



PHIL-27765

May 30, 2023

Project Number 08005-WE04

Mr. Thomas Magge
Clean Water Environmental Program Manager
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, Pennsylvania 19401

Reference: Contract No. N6247016D9008
Contract Task Order No. WE04

Subject: Temporary Discharge Monitoring Report - April 1 to April 30, 2023
Hangar 680 Per- and Polyfluoroalkyl Substances Pilot Test System
Former Naval Air Station Joint Reserve Base Willow Grove
Horsham Township, Pennsylvania

Dear Mr. Magge:

On behalf of the United States (U.S.) Navy, Tetra Tech is pleased to submit the Temporary Discharge Monitoring Report (DMR) for the Hangar 680 per- and polyfluoroalkyl substances (PFAS) pilot test system at the Former Naval Air Station Joint Reserve Base Willow Grove in Horsham Township, Pennsylvania. This DMR includes available influent, effluent, and field quality assurance/quality control (QA/QC) results for sampling from April 1 to April 30, 2023.

The temporary discharge was first approved by the Pennsylvania Department of Environmental Protection (PADEP) on February 10, 2020, as requested by the U.S. Navy under a Federal Facility Agreement permit equivalency. PADEP approved subsequent modifications to the permit equivalency in letters dated August 5, 2020, January 27, 2021, July 23, 2021, January 13, 2022, and July 1, 2022 (modified on August 12, 2022). PADEP approved a request to extend the permit equivalency duration for 180 more days on December 28, 2022. As part of this extension approval, phenols are no longer sampled, and the schedule for sampling for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) has been reduced from weekly to biweekly; however, the Navy decided they would continue sampling PFOA and PFOS on a weekly basis for data collection purposes at this time.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 30,312,039 gallons of water have been treated and discharged to Outfall 8 as of April 24, 2023. The discharge for the reporting period complied with the effluent limitations and monitoring requirements as summarized in the following bullets:

- Influent samples were collected weekly on April 3, April 10, April 17, and April 24, 2023. These samples were collected from shallow extraction well HA-EW-1S, first intermediate extraction well HA-EW-1I, second intermediate extraction well HA-EW-2I, and the combined influent of these extraction wells. These samples were analyzed for PFAS, specifically PFOA and PFOS, and the results are provided in Table 1. During the operational period, the shallow extraction well HA-EW-1S was operated at approximately 4.4 gallons per minute (gpm), the first intermediate extraction well HA-EW-1I was operated at approximately 6.4 gpm, and the second intermediate extraction well HA-EW-2I was operated at approximately 7.1 gpm.

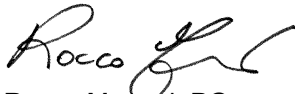
- Effluent samples were collected weekly on April 3, April 10, April 17, and April 24, 2023. These samples were analyzed for PFOA and PFOS. Effluent samples for tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), and total lead were collected on April 10, 2023. All effluent analytical sample results for this reporting period are provided in Table 2. Field blank QA/QC samples were collected weekly on April 3, April 10, April 17, and April 24, 2023. These samples were analyzed for PFOA and PFOS, and their analytical results are provided in Table 2. PFOA was detected in the field sample, its duplicate, and the field blank in the April 24, 2023 samples at an estimated value of ~0.001 µg/L. Both the field sample and the duplicate had estimated concentrations that were less than the field blank; all three samples had estimated results significantly less than the permit requirement of 0.07 µg/L.
- A trip blank QA/QC sample was collected on April 10, 2023. This sample was analyzed for PCE, TCE, CTC, and 1,2-DCA. The results are provided in Table 2.
- Per the August 12, 2022 permit equivalency modification and the December 28, 2022 permit equivalency extension, weekly monitoring of PFOA and PFOS shall be conducted at discharge sampling port HA-Mid2IX to determine if maintenance actions are needed. During this reporting period, all weekly PFOA and PFOS sampling results at HA-Mid2IX were below the maintenance levels described in the permit equivalency modification (0.014 µg/L PFOA and 0.018 µg/L PFOS). Therefore, no maintenance actions are planned before the next reporting period. However, despite these levels not being exceeded, the Navy is planning on conducting changeout of the GAC, lead ion exchange resin, and mid-lead ion exchange resin during the June reporting period.

The Aqueous IDW treatment system was not operated during this reporting period.

Lastly, analytical results from samples collected since the start of the Hangar 680 PFAS pilot test system and intermittent operation of the aqueous IDW treatment system have demonstrated that both systems effectively reduce the compounds identified in the permit equivalency to below the established limits.

Please do not hesitate to contact me if you have any questions.

Sincerely,



Rocco Mercuri, PG
Senior Project Manager

RM/nfs

Attachments:

Table 1 – NPDES Permit Equivalency Influent Sample Results from April 1, 2023 through April 30, 2023
Table 2 – NPDES Permit Equivalency Effluent Sample Results from April 1, 2023 through April 30, 2023

c: Brian Helland (Navy BRAC PMOE)
Dawn DeFreitas (Navy BRAC PMOE)
Colin Wade (PADEP)
Sarah Kloss (EPA Region 3)
Navy Caretaker Office
Horsham Library
NIRIS RDM

TABLES

**Table 1: NPDES Permit Equivalency Influent Sample Results from April 1, 2023 through April 30, 2023
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		161			
Sample ID		HA-EW-1S-20230403	HA-EW-1I-20230403	HA-EW-2I-20230403	HA-CombinedINF-20230403
Sample Date		4/3/2023	4/3/2023	4/3/2023	4/3/2023
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.621	2.450 D	2.670 D	2.210 D
Perfluorooctanesulfonic acid (PFOS)	NA	51.900 D	14.200 D	57.500 D	45.900 D
PFOA + PFOS	0.07	52.521	16.650	60.170	48.110

Notes:

⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

Results from the shallow (HA-EW-1S), first intermediate (HA-EW-1I), second intermediate (HA-EW-2I), and combined (HA-CombinedINF) influent locations are not validated.

Bold value indicates result is above applicable maximum effluent limit.

PADEP: Pennsylvania Department of Environmental Protection.

µg/L: Micrograms per liter (also referred to as parts per billion [ppb]).

NA: Not applicable.

D: Dilution Run. Initial run outside the initial calibration range of the instrument.

**Table 1: NPDES Permit Equivalency Influent Sample Results from April 1, 2023 through April 30, 2023
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Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		162			
Sample ID		HA-EW-1S-20230410	HA-EW-1I-20230410	HA-EW-2I-20230410	HA-CombinedINF-20230410
Sample Date		4/10/2023	4/10/2023	4/10/2023	4/10/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.713	2.450 D	2.220 D	1.780 D
Perfluorooctanesulfonic acid (PFOS)	NA	64.600 D	16.200 D	59.500 D	40.800 D
PFOA + PFOS	0.07	65.313	18.650	61.720	42.580

Notes:

⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

Results from the shallow (HA-EW-1S), first intermediate (HA-EW-1I), second intermediate (HA-EW-2I), and combined (HA-CombinedINF) influent locations are not validated.

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Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		163			
Sample ID		HA-EW-1S-20230417	HA-EW-1I-20230417	HA-EW-2I-20230417	HA-CombinedINF-20230417
Sample Date		4/17/2023	4/17/2023	4/17/2023	4/17/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.885	3.050 D	2.420 D	2.380 D
Perfluorooctanesulfonic acid (PFOS)	NA	74.300 D	19.300 D	65.400 D	53.200 D
PFOA + PFOS	0.07	75.185	22.350	67.820	55.580

Notes:

⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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Hangar 680 PFAS Pilot Test
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Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		164			
Sample ID		HA-EW-1S-20230424	HA-EW-1I-20230424	HA-EW-2I-20230424	HA-CombinedINF-20230424
Sample Date		4/24/2023	4/24/2023	4/24/2023	4/24/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.660	2.220 D	2.330 D	1.710 D
Perfluorooctanesulfonic acid (PFOS)	NA	60.000 D	19.900 D	66.300 D	49.700 D
PFOA + PFOS	0.07	60.660	22.120	68.630	51.410

Notes:

⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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Bold value indicates result is above applicable maximum effluent limit.

PADEP: Pennsylvania Department of Environmental Protection.

µg/L: Micrograms per liter (also referred to as parts per billion [ppb]).

NA: Not applicable.

D: Dilution Run. Initial run outside the initial calibration range of the instrument.

**Table 2: NPDES Permit Equivalency Effluent Sample Results from April 1, 2023 through April 30, 2023
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		162		
Sample ID		HA-GEFF-20230403	HA-DUP-165-20230403	HA-FB-20230403
Sample Date		4/3/2023	4/3/2023	4/3/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00225 U	0.00236 U	0.00245 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00225 U	0.00236 U	0.00245 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		162		
Sample ID		HA-GEFF-20230403	HA-DUP-165-20230403	--
Sample Date		4/3/2023	4/3/2023	4/3/2023
Units		µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--
Carbon Tetrachloride	0.23	--	--	--
1,2-Dichloroethane	0.38	--	--	--
Lead (total)	3.2	--	--	--

Notes:

⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

Effluent and effluent field duplicate results have not yet been validated.

Bold value indicates result is above applicable maximum effluent limit.

Quality assurance/quality control sample (field blank and trip blank) results are not validated.

PADEP: Pennsylvania Department of Environmental Protection

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NA: Not applicable.

U: Analyte not detected (lab qualifier). Value reported to limit of detection.

ND: Not detected.

J: Estimated (lab qualifier). The analyte was positively identified; the quantitation is an estimation.

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Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample					
		Effluent		Effluent Field Duplicate		Field Blank	
Operation Week		163					
Sample ID		HA-GEFF-20230410		HA-DUP-167-20230410		HA-FB-20230410	
Sample Date		4/10/2023		4/10/2023		4/10/2023	
Units		µg/L		µg/L		µg/L	
Perfluorooctanoic acid (PFOA)	NA	0.00226	U	0.00220	U	0.00219	U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00226	U	0.00220	U	0.00219	U
PFOA + PFOS	0.07	ND		ND		ND	

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample					
		Effluent		Effluent Field Duplicate		Trip Blank	
Operation Week		163					
Sample ID		HA-GEFF-20230410		HA-DUP-167-20230410		HA-TB-20230410	
Sample Date		4/10/2023		4/10/2023		4/10/2023	
Units		µg/L		µg/L		µg/L	
Tetrachloroethylene (PCE)	0.69	0.20	U	0.2	U	0.2	U
Trichloroethylene (TCE)	2.5	0.20	U	0.2	U	0.2	U
Carbon Tetrachloride	0.23	0.07	J	0.2	U	0.2	U
1,2-Dichloroethane	0.38	0.20	U	0.2	U	0.2	U
Lead (total)	3.2	0.70	U	0.70	U	--	

Notes:

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Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		164		
Sample ID		HA-GEFF-20230417	HA-DUP-168-20230417	HA-FB-20230417
Sample Date		4/17/2023	4/17/2023	4/17/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00228 U	0.00230 U	0.00255 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00228 U	0.00230 U	0.00255 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		164		
Sample ID		HA-GEFF-20230417	HA-DUP-168-20230417	--
Sample Date		4/17/2023	4/17/2023	4/17/2023
Units		µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--
Carbon Tetrachloride	0.23	--	--	--
1,2-Dichloroethane	0.38	--	--	--
Lead (total)	3.2	--	--	--

Notes:

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		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		165		
Sample ID		HA-GEFF-20230424	HA-DUP-169-20230424	HA-FB-20230424
Sample Date		4/24/2023	4/24/2023	4/24/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00103 J	0.00101 J	0.00111 J
Perfluorooctanesulfonic acid (PFOS)	NA	0.00219 U	0.00223 U	0.00243 U
PFOA + PFOS	0.07	0.00103 J	0.00101 J	0.00111 J

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		165		
Sample ID		HA-GEFF-20230424	HA-DUP-169-20230424	--
Sample Date		4/24/2023	4/24/2023	4/24/2023
Units		µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--
Carbon Tetrachloride	0.23	--	--	--
1,2-Dichloroethane	0.38	--	--	--
Lead (total)	3.2	--	--	--

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