SUMMARY
Federal REMEDIATION TECHNOLOGIES ROUNDTABLE

System Planning Corporation Building
Rosslyn, Virginia
June 3, 1992

Introduction

Dr. Walter W. Kovalick, Jr., Director of EPA's Technology Innovation Office (TIO), opened the meeting at 8:30 a.m. and welcomed all participants. He said the focus topic for this meeting would be technology development facilities and testing centers.

Attendees introduced themselves. Roundtable agencies represented by meeting participants included:

U.S. Environmental Protection Agency (EPA);
U.S. Army Secretariat;
U.S. Army Corps of Engineers (USACE);
U.S. Army Toxic and Hazardous Materials Agency (USATHAMA);
U.S. Navy (USN);
U.S. Air Force (USAF);
U.S. Department of Energy (DOE);
U.S. Department of Interior, Bureau of Mines;
U.S. Department of Interior, U.S. Geological Survey (USGS); and
Nuclear Regulatory Commission (NRC).

A complete list of participants and other attendees is included as an attachment to this summary.

Dr. Kovalick updated Roundtable members on several TIO initiatives. He indicated that TIO plans to promote its new Vendor Information System for Innovative Treatment Technologies (VISITT) through advertisements in various publications and direct mail of a VISITT fact sheet. The fact sheet includes a description of the VISITT database, hardware and software requirements, and how to order VISITT by mail or through the VISITT Hotline, 800/245-4505 or 703/883-8448. Prepublication copies of the fact sheet were distributed, and Dr. Kovalick said that copies would be mailed to all Roundtable members. He asked that Roundtable members assist TIO in the promotion effort by passing the fact sheet on to appropriate people in their respective agencies.

TIO has produced a series of *Citizen's Guides To Understanding Innovative Treatment Technologies*, which are now available for distribution. Dr. Kovalick said the guides were prepared for use by EPA regional personnel and others in expanding acceptance of innovative treatment technologies. Ten guides have been produced. Eight of these focus on specific innovative technologies. One provides an overview, and one profiles successful applications of innovative technologies. A flyer describing the guides and how to order copies was distributed. Dr. Kovalick encouraged participants to call Nancy Dean of TIO (703/308-8797) if they were interested in obtaining a complete set of the guides.

Dr. Kovalick said TIO will sponsor the *Fourth Forum on Innovative Hazardous Waste Treatment Technologies: Domestic and International* in San Francisco in November. The forum draws scientists and

engineers from the government and private sector in the United States and a number of other countries interested in exchanging solutions to hazardous waste treatment problems. A flyer on the meeting is included as an attachment to this summary.

Dr. Kovalick announced that the Roundtable's Site Characterization Technologies Subcommittee would meet on June 4. The group is chaired by Eric Koglin of EPA's Environmental Monitoring Systems Laboratory in Las Vegas. The group was formed to explore the possibilities for joint selection and evaluation of innovative characterization and monitoring technologies.

Update on Public-Private Partnership Project at McClellan AFB

Margaret Kelly, Deputy Director of TIO, provided a brief overview of a project to facilitate full-scale demonstration and evaluation of innovative technologies at Federal facilities. Sarah Hokanson and Tom Grumbly of Clean Sites, Inc., provided additional details about the current status of the project.

The effort was originally undertaken in response to comments by major corporations, engineering consulting firms, and others — as well as a recommendation from the National Advisory Council for Environmental Policy and Technology (NACEPT). Comments from the private sector indicated that a lack of data on real-world performance of innovative technologies keeps these firms from selecting and recommending use of these technologies. In addition, cleanup professionals have expressed interest in developing cost and performance data on "treatment trains" that are designed with cleanup of a site to required levels as the endpoint and in the need for information on demonstration results sooner than that available through EPA's SITE program. About the same time as these comments were being received, NACEPT recommended the use of Federal facilities to test and evaluate innovative treatment technologies.

Following the Air Force's proposal of McClellan Air Force Base (California) as a facility for the demonstrations under the project, as many as 35 companies expressed interest in participating. Clean Sites, Inc., was chosen to facilitate the process of matching corporate interests with available sites and a strawman proposal (distributed to Roundtable members prior to the meeting) was developed.

