



PHIL-27750

April 28, 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 - March 1 to March 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 March 1 to March 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, 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 would like to continue sampling on a weekly basis for data collection purposes.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 29,692,364 gallons of water have been treated and discharged to Outfall 8 as of March 27, 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 March 6, March 13, March 20, and March 27, 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 6.2 gpm, and the second intermediate extraction well HA-EW-2I was operated at approximately 7.5 gpm.

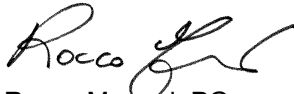
- Effluent samples were collected weekly on March 6, March 13, March 20, and March 27, 2023. These samples were analyzed for PFOA and PFOS. Effluent samples for tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), and total lead were collected on March 6, 2023. All effluent analytical sample results for this reporting period are provided in Table 2. Field blank QA/QC samples were collected weekly on March 6, March 13, March 20, and March 27, 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 March 6, 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.

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 March 1, 2023 through March 31, 2023

Table 2 – NPDES Permit Equivalency Effluent Sample Results from March 1, 2023 through March 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

## **TABLES**

**Table 1: NPDES Permit Equivalency Influent Sample Results from March 1, 2023 through March 31, 2023  
Hangar 680 PFAS Pilot Test  
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		157			
Sample ID		HA-EW-1S-20230306	HA-EW-1I-20230306	HA-EW-2I-20230306	HA-CombinedINF-20230306
Sample Date		3/6/2023	3/6/2023	3/6/2023	3/6/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.516	1.960 D	2.170 D	1.590 D
Perfluorooctanesulfonic acid (PFOS)	NA	30.700 D	9.580 D	42.700 D	26.600 D
PFOA + PFOS	0.07	<b>31.216</b>	<b>11.540</b>	<b>44.870</b>	<b>28.190</b>

Notes:

<sup>(1)</sup>: 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.

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Hangar 680 PFAS Pilot Test  
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Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		158			
Sample ID		HA-EW-1S-20230313	HA-EW-1I-20230313	HA-EW-2I-20230313	HA-CombinedINF-20230313
Sample Date		3/13/2023	3/13/2023	3/13/2023	3/13/2023
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.601	2.190 D	1.900 D	1.600 D
Perfluorooctanesulfonic acid (PFOS)	NA	38.400 D	13.700 D	52.300 D	36.100 D
PFOA + PFOS	0.07	<b>39.001</b>	<b>15.890</b>	<b>54.200</b>	<b>37.700</b>

Notes:

<sup>(1)</sup>: 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 <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		159			
Sample ID		HA-EW-1S-20230320	HA-EW-1I-20230320	HA-EW-2I-20230320	HA-CombinedINF-20230320
Sample Date		3/20/2023	3/20/2023	3/20/2023	3/20/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.858	1.860 D	1.970 D	1.660 D
Perfluorooctanesulfonic acid (PFOS)	NA	54.200 D	13.000 D	53.400 D	41.100 D
PFOA + PFOS	0.07	<b>55.058</b>	<b>14.860</b>	<b>55.370</b>	<b>42.760</b>

Notes:

<sup>(1)</sup>: 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  
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Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent - 2	Combined Influent
Operation Week		160			
Sample ID		HA-EW-1S-20230327	HA-EW-1I-20230327	HA-EW-2I-20230327	HA-CombinedINF-20230327
Sample Date		3/27/2023	3/27/2023	3/27/2023	3/27/2023
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.603	1.650 D	2.030 D	1.510 D
Perfluorooctanesulfonic acid (PFOS)	NA	53.000 D	12.300 D	48.000 D	36.200 D
PFOA + PFOS	0.07	<b>53.603</b>	<b>13.950</b>	<b>50.030</b>	<b>37.710</b>

Notes:

<sup>(1)</sup>: 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.**

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

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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 March 1, 2023 through March 31, 2023  
Hangar 680 PFAS Pilot Test  
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample					
		Effluent		Effluent Field Duplicate		Field Blank	
Operation Week		158					
Sample ID		HA-GEFF-20230306		HA-DUP-162-20230306		HA-FB-20230306	
Sample Date		3/6/2023		3/6/2023		3/6/2023	
Units		µg/L		µg/L		µg/L	
Perfluorooctanoic acid (PFOA)	NA	0.00222	U	0.00231	U	0.00252	U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00222	U	0.00231	U	0.00252	U
PFOA + PFOS	0.07	ND		ND		ND	

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample					
		Effluent		Effluent Field Duplicate		Trip Blank	
Operation Week		158					
Sample ID		HA-GEFF-20230306		HA-DUP-162-20230306		HA-TB-20230306	
Sample Date		3/6/2023		3/6/2023		3/6/2023	
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	0.20	U	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:

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

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

PADEP: Pennsylvania Department of Environmental Protection

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

NA: Not applicable.

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

ND: Not detected.

--: Not sampled.



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Hangar 680 PFAS Pilot Test  
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Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		159		
Sample ID		HA-GEFF-20230313	HA-DUP-163-20230313	HA-FB-20230313
Sample Date		3/13/2023	3/13/2023	3/13/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00210 U	0.00211 U	0.00250 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00210 U	0.00211 U	0.00250 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		159		
Sample ID		HA-GEFF-20230313	HA-DUP-163-20230313	--
Sample Date		3/13/2023	3/13/2023	3/13/2023
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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Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		160		
Sample ID		HA-GEFF-20230320	HA-DUP-164-20230320	HA-FB-20230320
Sample Date		3/20/2023	3/20/2023	3/20/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00221 U	0.00244 U	0.00220 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00221 U	0.00244 U	0.00220 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		160		
Sample ID		HA-GEFF-20230320	HA-DUP-164-20230320	--
Sample Date		3/20/2023	3/20/2023	3/20/2023
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:

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

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		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		161		
Sample ID		HA-GEFF-20230327	HA-DUP-165-20230327	HA-FB-20230327
Sample Date		3/27/2023	3/27/2023	3/27/2023
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00226 U	0.00239 U	0.00227 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00226 U	0.00239 U	0.00227 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		161		
Sample ID		HA-GEFF-20230327	HA-DUP-165-20230327	--
Sample Date		3/27/2023	3/27/2023	3/27/2023
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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