

## **Baseline PFAS Results - Groundwater Monitoring Wells**

### Background:

The Navy conducted baseline sampling for per- and polyfluoroalkyl substances (PFAS) from 21 groundwater monitoring wells located in and around the Red Hill Bulk Fuel Storage Facility (RHBFSF) in Sept 2023. The sampling was conducted in coordination with the U. S. Environmental Protection Agency (EPA) and Hawaii Department of Health (DOH).

Groundwater samples were sent off-island to U.S. EPA-certified laboratories for independent analysis. Test results are shared with the EPA and DOH, and are available here for public viewing: [www.JBPHH-Safewaters.org](http://www.JBPHH-Safewaters.org).

The Navy's drinking water system is fed solely from the Waiawa Shaft 6.2 miles from the RHBFSF, which continues to meet regulatory requirements and remains safe to drink. Recent drinking water samples collected from Waiawa Shaft were non-detect for PFAS.

### Results:

Analytical results from four of the 21 wells (RHP01, RHP02, RHP07, and NMW32) showed detections of PFAS, but only perfluorooctane sulfonic acid (PFOS) was detected above the DOH Environmental Action Level (EAL) for PFOS in Groundwater of 7.69 ng/L, with concentrations ranging from 9.0 nanograms per liter (ng/L) to 16.0 ng/L. Results are included in Table A-1. EALs are non-regulatory and used to rapidly screen soil, soil vapor, and groundwater data collected for a site and identify potential environmental hazards.

The PFOS detections in the groundwater samples were compared to the PFOS ion profiles from the aqueous film-forming foam (AFFF) concentrate released at Adit 6 in the November 2022. Based on analysis of the PFOS ion profiles, the PFOS detections found in the groundwater sampling are not related to the AFFF product released in November 2022.

Additionally, recurring drinking water samples taken from the Red Hill Shaft have not yielded an exceedance of PFAS. The most recent Red Hill Shaft PFAS sample results, taken from October 2023, are also included herein.

### Next Steps:

Early stages of the Navy's cleanup of the RHBFSF include identifying and characterizing chemicals of concern for environmental remediation.

The baseline PFAS groundwater results will be incorporated into, and help inform of the scope of the PFAS Remedial Investigation being performed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for the Red Hill facility.

**Table A-1: Comprehensive Groundwater Analytical Results  
Non-Routine Monitoring Wells**

2023 November EPA Tapwater (TR 1E-06 THQ 0.1)	Hawaii DOH GW Environmental Action Levels 2023 (Table A)	Compound	Job Code:	FC10029	FC10029	FC10042	FC9604	FC9604	FC9640	FC9640
			Client Sample ID:	AF-RHMW08-WGN01LF-2309	AF-RHMW19-WGN01LF-2309	AF-RHP04C-WGN01LF-2309	AF-RHP01-WGN01LF-2309	AF-RHMW01R-WGN01LF-2309	AF-RHP02-WGN01LF-2309	AF-RHP02-WGFD01LF-2309
			Lab Sample ID:	FC10029-1	FC10029-2	FC10042-1	FC9604-1	FC9604-4	FC9640-1	FC9640-2
			Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water Field Duplicate
			Location:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Sample Date:	9/26/2023 5:50 PM	9/26/2023 1:15 PM	9/28/2023 1:50 PM	9/12/2023 2:30 PM	9/12/2023 2:15 PM	9/13/2023 12:05 PM	9/13/2023 12:05 PM
Units										
NA	NA	11Cl-PF3OUdS (F-53B Minor)	ng/l	1.8 U	1.6 U	1.7 U	1.7 U	1.6 U	1.5 U	1.6 U
NA	NA	3:3 Fluorotelomer carboxylate	ng/l	4.6 U	4.2 U	4.4 U	4.3 U	4.2 U	4.0 U	4.1 U
NA	NA	4:2 Fluorotelomer sulfonate	ng/l	3.3 U	3.0 U	3.2 U	3.0 U	3.0 U	2.8 U	2.9 U
NA	NA	5:3 Fluorotelomer carboxylate	ng/l	8.9 U	8.2 U	8.6 U	8.2 U	8.1 U	7.7 U	7.9 U
NA	1,500	6:2 Fluorotelomer sulfonate	ng/l	3.5 U	3.2 U	3.4 U	3.3 U	3.2 U	3.0 U	3.2 U
NA	NA	7:3 Fluorotelomer carboxylate	ng/l	8.0 U	7.3 U	7.7 U	7.4 U	7.3 U	6.9 U	7.1 U
NA	NA	8:2 Fluorotelomer sulfonate	ng/l	4.2 U	3.8 U	4.0 U	3.9 U	3.8 U	3.6 U	3.7 U
NA	NA	9Cl-PF3ONS (F-53B Major)	ng/l	1.4 U	1.3 U	1.4 U	1.3 U	1.3 U	1.2 U	1.3 U
NA	1,154	ADONA	ng/l	1.9 U	1.7 U	1.8 U	1.8 U	1.7 U	1.6 U	1.7 U
NA	NA	EtFOSA	ng/l	1.0 U	0.93 U	0.98 U	0.94 U	0.93 U	0.88 U	0.91 U
NA	NA	EtFOSAA	ng/l	1.4 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.2 U
NA	NA	EtFOSE	ng/l	7.6 U	6.9 U	7.3 U	7.0 U	6.9 U	6.5 U	6.7 U
1.5	11.5	HFPO-DA (GenX)	ng/l	1.0 U	0.93 U	0.98 U	0.94 U	0.93 U	0.88 U	0.91 U
NA	NA	MeFOSA	ng/l	1.0 U	0.93 U	0.98 U	0.94 U	0.93 U	0.88 U	0.91 U
NA	NA	MeFOSAA	ng/l	1.0 U	0.93 U	0.98 U	0.94 U	0.93 U	0.88 U	0.91 U
NA	NA	MeFOSE	ng/l	4.5 U	4.1 U	4.3 U	4.1 U	4.1 U	3.8 U	4.0 U
NA	NA	NFDHA	ng/l	1.2 U	1.1 U	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U
NA	NA	PFEESA	ng/l	0.80 U	0.73 U	0.76 U	0.74 U	0.72 U	0.68 U	0.71 U
NA	NA	PFMBA	ng/l	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
NA	NA	PFMPA	ng/l	1.0 U	0.93 U	0.98 U	0.94 U	0.93 U	0.88 U	0.91 U
NA	46.2	PFOSA	ng/l	0.68 U	0.63 U	0.66 U	0.63 U	0.62 U	0.59 U	0.61 U
600	1,695	Perfluorobutanesulfonic acid	ng/l	0.51 U	0.47 U	0.49 U	1.7 J	0.46 U	4.3	3.6
1,800	14,615	Perfluorobutanoic acid	ng/l	8.4 J	1.8 U	1.9 U	13.7 J	1.8 U	14.2	12.9 J
NA	38.5	Perfluorodecanesulfonic acid	ng/l	0.65 U	0.60 U	0.63 U	0.60 U	0.59 U	0.56 U	0.58 U
NA	7.69	Perfluorodecanoic acid	ng/l	0.51 U	0.47 U	0.49 U	0.47 U	0.46 U	0.44 U	0.45 U
NA	NA	Perfluorododecanesulfonic acid	ng/l	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
100	25.6	Perfluorododecanoic acid	ng/l	0.61 U	0.56 U	0.59 U	0.57 U	0.56 U	0.53 U	0.55 U
NA	38.5	Perfluoroheptanesulfonic acid	ng/l	0.51 U	0.47 U	0.49 U	0.47 U	0.46 U	0.46 J	0.45 U
NA	76.9	Perfluoroheptanoic acid	ng/l	2.3 J	0.47 U	0.49 U	3.9	0.46 U	5.0	5.2
39	76.9	Perfluorohexanesulfonic acid	ng/l	0.71 U	0.65 U	0.69 U	4.9	0.65 U	5.0	4.5
990	1,923	Perfluorohexanoic acid	ng/l	3.0 J	0.47 U	0.49 U	4.4	0.46 U	6.3	5.8
NA	NA	Perfluorononanesulfonic acid	ng/l	0.58 U	0.53 U	0.56 U	0.54 U	0.53 U	0.50 U	0.52 U
5.9	11.5	Perfluorononanoic acid	ng/l	0.62 U	0.57 U	0.60 U	1.1 J	0.56 U	1.6 J	1.3 J
4	7.69	Perfluorooctanesulfonic acid	ng/l	0.55 U	0.50 U	0.53 U	13.2	0.50 U	16.0 J	11.4 J
6	11.5	Perfluorooctanoic acid	ng/l	0.51 U	0.47 U	0.49 U	3.9	0.46 U	5.8	5.2
NA	NA	Perfluoropentanesulfonic acid	ng/l	1.1 U	1.0 U	1.1 U	1.1 U	1.0 U	0.98 U	1.0 U
NA	1,538	Perfluoropentanoic acid	ng/l	10.4	0.88 U	0.92 U	9.5	2.4 J	12.3	11.2
2,000	256	Perfluorotetradecanoic acid	ng/l	0.51 U	0.47 U	0.49 U	0.47 U	0.46 U	0.44 U	0.45 U
NA	25.6	Perfluorotridecanoic acid	ng/l	0.86 U	0.79 U	0.82 U	0.79 U	0.78 U	0.74 U	0.76 U
600	19.2	Perfluoroundecanoic acid	ng/l	0.61 U	0.56 U	0.59 U	0.57 U	0.56 U	0.53 U	0.55 U

Notes:

Results highlighted blue exceed the 2023 November EPA Tapwater RSL (TR 1E-06 THQ 0.1)

Results highlighted purple exceed Hawaii DOH GW Environmental Action Levels 2023 (Table A) and 2023 November EPA Tapwater RSL (TR 1E-06)

**Table A-1: Comprehensive Groundwater Analytical Results  
Non Routine Monitoring Wells (cont'd)**

2023 November EPA Tapwater (TR 1E-06 THQ 0.1)	Hawaii DOH GW Environmental Action Levels 2023 (Table A)	Compound	Job Code:	FC9666	FC9666	FC9666	FC9674	FC9720	FC9720	FC9796
			Client Sample ID:	AF-RHP03-WGN01LF-2309	AF-RHP07-WGN01LF-2309	AF-RHMW05-WGN01LF-2309	AF-RHP04A-WGN01LF-2309	AF-RHP05-WGN01LF-2309	AF-NMW32-WGN01LF-2309	AF-RHMW09-WGN01LF-2309
			Lab Sample ID:	FC9666-1	FC9666-2	FC9666-3	FC9674-1	FC9720-1	FC9720-2	FC9796-1
			Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
			Location:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Sample Date:	9/14/2023 1:30 PM	9/14/2023 1:10 PM	9/14/2023 3:45 PM	9/15/2023 12:50 PM	9/18/2023 1:35 PM	9/18/2023 2:55 PM	9/19/2023 1:55 PM
Units										
NA	NA	11Cl-PF3OUdS (F-53B Minor)	ng/l	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U
NA	NA	3:3 Fluorotelomer carboxylate	ng/l	4.3 U	4.3 U	4.3 U	4.4 U	4.3 U	4.3 U	4.1 U
NA	NA	4:2 Fluorotelomer sulfonate	ng/l	3.1 U	3.0 U	3.1 U	3.2 U	3.0 U	3.1 U	2.9 U
NA	NA	5:3 Fluorotelomer carboxylate	ng/l	8.4 U	8.2 U	8.4 U	8.6 U	8.2 U	8.4 U	7.9 U
NA	1,500	6:2 Fluorotelomer sulfonate	ng/l	3.3 U	3.3 U	3.3 U	3.4 U	3.3 U	3.3 U	3.2 U
NA	NA	7:3 Fluorotelomer carboxylate	ng/l	7.5 U	7.4 U	7.5 U	7.7 U	7.4 U	7.5 U	7.1 U
NA	NA	8:2 Fluorotelomer sulfonate	ng/l	4.0 U	3.9 U	4.0 U	4.0 U	3.9 U	4.0 U	3.7 U
NA	NA	9Cl-PF3ONS (F-53B Major)	ng/l	1.3 U	1.3 U	1.3 U	1.4 U	1.3 U	1.3 U	1.3 U
NA	1,154	ADONA	ng/l	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
NA	NA	EtFOSA	ng/l	0.96 U	0.94 U	0.96 U	0.98 U	0.94 U	0.96 U	0.91 U
NA	NA	EtFOSAA	ng/l	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U
NA	NA	EtFOSE	ng/l	7.1 U	7.0 U	7.1 U	7.3 U	7.0 U	7.1 U	6.7 U
1.5	11.5	HFPO-DA (GenX)	ng/l	0.96 U	0.94 U	0.96 U	0.98 U	0.94 U	0.96 U	0.91 U
NA	NA	MeFOSA	ng/l	0.96 U	0.94 U	0.96 U	0.98 U	0.94 U	0.96 U	0.91 U
NA	NA	MeFOSAA	ng/l	0.96 U	0.94 U	0.96 U	0.98 U	0.94 U	0.96 U	0.91 U
NA	NA	MeFOSE	ng/l	4.2 U	4.1 U	4.2 U	4.3 U	4.1 U	4.2 U	4.0 U
NA	NA	NFDHA	ng/l	1.2 U	1.1 U	1.2 U	1.2 U	1.1 U	1.2 U	1.1 U
NA	NA	PFEESA	ng/l	0.75 U	0.74 U	0.75 U	0.76 U	0.74 U	0.75 U	0.71 U
NA	NA	PFMBA	ng/l	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U
NA	NA	PFMPA	ng/l	0.96 U	0.94 U	0.96 U	0.98 U	0.94 U	0.96 U	0.91 U
NA	46.2	PFOSA	ng/l	0.64 U	0.63 U	0.64 U	0.66 U	0.63 U	0.64 U	0.61 U
600	1,695	Perfluorobutanesulfonic acid	ng/l	1.9 J	1.1 J	0.48 U	0.49 U	1.1 J	3.9	0.45 U
1,800	14,615	Perfluorobutanoic acid	ng/l	6.0 J	5.8 J	1.8 U	1.9 U	1.8 U	4.2 J	1.7 U
NA	38.5	Perfluorodecanesulfonic acid	ng/l	0.62 U	0.60 U	0.62 U	0.63 U	0.60 U	0.62 U	0.58 U
NA	7.69	Perfluorodecanoic acid	ng/l	0.48 U	0.47 U	0.48 U	0.49 U	0.47 U	0.48 U	0.45 U
NA	NA	Perfluorododecanesulfonic acid	ng/l	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U
100	25.6	Perfluorododecanoic acid	ng/l	0.58 U	0.57 U	0.58 U	0.59 U	0.57 U	0.58 U	0.55 U
NA	38.5	Perfluoroheptanesulfonic acid	ng/l	0.48 U	0.47 U	0.48 U	0.49 U	0.47 U	0.48 U	0.45 U
NA	76.9	Perfluoroheptanoic acid	ng/l	2.8 J	1.5 J	0.48 U	0.49 U	1.2 J	3.3 J	0.45 U
39	76.9	Perfluorohexanesulfonic acid	ng/l	4.0	3.6 J	0.67 U	4.6	5.2	9.7	0.64 U
990	1,923	Perfluorohexanoic acid	ng/l	3.1 J	1.6 J	0.48 U	0.49 U	1.2 J	4.5	0.45 U
NA	NA	Perfluorononanesulfonic acid	ng/l	0.55 U	0.54 U	0.55 U	0.56 U	0.54 U	0.55 U	0.52 U
5.9	11.5	Perfluorononanoic acid	ng/l	0.59 U	0.58 U	0.59 U	0.60 U	0.58 U	0.59 U	0.55 U
4	7.69	Perfluorooctanesulfonic acid	ng/l	5.1	9.0	0.52 U	0.53 U	3.6 J	14.7	0.49 U
6	11.5	Perfluorooctanoic acid	ng/l	2.6 J	1.8 J	0.48 U	0.49 U	2.3 J	5.9	0.45 U
NA	NA	Perfluoropentanesulfonic acid	ng/l	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.7 J	1.0 U
NA	1,538	Perfluoropentanoic acid	ng/l	5.7 J	3.3 J	0.90 U	0.92 U	0.89 U	5.2 J	0.85 U
2,000	256	Perfluorotetradecanoic acid	ng/l	0.48 U	0.47 U	0.48 U	0.49 U	0.47 U	0.48 U	0.45 U
NA	25.6	Perfluorotridecanoic acid	ng/l	0.81 U	0.79 U	0.81 U	0.82 U	0.79 U	0.81 U	0.76 U
600	19.2	Perfluoroundecanoic acid	ng/l	0.58 U	0.57 U	0.58 U	0.59 U	0.57 U	0.58 U	0.55 U

