

**Strategic Environmental Research and Development Program
(SERDP)**

FY 2012 STATEMENT OF NEED

Environmental Restoration (ER) Program Area

**DEVELOPMENT OF SUSTAINABLE WASTEWATER TREATMENT
PROCESSES FOR FORWARD OPERATING BASES**

1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to solicit proposals to develop innovative systems for on site, sustainable wastewater treatment at the Department of Defense's Forward Operating Bases (FOBs)¹. Proposed research should focus on developing systems that have the potential to meet the following requirements:

1. Capable of on site treatment of various wastewaters. Development of innovative technologies for the treatment of graywater (including water with low levels of microbial contamination from laundries, wash racks, and showers) and blackwater from toilet facilities are both of interest.
2. Scalable in size, with a capacity to treat wastewater on site from approximately 500 personnel to many thousands. Proposed work does not need to be conducted at scale.
3. Capable of operating in an energy neutral configuration, at a minimum, so that fuel need not be transported in to operate facilities. Systems that produce power or materials that can easily be converted into power (e.g., biogas, H₂, etc.) are of interest.
4. Capable of generating water for potable or nonpotable re-use in order to minimize water demand from off-base resources.
5. Capable of transport to FOBs and requiring relatively minimal operator expertise, as well as having low operation and maintenance requirements.

Proposed efforts may consist of both bench- and pilot-scale experimentation. Proposers are strongly encouraged to review SERDP's recent document on Sustainable Forward Operating Bases (http://www.serdp-estcp.org/content/download/8524/104509/file/FOB_Report_Public.pdf) to gain an understanding of the opportunities and constraints under which an FOB functions.

¹ We use the term Forward Operating Base (FOB) to include all facilities used in support of expeditionary or contingency operations.

2. Expected Benefits of Proposed Work

Developing sustainable wastewater treatment facilities for the military's FOBs will improve the safety of military personnel by reducing fuel and water transport needs. In addition, such sustainable treatment facilities would improve the base environment, and concurrently reduce costs associated with fuel and water.

3. Background

Current United States military contingency operations underscore a need for more sustainable FOBs. FOBs have been vital in supporting the expeditionary and campaign capabilities of the U.S. military, but building and sustaining FOBs have incurred significant costs in terms of both dollars spent and lives lost.

FOBs can vary depending on size, mission, duration, type of unit supported, area of operations, and the availability / sophistication of host-nation infrastructure. FOBs can range from austere, platoon-sized bases on the tactical edge to division-sized enduring bases. The amount of materiel required and rate of waste generated will differ between different FOB types, but the fundamental problems remain the same. By reducing the amount of support materiel needed, designing more sustainable FOBs will have a direct impact on logistics costs, potential casualties, and U.S. combat force effectiveness.

Water is paramount to expeditionary success. By far the largest shipments of supplies to the tactical edge in Afghanistan and Iraq have been to deliver water and fuel, with an emphasis on water. Supplying FOBs with water and removing wastewater are both significant challenges, but also represent significant opportunities to tackle a primary obstacle to more sustainable FOBs.

Water is used for drinking, food preparation, laundering, centralized hygiene, Force Provider, and in a variety of buildings and structures. Drinking, hygiene, and food preparation require potable water. Measures used to handle wastewater differ according to FOB population, general standards, contractor services, and location. As a general rule, the smaller and more austere the FOB, the more primitive the methods employed for managing wastewater. As FOBs mature and take on a more enduring role, however, methods evolve as well, with more rudimentary systems giving way to chemical latrines, storage/septic tanks, and ultimately to conventional treatment systems.

A deployable and easy-to-use on-site, wastewater treatment system that minimizes energy and water usage would improve the security of military personnel, improve the base environment, and reduce associated costs by minimizing the need for fresh water and fuel from off-base sources.

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 \$150,000 and approximately one year in duration. Such proposals are 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 web site at www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations.