

**SUBMITTING A PROPOSAL FOR
TREATMENT TECHNOLOGIES FOR ARSENIC REMOVAL
FOR SMALL DRINKING WATER SYSTEMS
FY 2007
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY (NRMRL)**

Opening date: January 30 2007
Closing date: March 26, 2007

GENERAL INFORMATION

Program Title

Treatment Technologies for Arsenic Removal for Small Drinking Water Systems

Program Synopsis

This solicitation seeks proposals for treatment technologies for cost-effective arsenic removal for small drinking water systems.

The objective of this program is to pre-qualify treatment technologies for a subsequent demonstration program. The program provides an evaluation of the efficiency, effectiveness, and cost of drinking water treatment technologies in meeting the new arsenic Maximum Contaminant Level (MCL) of 0.010 milligrams per liter (mg/L) (10 micrograms per liter [$\mu\text{g/L}$]) for varying source water quality and site conditions. The program includes:

- An evaluation of the reliability of technologies for small systems
- A gauge of the simplicity of the operation, the maintenance, and required operator skills
- A determination of the cost effectiveness
- A characterization of the treatment residuals

Proposals selected under this competition will not receive direct monetary awards, but will be pre-qualified for subsequent demonstration projects to be supported by EPA through funding to a third party contractor. The contractor will work with the local water authority and other parties as necessary to plan and implement the demonstration project. If a treatment technology is selected for demonstration, the proposer will be compensated (by the EPA contractor) for the technology and will participate in the installation, shakedown, and startup of the technology. Successful proposers under this solicitation are not guaranteed that a demonstration project will be initiated.

Contacts

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[Darren Lytle](#) (513) 569-7432

Eligibility Information

See below for eligibility information.

Selection Information

Anticipated Type of Selection: Pre-Qualification for Demonstration Agreement
Estimated Number of Selections: Up to 10
Anticipated Funding Amount: See below for funding information

Deadline/Target Dates

Letter of Intent Due Date: None
Application Proposal Due Date: March 26, 2007
(The deadline for receipt of the applications by NRMRL is no later than 4:00 p.m. ET.)

INTRODUCTION

In October 2001, EPA Administrator Christine Todd Whitman announced an initiative for additional research and development for cost-effective technologies to help small systems meet the new arsenic standard and to provide technical assistance to operators of small systems to reduce compliance costs. To assist small community water systems (those that serve fewer than 10,000 customers) in complying with the new standard, EPA initiated the [Arsenic Removal Technology Demonstration Program](#). Under the program, EPA has conducted a series of full-scale, long-term, on-site demonstrations of arsenic removal technologies, process modifications, and engineering approaches. Because of additional funding from Congress, EPA is planning to expand the demonstration program with 10 additional projects.

BACKGROUND

Solicitation Objectives

The objective of this solicitation is to pre-qualify treatment technologies for a subsequent research demonstration program. This program will evaluate the efficiency, effectiveness, and cost of drinking water treatment technologies and engineering approaches to meet the new arsenic MCL of 10 µg/L at host site locations that have varying source water quality and site conditions. The program will evaluate the reliability of technologies for small systems; gauge the simplicity of the operation, the maintenance, and the required operator skills; determine the cost effectiveness; and characterize treatment residuals. EPA is aware that there are commercially available arsenic treatment technologies for small systems that may offer alternative treatment approaches to those currently being demonstrated.

PROGRAM REQUIREMENTS AND DESCRIPTION OF HOST SITES

This solicitation seeks vendors, engineering firms, and others to propose treatment technologies for the removal of arsenic to the revised MCL or lower. Technologies selected under this solicitation will be pre-qualified for demonstration at selected host sites whose names are shown below. Proposers should select one or more of the host sites identified below where their technology or engineering approach is expected to perform successfully.

All technologies must be commercially available for purchase with no additional development work required. Documentation to support the commercially available designation may include:

- Patent pending
- Operations and maintenance manual
- Pilot-scale data
- Performance verification tests

- Full-scale data
- Other relevant information

Arsenic treatment is a national problem and the arsenic treatment technologies selected for this demonstration program must be applicable to the wide variety of water quality and site conditions found throughout the United States. Some of the sites selected for demonstration incorporate the different water quality and site conditions. In addition to reducing elevated arsenic concentrations, the proposed technologies should be able to accommodate varying levels of naturally occurring substances in the source water. Examples of possible treatment interferences are:

- Iron
- Manganese
- Sulfate
- Silicate
- Phosphate
- Total organic carbon (TOC)

The pH of the source water and its relationship to the proposed technology or engineering approach is another important factor. Moreover, not all the sites have access to sanitary sewers or other direct disposal methods for the waste residuals. The quantity and characteristics of the residual produced by the technology may be a critical factor in the application of the technology for some of the sites based on potential waste disposal options available for the demonstration site and specific state regulations.

