Investigating Innovative Approaches to Site Remediation Through the U.S. EPA SITE Program

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Research and Development

- 1,950 employees
- 13 lab or research facilities across the U.S.
- Credible, relevant and timely research results and technical support that inform EPA policy decisions
Making decisions with sound science requires:

- Relevant, high quality, cutting-edge research in human health, ecology, pollution control and prevention, economics and decision sciences
- Proper characterization of scientific findings
- Appropriate use of science in the decision process

Research and development contribute uniquely to:

- Health and ecological research, as well as research in pollution prevention and new technology
- In-house research and an external grants program
- Problem-driven and core research
High Priority Research Areas

- Human Health
- Particulate Matter
- Drinking Water
- Clean Water
- Global Change
- Endocrine Disruptors
- Ecological Risk
- Pollution Prevention
- Homeland Security
National Risk Management Research Laboratory - Research Areas

- Drinking Water Protection
- Watershed Management & Restoration
- Air Pollution Control
- Pollution Prevention and Sustainability
- Contaminated Media Remediation
Risk Management Research SITE Program

• Purpose: evaluation of innovative technology performance and cost

• *Why is it Important?*
  
  ▪ provides relevant innovative technology performance data to regions and other decision makers
  
  ▪ provides cost data for evaluation of remedial options
Risk Management Research
SITE Program

• Why Important (cont.)
  ▪ SITE focuses on in-situ treatment and hard-to-treat wastes
    58% of all Superfund site source control treatment is in-situ
  ▪ Twice as much Superfund site contaminated soil (28M yd$^3$) is being treated in-situ than ex-situ (14M yd$^3$)
Risk Management Research SITE Program

- Types of Research Activities
  - Evaluation of innovative treatment approaches, and their associated costs
  - DNAPL remediation processes
  - Evaluation of sediment capping or treatment technologies
Risk Management Research SITE Program

• Types of Research Activities
  ▪ Investigation of mine waste remediation options
  ▪ Evaluation of innovative measuring, monitoring and characterization technologies
  ▪ Containment technology research
SITE Program Priority Areas

Sites

- Sites with Mine Drainage
- Manufactured Gas Plants
- Superfund
- RCRA
- Other Federal Facilities
SITE Program Priority Areas

Soils/Groundwater

- DNAPL
- Chlorinated Solvents
- PCBs
- Arsenic, Mercury or other Heavy Metals
SITE Program Priority Areas

Sediments

- Pesticides
- PCBs
- PAHs
- Arsenic, Mercury or other Heavy Metals
Development of Biological Tools and Methods for Evaluating Monitored Natural Recovery of PCB-Contaminated Sediments at the Sangamo-Weston/Twelvemile Creek/Lake Hartwell Superfund Site
What is it?

- EPA estimates ~ 10% of sediment underlying surface waters is contaminated with toxic substances
- Half of sites on the NPL contain PCBs and 10% have PCB contaminated sediments (122 sites)
- PCBs affect not only individual organisms but whole ecosystems (NRC ref.)

A multi-phased study to develop a fully integrated assessment of PCB uptake through all levels of the ecosystem
What Made It a Good Value?

- Place based research with a broad application
- Provides biological tools that serve a dual purpose of assessing condition and gauging the efficacy of mitigation efforts for contaminated sediments
- SITE funded the development of the monitoring framework
Loring Air Force Base, Maine

- Remediation of in-Situ DNAPL Treatment in Fractured Rock
- Based on SITE performance and cost data, the technology was implemented by the Army Corps in Rhode Island
- Two additional implementations are planned for Maine
Roosevelt Mills, Vernon, CT

- In-situ chemical oxidation treatment for chlorinated solvent contaminated media
- SITE treatability study results used as decision tool for remediation of the site
- Roosevelt Mills revitalization plan calls for mixed use retail/residential facility
Future direction

• Place based research with broad applicability
• Demonstration conducted as part of remediation/revitalization
• Continue partnerships/resource leveraging
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Site Homepage...

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