 U	0.69	0.35	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFEESA	0.35 U	0.69	0.35	0.094	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMPA	0.35 U	0.69	0.35	0.047	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMBA	0.35 U	0.69	0.35	0.079	ng/L	04/07/23	1	EPA 1633	BCD0035
NFDHA	0.35 U	0.69	0.35	0.26	ng/L	04/07/23	1	EPA 1633	BCD0035
9CL-PF3ONS	0.35 U	0.69	0.35	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
11CL-PF3OUDS	0.35 U	0.69	0.35	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
3:3FTCA	0.69 U	1.4	0.69	0.50	ng/L	04/07/23	1	EPA 1633	BCD0035
5:3FTCA	0.69 U	1.4	0.69	0.38	ng/L	04/07/23	1	EPA 1633	BCD0035
7:3FTCA	0.69 U	1.4	0.69	0.48	ng/L	04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFBA	93.3%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFPEA	92.1%		35-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFHXA	97.5%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFHPA	98.4%		55-150			04/07/23	1	EPA 1633	BCD0035

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

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Sample Results (Continued)

Sample: AF-RHMW06-WGN01LF-2303W3 (Continued)
23C0204-04 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	111%		60-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C9-PFNA	98.6%		55-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C6-PFDA	107%		50-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C7-PFUnA	114%		30-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFDOA	96.8%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFTEDA	102%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFBS	121%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFHXS	110%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOS	103%		45-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-4:2FTS	128%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-6:2FTS	108%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-8:2FTS	113%		50-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOA	99.1%		30-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOA	56.6%		15-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOA	56.6%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOSAA	104%		45-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOSAA	103%		10-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D7-NMEFOSE	66.3%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: D9-NETFOSE	80.6%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-HFPO-DA	97.5%		25-160			04/07/23	1	EPA 1633	BCD0035

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

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Sample Results (Continued)

**Sample: AF-RHMW04-WGN01LF-2303W3
23C0204-05 (Water)**

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	0.69 U	1.4	0.69	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEA	0.35 U	0.69	0.35	0.056	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXA	0.17 U	0.35	0.17	0.048	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPA	0.17 U	0.35	0.17	0.036	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOA	0.26 U	0.35	0.26	0.13	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNA	0.17 U	0.35	0.17	0.071	ng/L	04/07/23	1	EPA 1633	BCD0035
PFDA	0.17 U	0.35	0.17	0.088	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	0.17 U	0.35	0.17	0.097	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	0.17 U	0.35	0.17	0.032	ng/L	04/07/23	1	EPA 1633	BCD0035
PFPEs	0.17 U	0.35	0.17	0.054	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHXS	0.17 U	0.35	0.17	0.027	ng/L	04/07/23	1	EPA 1633	BCD0035
PFHPS	0.17 U	0.35	0.17	0.045	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOS	0.17 U	0.35	0.17	0.055	ng/L	04/07/23	1	EPA 1633	BCD0035
PFNS	0.17 U	0.35	0.17	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	0.17 U	0.35	0.17	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
4:2FTS	0.69 U	1.4	0.69	0.25	ng/L	04/07/23	1	EPA 1633	BCD0035
6:2FTS	0.69 U	1.4	0.69	0.27	ng/L	04/07/23	1	EPA 1633	BCD0035
8:2FTS	0.69 U	1.4	0.69	0.071	ng/L	04/07/23	1	EPA 1633	BCD0035
PFOSA	0.17 U	0.35	0.17	0.090	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSA	0.69 U	1.4	0.69	0.41	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSA	0.69 U	1.4	0.69	0.36	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSAA	0.17 U	0.35	0.17	0.092	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSAA	0.17 U	0.35	0.17	0.10	ng/L	04/07/23	1	EPA 1633	BCD0035
NMeFOSE	1.0 U	1.4	1.0	0.88	ng/L	04/07/23	1	EPA 1633	BCD0035
NEtFOSE	1.0 U	1.4	1.0	0.91	ng/L	04/07/23	1	EPA 1633	BCD0035
HFPO-DA	0.35 U	0.69	0.35	0.15	ng/L	04/07/23	1	EPA 1633	BCD0035
ADONA	0.35 U	0.69	0.35	0.11	ng/L	04/07/23	1	EPA 1633	BCD0035
PFEESA	0.35 U	0.69	0.35	0.095	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMPA	0.35 U	0.69	0.35	0.047	ng/L	04/07/23	1	EPA 1633	BCD0035
PFMBA	0.35 U	0.69	0.35	0.079	ng/L	04/07/23	1	EPA 1633	BCD0035
NFDHA	0.35 U	0.69	0.35	0.26	ng/L	04/07/23	1	EPA 1633	BCD0035
9CL-PF3ONS	0.35 U	0.69	0.35	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
11CL-PF3OUDS	0.35 U	0.69	0.35	0.18	ng/L	04/07/23	1	EPA 1633	BCD0035
3:3FTCA	0.69 U	1.4	0.69	0.50	ng/L	04/07/23	1	EPA 1633	BCD0035
5:3FTCA	0.69 U	1.4	0.69	0.38	ng/L	04/07/23	1	EPA 1633	BCD0035
7:3FTCA	0.69 U	1.4	0.69	0.48	ng/L	04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFBA	95.7%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFPEA	107%		35-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C5-PFHXA	100%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C4-PFHPA	106%		55-150			04/07/23	1	EPA 1633	BCD0035

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

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Sample Results (Continued)

Sample: AF-RHMW04-WGN01LF-2303W3 (Continued)
23C0204-05 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	96.0%		60-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C9-PFNA	106%		55-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C6-PFDA	96.3%		50-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C7-PFUnA	109%		30-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFDOA	93.5%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-PFTEDA	101%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFBS	110%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-PFHXS	101%		55-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOS	93.6%		45-140			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-4:2FTS	125%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-6:2FTS	112%		60-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C2-8:2FTS	99.3%		50-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C8-PFOA	94.7%		30-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOA	58.4%		15-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOA	55.5%		10-130			04/07/23	1	EPA 1633	BCD0035
Surrogate: D3-NMEFOSAA	97.5%		45-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D5-NETFOSAA	96.0%		10-200			04/07/23	1	EPA 1633	BCD0035
Surrogate: D7-NMEFOSE	63.6%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: D9-NETFOSE	75.2%		10-150			04/07/23	1	EPA 1633	BCD0035
Surrogate: 13C3-HFPO-DA	106%		25-160			04/07/23	1	EPA 1633	BCD0035

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 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 11:17

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-RHMW16-WGN01LF-2303W3	23C0204-01RE2	04/04/23 12:20	562.11	2.00
AF-RHMW12A-WGN01LF-2303W3	23C0204-02RE2	04/04/23 12:20	546.07	2.00
AF-RHMW12A-WGFD01LF-2303W3	23C0204-03RE2	04/04/23 12:20	500.72	2.00
AF-RHMW06-WGN01LF-2303W3	23C0204-04RE2	04/04/23 12:20	578.08	2.00
AF-RHMW04-WGN01LF-2303W3	23C0204-05RE2	04/04/23 12:20	575.77	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 11:17
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Quality Control

Per- and Polyfluoroalkyl Substances

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

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 11:17

Quality Control (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

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

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		

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 11:17

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										
LCS (BCD0035-BS1)								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		
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
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 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 11:17

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 11:17

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		
<i>Surrogates</i>										
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
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 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 11:17

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 11:17



AGRICULTURE & PRIORITY POLLUTANTS LABORATORIES

A METIRI GROUP COMPANY

WORK ORDER

23C0204

Printed: 04/11/2023 11:17 am

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 02:55 PM
Date Due: 03/31/2023 (5.00 day TAT)

