



PHIL-27783

June 22, 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 - May 1 to May 31, 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 May 1 to May 31, 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, July 1, 2022 (modified on August 12, 2022), and December 28, 2022. PADEP approved a request to extend the permit equivalency duration for 180 more days on June 14, 2023. Although the permit requirements only require sampling for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) on a biweekly basis, sampling for these compounds is conducted more frequently than required for data collection purposes.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 31,096,623 gallons of water have been treated and discharged to Outfall 8 as of May 30, 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 May 1, May 8, May 15, May 22, and May 30, 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 4.6 gallons per minute (gpm), the first intermediate extraction well HA-EW-1I was operated at approximately 6.6 gpm, and the second intermediate extraction well HA-EW-2I was operated at approximately 5.7 gpm.
- Effluent samples were collected weekly on May 1, May 8, May 15, May 22, and May 30, 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 May 8, 2023. All effluent analytical sample results for this reporting period are provided in Table 2. Field blank QA/QC samples were collected weekly on May 1, May 8, May 15, May 22, and May 30, 2023. These samples were analyzed for PFOA and PFOS, and their analytical results are provided in Table 2.

- A trip blank QA/QC sample was collected on May 8, 2023. This sample was analyzed for PCE, TCE, CTC, and 1,2-DCA. The results are provided in Table 2.
- Per the June 14, 2023 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 based on this requirement were deemed necessary before the next reporting period. However, despite these levels not being exceeded, the Navy is currently conducting changeout of the LeadGAC, LagGAC, LeadIX, Mid1IX, and Mid2IX media. (This does not include the polishing GAC vessels at the end of the treatment train.) In addition, the ion exchange vessels were switched around per the table below. The system was taken offline on June 13, 2023 for replacement of this filtration media; therefore, the overall discharge amount for the June reporting period will be reduced.

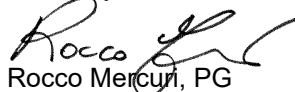
Old Vessel Location	New Vessel Location
Lag1IX	LeadIX
Mid2IX	Mid1IX
Mid1IX	Mid2IX
LeadIX	LagIX

The Aqueous IDW treatment system was not operated during this reporting period, and therefore there are no discharge results to report.

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 continue to 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 May 1, 2023 through May 31, 2023
 Table 2 – NPDES Permit Equivalency Effluent Sample Results from May 1, 2023 through May 31, 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
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TABLES

**Table 1: NPDES Permit Equivalency Influent Sample Results from May 1, 2023 through May 31, 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		165			
Sample ID		HA-EW-1S-20230501	HA-EW-1I-20230501	HA-EW-2I-20230501	HA-CombinedINF-20230501
Sample Date		5/1/2023	5/1/2023	5/1/2023	5/1/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.460	2.350 D	2.020 D	1.710 D
Perfluorooctanesulfonic acid (PFOS)	NA	36.200 D	14.000 D	61.400 D	38.900 D
PFOA + PFOS	0.07	36.660	16.350	63.420	40.610

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.

Data from 5/22/23 and 5/30/23 are pending.

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.

P: Results pending.

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

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Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		166			
Sample ID		HA-EW-1S-20230508	HA-EW-1I-20230508	HA-EW-2I-20230508	HA-CombinedINF-20230508
Sample Date		5/8/2023	5/8/2023	5/8/2023	5/8/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.288	2.640 D	5.710 D	1.930 D
Perfluorooctanesulfonic acid (PFOS)	NA	28.400 D	15.500 D	133.000 D	31.500 D
PFOA + PFOS	0.07	28.688	18.140	138.710	33.430

Notes:

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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		167			
Sample ID		HA-EW-1S-20230515	HA-EW-1I-20230515	HA-EW-2I-20230515	HA-CombinedINF-20230515
Sample Date		5/15/2023	5/15/2023	5/15/2023	5/15/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.457 0.00	2.290 D	2.270 D	1.470 0.00
Perfluorooctanesulfonic acid (PFOS)	NA	44.700 D	14.400 D	60.900 D	36.500 D
PFOA + PFOS	0.07	45.157	16.690	63.170	37.970

