



DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY ENVIRONMENTAL COMMAND
2455 REYNOLDS ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-7588

AMIM-AEC-N (200-1a2)

MEMORANDUM FOR RECORD

SUBJECT: Additional Per- and Poly-fluoroalkyl Substances (PFAS) Sites Requiring Further Evaluation in a Remedial Investigation at Radford Army Ammunition Plant, VA.

1. A PFAS Site Inspection (SI) has been completed at Radford Army Ammunition Plant, Virginia. In the SI, 5 Areas of Potential Interest (AOPIs) were screened against the Regional Screening Levels (RSLs) provided in the September 2021 Office of the Assistant Secretary of Defense (OASD) memo, Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. This screening effort determined that 1 of the 5 AOPIs required additional investigation in the Remedial Investigation (RI) phase.

2. On July 6, 2022, OASD published a revised memorandum (Enclosure) that provided RSLs for six PFAS compounds including Perfluorooctanesulfonic acid (PFOS), Perfluorooctanoic acid (PFOA), Perfluorononanoic acid (PFNA), Perfluorohexanesulfonic acid (PFHxS), Hexafluoropropylene oxide dimer acid (HFPO- DA) and Perfluorobutane Sulfonate (PFBS) based on the latest (May 2022) U.S. Environmental Protection Agency screening levels.

3. The environmental sampling data from the Radford SI effort were rescreened against the levels identified in the July 2022 OASD memo. It was determined that 4 of the 5 AOPIs now warrant further evaluation in the Remedial Investigation. The 4 AOPIs that will be included in the Radford PFAS RI are:

- Teflon Coating Facility
- **Old Fire Station 1, Old Ladder Shed, Current Storage Shed***
- **Old Fire Station 2**
- **River Warehouse**

* Bolded text indicates AOPI moving to RI based on July 2022 screening levels

4. The point of contact for this memorandum is the undersigned at 210-793-6898.

Encl
Investigating Per- and Polyfluoroalkyl
Substances within the Department of
Defense Cleanup Program

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Team Lead, PFAS Program Team
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OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

3400 DEFENSE PENTAGON
WASHINGTON, DC 20301-3400ENERGY, INSTALLATIONS,
AND ENVIRONMENT

July 6, 2022

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS,
ENERGY AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY (ENERGY,
INSTALLATIONS AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE
(INSTALLATIONS, ENVIRONMENT AND ENERGY)
DIRECTOR, NATIONAL GUARD BUREAU (JOINT STAFF, J8)
DIRECTOR, DEFENSE LOGISTICS AGENCY (INSTALLATION
MANAGEMENT)

SUBJECT: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense
Cleanup Program

The Department of Defense (DoD) conducts cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Defense Environmental Restoration Program (DERP). Our goal is protection of human health and the environment in a risk-based, fiscally-sound manner. This memorandum provides clarifying technical guidance on the investigation of perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA, or GenX), based on recent U.S. Environmental Protection Agency (EPA) information. This guidance is applicable to investigating these chemicals at Environmental Restoration Account-funded, Base Realignment and Closure Account-funded, and federal Air and Army Guard Operation and Maintenance account-funded sites.

This revised memorandum accounts for the May 2022 EPA screening levels for PFOS, PFOA, PFNA, PFHxS and HFPO-DA. PFBS remains unchanged since the May 2021 update. EPA has provided screening levels for these PFAS compounds using, updated, final, peer-reviewed information from the Agency for Toxic Substances and Disease Registry¹ and the EPA Office of Water.²

PFOS, PFOA, PFBS, PFNA, PFHxS, and HFPO-DA are part of a larger class of chemicals known as per- and polyfluoroalkyl substances (PFAS). PFAS shall be addressed in the same manner as other contaminants of concern within the DERP. HFPO-DA has primarily

¹ Agency for Toxic Substances and Disease Registry (ATSDR), May 2021. *Toxicological Profile for Perfluoroalkyls*.

² U.S. Environmental Protection Agency (EPA), *Provisional Peer-Reviewed Toxicity Values for Perfluorobutane Sulfonic Acid (CASRN 375-73-5)* and October 2021. *Human Health Toxicity Values for Hexafluoropropylene Oxide (HFPO) Dimer Acid and Its Ammonium Salt (CASRN 13252-13-6 and CASRN 62037-80-3), Also Known as "GenX Chemicals."* Office of Water.

been used as a replacement for PFOA in the manufacture of fluoropolymers, so it is not likely to have been released at the vast majority of DoD properties. As with other chemicals, the conceptual site model should be used to determine the necessity for addressing HFPO-DA.

