PARTNERS IN ENVIRONMENTAL TECHNOLOGY

FALL 2001
NUMBER 10

SERDP
Strategic Environmental Research and Development Program

ESTCP

INFORMATION BULLETIN

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Expert Panel Convened to Address R&D Needs for Chlorinated Solvent Site Cleanup

Chlorinated solvents, also known as chlorinated aliphatic hydrocarbons (CAH), are by far the most prevalent contaminants at Department of Defense (DoD) facilities and remain among the most difficult to remediate, despite several years of research and development. Examples of CAHs include trichloroethylene (TCE) and perchloroethylene (PCE), as well as related compounds such as trichloroethane (TCA), vinyl chloride (VC), dichloroethenes (DCE), and carbon tetrachloride (CT). To evaluate the needs and priorities for future research and development in support of chlorinated solvent site cleanup, the SERDP and ESTCP programs convened a panel of 23 experts on August 6-7, 2001. The overall objective of the workshop was to provide guidance as to how SERDP and ESTCP can best invest their research, development, and demonstration resources in the next 5-10 years to improve DoD's ability to address effectively its CAH-contaminated sites.

During the two-day workshop, participants were asked to identify the specific technical issues that must be addressed to meet regulatory and other stakeholder concerns, the major gaps in scientific understanding of CAH contamination and cleanup, and the most important basic and applied research needs. The participants also were tasked with prioritizing these research needs and identifying those areas with the greatest potential to help DoD accomplish its goals. Prior to tackling these issues, the panel was briefed by representatives of the DoD, including Ms. Laura Yeh of the Naval Facilities Engineering Service Center and Ms. Johnnie Shockley of the U.S. Army Corps of Engineers, on the current status of CAH cleanup efforts and the DoD-specific needs for improved technologies. To accomplish their goals, participants then were divided into two groups to encourage focused discussions on the **science** and **technology** needs for groundwater plume restoration and NAPL source remediation. Following small group discussions, the panel reconvened and findings were shared.

Through panel discussions, it became apparent that research and development of NAPL source treatment technologies was

See EXPERT PANEL, page 4

Workshop Participants

Co-Chair Dr. Michael Kavanaugh, Malcolm Pirnie, Inc.; **Co-Chair Dr. Herb Ward**, Rice University; **Co-Chair Dr. Hans Stroo**, RETEC; **Dr. Linda Abriola**, University of Michigan; **Dr. Randall Charbeneau**, University of Texas at Austin; **Mr. Evan Cox**, GeoSyntec, Inc.; **Dr. David Dzomback**, Carnegie Mellon University; **Dr. Carl Enfield**, U.S. EPA, Office of Research and Development; **Dr. James Gossett**, Cornell University; **Dr. Rob Hinchee**, Battelle Memorial Institute; **Dr. Joseph Hughes**, Rice University; **Dr. Paul Johnson**, Arizona State University; **Dr. Rick Johnson**, Oregon Graduate Institute of Science & Technology; **Dr. Perry McCarty**, Stanford University; **Dr. Douglas McKay**, University of Waterloo; **Dr. David McWhorter**, Colorado State University; **Dr. James Mercer**, GeoTrans, Inc.; **Dr. Cas Miller**, University of North Carolina at Chapel Hill; **Dr. Dennis Paustenbach**, Exponent, Inc.; **Dr. William Rixey**, University of Houston; **Dr. Robert Seigrist**, Colorado School of Mines; **Dr. Thomas Simpkin**, CH2M Hill Inc.; **Dr. Kent Udell**, University of California – Berkeley; **Mr. Bradley Smith**, SERDP; **Dr. Jeffrey Marqusee**, SERDP/ESTCP; **Ms. Catherine Vogel**, SERDP/ESTCP; **Dr. Andrea Leeson**, SERDP/ESTCP; and **Dr. Jan Kool**, HydroGeoLogic, Inc.

S•U•C•C•E•S•S STORIES

SERDP-funded research and development efforts and ESTCP-funded demonstration and validation activities continue to provide a rapidly increasing number of outstanding technical advances. These developments are highly important and relevant to the Department of Defense (DoD), Department of Energy (DOE), Environmental Protection Agency (EPA), and many other user communities.