Notes:

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

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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		168			
Sample ID		HA-EW-1S-20230522	HA-EW-1I-20230522	HA-EW-2I-20230522	HA-CombinedINF-20230522
Sample Date		5/22/2023	5/22/2023	5/22/2023	5/22/2023
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	1.000 D	2.230 D	2.320 D	2.220 D
Perfluorooctanesulfonic acid (PFOS)	NA	54.300 D	16.000 D	66.600 D	48.000 D
PFOA + PFOS	0.07	55.300	18.230	68.920	50.220

Notes:

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

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Data from 5/22/23 and 5/30/23 are pending.

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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		169			
Sample ID		HA-EW-1S-20230530	HA-EW-1I-20230530	HA-EW-2I-20230530	HA-CombinedINF-20230530
Sample Date		5/30/2023	5/30/2023	5/30/2023	5/30/2023
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.834	2.140 D	2.480 D	1.830 D
Perfluorooctanesulfonic acid (PFOS)	NA	52.700 D	13.300 D	55.100 D	44.500 D
PFOA + PFOS	0.07	53.534	15.440	57.580	46.330

Notes:

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

**Table 2: NPDES Permit Equivalency Effluent Sample Results from May 1, 2023 through May 31, 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		166		
Sample ID		HA-GEFF-20230501	HA-DUP-170-20230501	HA-FB-20230501
Sample Date		5/1/2023	5/1/2023	5/1/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00228 U	0.00231 U	0.00239 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00228 U	0.00231 U	0.00239 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		166		
Sample ID		HA-GEFF-20230501	HA-DUP-170-20230501	--
Sample Date		5/1/2023	5/1/2023	5/1/2023
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.

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

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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		167					
Sample ID		HA-GEFF-20230508		HA-DUP-171-20230508		HA-FB-20230508	
Sample Date		5/8/2023		5/8/2023		5/8/2023	
Units		µg/L		µg/L		µg/L	
Perfluorooctanoic acid (PFOA)	NA	0.00226	U	0.00218	U	0.00258	U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00226	U	0.00218	U	0.00258	U
PFOA + PFOS	0.07	ND		ND		ND	

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample					
		Effluent		Effluent Field Duplicate		Trip Blank	
Operation Week		167					
Sample ID		HA-GEFF-20230508		HA-DUP-171-20230508		--	
Sample Date		5/8/2023		5/8/2023		5/8/2023	
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	0.08	J	0.083	J	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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Effluent and effluent field duplicate results have not yet been validated.

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

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Hangar 680 PFAS Pilot Test
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		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		168		
Sample ID		HA-GEFF-20230515	HA-DUP-172-20230515	HA-FB-20230515
Sample Date		5/15/2023	5/15/2023	5/15/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00231 U	0.00235 U	0.00256 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00231 U	0.00235 U	0.00256 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		168		
Sample ID		HA-GEFF-20230515	HA-DUP-172-20230515	--
Sample Date		5/15/2023	5/15/2023	5/15/2023
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.

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Hangar 680 PFAS Pilot Test
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		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		169		
Sample ID		HA-GEFF-20230522	HA-DUP-173-20230522	HA-FB-20230522
Sample Date		5/22/2023	5/22/2023	5/22/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00242 U	0.00233 U	0.00247 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00242 U	0.00233 U	0.00247 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		169		
Sample ID		HA-GEFF-20230522	HA-DUP-173-20230522	--
Sample Date		5/22/2023	5/22/2023	5/22/2023
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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		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		170		
Sample ID		HA-GEFF-20230530	HA-DUP-174-20230530	HA-FB-20230530
Sample Date		5/30/2023	5/30/2023	5/30/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00216 U	0.00232 U	0.00233 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00216 U	0.00232 U	0.00233 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		170		
Sample ID		HA-GEFF-20230530	HA-DUP-174-20230530	--
Sample Date		5/30/2023	5/30/2023	5/30/2023
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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