Logged In By: Megan Salata
Received By: Lincoln Hooper

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 11:17

23C0204

Sample Receipt Log

Default Cooler

Samples Received at: **10.1°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. 2303W3AFAL08

230204

Report to: PLEASE PRINT
 Company Name: **AECOM** Phone: 808-954-4512 / 303-796-4624
 Address: **1001 Bishop St ste1600**
Honolulu, HI 96813
 Attn: **Watson Tanji / Katie Abbott**
 Email: **watson.tanji@aecom.com/katie.abbott@aecom.com**

Invoice to: PLEASE PRINT
 Company Name: **AECOM** Phone: _____
 Address: _____ Fax: _____
 Attn: **Sheree Smith**
 Email: **USAPimaging@aecom.com**

Project Name/Number		Sampler (Print)			No. of Containers	Matrix			PFAS EPA Draft 1633	Analysis Requested/Method Number										Date Shipped:	
Purchase Order Number		Sampler (Signature)				Aq	Sed.	Soil												Carrier: United	
Sample Identification		Location				Date Collected	Time Collected	Time Zone												Waybill No. 016 04367662	
CTO N6274223F0104 / 60697810		TESSA MURPHY			2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											EDMS Coverage: AFFF Assessment Sampling GW	
RHMW04		RHMW04				3/20/23	1020	HST													

Shuttle Temperature: **IRB: 10.4/10.1 °C**

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

Sample Disposal:
 Return to client Disposal by Lab (30-day retention)

Relinquished by sampler: TESSA MURPHY	Date 3/20/23	Time 1330	Received by: 	Relinquished by: 	Date 3/20/23	Time 1440	Received by:
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date 3/24/23	Time 1455	Received at lab by:

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



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. 2303W3AFAL09

Report to: PLEASE PRINT
 Company Name: **AECOM** Phone: 808-954-4512 / 303-796-4624
 Address: **1001 Bishop St ste1600**
Honolulu, HI 96813 Fax:
 Attn: **Watson Tanji / Katie Abbott**
 Email: **watson.tanji@aecom.com/katie.abbott@aecom.com**

Invoice to: PLEASE PRINT
 Company Name: **AECOM** Phone:
 Address: Fax:
 Attn: **Sheree Smith**
 Email: **USAPimaging@aecom.com**

Project Name/Number	Sampler (Print)				No. of Containers	Matrix			PFAS EPA Draft 1633	Analysis Requested/Method Number												Date Shipped:
Purchase Order Number	Sampler (Signature)					Aq	Sed.	Soil														Carrier: <i>united</i>
Sample Identification	Location	Date Collected	Time Collected	Time Zone													Comments: EDMS upload database: JBPHE EDMS Coverage: AFFF Assessment Sampling GW					
CTO N6274223F0104 / 60697810					2	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>													
AF-RHMW06-WGN01LF-2303W3	RHMW06	03.20.23	1210	HST																		
<i>M6 03.20.23</i>																						
<i>COU 3/20/23</i>																						

Shuttle Temperature: Turnaround Requested: Check one
 Standard 2-3 wk One week 3 days 24/48 Hrs. Other: **5 day TAT**
 Sample Disposal: Return to client Disposal by Lab (30-day retention)

Relinquished by sampler: <i>Mariah Gascho</i>	Date <i>03.20.23</i>	Time <i>1330</i>	Received by: <i>Ken Yan</i>	Relinquished by: <i>Ken Yan</i>	Date <i>3/20/23</i>	Time <i>1440</i>	Received by:
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date <i>3/24/23</i>	Time <i>1455</i>	Received at lab by: <i>Justin Lopez</i>

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



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. 2303W3AFAL05

Report to: PLEASE PRINT
 Company Name: **AECOM** Phone: 808-954-4512 / 303-796-4624
 Address: **1001 Bishop St ste1600**
Honolulu, HI 96813
 Attn: **Watson Tanji / Katie Abbott**
 Email: **watson.tanji@aecom.com/katie.abbott@aecom.com**