Notes:  
 Results highlighted blue exceed the 2023 November EPA Tapwater RSL (TR 1E-06 THQ 0.1)  
 Results highlighted purple exceed Hawaii DOH GW Environmental Action Levels 2023 (Table A) and 2023 November

**Table A-1: Comprehensive Groundwater Analytical Results  
Non Routine Monitoring Wells (cont'd)**

2023 November EPA Tapwater (TR 1E-06 THQ 0.1)	Hawaii DOH GW Environmental Action Levels 2023 (Table A)	Compound	Job Code:	FC9796	FC9816	FC9816	FC9816	FC9898	FC9898	FC9898
			Client Sample ID:	AF-RHMW20-WGN01LF-2309	AF-RHP08-WGN01LF-2309	AF-RHP06-WGN01LF-2309	AF-RHP06-WGFD01LF-2309	AF-RHMW07-WGN01LF-2309	AF-NMW25-WGN01LF-2309	AF-RHP04B-WGN01LF-2309
			Lab Sample ID:	FC9796-2	FC9816-1	FC9816-2	FC9816-3	FC9898-1	FC9898-2	FC9898-3
			Matrix:	Ground Water	Ground Water	Ground Water	Ground Water Field Duplicate	Ground Water	Ground Water	Ground Water
			Location:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Sample Date:	9/19/2023 2:45 PM	9/20/2023 2:35 PM	9/20/2023 10:35 AM	9/20/2023 10:35 AM	9/21/2023 2:00 PM	9/21/2023 4:20 PM	9/25/2023 3:00 PM
Units										
NA	NA	11Cl-PF3OUdS (F-53B Minor)	ng/l	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
NA	NA	3:3 Fluorotelomer carboxylate	ng/l	4.2 U	4.1 U	4.1 U	4.1 U	4.0 U	4.2 U	4.0 U
NA	NA	4:2 Fluorotelomer sulfonate	ng/l	3.0 U	2.9 U	2.9 U	3.0 U	2.9 U	3.0 U	27 U
NA	NA	5:3 Fluorotelomer carboxylate	ng/l	8.2 U	7.9 U	7.9 U	8.0 U	7.8 U	8.1 U	7.8 U
NA	1,500	6:2 Fluorotelomer sulfonate	ng/l	3.2 U	3.7 J	3.1 U	3.2 U	3.1 U	3.2 U	3.1 U
NA	NA	7:3 Fluorotelomer carboxylate	ng/l	7.3 U	7.1 U	7.1 U	7.2 U	7.0 U	7.3 U	7.0 U
NA	NA	8:2 Fluorotelomer sulfonate	ng/l	3.8 U	3.7 U	3.7 U	3.8 U	3.7 U	3.8 U	3.7 U
NA	NA	9Cl-PF3ONS (F-53B Major)	ng/l	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U	1.2 U
NA	1,154	ADONA	ng/l	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
NA	NA	EtFOSA	ng/l	0.93 U	0.90 U	0.90 U	0.92 U	0.89 U	0.93 U	0.89 U
NA	NA	EtFOSAA	ng/l	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
NA	NA	EtFOSE	ng/l	6.9 U	6.7 U	6.7 U	6.8 U	6.6 U	6.9 U	6.6 U
1.5	11.5	HFPO-DA (GenX)	ng/l	0.93 U	0.90 U	0.90 U	0.92 U	0.89 U	0.93 U	0.89 U
NA	NA	MeFOSA	ng/l	0.93 U	0.90 U	0.90 U	0.92 U	0.89 U	0.93 U	0.89 U
NA	NA	MeFOSAA	ng/l	0.93 U	0.90 U	0.90 U	0.92 U	0.89 U	0.93 U	0.89 U
NA	NA	MeFOSE	ng/l	4.1 U	3.9 U	3.9 U	4.0 U	3.9 U	4.1 U	3.9 U
NA	NA	NFDHA	ng/l	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
NA	NA	PFEESA	ng/l	0.73 U	0.70 U	0.70 U	0.72 U	0.70 U	0.72 U	0.70 U
NA	NA	PFMBA	ng/l	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U	1.0 U
NA	NA	PFMPA	ng/l	0.93 U	0.90 U	0.90 U	0.92 U	0.89 U	0.93 U	0.89 U
NA	46.2	PFOSA	ng/l	0.63 U	0.60 U	0.60 U	0.61 U	0.60 U	0.62 U	0.60 U
600	1,695	Perfluorobutanesulfonic acid	ng/l	0.47 U	1.5 J	1.3 J	1.5 J	0.45 U	2.1 J	0.45 U
1,800	14,615	Perfluorobutanoic acid	ng/l	1.8 U	1.7 U	2.2 J	2.3 J	1.7 U	1.8 U	1.7 U
NA	38.5	Perfluorodecanesulfonic acid	ng/l	0.60 U	0.58 U	0.58 U	0.59 U	0.57 U	0.59 U	0.57 U
NA	7.69	Perfluorodecanoic acid	ng/l	0.47 U	0.45 U	0.45 U	0.46 U	0.45 U	0.46 U	0.45 U
NA	NA	Perfluorododecanesulfonic acid	ng/l	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U	1.0 U
100	25.6	Perfluorododecanoic acid	ng/l	0.56 U	0.54 U	0.54 U	0.55 U	0.54 U	0.56 U	0.54 U
NA	38.5	Perfluoroheptanesulfonic acid	ng/l	0.47 U	4.8	0.45 U	0.46 U	0.45 U	0.46 U	0.45 U
NA	76.9	Perfluoroheptanoic acid	ng/l	0.47 U	1.1 J	1.7 J	1.9 J	0.46 J	1.4 J	0.45 U
39	76.9	Perfluorohexanesulfonic acid	ng/l	0.65 U	2.9 J	4.5	4.5	0.62 U	4.2	0.62 U
990	1,923	Perfluorohexanoic acid	ng/l	0.55 J	1.5 J	2.2 J	2.4 J	0.45 U	1.6 J	0.45 U
NA	NA	Perfluorononanesulfonic acid	ng/l	0.53 U	0.51 U	0.51 U	0.52 U	0.51 U	0.53 U	0.51 U
5.9	11.5	Perfluorononanoic acid	ng/l	0.57 U	0.55 U	0.55 U	0.56 U	0.54 U	0.56 U	0.54 U
4	7.69	Perfluorooctanesulfonic acid	ng/l	0.69 J	3.9	4.1	3.3 J	0.48 U	1.6 J	0.48 U
6	11.5	Perfluorooctanoic acid	ng/l	0.47 U	2.4 J	2.4 J	2.6 J	0.85 J	2.9 J	0.45 U
NA	NA	Perfluoropentanesulfonic acid	ng/l	1.0 U	1.5 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
NA	1,538	Perfluoropentanoic acid	ng/l	1.0 J	1.9 J	2.8 J	3.0 J	0.84 U	2.4 J	1.6 J
2,000	256	Perfluorotetradecanoic acid	ng/l	0.47 U	0.45 U	0.45 U	0.46 U	0.45 U	0.46 U	0.45 U
NA	25.6	Perfluorotridecanoic acid	ng/l	0.79 U	0.76 U	0.76 U	0.77 U	0.75 U	0.78 U	0.75 U
600	19.2	Perfluoroundecanoic acid	ng/l	0.56 U	0.54 U	0.54 U	0.55 U	0.54 U	0.56 U	0.54 U

Notes:  
 Results highlighted blue exceed the 2023 November EPA Tapwater RSL (TR 1E-06 THQ 0.1)  
 Results highlighted purple exceed Hawaii DOH GW Environmental Action Levels 2023 (Table A) and 2023 November