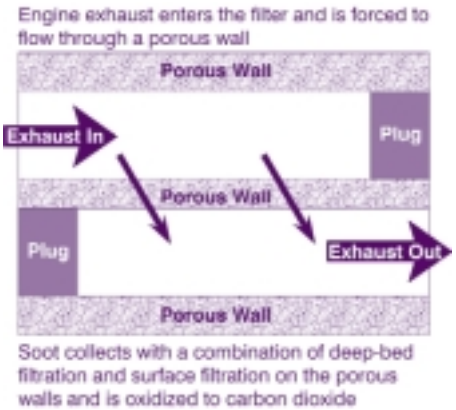
SUCCESS STORY

ESTCP Demonstrating New Self-Regenerating Filter for Reducing Particulate Emissions

Diesel engines are widely used throughout the Department of Defense (DoD) for powering tactical and non-tactical vehicles and vessels, off-road equipment, engine-generator sets, aircraft ground-support equipment, and a variety of other applications. Although diesel engines, like gasoline engines, are known to emit several types of pollutants into the atmosphere, human health concerns regarding the penetration of small particulate matter (PM), specifically those having diameters of less than 2.5 microns (PM2.5), into the deeper regions of the lungs have greatly increased interest in diesel PM emissions. This increased concern about PM health and safety effects and DoD's policy of abiding by all air pollution regulations have led the DoD to investigate those technologies that show promise for improvements in air quality in the workplace and the environment.

For more than a decade, investigators have developed soot filters to reduce PM emissions from diesel engines. However, important unresolved technical and economic problems have plagued these filters and prevented their widespread application. An approach for resolving the most important of these problems, regeneration of the soot filter on-line during engine operation, has been developed by Cummins Engine Company with co-developers Engelhard Corporation and Nelson Industries. Initial field tests of the self-regenerating catalyzed soot filters (CSF) have been completed successfully on eight urban buses operated by the New Jersey Transit Authority. Results demonstrated CSF life spans of greater than one year (>100,000 miles), and PM emission reductions of greater than 80 percent.

Given the promise of this technology, ESTCP is funding the Naval Facilities Engineering Service Center (NFESC) to work with the CSF developers to demonstrate that equivalent CSF durability and PM emissions reductions can be obtained for a range of DoD diesel engine systems. This ESTCP project, entitled *Reduction of Diesel Engine Particulate Emissions (PM2.5) Using a Catalyzed, Self-Regenerating Ceramic Filter*, seeks to accomplish the following objectives: survey DoD diesel engine operating systems to establish the range of applicability of the CSFs; demonstrate/validate the catalyzed soot filter for reducing PM2.5 emissions from new and retro-fit DoD diesel engine systems; investigate the simultaneous reduction of PM2.5, carbon monoxide, hydrocarbon, and soluble organics; and confirm minimum loss in engine operating efficiency.



The lead researcher for this project, Dr. Norman Helgeson of the NFESC , recently met with and briefed the Executive Director and staff of the California Air Resources Board (CARB) regarding the anticipated benefits of this project as well as related SERDP efforts. CARB representatives stated that they were very impressed by the scope and direction of the particulate filter work. Based on this meeting a follow-up meeting has been scheduled to discuss these projects in more detail so as to identify issues of mutual interest and possible collaboration for CARB and the DoD.

The successful application of self-regenerating CSFs would enable DoD to operate its diesel engines in a cleaner, safer manner. Additionally, the reduced particulate emissions possible through the use of these soot filters would allow DoD to comply more easily with air pollution regulations nationwide.

For more information about this project, please contact Dr. Norman Helgeson, Naval Facilities Engineering Service Center, Port Hueneme, CA, at (805) 982-1335 or via e-mail at helgesonnl@nfesc.navy.mil. ◆

SERDP
Strategic Environmental Research and Development Program

SUCCESS STORY

Getting to the Root of DoD's Revegetation Problem

The military mission requires extensive training maneuvers that can be highly damaging to vegetation and soil. Tracked and wheeled vehicles tear at the plants and compress the soils resulting in injured or destroyed plants and reduced soil cover. As a result, plants resistant to this wear and tear are needed to mitigate these environmental impacts. Until now, however, very limited research and development has been done to address this relationship between military training and plant resistance to mechanical injury. The SERDP project CS-1103: *Identify Resilient Plant Characteristics and Develop Wear Resistant Plant Cultivars for Use on Military Training Lands* has been extremely successful in responding to the Department of Defense (DoD) land restoration need by developing new plant types and seed mixtures and providing a better understanding of the effects of training on soil compaction, plant injury, and regrowth.

Through the leadership of the Cold Regions Research and Engineering Laboratory (CRREL) of the U.S. Army Corps of Engineers, Engineer Research and Development Center and the efforts of its collaborators, including the U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS), three new germplasms have been developed: two crested wheatgrasses (Reg. no. CV-24, PI 594024 and Reg. No. CV-25, PI 606546) and one wildrye (Reg. no. GP-75, PI 599302). The new plant types developed through this SERDP-funded effort are individuals consisting of specific genotypes and acting as a repository for various alleles within a species (germplasms) with improved establishment characteristics and recovery. The plants resulting from these germplasms are more resilient to military training activities and severe environmental conditions because of their resistance to drought and cold temperatures, requirement for low maintenance, and improved seedling vigor. Consequently, these plants are being used to rehabilitate training lands.

Identifying the type of plants that resist being uprooted by tanks or other traffic is part of the search for plants with improved adaptability and chance of survival

Another component of this project uses seed mixtures that combine naturalized species from the new germplasms with native species indigenous to military lands. Native plants, well suited to their natural ecosystem, provide long-term cover but often are slow to re-establish after a disturbance such as heavy vehicle traffic. On the other hand, naturalized plants generally establish rapidly and are self-propagating, making them highly desirable for intensely used areas. The combination of native and naturalized species that make up the seed mixtures developed through this project helps to foster biodiversity of plant species on military lands while also enriching soil cover and animal habitats.

In addition to the development of germplasms and seed mixtures, this research project is providing the DoD with guidance on specific restoration procedures that will help to increase training opportunities on existing training lands. Greenhouse studies have examined the interaction of root growth and soil compaction, while field studies have evaluated root growth of newly-developed cultivars in soil compacted conditions. Results show that the finer-textured soils and those with higher soil moisture content have greater compaction at the soil surface than the coarse textured or drier soils. The results are being used to determine precise land rehabilitation requirements.

The new germplasms, seed mixtures, and compaction studies are providing a far-reaching return on the military investment in land repair and maintenance. Military land managers now have access to better information on what types of plants are best suited to rehabilitate their lands and the effects of seeding naturalized species on the biodiversity of an ecosystem. This guidance is assisting land managers and trainers in arranging training schedules and in estimating cost and time requirements for maintaining military training sites. According to Stu Cannon, Headquarters-U.S. Army Forces Command who is responsible for overseeing the land management of 11 major Army installations, "[This] work, on several of my installations, has proven most effective at rapidly recovering lands unavoidably damaged by military training. Specifically, [Mr. Palazzo's] work at Fort Carson, Colorado, and the Yakima Training Center, Washington, has made much faster land repair and maintenance projects possible, using more rapidly establishing native grasses that are enhanced through his selective breeding techniques. This directly supports use by military units in a much more timely fashion."

See REVEGETATION EFFORTS, page 7

F ◆ A ◆ Q s

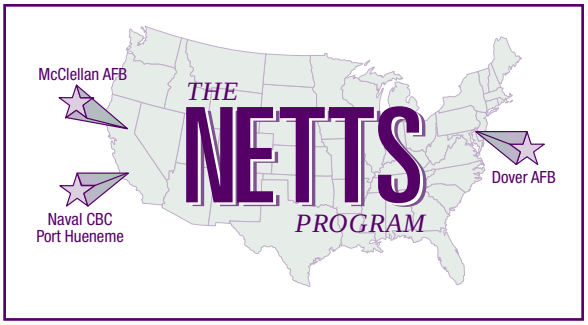
from SERDP and ESTCP Principal Investigators

SUBJECT: SERDP'S NATIONAL ENVIRONMENTAL TECHNOLOGY TEST SITES (NETTS) PROGRAM

Q: *Is there any provision under SERDP for a non-SERDP funded researcher to advance his or her technology?*

A: SERDP established the National Environmental Technology Test Sites (NETTS) program in 1993 to facilitate the transition of environmental remediation technologies to full-scale use by overcoming the barriers that presently inhibit commercialization of such technologies. The NETTS Program is a comprehensive technology demonstration, evaluation, and transfer program that addresses these barriers. It is a Tri-Services effort to establish a coordinated environmental technology testing and evaluation program to reduce the cost and accelerate the pace of remediation technology development and deployment.

The Program provides three sites for applied research and comparative demonstration and evaluation of innovative, and potentially cost-effective, cleanup, site characterization, and monitoring technologies. These test locations are available for use by both federal and private sector technology developers who need not have SERDP funding in order to utilize a test location. The dedicated NETTS sites allow better use of resources compared to one-time, developer-staged demonstrations because site selection, permitting, characterization, and infrastructure are not required for each new technology demonstration. The infrastructure provided by the Program includes site preparation, access roads, test pads, offices, laboratories, analytical equipment, drill rigs, field vehicles, utilities, lighting, fencing, and security. Site support provided by the Program also includes technology transfer assistance.



Each of the NETTS locations offers different environmental settings, media, and contaminants for field demonstrations at well-characterized test sites, as well as the infrastructure and site support required for a technology demonstration. Please see the NETTS web site www.serdp.org/NETTS for additional information and points of contact. ◆

EXPERT PANEL, from page 1

considered far more important at the present time than improved plume treatment approaches. Recent development of more aggressive source-zone treatment technologies has led to increasing regulatory and public pressure to remediate source zones, despite significant scientific uncertainties about the value of source-zone remediation or even the appropriate methods to measure or define the "success" of such efforts. To measure the impacts of source treatment or to understand the real risks posed by a residual source, it is essential to have accurate estimates of the total NAPL mass and the mass release before and after treatment. Workshop participants voiced a clear overall priority for research and development of diagnostic tools to assess performance. Many participants emphasized that better use of existing technologies would be more valuable than the development of still newer technologies and that guidance is clearly needed in the selection, design, and implementation of available technologies. In terms of specific remedial technologies, the group considered thermal and bioremediation treatment as the most promising areas for future investments of research funding. Further, monitored natural attenuation (MNA) and enhanced bioremediation were regarded as important because they are likely to be part of treatment trains for source zone remediation, in many cases following more aggressive technologies. Finally, there was a clear recommendation for increased efforts in technology transfer.

At the conclusion of the workshop, the **highest-priority research needs** identified by the panel included 1) Assessment of Source Zone Treatment, 2) Source Zone Delineation and Characterization, and 3) Bioaugmentation. In addition to identifying the highest-priority research needs, the panel also identified high-priority needs for science and technology. **High-priority science needs** included 1) Physical, Chemical, and Biological Interactions at NAPL Interfaces, 2) Uncertainty Quantification, and 3) Effects of Treatment Amendments. **High-priority technology needs** included 1) Diagnostic Tools to Evaluate Remediation Performance, 2) Assessment of *In-Situ* Thermal Treatment, 3) Monitored Natural Attenuation, 4) Source Zone Bioremediation, and 5) Source Characterization Tools.

A detailed formal report from the Chlorinated Solvent Workshop is in progress and will be disseminated to all interested individuals once finalized. Results from this workshop will undoubtedly influence future SERDP and ESTCP solicitations and the Programs' activities in general in the years to come. SERDP and ESTCP thank all workshop participants for their invaluable contributions in guiding future research and development. ◆

Program Development Update

SERDP

While the SERDP Council has approved the baseline FY 2002 Program, proposals submitted under the FY 2002 Supplemental Solicitation continue to be reviewed.

On September 26, the SERDP Council met to approve the baseline FY 2002 SERDP Program and all New Start projects that were recommended for funding by the SERDP Scientific Advisory Board (SAB). Due to the tragic events of September 11, the SAB meeting held in Falmouth, MA, ended prematurely, and many proposals were rescheduled to brief during the October meeting in Arlington. The Council authorized the SAB and the Executive Director to recommend and approve, respectively, these remaining proposals as deemed appropriate.

Having made final selections, SERDP has sent notices of selection to successful proposers. Project Plans are being requested, and conference calls to kick off the projects are being scheduled. Funding will be provided upon signature of the Defense Appropriations Bill by the President. Shortly thereafter, federal Principal Investigators (PI) will receive funding. Industrial or academic projects will receive their funding when the contracts are awarded. A continuing resolution by Congress has delayed the availability of funds for these New Start projects.

Under the FY 2002 Supplemental Solicitation, the SERDP Staff has reviewed pre-proposals for program relevance. Subsequently, the Executive Director requested proposers of these relevant efforts to submit full proposals, and these will be undergoing independent Peer Review shortly. Upon completion, top band proposals will be forwarded to the multi-agency technical working groups for evaluation and recommendation to the Executive Director who will provide them to the SAB to review at its March 2002 meeting.

Concurrent with firming up the FY 2002 Program, planning for the FY 2003 solicitation is nearly completed. Statements of Need in all thrust areas were developed and were scheduled for release in the *Commerce Business Daily* (a Call for Proposals for federal partners) on or about November 14, 2001. Visit the SERDP web site at www.serdp.org for information about this solicitation.

ESTCP

After a set of very fruitful Phase II evaluation meetings in August, the Director has made final selections of New Start projects for the FY 2002 Program and has received approval from the Deputy Under Secretary of Defense for Installations and Environment. Correspondence has been sent to all proposers to indicate their status, and kickoff conference calls are being scheduled for New Start efforts. These conference calls will establish the Project Plan for the life of the project and the Obligation/ Expenditure Plan for the project's first execution year. ◆

SERDP and ESTCP Welcome Two New Program Managers to Staff

Dr. Andrea Leeson Replaces Ms. Catherine Vogel as Cleanup Program Manager

After three years of service to SERDP and ESTCP as the Program Manager for Cleanup, Ms. Catherine Vogel has departed to pursue a law degree and study environmental law. While she will certainly be missed, we wish her well in this new professional endeavor!

Dr. Andrea Leeson recently moved to the Arlington, VA, area to assume the role as Program Manager for Cleanup efforts. She joins us from Columbus, Ohio, where she was the Research Leader for the Environmental Restoration Department of Battelle Memorial Institute for the past 10 years. Andrea earned her doctoral degree in Environmental Engineering from the Johns Hopkins University. She can be reached at (703) 696-2118 or via e-mail at Andrea.Leeson@osd.mil.

Dr. Anne Andrews Fills New Position as UXO Program Manager

As a result of the increased emphasis on Unexploded Ordnance (UXO), a new position as Program Manager for UXO for SERDP and ESTCP efforts had been created. For the past several months, Mr. Matthews Chambers from HydroGeoLogic, Inc., has been serving in an "acting" role. Recently, Dr. Anne Andrews was selected to fill this position on a more permanent assignment. Prior to joining the SERDP and ESTCP Staff, Anne worked as a Research Staff Member for the Institute of Defense Analyses (IDA) in Alexandria, VA, where her research interests included Detection of Unexploded Ordnance and Landmines, Ground Penetrating Radars, and Missile Defense. She earned her doctoral degree in Physical Chemistry from the University of Michigan. Anne can be reached at (703) 696-3826 or via e-mail at Anne.Andrews@osd.mil.

Given the high level of activity in the Cleanup and UXO areas, both Andrea and Anne have hit the ground running. Please join us in welcoming them as our new Program Managers. ◆

SERDP/ESTCP Kudos to…

…**Drs. Benny Freeman** and **Ingo Pinnau**, two SERDP Principal Investigators, who recently were notified of their selection as recipients of the 2002 Cooperative Research Award in Polymer Science and Engineering presented by the American Chemical Society (ACS) Division of Polymeric Materials: Science and Engineering (PMSE). This prestigious award, which is national in scope, is given annually to only one person or research team. The two SERDP researchers will receive this year's award for their pioneering contributions to membrane science. A central focus of their collaboration has been their development of a novel type of fouling-resistant composite membrane for nanofiltration and ultrafiltration applications. This work was conducted under SERDP Project CP-1108: *Novel Nonporous Fouling-Resistant Composite Nanofiltration Membrane and Membrane Separation Systems for Wastewater Treatment* and responds to the Navy's need to meet new environmental regulations requiring the treatment of wastewater prior to overboard discharge. To illustrate this problem, consider that a 300-man ship generates 160,000 gallons per day of wastewaters that contain high levels of suspended solids. Treatment by nanofiltration or ultrafiltration can produce dischargeable water, but conventional filtration membranes are finely porous and are subject to severe fouling by particulates (Figure 1). This fouling reduces the effectiveness of membranes dramatically, requiring time consuming backpulsing with water to clean the membranes and ultimately replacement of irreversibly fouled membranes.

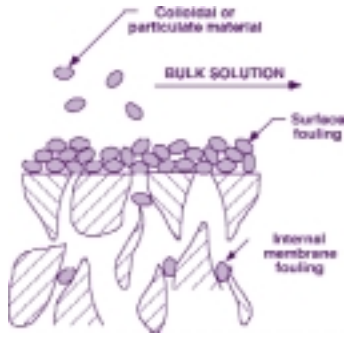


Figure 1 - Cross-sectional view illustrating fouling of conventional porous filtration membranes

The composite membrane developed by Dr. Pinnau, Membrane Technology and Research, Inc. (MTR), and Dr. Freeman, North Carolina State University Department of Chemical Engineering, consists of an ultrathin (0.2-0.5 µm), nonporous layer of highly water-permeable polymer Pebax 4011 supported by a microporous poly (vinylidene fluoride) (PVDF) membrane. This novel composite membrane is more fouling-resistant than current commercial membranes because of the extremely hydrophilic nature and the nonporous surface of the polymer layer. The most promising membranes were incorporated first into bench-scale and later into industrial-scale membrane modules. These modules were evaluated in the laboratory, and a design for a skid-mounted, shipboard prototype unit was prepared. Results of testing of these membranes indicate significant decreases in membrane fouling (Figure 2), resulting in continuously high levels of filtration while minimizing the need to clean or replace the membrane modules.

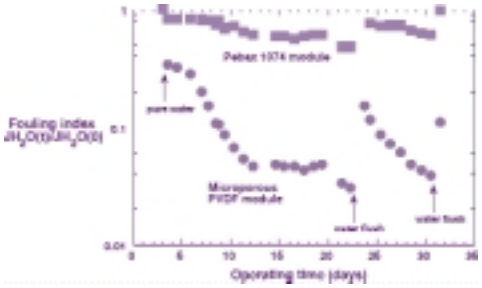


Figure 2 - New composite membrane shows increased flow through compared to conventional PVDF module

The Cooperative Research Award for which Drs. Freeman and Pinnau were selected is given to recognize and encourage sustained cooperative research between industrial and academic or industrial and national laboratory scientists. The cooperative research must be of significant importance to polymer science and technology. The award was established in the fall of 1992 and is supported by a generous gift from the Eastman Kodak Company. It consists of a cash award, a plaque, and a travel allowance to attend the meeting at which the award is presented. Loren Hill, the Chair of the Cooperative Research Award Committee, noted that Jurors made many favorable comments about the researchers' work, and in a letter to Dr. Freeman stated, "I was also very impressed by your joint work with Dr. Pinnau, and I believe your selection is consistent with the very high quality of research carried out jointly by previous recipients."

The awards ceremony and a day-long Symposium in honor of their research will be held in Orlando next spring at the ACS National Meeting. More background info on the award is available on the PMSE web site http://membership.acs.org/p/PMSE/awards/coop.html. ◆

PROGRAM NOTES

S◆E◆R◆D◆P

- **BOTH THE SERDP FY 2003 CORE SOLICITATION AND THE SOLICITATION FOR THE SERDP EXPLORATORY DEVELOPMENT (SEED) PROGRAM WERE SCHEDULED TO BE RELEASED ON OR ABOUT NOVEMBER 14, 2001.** Visit the SERDP web site at www.serdp.org for specifics about the solicitations and the schedules.
- **PROGRESS REPORT DATA** (ie., a written summary of the quarter's technical accomplishments, updated completion dates for milestones, and any concerns regarding technical/financial progress) for the first quarter of Government FY 2002 is due by January 15, 2002. For assistance, contact your Program Manager Assistant.