Proposers are encouraged to contact host sites to determine whether their technology is suitable for the given water supplies and compatible with the site conditions.

List of Host Sites

A [list of host sites](#) on EPA's Arsenic Treatment Technologies Web site provides site-specific information, including treatment capacity of host site, water quality characteristics, and site conditions.

APPLICATION REQUIREMENTS AND EVALUATION CRITERIA

General

Treatment technologies will be pre-qualified for participation in the demonstration program based on their:

- Treatment effectiveness and efficiency
- Cost effectiveness
- Operation and maintenance (O&M) requirements
- Applicability to the selected host site

Important criteria also include readiness and suitability for full-scale demonstration, applicability to the source water quality (arsenic and other water chemistry) at a selected host site, and residual disposal options. All treatment technologies proposed for these demonstrations must be commercially available for treatment of arsenic in drinking water. The demonstration program is not meant to be a developmental arena for emerging technologies or a forum for constructing, testing, modifying, or redesigning equipment and technologies. Treatment technologies should address water quality and site conditions that are associated with a specific host site.

Proposal Requirements

Each applicant is required to submit a technical proposal for each host site. The order of material presented in the technical proposal should correspond to the "Outline of Proposal and Evaluation Criteria" presented later in this section. This outline is designed to cover material necessary for evaluating the proposal.

Evaluation of a proposed technology by a peer panel, EPA, the utility, and the respective state permitting agency will be based on the material presented in the proposal. The main evaluation criteria (listed below) are of equal importance.

The format particulars are as follows:

- The proposal should not exceed 30 pages, including the cover sheet and abstract (see the [last page](#) of this document), charts, tables, diagrams, drawings, and appendices.
- The font should be Times New Roman, 12 point.
- The format should be single-spaced with 1-inch margins.
- Proprietary data or confidential business information (CBI) should not be included.
- It's particularly important to include a summary of previous performance data.
- Quality assurance documentation for the collected data should be included.
- Company literature, brochures, resumes, and references may be attached as appendices. All attached materials will be counted toward the 30-page limit.
- An abstract, not to exceed two pages, must be included, which describes the treatment technology, and summarizes the three elements of the proposal outlined below.
- An original and eight copies of the proposal should be submitted.

Outline of Proposal and Evaluation Criteria

- I. Treatment Effectiveness and Efficiency
 - A. Technology Description and Function (include footprint)
 - B. Process Flow Sheet
 - C. Capability of Treating Source Water With Characteristics of the Selected Host Site
 - D. Capability of Meeting the New Arsenic MCL
 - E. History of Full-Scale and Pilot-Scale Operation
 - F. Location and Contact Person for the Last Five Systems Installed (include telephone number or e-mail address)
 - G. Strength of Supporting Data: Lab, Pilot-Scale, Full-Scale
 - H. Availability of Third-Party Test Data
 - I. Pre- and Post-Treatment Needs for a Specific Host Site (include residuals handling)
 - J. Patent Citation (if applicable)

- II. Cost Effectiveness, Capital, and O&M Costs
 - A. Capital Costs (include engineering and installation)
 - B. O&M Costs
 - C. Pre- and Post-Treatment Costs
 - D. Warrantees or Guarantees

- III. Operation and Maintenance Requirements and System Applicability to Host Site
 - A. Operator Skill Requirements
 - B. Automation and Process Control Capability
 - C. Level of Required Maintenance (e.g., backwashing and cleaning)
 - D. Chemical Usage and Handling Requirements
 - E. Safety Requirements
 - F. Physical Characteristics: Description of Equipment
 - G. Unit Size and Transportability: Space Requirements (include footprint and height)
 - H. Energy Requirements
 - I. Engineering and Installation Requirements (e.g., package vs. specially designed systems)
 - J. Environmental Impacts
 - K. Ability to Troubleshoot and Repair Equipment in a Timely Manner

Discussion of Evaluation Criteria

A brief discussion of the three identified evaluation criteria is presented to clarify certain aspects of the criteria. These discussions are intended to assist the proposer, but are not exhaustive.

Treatment Effectiveness and Efficiency

This section of the proposal should explain the technical aspects of the treatment technology and describe its operation and function. Capabilities and limitations should be addressed as well as the ability of the technology to meet the new MCL. Detailed performance data are essential with full-scale data having more significance than pilot-scale data. A list of the last five full-scale installations with contacts should be provided. Identification of the proposed treatment technology should include adequate data to determine the potential success as a compliance strategy for the specific site. Third-party evaluations and appropriate quality assurance information are important components of the supporting data. CBI should be omitted from the proposal.

Arsenic treatment systems typically concentrate arsenic and other pollutants resulting in a liquid waste stream or a contaminated solid. Proposals should outline on-site handling of wastes and ultimate disposal options for the specific site. Waste generation, handling, and treatment costs need to be factored into the "Cost Effectiveness" section of the proposal.

Cost Effectiveness, Capital, and O&M Costs

A critical factor in the evaluation of proposals is the cost of purchasing and maintaining the treatment technology or engineering approach. This section of the proposal should include a conceptual design covering the capital costs of purchasing and installing the arsenic treatment technology and the expected O&M costs. A breakdown of the capital cost and estimated operating costs should be provided. Warrantees on equipment and performance guarantees on performance should be provided.

Where possible, capital and O&M costs should also be presented on a per-unit basis (i.e., dollars per 1,000 gallons treated). Construction of facilities to house the treatment technology and the handling of residuals should not be included in the capital cost estimate.

Operation and Maintenance Requirements and System Applicability to Host Site

The complexity of the different arsenic treatments or engineering approaches will vary and this will be translated into different O&M requirements. This section of the proposal should discuss in detail the operation of the proposed treatment technology or engineering approach and relate its operation to the required maintenance procedures. Maintenance of critical components should be highlighted and an estimate of the time and cost should be included. (This information should also be presented or referenced in the "Cost Effectiveness" section.) The ability of the proposer to troubleshoot and repair equipment in a timely manner should be described.

This section of the proposal should demonstrate how the technology or engineering solution can be successfully matched with the host site's physical plant, associated piping, and water chemistry. Energy requirements and waste disposal capabilities need to be addressed as well as other environmental impacts such as the use of specialty chemicals or fugitive emissions from the process. To ensure this section of the proposal is accurate, communication with the proposed host site may be necessary.

REVIEW AND SELECTION PROCESS

All proposals submitted for this competition will be reviewed by an external (i.e., non-EPA) panel of experts. Proposals will be ranked "highly recommended," "recommended," or "not recommended." Considering the external peer review evaluations, EPA, with input from the utility and respective state permitting agency, will select one proposal for demonstration at each site. Depending on the results of the reviews, one or more proposers may be requested to make a presentation to EPA regarding their proposed technology before the final selection of a proposal is made by EPA.

The EPA is under no obligation to select any proposal or any specific number of proposals.

DEMONSTRATION PROGRAM ROLES

Role of Technology Developer/Engineering Firm or Other Proposer After Successful Competition

The technology proposer, who is selected as pre-qualified under this competition, will be a participant to the agreement developed between EPA and the host site for the demonstration. The main role of the proposer will be to provide the approved technology or design modification (through purchase by the EPA contractor). Its role will also include consultation on site engineering, installation, and operation of the technology.

The technology proposer should indicate in the proposal its willingness to provide site-specific engineering and system permitting services including the preparation of the required engineering submittal package and the review by a professional engineer by teaming with a local engineering firm. The proposer will be responsible for working with EPA, its contractor, and the site to install the technology or the engineering solution at the host site. The proposer will also assist EPA and host site personnel with the start-up phase of the demonstration. The proposer will provide guidance and training on operation and maintenance of any equipment. The proposer will also provide technical services for troubleshooting equipment and performance issues.

Once the technology or engineering solution has been installed and the start-up phase is completed, the host site will be responsible for operation of the technology or engineering approach. Because the objective of the demonstration is to collect real-world operating data on the performance, reliability and simplicity of operation, and costs, the proposer will not have personnel on-site to provide daily guidance on the operation of the technology or

engineering approach or make modifications to the equipment. The proposer will, however, be expected to troubleshoot and repair the equipment as needed in a reasonable amount of time and as covered under their warranty and guarantee. EPA will not have personnel on-site. The proposer may need to visit the site on occasion, but all site visits must be coordinated with EPA.

The proposer may wish to discuss the potential for demonstration of their technology with specific host sites prior to submission of a proposal.

Role of the Host Site

At each demonstration site, an agreement will be developed between EPA and the site to specify the duties and responsibilities of each party and any special conditions that apply. In part, these responsibilities are expected to include:

- Daily operation of the arsenic treatment technology
- Sample collection according to project plan
- Preparation and shipment of samples (EPA underwrites the cost)
- Documentation of maintenance data
- Maintenance of inventory of spare parts and maintenance items (EPA underwrites the cost)
- Coordination of any service calls
- Documentation of waste disposal operations

Any new or add-on arsenic treatment technology or engineering approach will be operated by the host facility in accordance with manufacturer specifications.

Role of EPA and Support Contractor

The EPA contractor will work with the host site and the successful proposer to design the demonstration project plan and will oversee all aspects of its conduct.

The EPA contractor will purchase and supervise the installation of all arsenic treatment technologies or engineering services from successful proposers.

EPA and its contractor, along with the host site and the successful proposer, will arrange for the preparation of the plans and specifications for submission to the State for approval of the installation of the technology or engineering approach.

The EPA contractor will prepare a site-specific sampling protocol and a quality assurance project plan (QAPP) for the demonstration project (see [EPA's Quality System for Environmental Data and Technology](#) for guidance on the content). If chemical analyses are performed on site, they will be included in the approved QAPP that must be in place before initiating any analytical work. Analytical chemistry costs for arsenic and other nonstandard project-related analyses will be the responsibility of EPA. Data analysis and reporting will also be underwritten by EPA.

The EPA contractor, in consultation with the host facility, will provide a final report summarizing the performance and O&M conditions for the treatment technology. The report will include the performance of the arsenic treatment technology, cost effectiveness, required maintenance, unexpected repairs, and waste management. Training of the operators along with any adverse impacts on their regularly scheduled duties will also be documented.

At the conclusion of the project, EPA will dismantle and remove the arsenic treatment technology or negotiate a transfer of title with the host facility.

REFERENCES

[Arsenic in Drinking Water](#) (background on development of the Arsenic Rule)

[Arsenic Treatment Technologies](#)

FUNDING

No funds will be directly awarded to the selected proposers under this solicitation. From the pool of pre-qualified proposers, EPA anticipates selecting up to 10 proposals for demonstration. For those demonstrating, EPA will purchase any equipment or engineering services through an independent contractor and will pay for the installation of the equipment at the site. EPA will also purchase and provide supplies such as chemicals or media if needed.

CONTACTS

More information may be obtained from the EPA officials indicated below. Email inquiries are preferred.

[Thomas Sorg](#) (513) 569-7370

[Darren Lytle](#) (513) 569-7432

HOW TO APPLY

The proposal cover sheet, abstract, and proposal must be prepared in accordance with these instructions. All proposals must include the proposal cover sheet and abstract. The original documents must not be bound or stapled. The other eight required copies of the documents should be secured with paper or binder clips or secure staples.

Send completed applications via regular mail to:

U.S. Environmental Protection Agency
Water Supply and Water Resources Division, NRMRL
Attention: Thomas J. Sorg MS-B17
26 W. Martin Luther King Drive
Cincinnati, OH 45268

The following address must be used for applications delivered via express mail:

U.S. Environmental Protection Agency
Water Supply and Water Resources Division, NRMRL
Attention: Thomas J. Sorg MS-B17
26 W. Martin Luther King Drive
Cincinnati, OH 45220
For an express mail application, call (513) 569-7370.

Courier-delivered or personally delivered applications must be brought to:

U.S. EPA Environmental Research Center
26 W. Martin Luther King Drive
Cincinnati, OH 45268

If the applicant requires a receipt for the delivery, he or she must provide a form that the security person will sign. U.S. EPA Environmental Research Center receives deliveries from 8:00 am to 4:00 pm.

APPLICATION FORM

**Proposal Cover Sheet
U.S. Environmental Protection Agency**

**Treatment Technologies and Engineering Solutions for Arsenic Removal
For Small Drinking Water Systems**

Proposal Title: _____

Firm Name: _____

Contact: _____ **Phone:** _____

E-mail: _____ **Fax:** _____

Mailing Address: _____

Selected Host Site: _____

Attach Technical Abstract (Two pages or less; must be publishable. Must include a description of the technology and must address each of the three elements of the evaluation criteria.)