SON Number: ERSON-17-02 **October 29, 2015**

Strategic Environmental Research and Development Program (SERDP)

FY 2017 STATEMENT OF NEED

Environmental Restoration (ER) Program Area

DEVELOPMENT OF STANDARDIZED SAMPLING AND ANALYTICAL TECHNIQUES FOR MUNITIONS CONSTITUENTS

1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to develop standardized sampling and analytical techniques for munitions constituents. Of particular interest is the development of such methods for the insensitive munitions formulations that contain 2,4-dinitroanisole (DNAN) and nitrotriazolone (NTO). Specific objectives are as follows:

- Develop standardized sampling, preservation and analytical methodologies for DNAN, NTO, and nitroguanidine (NQ) and their daughter products, as well as the nitrophenols, picric acid, ammonium picrate, and dinitrophenol in environmental matrices including soil, groundwater, and surface waters.
- Develop standardized extraction methods for these same munitions constituents in soils, sediments, plant and animal tissues, and biota.

Proposers must address both objectives listed above. Proposals addressing compounds other than those listed in the objectives above will not be considered. Proposers must demonstrate their ability to develop methods that can eventually be used to establish USEPA or ASTM standards.

2. Expected Benefits of Proposed Work

An improved ability to assess the concentration of munitions constituents in the field will lead to better site assessments and a better understanding of environmental risk at Department of Defense (DoD) sites. Accurate measurements will assist in the assessment of potential impacts from past and future DoD activities to ensure sustainable management of DoD testing and training ranges.

3. Background

The Joint Insensitive Munitions Technology Program (JIMTP) has developed high-explosive compositions as replacements for trinitrotoluene (TNT) and Composition-B to increase the safety of artillery projectiles, mortars, and bombs. These new compositions consist of mixtures of compounds, including NTO, DNAN, RDX, and HMX. RDX and HMX are materials well-known in the DoD and environmental community, whereas DNAN and NTO are relatively new materials for use in munitions.

Environmental concerns associated with the fate and transport of insensitive munitions (IM) persist. During the entire manufacturing, testing, operation, and demilitarization processes, there is the potential for releases. Although current regulations require DoD to determine human and environmental impact resulting from exposure to these IM formulations, there is no standard methodology consistently used across the community that delivers sensitive, rapid, and reproducible sampling, preservation, and analytical performance for IM precursors, IM, and IM daughter products in water, air, soil, and tissues. Ultimately, sampling results feed into toxicity models; therefore, it is critical that the results represent an accurate and precise measure.

The research conducted in response to this SON is intended to contribute to DoD's capacity to: 1) understand range environmental issues; 2) improve management of environmental resources; 3) assure the long-term viability of key DoD assets; and 4) facilitate compliance with current and proposed regulations.

In July 2015, the SERDP and the Environmental Security Technology Certification Program (ESTCP) held a workshop to develop research and demonstration needs to improve management of munitions constituents. Approximately 80 personnel, including representatives from the DoD, federal and state regulators, engineers, researchers, industry representatives, and consultants, attended. A more detailed description of these issues can be found in the report from the workshop. Proposers are strongly encouraged to review the workshop report for additional detail. (https://www.serdp-estcp.org/content/download/36213/346223/version/3/file/MC+Workshop+Report+November+2015.pdf)

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. Two options are available:

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 five 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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For Core proposal submission due dates, instructions, and additional solicitation information, visit the SERDP website at www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations.