



Green Cleanup Standards Initiative

April 21-22 NEWMOA Meetings

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Today's Topics

- Sustainability and green cleanups: The challenge
- EPA's vision of a "green cleanup" standard
- Discussion & feedback on key questions
 - Green cleanup framework
 - Structuring standards and certification
 - Implementation considerations such as cost, recognition, etc.

Sustainable Revitalization

Deconstruction, Demolition & Removal

- Reuse/recycle deconstruction and demolition materials
- Reuse materials on site whenever possible
- Consider future site use and reuse existing infrastructure
- Use clean fuels for equipment
- Retain native vegetation and soils, wherever possible

Cleanup & Waste Management

- Use clean fuels for equipment
- Use renewable energy sources
- Improve energy efficiency
- Use cleanup approaches that reduce resource use and impact on air, water, land
- Incorporate remediation activities that sequester carbon

Design & Construction for Reuse

- Use Energy Star, LEED, and GreenScapes principles
- Incorporate Smart Growth concepts
- Use best management practices for stormwater
- Create ecological enhancements
- Use native landscaping

Sustainable Use & Long Term Stewardship

- Reduce use of toxic materials in building and land maintenance
- Minimize waste generation and recycle
- Use energy efficiently
- Monitor engineering and institutional controls
- Manage waste properly to prevent contamination



What is a Green Cleanup?

The practice of considering all environmental effects of a cleanup during each phase of the process, and incorporating strategies to maximize the net environmental benefit of the cleanup.

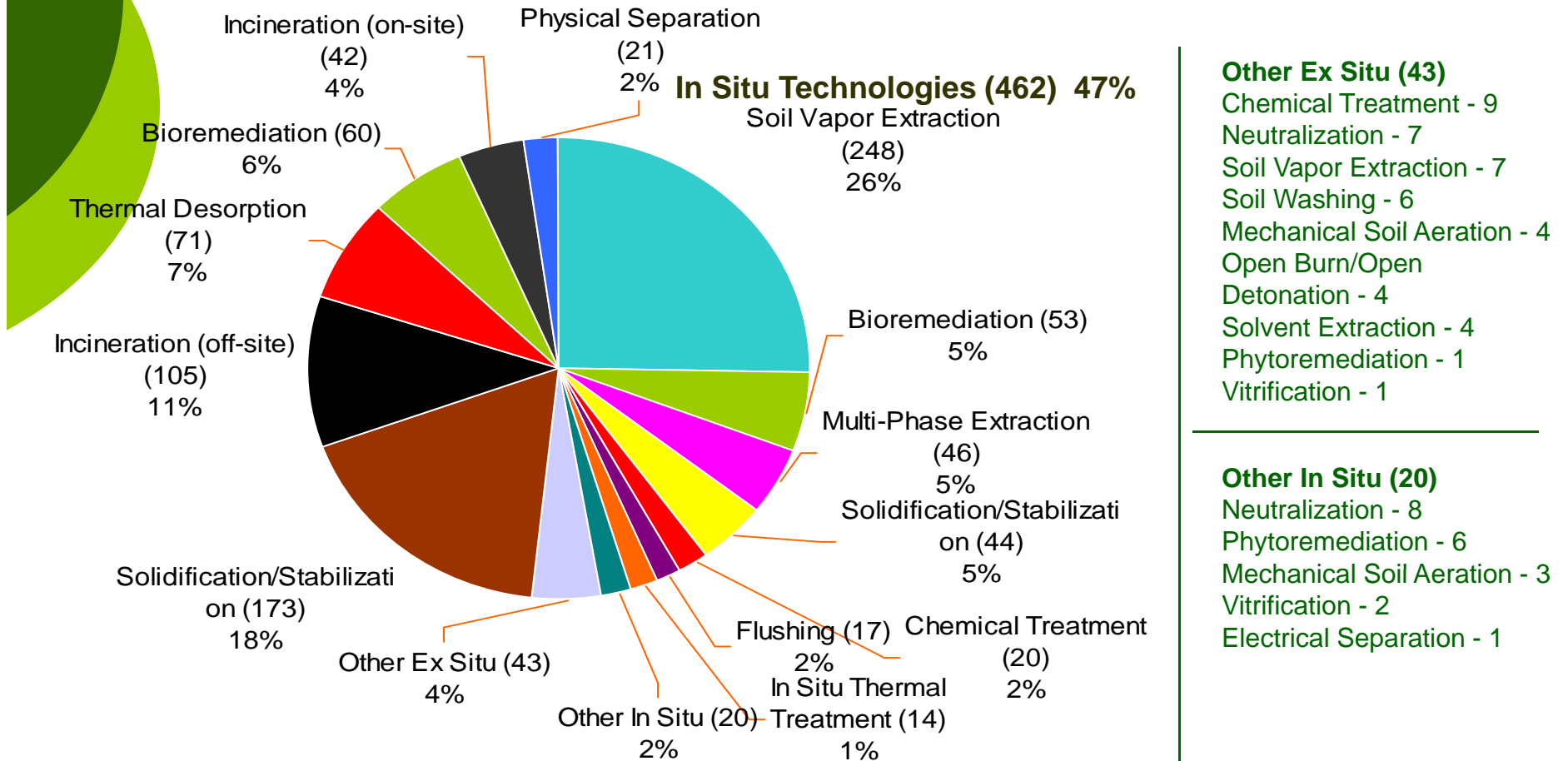
Opportunities to Increase Sustainability in Site Cleanups

- Apply to all cleanup programs
- Exist throughout site investigation, design, construction, operation, and monitoring
- Involve best management practices for core elements



The Work of Cleaning Up Contaminated Sites

Sample subset of soil treatment technologies (Superfund, 2005-2008)*



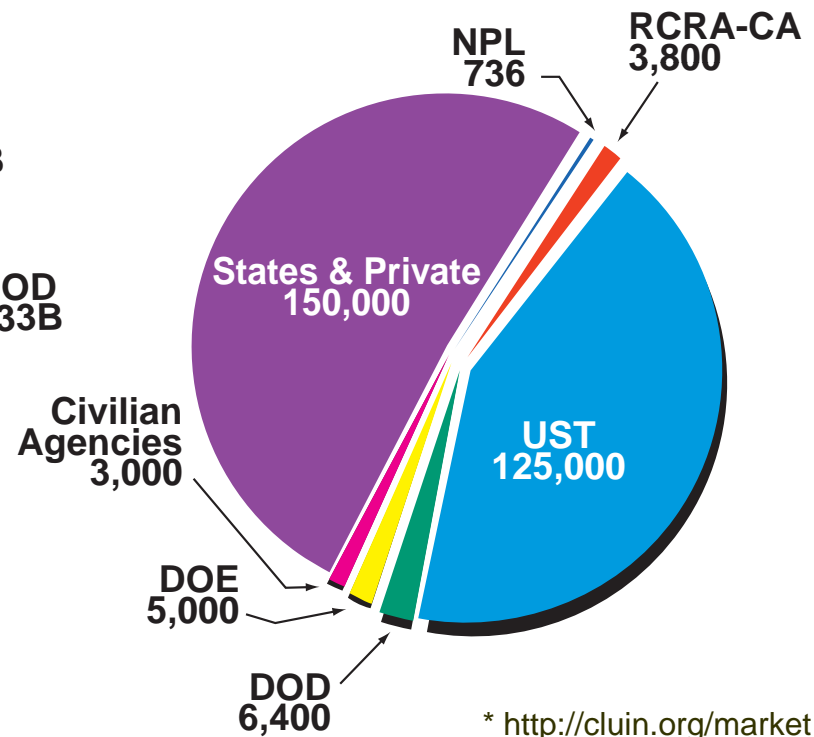
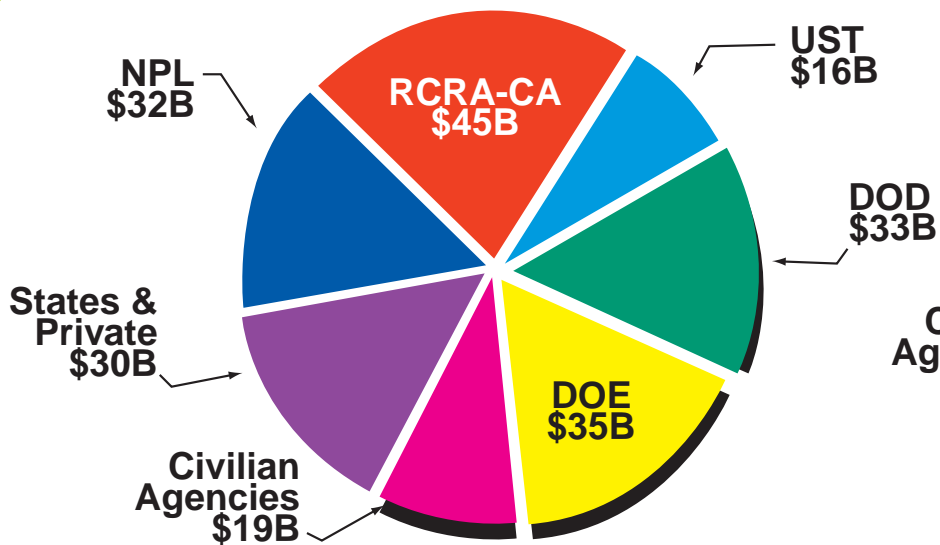
*<http://clu.in.org/asr>