Under CERCLA, site-specific regional screening levels³ (RSLs) for these chemicals are shown in the EPA RSL Tables or may be calculated using the EPA online calculator. The values are provided in the attachment. When multiple PFAS are encountered at a site, RSLs set at a hazard quotient of 0.1 are used for screening purposes. These RSLs should be used to determine if further investigation in the remedial investigation (RI) phase is warranted or if no further action is required. Consistent with the CERCLA process, DoD Components will incorporate these screening values into ongoing and future preliminary assessment/site inspections (PA/SI) and will reevaluate completed PA/SIs with a determination of “no further action,” to assess if an RI is now necessary.

During the RI phase, the RfDs for PFOS, PFOA, PFBS, PFNA, PFHxS, and HPFO-DA and the oral cancer slope factor (CSF) for PFOA of $0.07 \text{ (mg/kg-day)}^{-1}$ will be used to conduct site specific risk assessments in accordance with Risk Assessment Guidance for Superfund Volume I, Part A (EPA/540/1-89/002, December 1989).⁴ Site-specific risk assessment results will depend on the levels of PFAS found at each site, and will be used to determine if any necessary remedial actions are required in accordance with CERCLA, DERP, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This memorandum is effective immediately and supersedes and cancels the Assistant Secretary of Defense for Sustainment memorandum, “Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program,” September 15, 2021. The point of contact for this matter is Ms. Alexandria Long, at 703-571-9061 or alexandria.d.long.civ@mail.mil.

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Michael McAndrew
Deputy Assistant Secretary of Defense for
Construction
Performing the Duties of Principal Deputy
Assistant Secretary of Defense for Energy,
Installations, and Environment

Attachment:
As stated

³ For sites on the National Priorities List, the DoD Components will use the EPA site specific screening levels, if provided.

⁴ Currently there are six PFAS – PFOS, PFOA, PFBS, PFNA, PFHxS, HPFO-DA (GenX) – with established toxicity values that DoD can use to perform a baseline risk assessment to determine whether remedial action is needed under CERCLA.

**Attachment: Risk Screening Levels Calculated for PFOS, PFOA, PFBS, PFNA, PFHxA, HFPO-DA in Groundwater or Soil
Using EPA's RSL Calculator**

Chemical	Carcinogenic Slope Factor - Oral (SF) (mg/kg-day) ⁻¹	Non-Carcinogenic Reference Dose (RfD) (mg/kg-day)	Residential Scenario Screening Levels Calculated Using EPA RSL Calculator								Industrial/Commercial Composite Worker Screening Levels Calculated Using EPA RSL Calculator			
			Tap Water (ng/L or ppb)				Soil (mg/kg or ppm)				Soil (mg/kg or ppm)			
			HQ = 0.1	HQ = 1.0	ILCR = 1E-06	ILCR = 1E-04	HQ = 0.1	HQ = 1.0	ILCR = 1E-06	ILCR = 1E-04	HQ = 0.1	HQ = 1.0	ILCR = 1E-06	ILCR = 1E-04
PFOS	NA	2.00E-06	4	40	NA	NA	0.013	0.13	NA	NA	0.16	1.6	NA	NA
PFOA	7.00E-02	3.00E-06	6	60	1,100	111,000	0.019	0.19	7.8	775	0.25	2.5	33	3,280
PFBS	NA	3.00E-04	601	6010	NA	NA	1.9	19	NA	NA	25	250	NA	NA
PFNA	NA	3.00E-06	6	59	NA	NA	0.019	0.19	NA	NA	0.25	2.5	NA	NA
PFHxS	NA	2.00E-05	39	394	NA	NA	0.13	1.30	NA	NA	1.6	16	NA	NA
HFPO-DA	NA	3.00E-06	6	60	NA	NA	0.023	0.23	NA	NA	0.35	3.5	NA	NA

HQ=Hazard Quotient

ILCR=Incremental Lifetime Cancer Risk

NA=Not available/applicable

NOTES:

- Apply the Tap Water RSLs to groundwater used as drinking water.
- The table represents screening levels based on residential and industrial/commercial worker receptor scenarios for either direct ingestion of groundwater (residential scenario only) or incidental ingestion of soil (both residential and composite worker scenarios).
- Default exposure assumptions for each potential receptor scenario, contained in EPA's RSL Calculator on May 2022.
- Final peer reviewed toxicity values considered valid for risk assessment, and the screening levels may be found in EPA's RSL table or EPA's RSL calculator used to develop them.
- Other potential receptor scenarios (e.g., recreational user, site trespasser, construction worker) are not included in the above table, but could be relevant receptors at a site potentially containing PFAS. These receptors, and their associated exposure scenarios, should be further considered in the scoping phase and completion of the Baseline Human Health Risk Assessment typically completed during an RI.
- The shaded values represent conservative screening levels in groundwater or soil that when exceeded should be considered a contaminant of potential concern in the risk assessment process and calculations of site-specific risk posed.