

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

**FY 2013 STATEMENT OF NEED**

**Environmental Restoration (ER) Program Area**

**IMPROVED ASSESSMENT AND OPTIMIZATION OF REMEDIATION  
TECHNOLOGIES FOR TREATMENT OF CHLORINATED SOLVENT-  
CONTAMINATED GROUNDWATER**

**1. Objective of Proposed Work**

The objective of this Statement of Need (SON) is to solicit proposals for applied research to improve our understanding of how to assess and optimize treatment of complex contaminated groundwater plumes and to determine cost effectively the performance limitations of a remedial approach. Specific objectives include:

- Determination of which parameters or processes may be measured to quickly determine the feasibility of a treatment approach.
- Development of field measurements or methodologies that provide predictive capability of performance to reduce the uncertainty associated with long-term performance so that decisions can be made early in the remedial process to avoid years of suboptimal operation.
- Development of field measurements or methodologies that provide data to optimize treatment if current operations are not expected to meet performance objectives.
- Development of assessment procedures and methodologies that aid in the decision to discontinue operation of a technology and implement an alternative technology.

Assessment procedures and methodologies are likely to be technology-specific; therefore, proposals should focus on standard remedial technologies, such as bioremediation, thermal treatment, monitored natural attenuation (MNA), and chemical addition. Procedures and methodologies for the more challenging sites are the focus of this call (i.e., dense nonaqueous phase liquid [DNAPL] source zones; fractured matrices; or large, dilute plumes). Assessment procedures and methodologies should be applicable to a variety of hydrogeologic settings as well as to evaluation of technologies at various stages of the remedial process, including pilot-scale testing, active operation, and post-monitoring.

Research and development activities at laboratory-, bench-, and field-scale will be considered, but work does not necessarily have to culminate in a field-scale effort. Proposals focused solely on modeling efforts will not be considered; proposed efforts must be tied into field measurements and assessments, but may incorporate modeling aspects. Proposals focused on developing new treatment technologies also will not be considered.

In June 2011, SERDP and the Environmental Security Technology Certification Program (ESTCP) co-sponsored a Workshop on *Investment Strategies to Optimize Research and Demonstration Impacts in Support of DoD Restoration Goals*. This workshop identified high priority research topics involving improved assessment and optimization of remediation technologies for treatment of chlorinated solvent-contaminated groundwater. A more detailed description of these issues can be found in the report from the workshop ([www.serdp-estcp.org/content/download/12020/145838/version/2/file/Investment+Strategies+Workshop+Report+October+2011.pdf](http://www.serdp-estcp.org/content/download/12020/145838/version/2/file/Investment+Strategies+Workshop+Report+October+2011.pdf)). Proposers are strongly encouraged to review the workshop report for additional detail.

## **2. Expected Benefits of Proposed Work**

An improved understanding of how to assess and optimize treatment of complex contaminated groundwater plumes and to quickly determine the performance limitations of a remedial approach will improve our ability to manage such sites in a cost effective manner. Once procedures and methodologies are developed for assessment and optimization of the more difficult contaminated sites, more cost-effective management and treatment approaches can be implemented, substantially reducing the life cycle costs for managing these plumes.

## **3. Background**

Chlorinated solvents are the most prevalent groundwater contaminants, found at over 3,000 Department of Defense (DoD) sites. Chlorinated solvents are often persistent in the groundwater environment and can be difficult to remediate. Because of their high solubility and limited retardation, chlorinated solvents can form large, dissolved-phase plumes, often extending miles downgradient from the sources.

A number of technologies are currently in use for remediation of chlorinated solvent-contaminated sites. However, while the current selection of remedial technologies is probably sufficient, the long-term performance of these technologies is often difficult to predict, and the methods to optimize these technologies are not well understood. Monitoring the performance of remedial technologies has traditionally relied on relatively expensive and time-intensive sampling techniques, with rapid analysis often not available or possible. Consequently, diagnosis and evaluation of system performance can be inadequate or misleading and it can be difficult for site managers to move beyond the Remedial Action-Operation phase. Development of rapid, cost-effective assessment procedures and methodologies for evaluating system performance will likely result in more rapid optimization of system performance and ultimately more rapid and cost-effective achievement of remedial goals.

The need for improved diagnostic and optimization tools and guidance was identified as a high-priority research need during the SERDP-ESTCP workshop held in June 2011. Specific objectives of the workshop were to (1) review the current cleanup goals and management processes of the different services, (2) evaluate current and potential future issues associated with site closure, particularly under performance based contracts, and (3) identify research and demonstration strategies that, if incorporated into cleanup strategies, can improve remediation approaches, reduce risk, and ultimately reduce the cost to complete (CTC). A summary of the workshop findings is available at [www.serdp-estcp.org/content/download/12020/145838/version/2/file/Investment+Strategies+Workshop+Report+October+2011.pdf](http://www.serdp-estcp.org/content/download/12020/145838/version/2/file/Investment+Strategies+Workshop+Report+October+2011.pdf).

**Complementary SERDP/ESTCP-Funded Projects:** SERDP and ESTCP have supported several projects relating to chlorinated solvent-contaminated plumes. A brief description of these completed and ongoing projects can be found at the SERDP and ESTCP web site ([www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater](http://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater)).

#### **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 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 web site at [www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations](http://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations).