



Announcement Request for Applications ENG -01-92 Improved Pump-and-Treat Processes for Remediation of Superfund Sites

Background

Many hazardous waste sites have been placed on the National Priority List for cleanup or remediation under Superfund. A wide variety of contaminants can be found at these sites which over a period of time may enter subsurface aquifers and endanger the nation's water supplies.

Organic chemicals are contaminants of particular concern because they occur in large quantities at the waste sites and may be toxic at low concentrations. These substances include chlorinated and non-chlorinated solvents (e.g., trichloroethylene and benzene), preservatives and pesticides (e.g., creosote and lindane), and wastes from the manufacture of explosives, PCBs, and other industrial processes. A common characteristic of these contaminants is that they are difficult to remove from hazardous waste sites using current technology. These organic compounds often occur as separate liquid phases with densities different from that of water, and their movement may be largely decoupled from that of the groundwater. Many of these compounds are not amenable to biodegradation by naturally occurring microorganisms. Although the treatment of choice is most often extraction from the subsurface followed by surface treatment (pump-and-treat), the majority of pump-and-treat systems fail to meet their design goals or to remediate the site to the level desired. The major problems with pump-and-treat, invariably relate to the difficulty in extracting contaminants from the subsurface. Surface treatment of contaminants once they are removed from the subsurface is not always easy, but on the whole this part of the techEPA/600/R-92/028ology is much better developed than the technology for removing contaminants from the subsurface. New techniques are needed to enhance the effectiveness of pump-and-treat technology.

Scope

The purpose of this RFA is to solicit proposals that will result in the development of cost-effective methods to enhance the effectiveness of pump-and-treat remedial actions at Superfund sites. Remedial actions as used in this announcement include the use of chemical or physical agents to improve the efficiency of contaminant extraction, direct extraction of separate-phase liquids, and more effective pumping systems for removing dissolved contaminants. The research and development projects being solicited should result in products which have the potential for application to improving the efficiency of pump-and-treat technology.

The areas listed below are examples of appropriate research topics for the proposals being solicited but are not meant to be all inclusive.

- Chemical or physical agents to enhance contaminant removal from the subsurface.
- Properties of multiphase fluid systems related to the ability to remove the fluids from the subsurface.
- Subsurface processes affecting pump-and-treat systems.
- Site characterization methods to better define the spatial and temporal distribution of subsurface contaminants.
- Development and testing of simulation models to design and evaluate pump-and-treat systems.



Exclusions and Limitations

To be considered in this RFA, projects to improve the effectiveness of pump-and-treat must meet the following requirements:

1. The emphasis of the research must be on improving the efficiency with which hazardous substances can be extracted from the subsurface. Projects whose primary emphasis is to immobilize contaminants in the subsurface will not be considered.
2. Research, whose primary emphasis is on improving the treatment of hazardous materials once they are brought to the surface, will not be considered. Projects that include surface treatment may be considered if the surface treatment is an integral part of a system for improving the efficiency of contaminant extraction from the subsurface, e.g., separation and reuse of chemical agents used to enhance contaminant removal.
3. Technologies to remove hazardous materials using chemical or biochemical transformation processes will only be considered if the transformation enhances the efficiency of removal of the contaminants from the subsurface.

Mechanisms of Support

Assistance under this RFA will be provided by a research grant administered through EPA's research grants program. The applicant will be responsible for planning, directing, and executing the proposed research. Support under this program is limited to non-profit research organizations and educational institutions.

Approximately \$1.0 million will be available from fiscal 1992 funds, and it is estimated that about 5 or 6 projects will be supported. Each project will be supported for a period of up to 2 years at no more than \$100,000 per year. This RFA is for a single competition with a closing date of May 15, 1992.

The Application

Each application will consist of the APPLICATION FOR FEDERAL ASSISTANCE FORM (Standard Forms 424 and 424A) and separate sheets providing the budget breakdown for each year of the project, curriculum vitae for the principal investigators, abstract of the proposed project, and a project narrative. All certification (drug-free workplace, etc.) forms must be signed and included with the application. Application forms, instructions, and other pertinent informa-

tion are contained in the federal grant application kit obtainable from:

Research Grants Staff (RD-675)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
(202) 260-7473

Special Instructions

1. The project narrative section of the application must not exceed twenty-five 8 1/2 x 11 inch, consecutively numbered pages of standard type (10 characters per inch), including tables, graphs, and figures. Attachments, appendices and reference lists for the narrative section may be included but come under the 25-page limitation. The SF-424 and other forms, itemized budget, resumes, and the abstract are not included in the 25-page limitation.
2. Biographical sketches or resumes must not exceed two pages for each principal investigator and should focus on education, positions held, and most recent or related publications.
3. Project periods will be for a maximum of 2 years.
4. Applications in response to this RFA must be identified by printing "RFA ENG-01-92" in item 10 on the face page of Form 424. The absence of the above identifier from an application absolves EPA of any responsibility if it is not reviewed along with the other applications responding to the RFA.

Application Review

All applications will be reviewed at a single meeting after the closing date, by a scientific peer review panel that will evaluate and rank each proposal according to its scientific merit as a basis for recommending Agency approval. The panel will consider:

- the quality of research plan including theoretical or experimental design, originality, and creativity
- the qualifications of the research team
- the availability and adequacy of facilities and equipment
- the appropriateness of the proposed budget.

Application Submission

To be considered, the original and eight copies of the application must be received no later than the close of business on the closing date. The applications must be sent to:

Grants Operations Branch (PM-216F)
Grants Administration Division
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

For overnight express mail, the address is:

Grants Operations Branch (202) 260-9266
Grants Administration Division
U.S. Environmental Protection Agency
499 South Capitol Street, SW
Washington, DC 20460

Staff Contact

Administrative questions relating to this solicitation may be directed to Louis Swaby on (202) 260-7473.

Technical questions should be directed to Stephen Schmelling on (405) 332-8800, ext. 434.

United States
Environmental Protection
Agency

Center for Environmental Research
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Cincinnati, OH 45268

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