



Environmental Remediation Sciences

Who, what, where & why (when too)

12 June 2006

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U.S. Department of Energy

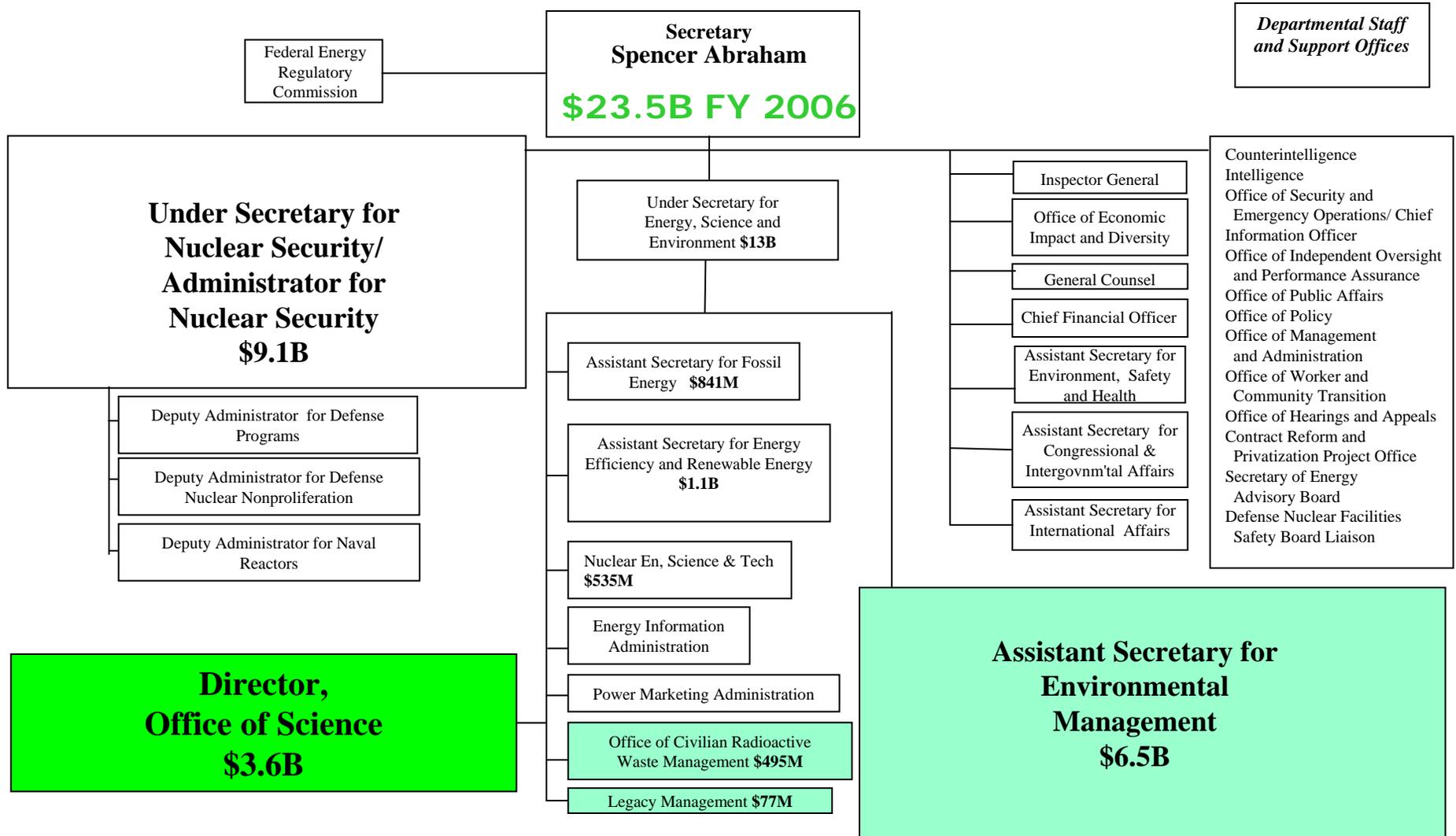
Office of Science

Office of Biological & Environmental Research

Environmental Remediation Sciences Division

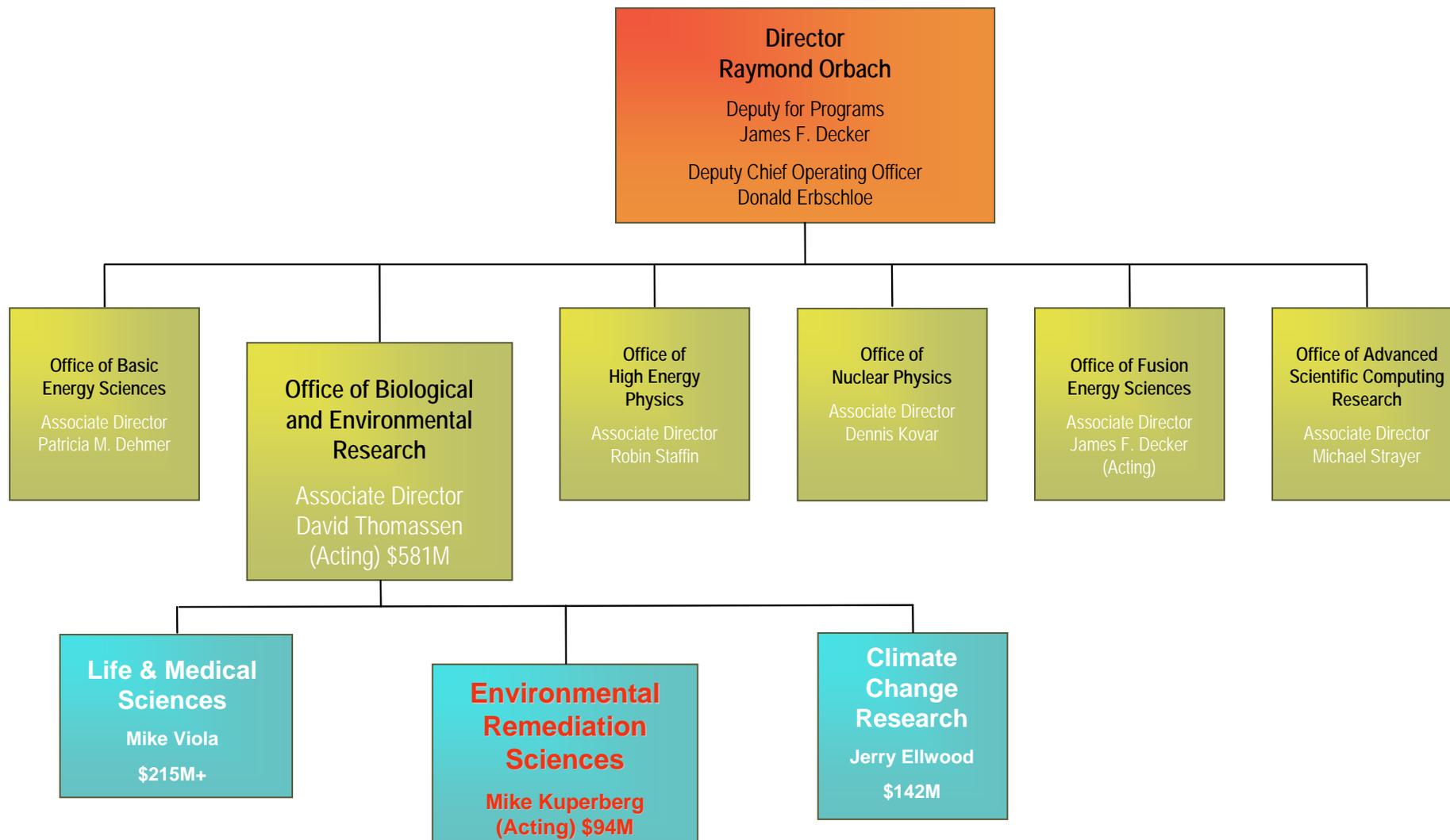


Department of Energy





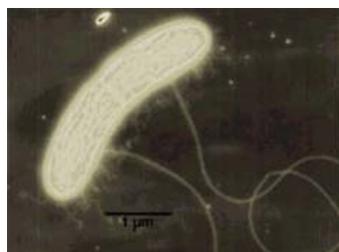
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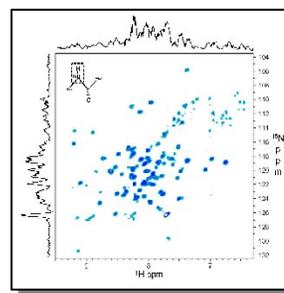


Environmental Remediation Sciences Division (\$87.5 M)

Fundamental research for DOE environmental problems. Supports a research program and a national scientific user facility:



**Environmental Remediation
Sciences Program
\$54M**



**Environmental Molecular
Sciences Laboratory (EMSL)
\$40M**

The William R. Wiley Environmental Molecular Sciences Laboratory (EMSL), a U.S. Department of Energy national scientific user facility located at Pacific Northwest National Laboratory (PNNL) in Richland, Washington provides integrated experimental and computational resources for discovery and technological innovation in the environmental molecular sciences to support the needs of DOE and the nation.



Environmental Remediation Sciences Mission

...Advance the fundamental science leading to solutions to **currently intractable environmental problems** or to **break-through strategies** for remediation of the DOE sites and other DOE environmental and energy missions.



Environmental Molecular Sciences Laboratory (\$40M FY06)

- Opened in 1997, \$250M investment
- ~110 FTE's
- 6 facilities
 - NMR, Mass Spec, Interfacial chemistry, 11tf computer, Environmental Spectroscopy, CPCS
- New strategic Plan
 - Science Themes: Biogeochemistry, Interfacial Chemistry, Aerosol Chemistry, Bio interactions/interfaces



Environmental Remediation Sciences Program (\$54M FY06)

- FY 2006 Budget consolidated NABIR and EMSP into a single research program
 - Environment Remediation Sciences Program (ERSP)
- Maintains interest in processes that control contaminant mobility in subsurface
- Currently redistributing programmatic responsibilities



ERSD Funding Process

- Annual solicitations
 - <http://www.er.doe.gov/grants/FAPN06-12.html>
- Awards through competitive peer review
- Approximately split between National Laboratories and universities
- Awards of 1 to 5 years duration
- Managed by one of five Program Managers



EM Science Program

- Subsurface science
 - ~25 new projects (40 awards) in FY06; \$7.6M
 - Fate & transport, innovative sensors & monitoring
- High-level waste
 - “contained high-level waste”
 - ~20 projects (30 awards) in FY05; \$5.5M in FY06
 - Funding terminated in FY 07
- Mixed Waste/Transuranics
 - 4 projects in FY06; \$1M; no further funding



NABIR*

(Natural & Accelerated Bioremediation)

- Biotransformation (\$2.1M)**
 - Microbial transformation (immobilization) of metals/rads
- Biogeochemistry (\$1.5M)
 - Biological fate & transport of metals/rads
- Microbial community dynamics (\$1.9M)
 - Role of microbial communities in immobilization
- Biomolecular science (\$2.8M)
 - Biomolecular understanding of immobilization process

* All subsurface science, ** FY 2006 dollars



NABIR* continued (Natural & Accelerated Bioremediation)

- Integrative (\$4.6M)**
 - Projects that integrate two or more NABIR elements.
- Field (\$6.0M)
 - Three in situ projects at the NABIR Field Research Center at Oak Ridge
- Assessment (\$0.4M)
 - Methods & tools in support of the NABIR program

* All subsurface science, ** FY 2006 dollars



Environmental Remediation Sciences Program

- New FY 2006 structure
 - 1) Subsurface Biogeochemistry;
 - 2) Subsurface Microbial Ecology and Community Dynamics;
 - 3) Innovative Field-scale Remediation and Long-Term Stewardship Research;
 - 4) Novel Measurement and Monitoring Concepts, and;
 - 5) Exploratory Research.



Performance Monitoring

- 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 into decision making for environmental remediation”
- Annual Target
 - FY 2006: Develop predictive model for contaminant transport that incorporates complex biology, hydrology, and chemistry of the subsurface. Validate model through field tests
- Quarterly Milestones



ERSP Strategic Plan

Research Goals

- Develop an improved **understanding** of the processes governing the fate and transport of contaminants to predict and control environmental remediation and facilitate stewardship of DOE sites
 - Coupled biological, chemical and hydrogeologic processes at field relevant spatial scales
 - Conceptual/numerical models for realistic process and parameter upscaling in field environments
- Explore new options and concepts for **remediation** of subsurface systems
 - Genomics:GTL tools for genomics and proteomics
 - Microbial metabolic processes that control contaminant mobility
 - Key redox/complexation reactions and degradation pathways
 - Form and stability of immobilized contaminants
- Provide the scientific foundation for new measurement and monitoring **tools** to better understand and manage contaminant transport
 - Changes in microbial community composition and metabolic potential
 - Measuring biogeochemical and hydrologic responses
 - Assessing chemical speciation in sediments and waters

http://www.sc.doe.gov/ober/ERSD/Strategic_plan_cover_letter.html



Contact information

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