



*U.S. Department of Energy's
Office of Science*

**Environmental Remediation Sciences
Division (ERSD) Research Programs and
Directions**

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ERSD Programs – FY06 Cont. Resolution

Natural and Accelerated Bioremediation Research (NABIR) Program

Assessment, BASIC, Biogeochemistry, Biomolecular Science and Engineering, Biotransformation, Community Dynamics/Microbial Ecology, Field Studies, Integrative Studies

Environmental Management Science Program (EMSP)

Subsurface Science, High Level Waste, Mixed Waste/TRU, Environmental Molecular Science Institutes (EMSI's), Synchrotron Support for Environmental Science

Savannah River Ecology Laboratory (SREL)

**William R. Wiley
Environmental
Molecular Sciences
Laboratory
(EMSL)**

**Small Business
Innovation Research
& Small Business
Technology Transfer
Research**

**FY05 Operations &
Other Funding ~\$40M**

FY05 Research Funding ~\$60M



BER's FY06 Budget Request

ERSD's FY06 Budget Request

- Total ERSD Funding Requested ~\$90M
 - ~\$50M for research
 - ~\$40M for EMSL operations & miscellaneous
- No funding requested for SREL and no surficial science research (~ **-\$10M**)
- NABIR and EMSP programs combined into a new program entitled Environmental Remediation Sciences (ERS) Program
- ERS focus will be on subsurface science & HLW
- Continued support for user facilities & field sites

Life Sciences Division's FY06 Budget Request

- Increased budget request for Genomics: GTL



ERSD Performance Targets

Long-Term Measure

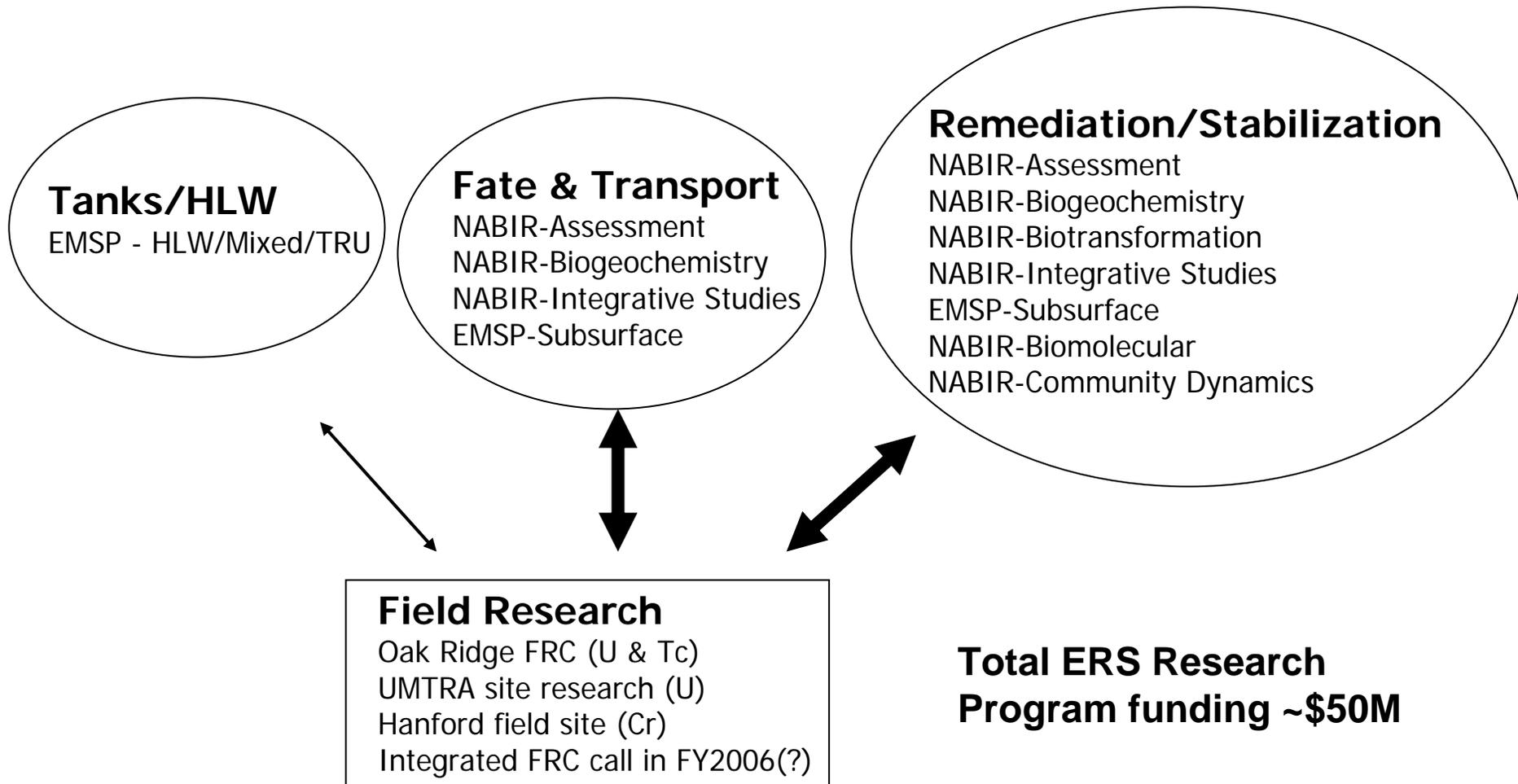
- By 2015, provide sufficient scientific understanding to allow a significant fraction of DOE sites to incorporate coupled biological, chemical and physical processes for decision making for environmental remediation and long-term stewardship.

Annual Targets/Goals

- **FY05** – Determine scalability of laboratory results in field experiments – Conduct two sets of field experiments to evaluate biological reduction of chromium and uranium by microorganisms and compare the results to laboratory studies to understand the long term fate and transport of these elements in field settings.
- **FY06** – Develop predictive model for contaminant transport that incorporates complex biology, hydrology, and chemistry of the subsurface. Validate model through field tests.



ERS Program: Science Themes





ERSD Programs in FY 2006?

Environmental Remediation Sciences Program

Tanks/HLW

Fate and Transport

Remediation/Stabilization

Savannah River Ecology Laboratory (SREL)?

~\$50M?

William R. Wiley Environmental Molecular Sciences Laboratory (EMSL)

Small Business Innovation Research & Small Business Technology Transfer Research

~\$40M

FY06 Total Budget Requested ~\$90M - \$8M?



ERSD Program Funding Status & Priorities for FY06

1) SREL operations/research

2) New EMSP Awards

- FY 2005 solicitation - ~100 proposals
 - ~1/2 dozen renewals awarded
 - ~65 declined
 - ~30 pending

3) NABIR Extension/Renewal Awards

- Approximately 1/4 of currently funded PI's

4) Integrated FRC Research Solicitation/White Papers?

- Late FY06?



Genomics: GTL – A Systems Biology Research Program

Program Goals

- Identify and characterize the molecular machines of life
- Characterize gene regulatory networks
- Characterize the functional repertoire of complex microbial communities in their natural environments at the molecular level
- Develop the computational capabilities to advance understanding of complex biological systems and predict their behavior

“Roadmap” for Genomics: GTL

- <http://doegenomestolife.org/roadmap/index.shtml>
- Appendix B: Environmental Remediation



Genomics: GTL Appendix B – S&T Milestones

Define Microbial Communities and their Potential

- Sequence and annotate genomes from more subsurface microbes
- Develop metagenomics methods for subsurface communities

Measure Microbial Processes and Responses

- Measure the proteome, metabolome and transcriptome of populations and communities
- Characterize cell signaling, materials and energy transfer, and gene transfer in subsurface communities

Examine Microbe-Mineral Interactions

- Determine the molecular basis for attachment and electron transfer
- Evaluate metabolic changes within cells on mineral surfaces

Modeling and Simulation Capabilities and Data Management

- Correlate spatial information with geochemical properties
- Develop visualization techniques for 3D simulation of processes