Invoice to: PLEASE PRINT
 Company Name: **AECOM** Phone: _____
 Address: _____ Fax: _____
 Attn: **Sheree Smith**
 Email: **USAPimaging@aecom.com**

Project Name/Number	Sampler (Print)		Analysis Requested/Method Number										Date Shipped:													
CTO N6274223F0104 / 60697810	<i>GABRIEL ALLEN</i>		No. of Containers	Matrix			PFAS EPA Draft 1633											Carrier: <i>United</i>								
Purchase Order Number	Sampler (Signature)			Aq	Sed.	Soil												Waybill No: <i>16-04367602</i>								
Sample Identification	Location	Date Collected	Time Collected	Time Zone	Comments: EDMS upload database: JBPHE EDMS Coverage: AFFF Assessment Sampling GW																					
AF-RHMW12A-WGN01LF-2303W3	<i>RH</i>	<i>03/20/23</i>	<i>0930</i>	HST	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
AF-RHMW12A-WGFD01LF-2303W3	<i>RH</i>	<i>03/20/23</i>	<i>0930</i>	HST	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<div style="text-align: center;"><i>[Large Handwritten Signature]</i> <i>03/20/23</i></div>																										

Shuttle Temperature: _____ Turnaround Requested: Check one
 Standard 2-3 wk One week 3 days 24/48 Hrs. Other: 5 day TAT
 Sample Disposal: Return to client Disposal by Lab (30-day retention)

Relinquished by sampler: <i>GABRIEL ALLEN</i>	Date <i>03/20/23</i>	Time <i>1310</i>	Received by: <i>[Signature]</i>	Relinquished by: <i>[Signature]</i>	Date <i>3/20/23</i>	Time <i>1440</i>	Received by:
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date <i>3/24/23</i>	Time <i>1455</i>	Received at lab by: <i>[Signature]</i>

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 Address: **1001 Bishop St ste1600**
Honolulu, HI 96813
 Attn: **Watson Tanji / Katie Abbott**
 Email: **watson.tanji@aecom.com/katie.abbott@aecom.com**

Invoice to: PLEASE PRINT
 Company Name: **AECOM** Phone: _____
 Address: _____ Fax: _____
 Attn: **Sheree Smith**
 Email: **USAPimaging@aecom.com**

Project Name/Number	Sampler (Print)					No. of Containers	Matrix			PFAS EPA Draft 1633	Analysis Requested/Method Number										Date Shipped:				
Purchase Order Number	Sampler (Signature)						Aq	Sed.	Soil		[Handwritten: 2303W3AFAL06]										Carrier: <u>United</u>				
Sample Identification	Location	Date Collected	Time Collected	Time Zone																			Waybill No: <u>16 04367602</u>	Comments: EDMS upload database: JBPHE EDMS Coverage: AFFF Assessment Sampling GW	
CTO N6274223F0104 / 60697810	GABRIEL ALLEN					2	✓			✓															
AF-RHMW16-WGN01LF-2303W3	RH	03/24/23	1200	HST																					
<div style="font-size: 2em; opacity: 0.5;">[Large Handwritten Signature]</div>																									

Shuttle Temperature: _____ Turnaround Requested: Check one
 Standard 2-3 wk One week 3 days 24/48 Hrs. Other: **5 day TAT**
 Sample Disposal: Return to client Disposal by Lab (30-day retention)

Relinquished by sampler: <u>GABRIEL ALLEN</u>	Date: <u>03/24/23</u>	Time: <u>1315</u>	Received by: <u>[Signature]</u>	Relinquished by: <u>[Signature]</u>	Date: <u>3/20/23</u>	Time: <u>1440</u>	Received by: _____
Relinquished by: _____	Date: _____	Time: _____	Received by: _____	Relinquished by: _____	Date: <u>3/24/23</u>	Time: <u>1455</u>	Received at lab by: <u>[Signature]</u>

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

CUSTODY SEAL

AECOM (808)-521-3051

Initials: JA Date 3/20/22