SC 23.4 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.

[NOTE: new version of goal -- OMB review pending]
Highlights & Accomplishments

- Microbial immobilization of metals & rads
  - Uranium @ FRC & Old Rifle
  - Chromium @ Hanford
- Advanced understanding of the molecular processes in microbial reduction of metals
- Grand Challenges @ EMSL
- Effects of caps on transport processes at Oak Ridge
In the last 12 months……

- Teresa Fryberger was detailed to OSTP
- Todd Anderson joined ERSD
- Ray Wildung & Drew Tait arrived on assignment
- Committee of Visitors reviewed ERSD
- ERSD reviewed FRC & Old Rifle
- EMSP Subsurface call
- NABIR Biomolecular call
- ERSD set for reorganization & reduced budget (FY 2006)
Staff of SC 23.4

- Todd Anderson - NABIR & EMSIs
- Paul Bayer - NABIR & EMSL
- Roland Hirsch - EMSP
- Judy Nusbaum - ERSD
- Drew Tait
- Ray Wildung
Impact of budget reduction

- $1 \text{ M} \text{ reduction in FY 2005 absorbed through funding delays and/or lost opportunities}$

- $9.762 \text{ M} \text{ reduction in FY 2006 eliminates all funding to SREL ($7.8\text{ M}$) and surficial science.}

- Remainder absorbed through funding delays and/or lost opportunities
SC 23.4 – Current Structure
ERSD Reorganization

At the recommendation of the BERAC COV, the Environmental Remediation subprogram has been reorganized. This new organization integrates research previously conducted under the Natural and Accelerated Bioremediation Research (NABIR) program, Environmental Management Science Program (EMSP), and the Savannah River Ecology Laboratory (SREL). Furthermore, the SREL will compete for funding within the Environmental Remediation subprogram rather than be included as a separately funded research activity. The integrated approach will provide complementary knowledge and capabilities that will optimize the research results over the structure that was established when three separate research activities from the Office of Science (BER) and the Office of Environmental Management were combined to form the subprogram in FY 2003.
SC 23.4 Science Themes

**Tanks/HLW**
- High-level waste
  - separations
  - vitrification
  - technology/materials
  - analytical
- Heels
  - recovery
  - stabilization
  - materials, barriers, monitoring, modelling

**Fate & Transport**
- Multi-process
  - biogeochemistry
  - hydrology
  - geophysics
- Multi-scale
  - lab
  - field
  - modeling

**Remediation/Stabilization**
- Biotransformation
  - metals & rads
  - organics
- Barriers/caps
- Long-term stewardship
- Long-term Monitoring and Analytical Characterization

**Field Research**
- Oak Ridge Field Research Center
- UMTRA (Old Rifle)
- Chromium field site (Hanford)
- New FY 2006 site
- Proving ground for models & tools
- DOE site for remediation/stabilization
SC 23.4 – Proposed management structure

- **High-Level Waste**
  - Separations Chemistry
  - Materials sciences
  - Technology
  - Modelling

- **Biological processes & DOE Contaminants**
  - Biotransformation
  - Basic biology
  - Genomics

- **Physical processes & DOE Contaminants**
  - Contaminant chemistry
  - Geochemistry
  - Geology/Hydrology

- **Cross-cutting**
  - Fate & transport
  - Modelling
  - Characterization & monitoring
  - Geophysics
  - Barriers & caps
  - Technology development

- **Cross-cutting**

- **William R. Wiley**
  - Environmental Molecular Sciences Laboratory (EMSL)
  - Molecular-level analytical & computational national user facility
  - Grand Challenges
SC 23.4 – Continued support for User Facilities and Field Sites

- Environmental Molecular Sciences Laboratory
- Oak Ridge Field Research Center
- Old Rifle UMTRA & Hanford Cr sites
- Soon to be released opportunity for additional field research
- Beam-line support for BER users at four DOE synchrotron light sources
SC 23.4 - Collaboration

- BES - Geosciences
  - Heavy element chemistry
  - Separations

- National Science Foundation
  - EMSI's

- Biological processes & DOE Contaminants
- Physical processes & DOE Contaminants
- Crosscutting
- High-Level Waste
- Other

- OBER
  - Life Sciences Division
  - Genomics GTL
  - Microbial Genome (JGI)

- DOE
  - Office of Environmental Management
  - Office of Legacy Management
Increased emphasis on field research
Revised management structure

- Three major elements with defined scope
- Annual solicitation from each element emphasizing themes within that scope
- Annual opportunities for “outlier proposals”
Reorganized ERSD seeks to advance the science needed to support cleanup of the DOE complex by:

- Supporting critical areas of science
- Integrating the entire research program
- Emphasizing scaling and application to field scale
- Funding research that supports ERSD long-term goal and DOE clean-up mission
- Providing annual funding opportunities for all areas within its scope
- Increasing “ceilings” on award amounts
- Toughening policy on “soft landings”
Summary

- Current programs have made important contributions to DOE’s clean-up effort
- Support some of the best scientists and the most important environmental research in the country
- Integrating environmental remediation research in BER
- Working to provide the science community with long-term support to address DOE cleanup needs
What’s next?

- Focus on field-scale needs
- We need you
  - Scientifically as investigators
  - Philosophically & physically
    - Details
    - IPA’s
    - Review committees
Questions?
Backup
# Biological & Environmental Research

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<tr>
<td>Life Sciences</td>
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<td>204,011</td>
<td>-1,175&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>105,272</td>
<td>-816&lt;sup&gt;a&lt;/sup&gt;</td>
<td>104,456</td>
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<td><strong>Medical Applications and Measurement Science</strong></td>
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<td>586,590</td>
<td>-4,678</td>
<td>581,912</td>
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Environmental Remediation Sciences

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<tr>
<th>Request</th>
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<th>FY 2005</th>
<th>FY 2006</th>
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<tr>
<td>Environmental Remediation Sciences Research</td>
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<td>959</td>
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<td>Facility Operations</td>
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<td>Total, Environmental Remediation</td>
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<td>104,456</td>
<td>94,694</td>
<td>-9,762</td>
<td>-9.3%</td>
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“Environmental Remediation Sciences reduced based on fiscal constraints in FY 2006. BER will focus research activities on GTL and Climate Change in support of the DOE goals and objectives. The Environmental Remediation research subprogram will focus research efforts on subsurface science and high level radioactive waste in support of high priority DOE goals and objectives for environmental cleanup. As a result, research funding for surficial science including radioecology and surficial fate and transport will be phased out in FY 2005 and terminated in FY 2006. (-9,511)”