



PHIL-27681

November 29, 2022

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 - October 1 to October 31, 2022
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 October 1 to October 31, 2022.

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, and January 13, 2022. PADEP approved a request to extend the permit equivalency duration for 180 more days on July 1, 2022 and subsequently modified on August 12, 2022. Another request to extend the permit equivalency will be submitted in December 2022.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 26,069,461 gallons of water have been treated and discharged to Outfall 8 as of October 31, 2022. 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 October 3, October 10, October 19, October 28, and October 31, 2022. 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 perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), and the results are provided in Table 1. The results from October 31, 2022 sampling are not available at this time due to laboratory delays. During the operational period, the shallow extraction well HA-EW-1S was operated at approximately 5.0 gallons per minute (gpm), the first intermediate extraction well HA-EW-1I was operated at approximately 8.0 gpm, and the second intermediate extraction well HA-EW-2I was operated at approximately 8.0 gpm. HA-EW-2I has operated with no malfunctions or faults through the end of this reporting period. Note that the influent flow rates will be adjusted as part of system optimization activities in the upcoming reporting periods.

- Effluent samples were collected weekly on October 3, October 10, October 19, October 28, and October 31, 2022. These samples were analyzed for PFOA and PFOS. Effluent samples for tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), total phenols, and total lead were collected on October 19, 2022. All effluent analytical sample results for this reporting period, except for the October 31, 2022 samples, are provided in Table 2, Field blank QA/QC samples were collected weekly on October 3, October 10, October 19, October 28, and October 31, 2022. These samples were analyzed for PFOA PFOS, and the analytical results (except for the October 31, 2022 sampling event) are provided in Table 2.
- A trip blank QA/QC sample was collected on October 19, 2022. 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, 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.

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,



Tricia E. Moore, PG
Senior Project Manager

TM/nfs

Attachments:

Table 1 – NPDES Permit Equivalency Influent Sample Results from October 1, 2022 through October 31, 2022

Table 2 – NPDES Permit Equivalency Effluent Sample Results from October 1, 2022 through October 31, 2022

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TABLES

**Table 1: NPDES Permit Equivalency Influent Sample Results from October 1, 2022 through October 31, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample				Sample			
		Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent	Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent
Operation Week		136				137			
Sample ID		HA-EW-1S-20221003	HA-EW-1I-20221003	HA-EW-2I-20221003	HA-CombinedINF-20221003	HA-EW-1S-20221010	HA-EW-1I-20221010	HA-EW-2I-20221010	HA-CombinedINF-20221010
Sample Date		10/3/2022	10/3/2022	10/3/2022	10/3/2022	10/10/2022	10/10/2022	10/10/2022	10/10/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.486	2.220 D	2.340 D	2.070 D	0.409	3.050 D	4.270 D	2.190 D
Perfluorooctanesulfonic acid (PFOS)	NA	26.900 D	15.400 D	69.700 D	34.200 D	26.800 D	19.800 D	111.000 D	28.200 D
PFOA + PFOS	0.07	27.386	17.620	72.040	36.270	27.209	22.850	115.270	30.390

Notes:
⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (July 1, 2022).
 Combined influent (HA-CombinedINF) results have not yet been validated.
 Results from the shallow (HA-EW-1S), first intermediate (HA-EW-1I), second intermediate (HA-EW-2I), and combined (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]).
 P: Results pending.

**Table 1: NPDES Permit Equivalency Influent Sample Results from October 1, 2022 through October 31, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample				Sample			
		Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent	Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent
Operation Week		138				139			
Sample ID		HA-EW-1S-20221019	HA-EW-1I-20221019	HA-EW-2I-20221019	HA-CombinedINF-20221019	HA-EW-1S-20221028	HA-EW-1I-20221028	HA-EW-2I-20221028	HA-CombinedINF-20221028
Sample Date		10/19/2022	10/19/2022	10/19/2022	10/19/2022	10/28/2022	10/28/2022	10/28/2022	10/28/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.663 Q	2.890 D	2.540 D	2.340 D	1.170 D	2.890 DQ	2.640 DQ	2.550 DQ
Perfluorooctanesulfonic acid (PFOS)	NA	39.500 D	14.400 D	59.700 D	42.800 D	61.300 D	10.600 D	56.700 D	40.700 D
PFOA + PFOS	0.07	40.163	17.290	62.240	45.140	62.470	13.490	59.340	43.250

Notes:
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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 1	Intermediate Influent 2	Combined Influent
Operation Week		140			
Sample ID		HA-EW-1S-20221031	HA-EW-1I-20221031	HA-EW-2I-20221031	HA-CombinedINF-20221031
Sample Date		10/31/2022	10/31/2022	10/31/2022	10/31/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	P	P	P	P
Perfluorooctanesulfonic acid (PFOS)	NA	P	P	P	P
PFOA + PFOS	0.07	P	P	P	P

Notes:

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Combined influent (HA-CombinedINF) results have not yet been validated.

