Federal Remediation Technologies Roundtable

Highlights from Session 1: Grand Challenges, Research Gaps, and Priorities

**Report out for FRTR
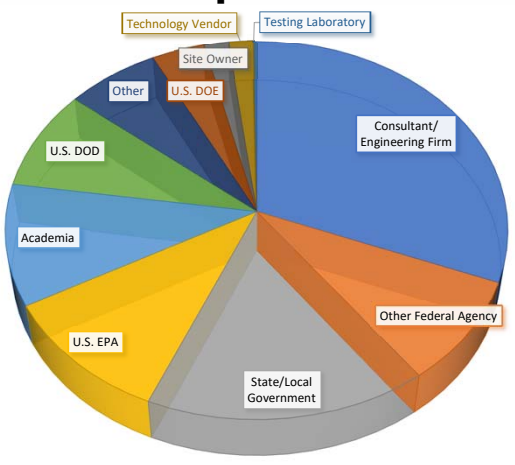Spring 2021 Webinar**

Tanya J. Gallegos, FRTR Steering Committee

Federal Remediation Technologies Roundtable

Session 1: 349 Participants

Consultant/ Engineering Firm	108
Other Federal Agency	31
State/Local Government	58
U.S. EPA	37
Academia	36
U.S. DOD	30
Other	23
U.S. DOE	13
Site Owner	6
Technology Vendor	6
Testing Laboratory	1

2

Federal Remediation Technologies Roundtable

Senior Leaders Respond to Questionnaire

- What are the challenges?
- Technology needs and gaps?
  - Contaminant source and site characterization
  - Emerging contaminants
  - Remedy resilience under evolving climatic conditions

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

USGS
science for a changing world

NIH National Institute of Environmental Health Sciences
Your Environment. Your Health.

3

Federal Remediation Technologies Roundtable

Recap: Grand Challenges

- Remaining difficult-to-remediate sites: long tails, complex groundwater systems, recalcitrant contaminants
- Effective source and site characterization to benefit remedy decision and design implementation
- Evaluating the long-term uncertainty and effectiveness of remedies
- Emerging contaminants and emerging science on contaminants (e.g. PFAS/PFOS, lead, 1,4-dioxane)
- "Valley of death": moving new technologies into full scale field application and commercialization
- Climate resiliency:
  - Efficacy of remediation strategies
  - Climate impacts of remedies (e.g. life cycle)
- Loss of expertise and personnel; transfer of knowledge
- Incorporating environmental justice into cleanup process

Photo credit:
https://www.niehs.nih.gov/health/topics/agents/climate-change/index.cfm

4

Recap: Needs

- Training resources for the environmental remediation community
- Full-scale and/or "off-the-shelf" technology
- Technology information exchange ("clearing house")
- Systems approach: decisions in "totality"
- Characterization and performance monitoring methods using new robotic sensors
- Mechanism to exchange information on decision making and how to evaluate and optimize remediation performance
- Long-term cost performance data
- Better predictive models
- Emerging contaminants
    - Tools for characterization, analytical methods, remediation
    - Science: data and information to assess fate and transport, risk, and behavior
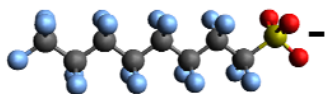
Recap: Recommendations

- Identify, document and discuss case studies which facilitate timely technical expert exchanges
- Coordinate lessons learned
- Evaluate new technologies and their associated QA/QC issues for field applications & data reliability
- Use artificial intelligence, machine learning and data mining tools to process data to understand remediation performance
- Continue to update the FRTR website, its Technology Screening Matrix and Decision Support Tools
- Place cost/benefit analyses into the context of risk analysis
- Develop mechanisms/tools for training
    - Continuing education on new innovative technologies and approaches
    - Transfer of knowledge/experience through mentoring