1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to develop improved forensic methods and tools for source tracking and allocation of per- and polyfluoroalkyl substances (PFAS). Specific areas of interest are as follows:

- Evaluation of conventional or novel analytical techniques or methodologies to differentiate PFAS from aqueous film forming foam (AFFF) versus non-AFFF sources.
- Develop spectral libraries of PFAS to include both AFFF-derived PFAS as well as PFAS derived from other sources (i.e., consumer products, utilization in industrial manufacturing processes, landfill leachate, etc.).
- Improved analytical methods and/or validated models to predict changes to AFFF mixtures over time, including chemical pathways to the most toxic compounds.

Proposals may address one or more of the objectives listed above. To provide strategic guidance for future research and demonstrations on management and remediation of AFFF-impacted sites, SERDP and ESTCP conducted a workshop on May 2-3, 2017 in Washington, D.C. Proposers are strongly encouraged to view the Workshop Report summarizing the research, demonstration, and technology transfer needs prior to submitting their proposal.

2. Expected Benefits of Proposed Work

Addressing the research objectives described above will meet a critical need for a more viable path for the development of PFAS forensic tools at Department of Defense (DoD) sites. This in turn will help DoD remedial program managers (RPMs) assess the nature and extent of PFAS contamination related to DoD releases, as well as the potential liability associated with those releases.

3. Background

AFFF formulations have been used by DoD since the 1970s to suppress fires, and there are hundreds of sites with associated PFAS contamination. The DoD used AFFF mixtures containing significant quantities of perfluorooctane sulfonate (PFOS) and related perfluoroalkyl sulfonates such as PFHxS until 2002, when production stopped, although the DoD continued to use PFOS-containing AFFF stocks for some time after. Although the DoD's legacy use of AFFF included
various fluorotelomer-based formulations, the vast majority of DoD's environmental liability likely results from the use of PFOS-based AFFF. Additional research on PFAS is timely given the USEPA's drinking water health advisories for two common PFAS, perfluorooctanoic acid (PFOA) and PFOS, as well as the numerous states that are beginning to promulgate drinking water standards. Although the current regulatory framework is focused primarily on PFOS and PFOA, the potential formation of these chemicals (and other PFAAs) will also likely be a key determinant in the successful demonstration of PFAS remediation technologies and risk mitigation.

With different AFFF mixtures being used over time, the presence or absence of certain compounds could be used to date a plume and help differentiate between DoD and non-DoD sources of PFAS. In addition, the ability to discriminate AFFF from non-AFFF sources would be useful for source allocation, delineating plumes, and determining the presence and location where AFFF-derived polyfluorinated precursors are present. With the unlikeliness of pure analytical standard availability for the numerous PFAS and their transformation products in the near future, there is a critical need for forensic tools for PFAS that address issues of PFAA precursors and do not rely on a broad suite of analytical standards.

4. Cost and Duration of Proposed Work

The cost and time to meet the requirements of this SON are at the discretion of the proposer with two options described below; however, given the state of the science, limited scope proposals are preferred, although full proposals will be carefully considered with sufficient justification and supporting data.

**Standard Proposals**: These proposals describe a complete research effort. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. SERDP projects normally run from two to three years in length and vary considerably in cost consistent with the scope of the effort. It is expected that most proposals will fall into this category.

**Limited Scope Proposals**: Proposers with innovative approaches to the SON that entail high technical risk or have minimal supporting data may submit a Limited Scope Proposal for funding up to $200,000 and approximately one year in duration. Such proposals may be eligible for follow-on funding if they result in a successful initial project. The objective of these proposals should be to acquire the data necessary to demonstrate proof-of-concept or reduction of risk that will lead to development of a future Standard Proposal. Proposers should submit Limited Scope Proposals in accordance with the SERDP Core Solicitation instructions and deadlines.

5. Point of Contact

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