Results from the shallow (HA-EW-1S), first intermediate (HA-EW-1I), second intermediate (HA-EW-2I), and combined (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]).

P: Results pending.

Table 2: NPDES Permit Equivalency Effluent Sample Results from October 1, 2022 through October 31, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Field Blank	Effluent	Effluent Field Duplicate	Field Blank
Operation Week		136			137		
Sample ID		HA-GEFF-20221003	HA-DUP-140-20221003	HA-FB-20221003	HA-GEFF-20221010	HA-DUP-141-20221010	HA-FB-20221010
Sample Date		10/3/2022	10/3/2022	10/3/2022	10/10/2022	10/10/2022	10/10/2022
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00258 U	0.00232 U	0.00242 U	0.00209 U	0.00215 U	0.00233 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00258 U	0.00232 U	0.00242 U	0.00209 U	0.00215 U	0.00233 U
PFOA + PFOS	0.07	ND	ND	ND	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Trip Blank	Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		136			137		
Sample ID		HA-GEFF-20221003	HA-DUP-140-20221003	HA-FB-20221003	HA-GEFF-20221010	HA-DUP-141-20221010	HA-FB-20221010
Sample Date		10/3/2022	10/3/2022	10/3/2022	10/10/2022	10/10/2022	10/10/2022
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--	--	--	--
Carbon Tetrachloride	0.23	--	--	--	--	--	--
1,2-Dichloroethane	0.38	--	--	--	--	--	--
Total Phenols	5	--	--	--	--	--	--
Lead (total)	3.2	--	--	--	--	--	--

Notes:
⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (July 1, 2022).
Effluent and effluent field duplicate results have not yet been validated.
PADEP: Pennsylvania Department of Environmental Protection
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NA: Not applicable.
U: Analyte not detected. Value reported to limit of detection.
ND: Not detected.
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**Table 2: NPDES Permit Equivalency Effluent Sample Results from October 1, 2022 through October 31, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Field Blank	Effluent	Effluent Field Duplicate	Field Blank
Operation Week		138			139		
Sample ID		HA-GEFF-20221019	HA-DUP-142-20221019	HA-FB-20221019	HA-GEFF-20221028	HA-DUP-143-20221028	HA-FB-20221028
Sample Date		10/19/2022	10/19/2022	10/19/2022	10/28/2022	10/28/2022	10/28/2022
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00227 U	0.00234 U	0.00240 U	0.00224 U	0.00235 U	0.00244 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00227 U	0.00126 J	0.00240 U	0.00224 U	0.00235 U	0.00244 U
PFOA + PFOS	0.07	ND	1.26000 J	ND	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Trip Blank	Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		138			139		
Sample ID		HA-GEFF-20221019	HA-DUP-142-20221019	HA-FB-20221019	HA-GEFF-20221028	HA-DUP-143-20221028	HA-FB-20221028
Sample Date		10/19/2022	10/19/2022	10/19/2022	10/28/2022	10/28/2022	10/28/2022
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	0.20 U	0.20 U	0.20 U	--	--	--
Trichloroethylene (TCE)	2.5	0.20 U	0.20 U	0.20 U	--	--	--
Carbon Tetrachloride	0.23	0.20 U	0.20 U	0.20 U	--	--	--
1,2-Dichloroethane	0.38	0.20 U	0.20 U	0.20 U	--	--	--
Total Phenols	5	5.00 U	5.00 U	--	--	--	--
Lead (total)	3.2	3.00 U	3.00 U	--	--	--	--

Notes:

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

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Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		140		
Sample ID		HA-GEFF-20221031	HA-DUP-144-20221031	HA-FB-20221031
Sample Date		10/31/2022	10/31/2022	10/31/2022
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	P	P	P
Perfluorooctanesulfonic acid (PFOS)	NA	P	P	P
PFOA + PFOS	0.07	P	P	P

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		140		
Sample ID		HA-GEFF-20221031	HA-DUP-144-20221031	HA-FB-20221031
Sample Date		10/31/2022	10/31/2022	10/31/2022
Units		µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--
Carbon Tetrachloride	0.23	--	--	--
1,2-Dichloroethane	0.38	--	--	--
Total Phenols	5	--	--	--
Lead (total)	3.2	--	--	--

Notes:

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

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