According to Ms. Hokanson, the project manager for Clean Sites, McClellan has designated 10 sites at the base which are characterized to a degree required for demonstration. Profiles were sent to the companies that had expressed interest, along with of a questionnaire seeking information about the type of cost and performance data they need, the technology they want to demonstrate, and which McClellan site would be suitable for such a demonstration. Responses received to date reinforce an interest in demonstrations that have cleanup as an endpoint and in demonstrating solutions that are transferable to other similar sites.

A meeting is planned at McClellan in July to confirm plans and kick off the project. According to Mr. Grumbly, the July meeting is very important and will solidify the commitment of individual companies to participate.

National Environmental Technology Applications Corporation (NETAC)

Dr. Edgar Berkey, president of NETAC, provided an overview of the organization and its work in technology development and demonstration. Overall, he said, technology development and demonstration account for about 25 percent of what NETAC does.

He explained that NETAC was created in 1988, through a cooperative agreement between the

University of Pittsburgh Trust and EPA, to promote the development of environmental technologies and help move them to the marketplace. The basis for NETAC is the Federal Technology Transfer Act of 1986.

While initial start-up funds were provided by EPA under the agreement, today the majority of NETAC funds come from non-EPA sources, such as industry, state governments, and foundations. Dr. Berkey said that NETAC currently has a $3.4 million budget. NETAC provides services to its clients in the areas of technology assessments, testing and evaluation, market and financial assessments, regulatory and legal assessments, information clearinghouse, and commercialization assistance. NETAC also is increasing its involvement in international technology transfer.

NETAC operates a Development and Demonstration (D&D) Laboratory, a 6,000-square-foot facility with space for bench-scale testing and small pilot units. Typical projects included an evaluation of a proprietary chemical destruction technology that included bench- and pilot-scale tests; proof-of-concept testing of a treatment process for sewage sludge; screening tests of a treatment technology for soils contaminated with hazardous organic compounds and heavy metals; and treatability testing of a dechlorination process for treating PCBs in contaminated soils. The D&D lab also is involved in testing and demonstrating of three EPA Emerging Technology Program projects: an acid extraction treatment system, a secondary lead smelting process, and a thermal chemical soil treatment process.

NETAC has withdrawn its applications for RD&D and Part B Storage permits, because the market for a facility having these permits has not developed. NETAC's RCRA treatability exemption has been sufficient thus far to meet all needs.

Dr. Berkey said NETAC also operates a Bioremediation Product Evaluation Center that is the only laboratory in the nation created solely to encourage commercial application of bioremediation products to mitigate the effects of oil spills and hazardous waste pollution. The lab currently is evaluating 10 products with potential for open-water oil spill cleanup.

Mr. Fleming (DOE) asked how NETAC disseminates the results of its testing. Dr. Berkey replied that NETAC only provides general information; the developers themselves disseminate results of tests involving their technologies.

National Defense Center for Environmental Excellence (NDCEE)

Jack Adams, Principal Technical Staff of the NDCEE, provided an overview of the center's role and capabilities related to technology development and demonstration. He indicated that NDCEE was established less than a year ago and is located in Johnstown, PA. It is operated by the National Defense Environmental Corporation (NDEC) for the U.S. Department of Defense. The Army Material Command is the executive agency for the Center which is advised by a Senior Board of Advisors made up of officials from the public and private sectors.

Mr. Adams pointed out that NDCEE operates under a task-order contract and can be accessed by other agencies. He encouraged Roundtable members to think about needs NDCEE might address and develop proposals for work assignments. While the processing of requests is usually faster for agencies that can fund the work they require, funding support may be available for agencies that need it.

Mr. Adams indicated that NDCEE mission includes the opportunity to transition environmentally acceptable manufacturing process technologies; to provide training in the use of environmentally acceptable processes and technologies; and to perform applied research and development, as appropriate,

to accelerate transitioning new technologies. In this context, an important part of NDCEE's work involves developing pollution prevention and abatement technologies needed for base realignment and closure activities. NDCEE also works with vendors of existing technologies to demonstrate how their technologies can satisfy defense-related manufacturing objectives.

NDCEE has a 65,000-square-foot "factory" equipped for full-scale technology and systems operation and demonstrations. The factory is used to demonstrate to facility managers and operators the various technical alternatives available to them. Mr. Adams said these demonstrations are complemented and reinforced with hands-on training programs to encourage the use of alternatives that offer improved environmental quality.

U.S. Army Engineer Waterways Experiment Station (WES)

John Cullinane, Manager of the Installation Restoration Program, described the capabilities and facilities at WES, located in Vicksburg, MS. WES' staff of 1,600 provides research and testing services to a variety of Federal and state agencies in addition to the Corps of Engineers.

WES is involved in about 250 projects related to hazardous waste treatment technologies for some 45 customers. The budget is $50 million, according to Mr. Cullinane. Most of the activity is concentrated in the Hazardous Waste Research and Development Center. The Center contains 10,000-square-foot of laboratory space for bench- and pilot-scale testing. It also includes a 7,000-square-foot analytical laboratory.

WES has been heavily involved in EPA's Best Demonstrated Available Technology (BDAT) Program and operates the Hazardous Waste Research and Development Center under a RCRA Part B permit for storage and treatment. He said that, with the cooperation of the State of Mississippi, WES has been able to meet a range of needs under its current permit status and has not had any need to apply for a RD&D permit.

The Center has conducted laboratory and treatability studies of treatment with ultraviolet and ozone, chemical precipitation technologies, and biotreatment processes, Mr. Cullinane said. He indicated that, among its many development-related projects, WES has been involved in development and testing of chemical oxidation technology for remediation of military-unique compounds at Rocky Mountain Arsenal; liquid-phase biotreatment for use at Superfund as well as military sites; bioslurry treatment technologies at Superfund and former defense sites; and xanthate precipitation technology.

WES also is involved in development of test protocols and analytical techniques and has provided support to clients on all aspects of site remediation from scoping to litigation. WES works on a cost-reimbursable basis.

Dr. Kovalick asked if WES has seen a growth in non-DOD customers. Mr. Cullinane said that the client list has grown only slightly. He said potential customers are surprised at the cost of WES services and often disappointed that WES can provide no source of additional funding.

Mr. Cullinane was asked how information about projects, particularly those related to innovative treatment technologies, is exchanged within the Corps of Engineers. He replied that the annual innovative technology transfer workshop, some program newsletters, and one-to-one contact are used.

Ms. Kuroda requested the average hourly rate charged for WES services, and Mr. Cullinane indicated the hourly rate ranges from $45 to $80.

Incinerator Research Facility

Bob Thurnau, Chief of the Technology Research Section at EPA's Risk Reduction Engineering Laboratory, described the operation of the Agency's Incinerator Research Facility (IRF), located in Jefferson, Arkansas. He explained that the facility was established in 1985 and has recently (1989) been expanded to include new RCRA storage facilities.

Mr. Thurnau said the IRF has a pilot-scale rotary kiln system that includes a 2-million-BTU/hour primary combustion chamber. The system includes a redundant air pollution control system that is designed to allow for quick, easy sampling. Customized sampling also can be performed.

The IRF has been involved in treatability testing for a number of Superfund sites requiring treatment of organics mixed with metals, Mr. Thurnau said. The facility has a full RCRA Part B permit.

Mr. Thurnau said IRF makes available to clients a complete inventory of stock sampling equipment and a staff proficient in the use of sampling techniques. He said tests can be customized with control of desired variables.

Mr. Berg (EPA/AO) asked how many customers IRF has and what percentage of the clientele is EPA. Mr. Thurnau pointed out that to date the EPA Regions have been IRF's customers exclusively. He explained that services of the facility have been marketed to potential private sector clients, but those efforts produced no new customers. Negotiations are underway, however, with the U.S. Department of Energy to provide services.

Mr. Thurnau said limited funding appears to be the reason there have been few new customers. He said IRF now has a bench-scale facility. There is hope that it will provide a solution to funding barriers, he said.

Using Federal Facilities as Test Centers for Technology Development

Dr. Kovalick invited group discussion on the value of having Federal test facilities, such as those described by the previous speakers.

Mr. Berg, speaking for EPA's National Advisory Council for Environmental Policy and Technology (NACEPT), said that NACEPT sees such facilities as places where technologies should be able to be tested and demonstrated relatively unencumbered. In a report issued in 1991, the NACEPT Technology Innovation and Economics Committee concluded that current permit procedures are a barrier to technological innovation and recommended that permitting systems be modified to help encourage development, testing, and demonstration of innovative technologies.

Mr. Berkey said NETAC has found there are two principal factors limiting demonstrations of new technologies. One factor is a lack of market assurance; investors are still not convinced there is a market for new technologies. The other factor is the lack of money to move to that step in the commercialization process. Mr. Berkey said NETAC estimates that each step in the process toward commercializing an innovative technology increases the required investment by a factor of 10. While the increase is hopefully balanced by a decrease in the risk to the investor, he said, the size of the necessary investment often is a problem.

Mr. Miller (DOE) pointed out that DOE encourages demonstration of innovative technologies at its sites.

Dr. Kovalick said that consulting engineering and other firms involved in doing feasibility studies should be the source of demand for new technologies. But they only do what their clients ask for. He pointed out that PRPs and agencies such as DOE and DOD do not appear to be stimulating that demand to the extent necessary.

Mr. Magee (NJIT) said that a survey in the State of New Jersey found a significant need for testing facilities but that industry is reluctant to commit to a technology that is evaluated in facilities that can accommodate only very small-scale tests. He suggested that supplemental funds are needed to support testing of technologies with potential from developers who cannot finance appropriately scaled tests on their own.

Dr. Berkey suggested that EPA's SITE program should be evaluated to determine how it can be expanded or broadened to further encourage demonstration and evaluation of innovative technologies.

Mr. Lindsey (EPA/ORD) said an important benefit of having test centers is that such facilities make it possible to run innovative technologies to failure without concern for other environmental problems that might result from the failure. He pointed out that this is not possible in a field demonstration such as in the SITE program.

Mr. Holliday (WPI) pointed out that, in most cases, innovative technologies fail at full scale or for non-technical reasons. This limits the usefulness of pilot-scale testing as a way of reducing risk to the investor.

Action on the Ground Water Technology Development Proposal

Nancy Dean of TIO summarized the outcome of the special Roundtable meeting, held on May 14, to review Federal efforts to develop sand implement ground-water remediation technologies. Thirty-two managers and researchers from Roundtable member-agencies and academia attended the meeting. Ms. Dean said that EPA has identified 15-20 emerging innovative ground-water technologies. As a result of the special meeting, the Roundtable would like to create a subgroup to plan and facilitate some collaborative demonstrations of the technologies and help move them into the field more quickly.

She said that TIO is interested in chairing the subgroup and that a draft charter was included in participants' meeting packets. Ms. Dean said that Rich Steimle of TIO (703/308-8846) would serve as the lead coordinator for the effort. In addition, EPA would like to have a representative from EPA's Ada, Oklahoma, Laboratory and a representative from the SITE Program. She asked each of the agencies present to indicate if they would be willing to participate in the effort. The following agencies indicated that they would participate: DOE (2 representatives); DOD; USAF; Army (2 representatives); USN; DOI/Bureau of Mines; and DOI/USGS. In addition, Mr. Anderson of DOE and Mr. Newsome of the Army indicated that they have site that might be suitable for demonstrations of the innovative ground-water technologies.

Ms. Mallard (USGS) asked for more definition of the scope of the assignment for representatives to the subgroup. Ms. Dean said EPA would do most of the staff work, but that representatives should plan for 2 to 3 meetings over the next six months; they should be knowledgeable about ground-water remediation; and they should be knowledgeable about the sites for which their respective agencies are responsible and any ground-water demonstrations they are carrying out. She said EPA would like to schedule a meeting of the subgroup in about a month at which time the charter can be finalized. The group's immediate goal would be to develop an action plan for delivery at the next meeting of the Roundtable late this year.

Coordinated Planning for Federal Research and Development Activities

Alfred W. Lindsey, Director, EPA/ORD Office of Environmental Engineering and Technology Demonstration, said the need for some sort of coordination and information sharing among Federal agencies about research, development, and demonstration plans and results has been voiced over and over again for a number of years. He explained that a mechanism to accomplish this was tried some years ago. A publication, commonly known as *The Blue Book*, was used as the vehicle for dissemination of information. The process of collecting, organizing, and publishing the information became so cumbersome, however, that the effort ceased.

He suggested that, since the need for coordination and information exchange in ongoing, the effort might be renewed in a different form — a series of focused sessions on specific cleanup-related topics. He said 3 to 4 could be held each year with each agency serving as host in turn. He said sessions could include both success stories and descriptions of projects or demonstrations looking for additional participants.

Mr. Marsh (DOD) said DOD supports the concept. DOD is developing a research, development, demonstration, and evaluation (RDD&E) strategic plan which is due to be completed in October 1992. In addition, DOD's "Project Reliance," an effort to make DOD laboratories more efficient, is ongoing. Under the project, each of the services has been assigned as lead agency for a specific technical area. He said DOD is very interested in knowing what work is being pursued by other agencies, so that its efforts can be focused in areas which are not being dealt with. He added that USATHAMA's Installation Restoration Technology Coordinating Committee (IRTCC) is being expanded and could be helpful in this effort.

Mr. Bartell (USATHAMA) suggested that each of these meetings should include an executive session and a separate information exchange session. The executive session would include people in each agency at a level that would allow them to commit their agencies to cooperative projects.

Mr. Berg indicated that NACEPT will be issuing a report shortly that encourages co-planning, not only among agencies but also with the private sector.

Mr. Hyman (DOI/Bur. of Mines) suggested that a readily accessible database would be a useful "product" of this coordination and information exchange effort.

Mr. Lindsey asked which agencies would be willing to be part of a Roundtable subcommittee to develop this idea and move it forward. The following agencies indicated interest: USACE, DOE, and DOI/Bureau of Mines. Mr. Lindsey indicated he would contact them to determine who would represent each agency on the subcommittee as a beginning step in the process.

Hazardous Waste Management System:
Identification and Listing of Hazardous Waste Proposed Rule

Robin Anderson of EPA's Office of Emergency and Remedial Response alerted Roundtable members to a proposed rule, published in the *Federal Register* on May 20, that takes an initial step toward definition of wastes that do not merit regulation under RCRA Subtitle C, such as low-risk waste that can be managed safely under other regulatory regimes. The regulation proposes several options for as-generated wastes and separate options for contaminated media.

The options fall into two broad categories: Concentration-based exemption (CBEC), which would

establish levels for listed wastes, and Expanded Characteristic Option (ECHO), which would establish characteristic levels for listed wastes for both exiting and entering RCRA Subtitle C.

Ms. Anderson said the comment period is 60 days and encouraged agencies to obtain a copy of the Proposed Rule and make comments as appropriate. She asked participants to contact her (703/308-8371) if they have any questions.

Update on Roundtable Documents

Dan Powell of TIO said that updated drafts of the three Roundtable Documents — *Synopses of Federal Demonstrations of Innovative Site Remediation Technologies*, *Accessing Federal Data Bases for Contaminated Site Clean-up Technologies*, and *Federal Publications on Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation* — were sent out for review by member agencies late in May. The deadline for comment is June 30, and Mr. Powell asked members to provide comments before that date if possible.

Mr. Powell said that all member agencies have agreed to provide $25,000 to support Roundtable activities and printing. Interagency agreements are being finalized and should be signed shortly.

Dr. Kovalick mentioned that TIO has had a good response to its promotion of the Roundtable documents, as well as TIO's *Semi-Annual Status Report*, through "deck cards" (pre-printed postcards for ordering copies of documents) distributed in *Engineering News Record* to about 80,000 subscribers. About 700 orders have been generated thus far, which is around the average percentage response for direct-mail promotions.

Mr. Powell also distributed a preliminary mock-up of a proposed Roundtable publication. The document, a brochure, would contain contact points in each agency for various technology development- and demonstration-related programs. He asked for feedback from members about the need for the publication and asked if they would be willing to supply the information shown in the mock-up for their respective agencies. All but one member agency indicated a willingness to supply information. Mr. Kaminski (USN) said that the Navy is understaffed and would not have staff available to field calls resulting from such a directory.

Mr. Powell said that the mock-up would be sent to all member agencies by mail requesting their input, with the understanding that if they did not respond by the date given, they would not be included.

Dr. Kovalick reminded attendees that minutes of the May 14 special meeting on ground-water technologies was included in their packets along with a copy of the summaries of *in situ* ground-water-related demonstrations that are being included in the updated *Synopses of Federal Demonstrations* document. No other distribution of these minutes will be done to Roundtable members. He indicated that anyone wishing to receive a copy should contact Rich Steimle of TIO (703/308-8846).

Dr. Kovalick indicated that the next meeting of the Roundtable would be scheduled for the November-December timeframe.

The meeting adjourned.

Participants

Federal REMEDIATION TECHNOLOGIES ROUNDTABLE
June 3, 1992

Name:	Agency:	Telephone:
Jack Adams	Nat'l. Defense Center for Environmental Excellence	814/269-2403
Doug Ammon	Clean Sites, Inc.	703/739-1223
Tom Anderson	U.S. Dept. of Energy	301/903-7295
Robin Anderson	U.S. EPA/OERR	703/308-8371
Melanie Barger	U.S. EPA/OFFE	202/260-4846
Bob Bartell	USATHAMA	410/671-1556
David Berg	U.S. EPA/AO	202/260-9153
Edgar Berkey	National Environmental Technology Applications Corp.	412/826-5320
Sandy Clavell	U.S. Navy	619/553-2775
John Cullinane	USACE/Waterways Experiment Station	601/634-3723
Jim Cummings	U.S. EPA/TIO	703/308-8796
Marcia Davies	U.S. Army Corps of Engineers	402/221=7324
Nancy Dean	U.S. EPA/TIO	703/308-8797
Winston deMonsabert	U.S. Navy	703/325-8176
Subijoy Dutta	U.S. EPA/OSW	202/260-1371
Bob Fleming	U.S. Dept. of Energy	301/903-7627
Tom Grumbly	Clean Sites, Inc.	703/739-1241
Clinton Hall	U.S. EPA/RSKERL	405/743-2224
Jeff Heimerman	U.S. EPA/TIO	703/308/8806
Sarah Hokanson	Clean Sites, Inc.	703/739-1271
Darryl Holliday	Waste Policy Institute	301/353-1166
David M. Hyman	U.S. Dept. of Interior/Bur. of Mines	412/892-6572
Joe Kaminski	U.S. Navy	703/325-8538
Meg Kelly	U.S. EPA/TIO	703/308-8800
Jenny King	U.S. EPA/OUST	703/308-8876
Eric Koglin	U.S. EPA/EMSL-LV	702/798-2432
Walt Kovalick	U.S. EPA/TIO	703/308-8800
Donna Kuroda	U.S. Army Corps of Engineers	202/504-4235
Alfred Lindsey	U.S. EPA/ORD	202/260-2600
Richard Magee	New Jersey Institute of Technology	201/596-3006
Gail Mallard	U.S. DOI/U. S. Geological Survey	703/648-6872
M.L. Mastracci	U.S. EPA/ORD/OEETD	202/260-8933
Steven McNeely	U.S. EPA/OUST	703/308-8889
Dennis Miller	U.S. Dept. of Energy/INEL	202/586-3022
Rick Newsome	Office, Army Secretariat	703/614-9531
Bill Noel	U. S. Dept. of Energy	301/903-7900
Jim Owendoff	U. S. Air Force	202/767-4616
Dan Powell	U.S. EPA/TIO	703/308-8827
Rich Steimle	U.S. EPA/TIO	703/308-8846
Robert Thurnau	U.S. EPA/Risk Reduction Engineering Laboratory	513/569-7692
Tom Voice	Michigan State University	517/353-9718
Pete Walker	Nat'l. Defense Center for Environmental Excellence	814/269-2444
Michael Weber	Nuclear Regulator Commission	301/504-1298