...and There's Still Much Work to be Done

Estimated Number of Sites and Cleanup Cost 2004-2033*

Total = \$209 Billion

Total Sites = 294,000



* <http://clu.in.org/market>



EPA Green Cleanup Activities

Existing

- Green remediation primer, website, and profiles of projects
- Ongoing internet seminars and archived discussions (clu-in.org)
- Training for staff and technical support for projects
- Renewable energy fact sheets and website
- Contracting Toolkits

In the Pipeline

- Green remediation evaluation toolkit
- Remedy specific green cleanup “cheat sheets”
- Superfund green remediation strategy



EPA Green Cleanup “Strategy”

- Benchmark and document green cleanup best management practices
- Build networks of practitioners
- Develop performance metrics and tracking mechanisms
- Assemble a toolkit of enablers
 - Collaborate with the private sector to develop a standard

The Challenge: Integrating Green Cleanup Goals Across Programs

Regulatory Frameworks

- Superfund
- RCRA
- Federal Facilities
- Tanks
- Brownfields

Green Cleanup Goals

- Minimize ancillary impacts such as CO2 emissions to the air
- Minimize total energy use and promote use of renewable energy
- Preserve natural resources
- Maximize the recycling of material
- Maximize reuse options for land



Why a Green Cleanup Standard?

- Growing interest in social responsibility
- Companies have internal goals to become greener
- Builds upon state and local government incentives
- Possible tie-in with other standards such as LEED ND*
- Leverages private sector resources
- May provide measurable results
- Fits within existing regulatory frameworks
- Initiates a constructive dialogue

<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>



Potential Incentives at a Site Level

- Carbon offsets and credits
- Credit for LEED or other green building programs
- Loans and grants
- Reduced processing time and fees for remedies
- Publicity and recognition
- Contract incentives
- Consultant education and accreditation



Key Challenges in Developing a GCS

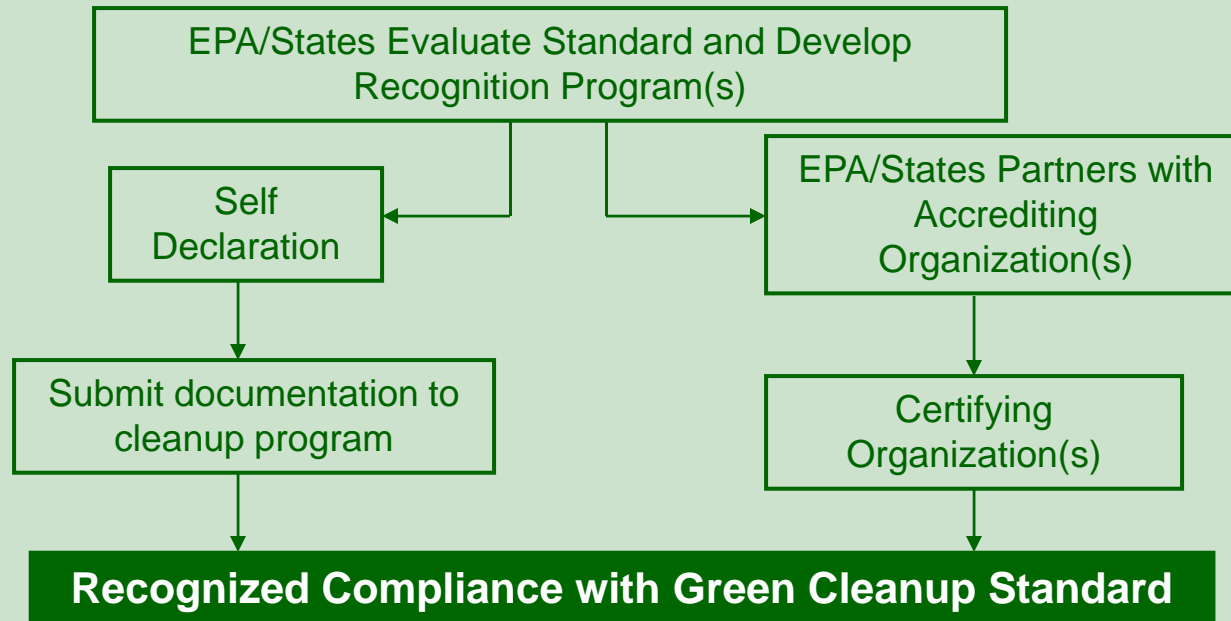
- Keeping it simple (*given site specific nature of cleanups*)
- Defining scope
- Balancing various stakeholders' needs
- Specifying incentives & certification prior to completion of standard
- Establishing baseline values to measure improvements against
- Minimizing energy use while supporting active cleanup

Conceptual Development for Green Cleanups Standard

STANDARD DEVELOPMENT



CERTIFICATION



Standards Development

National Technology Transfer and Advancement Act (NTTAA)