**Table A-1: Comprehensive Groundwater Analytical Results  
Non Routine Monitoring Wells (cont'd)**

2023 November EPA Tapwater (TR 1E-06 THQ 0.1)	Hawaii DOH GW Environmental Action Levels 2023 (Table A)	Compound	Job Code:	FC9898	FC9898
			Client Sample ID:	AF-NMW24-WGN01LF-2309	AF-RHMW01-WGN01B-2309
			Lab Sample ID:	FC9898-5	FC9898-6
			Matrix:	Ground Water	Ground Water
			Location:	N/A	N/A
			Sample Date:	9/22/2023 11:05 AM	9/22/2023 11:15 AM
Units					
NA	NA	11Cl-PF3OUdS (F-53B Minor)	ng/l	1.6 U	1.6 U
NA	NA	3:3 Fluorotelomer carboxylate	ng/l	4.1 U	4.2 U
NA	NA	4:2 Fluorotelomer sulfonate	ng/l	2.9 U	3.0 U
NA	NA	5:3 Fluorotelomer carboxylate	ng/l	7.9 U	8.1 U
NA	1,500	6:2 Fluorotelomer sulfonate	ng/l	3.2 U	128
NA	NA	7:3 Fluorotelomer carboxylate	ng/l	7.1 U	7.3 U
NA	NA	8:2 Fluorotelomer sulfonate	ng/l	3.7 U	3.8 U
NA	NA	9Cl-PF3ONS (F-53B Major)	ng/l	1.3 U	1.3 U
NA	1,154	ADONA	ng/l	1.7 U	1.7 U
NA	NA	EtFOSA	ng/l	0.91 U	0.93 U
NA	NA	EtFOSAA	ng/l	1.2 U	1.2 U
NA	NA	EtFOSE	ng/l	6.7 U	6.9 U
1.5	11.5	HFPO-DA (GenX)	ng/l	0.91 U	0.93 U
NA	NA	MeFOSA	ng/l	0.91 U	0.93 U
NA	NA	MeFOSAA	ng/l	0.91 U	0.93 U
NA	NA	MeFOSE	ng/l	4.0 U	4.1 U
NA	NA	NFDHA	ng/l	1.1 U	1.1 U
NA	NA	PFEESA	ng/l	0.71 U	0.72 U
NA	NA	PFMBA	ng/l	1.0 U	1.1 U
NA	NA	PFMPA	ng/l	0.91 U	0.93 U
NA	46.2	PFOSA	ng/l	0.61 U	0.62 U
600	1,695	Perfluorobutanesulfonic acid	ng/l	0.45 U	0.46 U
1,800	14,615	Perfluorobutanoic acid	ng/l	1.7 U	1.8 U
NA	38.5	Perfluorodecanesulfonic acid	ng/l	0.58 U	0.59 U
NA	7.69	Perfluorodecanoic acid	ng/l	0.45 U	0.46 U
NA	NA	Perfluorododecanesulfonic acid	ng/l	1.0 U	1.1 U
100	25.6	Perfluorododecanoic acid	ng/l	0.55 U	0.56 U
NA	38.5	Perfluoroheptanesulfonic acid	ng/l	0.45 U	0.46 U
NA	76.9	Perfluoroheptanoic acid	ng/l	0.54 J	0.93 J
39	76.9	Perfluorohexanesulfonic acid	ng/l	0.64 U	0.65 U
990	1,923	Perfluorohexanoic acid	ng/l	0.68 J	2.5 J
NA	NA	Perfluorononanesulfonic acid	ng/l	0.52 U	0.53 U
5.9	11.5	Perfluorononanoic acid	ng/l	0.55 U	0.56 U
4	7.69	Perfluorooctanesulfonic acid	ng/l	3.4 J	0.50 U
6	11.5	Perfluorooctanoic acid	ng/l	1.6 J	0.46 U
NA	NA	Perfluoropentanesulfonic acid	ng/l	1.0 U	1.0 U
NA	1,538	Perfluoropentanoic acid	ng/l	0.95 J	3.4 J
2,000	256	Perfluorotetradecanoic acid	ng/l	0.45 U	0.46 U
NA	25.6	Perfluorotridecanoic acid	ng/l	0.76 U	0.78 U
600	19.2	Perfluoroundecanoic acid	ng/l	0.55 U	0.56 U

