



Environmental Remediation Sciences Program

Fall PI Meeting

Oak Ridge, TN
October 23-25, 2006

*U.S. Department of Energy
Office of Science
Office of Biological & Environmental Research
Environmental Remediation Sciences Division*



Purpose of the PI Meeting

Objective

Assess progress on the evaluation, quantification and simulation of key processes affecting the transport of contaminants in the subsurface and explore future topics for research.

- Status of existing projects
- New projects (EMSP)

- Gauge direction(s) for future research
 - Breakout sessions
 - Discussion sections
 - Conversation



Solicitations

New ERSP Solicitations for FY07 will be posted early December



ERSP Status

- DOE Budget: Continuing Resolution till 11/17/06
 - Election cycle may extend the CR well into next year

- Status of Notice 06-12 (ERSP Notice)
 - Received about 180 proposed projects (across five science elements)
 - Review process is complete
 - Award process is complicated by the lack of a budget
 - Some declinations sent out already (~50% of submitted proposals)
 - We may be able to make a limited set of awards
 - A number of proposals will be of unknown status
 - We will provide as much information as we can, when we can.



ERSP Status Cont'd

- Notice 06-16 (Integrated Field Scale Subsurface Research Challenge)
 - Five proposals submitted (ORNL, SRNL, Hanford, Idaho, Rifle)
 - An initial mail review has been completed
 - Panel review planned for November 14th in Washington, DC

We anticipate decisions shortly after the panel review
Awards will also be complicated by the budget situation



Technology Transfer Highlights

Science-based cleanup of Rocky Flats

David L. Clark, David R. Janecky, and Leonard J. Lane

The chemical and physical interactions of radioactive compounds are key to understanding how they can contaminate the environment and, more importantly, how best to remove them.

feature
article

David Clark and David Janecky are technical staff members at Los Alamos National Laboratory in New Mexico. Leonard Lane is a consultant with L. J. Lane Consulting, Inc, in Tucson, Arizona, and was a hydrologist with the US Department of Agriculture's Agricultural Research Service.

From 1952 to 1989, the Rocky Flats Nuclear Weapons Plant, located about 24 km northwest of Denver, Colorado, made components for the nation's nuclear arsenal using various radioactive materials, including plutonium and uranium; toxic metals such as beryllium; and hazardous solvents, degreasers, and other chemicals. The key component produced at Rocky Flats was the plutonium pit, commonly referred to as the trigger for a nuclear weapon. The pit provides energy to fuel the explosion.

In 1989 the Federal Bureau of Investigation and the Environmental Protection Agency abruptly halted nuclear production work to investigate environmental and safety concerns, and the site was added to the EPA's Superfund list later that year. In 1993 the secretary of energy announced the end

tense rainfall and wet springtime conditions raised concerns about the mobility and dispersal of plutonium and americium. To account for increased concentrations of plutonium at various surface water-monitoring locations, researchers hypothesized that plutonium was soluble in surface and ground water. But modeling efforts at the time predicted very little movement of plutonium. The discord between the data and predictions prompted DOE and Kaiser-Hill in 1995 to establish the Actinide Migration Evaluation (AME) advisory group. The idea was to solicit advice and technical expertise on how elements such as plutonium, uranium, and americium are likely to behave in the air, surface water, ground water, and soil (see box 1).

Supported by scientific measurements, the group found

- RFETS project
 - Basic science informs cleanup decisions
- Cr(VI) Bioremediation at Hanford 100-D Area
- Push-Pull tests at SRS
 - MNA evaluation
- UMTRA Research
 - Rifle, Naturita

Physics Today, September 2006 pg 34-40.



Office of Science

Tuesday, October 24, 2006

8:00 AM Welcome and opening remarks

8:20 AM ***Field Research Project Reports: Stimulated In Situ Metal Reduction***

10:20 AM Break (15 min)

10:35 AM ***Scaling of Geochemical Reactions***

11:50 AM Lunch

1:30 PM ***Special Session: Characterization and Modeling Heterogeneity***

3:45 PM Break (15 min)

4:00 PM **Modeling/scaling**

5:30 PM **Poster Session/Mixer**
All Posters (Pollard Center Lobby)

7:00 PM Adjourn

Agenda

<p>ERSD Long Term Measure</p> <p>By 2015, provide sufficient scientific understanding to allow a significant fraction of DOE sites to incorporate coupled biological, chemical and physical processes into decision making for environmental remediation</p>	<p>Goal 1: Develop an improved understanding of the processes governing the fate and transport of contaminants in the subsurface in order to predict and control environmental remediation and long term stewardship of DOE sites.</p>	Fundamental Molecular Scale Research	Surface Chemistry	EMSL, EMSIs Synchrotrons
			Aqueous Complexes	
			Nanoscale Research	
		Subsurface Biogeochemistry	Microbe-Mineral Reactions	Notice 06-12 Projects
			Contaminant-Mineral Rxns	
		Subsurface Microbiology	Microbial Ecology/Metabolism	
			Microbially Catalyzed Rxns	
		Groundwater Flow and Transport	Aquifer Characterization	
			Groundwater Hydrology	
		Vadose Zone Processes	Geochemical Gradient Rxns	
	Unsaturated Zone Chemistry			
	Conceptual/Computer Model Development	Scaling of Processes	SciDAC 06-04	
		3D HPC Frameworks		
	<p>Goal 2: Explore new options and concepts for the remediation of subsurface environments.</p>	Physical/Chemical Remediation Processes	Immobilization	Notice 06-12 Projects
			Removal Techniques	
			Barrier research	
		Biological Processes	Bioremediation	
		Long Stewardship Research	MNA processes/ Modeling	TBA
	Field Scale Research	Fate & Transport/ Remediation Research at Large DOE Test Sites	Notice 06-16	
	<p>Goal 3: Develop new measurement and monitoring tools to better understand and manage contaminant transport.</p>	Site Characterization Technologies	Geophysics Techniques Seismic, GPR, EMT etc.	Notice 06-12 & SBIR/STTR Projects
Biological, Chemical and Physical Sensor Technology		Genomics-based technologies		
		Chemical speciation detection		
		Flow detection		
		Autonomous Sampling and Data Collection/Reporting Systems		