E◆S◆T◆C◆P

- **A FEDERAL CALL FOR PROPOSALS AND A BROAD AGENCY ANNOUNCEMENT SOLICITATION FOR ESTCP FY 2003 PROJECT FUNDING** is expected to be released on or about January 10, 2002. Watch the ESTCP web site www.estcp.org for the latest information and schedule.

E◆S◆T◆C◆P *(Continued)*

- **QUARTERLY REPORTS FOR THE FIRST QUARTER OF GOVERNMENT FY 2002 ARE DUE JANUARY 15, 2002.** For assistance, contact your Program Manager.
- **NEW PUBLICATIONS NOW AVAILABLE ON THE ESTCP HOME PAGE** www.estcp.org

Cost and Performance Reports:

Cleanup

Surfactant Enhanced DNAPL Removal

Tri-Service Site Characterization and Analysis Penetrometer System (SCAPS) Hydrosparge Volatile Organic Compound Sensor

Environmental Technology Verification Reports:

Cleanup

Measurement of Explosives in Contaminated Soil (Model 8610C Gas Chromatograph/Thermionic Ionization Detection)

Measurement of TNT in Contaminated Soil (Spreeta™ Sensor)

REVEGETATION EFFORTS, from page 3

This project's successes have been so significant that various technology transfer activities are under way and are worth noting. First, the project results are featured in the October 2001 issue of USDA ARS's *Agricultural Research* in an article titled "Plants That Take a Lickin' and Keep on Tickin'." Second, a plant germplasm workshop has been scheduled for Spring 2002 at Fort Carson and the U.S. Air Force Academy to provide an opportunity for seed growers and DoD land managers to exchange specific needs and knowledge of the new germplasms. Additionally, seed samples from the improved germplasms will be deposited in the National Plant Germplasm System where they will be available for research purposes, including development and commercialization of new cultivars. Information on this breeding research is available at http://www.crrel.usace.army.mil/es/research/breeding.htm.

For further information on this project, please contact Mr. Antonio Palazzo, U.S. Army Corps of Engineers, Engineer Research and Development Center–Cold Regions Research and Engineering Laboratory, Hanover, NH, at (603) 646-4374, or via e-mail at apalazzo@crrel.usace.army.mil. ◆

PARTNERS IN ENVIRONMENTAL TECHNOLOGY

STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM (SERDP)
&
ENVIRONMENTAL SECURITY TECHNOLOGY CERTIFICATION PROGRAM (ESTCP)

INFORMATION BULLETIN

FALL 2001 NUMBER 10

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C ◆ A ◆ L ◆ E ◆ N ◆ D ◆ A ◆ R

FOR SERDP AND ESTCP

NOVEMBER 2001

November 14
The FY 2003 Core Solicitation for SERDP as well as the solicitation for the SERDP Exploratory Development (SEED) Program to be released on or about this date

November 27-29
SERDP and ESTCP Partners in Environmental Technology Technical Symposium & Workshop, "Building on Past Successes to Address Emerging Issues," Marriott Wardman Park Hotel, Washington, D.C.

JANUARY 2002

January 10
Non-federal pre-proposals due in response to the SERDP FY 2003 Core Solicitation

January 10
A federal Call for Proposals and a Broad Agency Announcement (BAA) for ESTCP FY 2003 proposals to be released on or about this date

January 15
SERDP quarterly progress reports due for the first quarter of Government FY 2002

January 15
ESTCP quarterly reports due for the first quarter of Government FY 2002

FEBRUARY 2002

February 1
Full proposals requested from qualified proposers responding to the SERDP FY 2003 Core Broad Agency Announcement (BAA) Solicitation

February 7
Proposals due in response to the SERDP Exploratory Development (SEED) Broad Agency Announcement (BAA)

RELATED CONFERENCES & EVENTS

December 4-5
Interstate Technology and Regulatory Cooperation (ITRC) Training Course "Accelerated Bioremediation of Chlorinated Solvents"
Marriott Hotel
New Orleans, LA

For more information, call (770) 242-7712 or visit www.itrcweb.org.

December 10-13
Twelfth Annual Solvent Substitution Workshop "Striving for a Chemically Safe Workplace"
The Radisson Resort
Scottsdale, AZ

For more information, visit www.exchangemonitor.com or call (703) 750-6840.

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