Notes:

Results highlighted blue exceed the 2023 November EPA Tapwater RSL (TR 1E-06 THQ 0.1)

Results highlighted purple exceed Hawaii DOH GW Environmental Action Levels 2023 (Table A) and 2023 November

**AFFF Assessment Sampling GW 2023 October**  
**Chemistry Results**  
**RH Fire Suppression System**

Location ID: RHMW2254-01  
 Field Sample ID: AF-RHMW225401-WGN01B-2310  
 Lab Sample ID: FC10290-6  
 Sample Date: 10/5/2023  
 Sample Type: N

PFAS (NG/L)	Hawaii Department of Health Ground Water Environmental Action Levels 2023 (Table A) PFAS			
	2023 Nov EPA Tapwater (THQ 0.1)			
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NA	NA	NA	3.80 U
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	NA	NA	NA	19.0 U
3-Perfluoroheptyl propanoic acid (7:3FTCA)	NA	NA	NA	19.0 U
3-Perfluoropropyl propanoic acid (3:3FTCA)	NA	NA	NA	9.40 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NA	1,154	NA	3.80 U
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	NA	NA	NA	7.50 U
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NA	1,500	NA	7.50 U
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NA	NA	NA	7.50 U
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NA	NA	NA	3.80 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	1.50	11.5	NA	1.90 U
N-Ethyl perfluorooctanesulfonamide (NEtFOSA)	NA	NA	NA	3.80 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NA	NA	NA	3.80 U
N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	NA	NA	NA	19.0 U
N-Methyl heptadecafluorooctanesulfonamide (NMeFOSA)	NA	NA	NA	3.80 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NA	NA	NA	3.80 U
N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	NA	NA	NA	19.0 U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NA	NA	NA	3.80 U
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NA	NA	NA	1.90 U
Perfluoro-3-methoxypropanoic acid (PFMPA)	NA	NA	NA	1.90 U
Perfluoro-4-methoxybutanoic acid (PFMBA)	NA	NA	NA	3.80 U
Perfluorobutanesulfonic acid (PFBS)	600	1,695	NA	<b>0.610 J</b>
Perfluorobutanoic acid (PFBA)	1,800	14,615	NA	3.80 U

## AFFF Assessment Sampling GW 2023 October

### Chemistry Results

#### RH Fire Suppression System

Perfluorodecanesulfonic acid (PFDS)	NA	38.5	NA	1.90 U
Perfluorodecanoic acid (PFDA)	NA	7.69	NA	1.90 U
Perfluorododecanesulfonic acid (PFDoS)	NA	NA	NA	3.80 U
Perfluorododecanoic acid (PFDoA)	100	25.6	NA	1.90 U
Perfluoroheptanesulfonic acid (PFHpS)	NA	38.5	NA	1.90 U
Perfluoroheptanoic acid (PFHpA)	NA	76.9	NA	1.90 U
Perfluorohexanesulfonic acid (PFHxS)	39.0	76.9	NA	1.90 U
Perfluorohexanoic acid (PFHxA)	990	1,923	NA	<b>0.740 J</b>
Perfluorononanesulfonic acid (PFNS)	NA	NA	NA	1.90 U
Perfluorononanoic acid (PFNA)	5.9	11.5	NA	1.90 U
Perfluorooctanesulfonamide (PFOSA)	NA	46.2	NA	1.90 U
Perfluorooctanesulfonic acid (PFOS)	4	7.69	NA	1.90 U
Perfluorooctanoic acid (PFOA)	6	11.5	NA	<b>0.740 J</b>
Perfluoropentanesulfonic acid (PFPeS)	NA	NA	NA	3.80 U
Perfluoropentanoic acid (PFPeA)	NA	1,538	NA	1.90 U
Perfluorotetradecanoic acid (PFTeDA)	2,000	256	NA	1.90 U
Perfluorotridecanoic acid (PFTTrDA)	NA	25.6	NA	1.90 U
Perfluoroundecanoic acid (PFUnA)	600	19.2	NA	1.90 U
2-(2-Butoxyethoxy)ethanol	NA	NA	NA	NA

#### Notes:

MG/L = Milligrams per Liter