- Enacted February 1996
- Requires federal agencies to develop standards through a consensus process





Key Attributes

Voluntary - Not mandating new cleanup evaluation

Transparent - Consensus based development

Universal - Easier for stakeholders to implement

Flexible - Program or State-specific recognition options

Minimal Resources - Independent 3rd party or self-certification (audits)

Market Driven - Promote technology innovation

Verifiable - Documentation to support decisions



Green Cleanups Framework: Draft Available for Public Review

- Draft framework outlining desired outcomes for a standard is available for review and input through April 30
(http://www.clu-in.org/greenremediation/subtab_b5.cfm)
- Final framework will be posted in June 2009
- EPA's will use proposed framework as a starting point for discussion at the ASTM International kick-off the consensus-based process in October

New Guide for Green Cleanup at Contaminated Sites

<http://www.astm.org/DATABASE.CART/WORKITEMS/WK23495.htm>



Draft Framework for Green Cleanups (I)

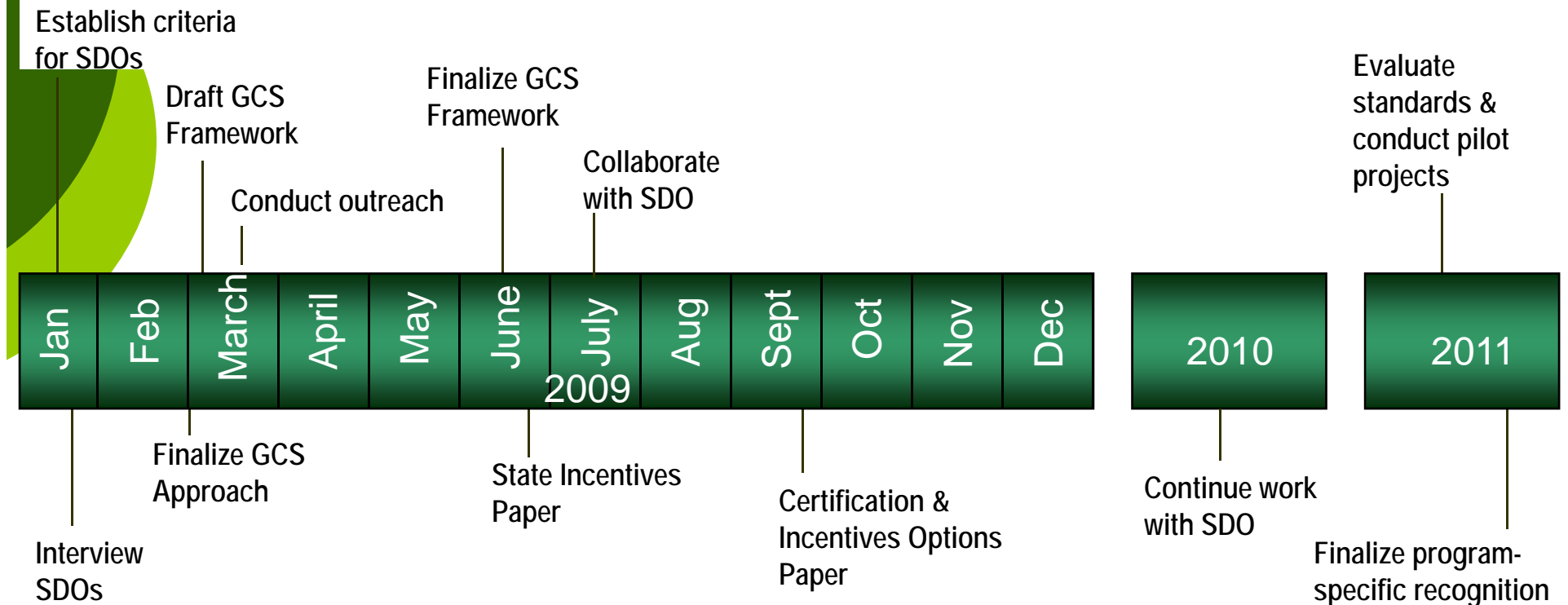
- The cleanup protects human health and the environment, meets requirements and is approved by applicable regulatory authority.
- Establish and employ processes for documenting environmental outcomes (not worker safety*) and provide measurable results.
- Can be done during remedy design and selection and/or by optimizing cleanup implementation.
 - consider assessing remedy options using life cycle analysis
 - reduce the environmental footprint of the cleanup.
- Optimize and encourage innovations related but not limited to the core elements.



Draft Framework for Green Cleanups (II)

- Minimize Total Energy Use and Maximize Use of Renewable Energy
- Minimize Air Pollutants and Greenhouse Gas Emissions
- Minimize Water Use and Impacts to Water Resources
- Optimize Future Land Use and Enhance Ecosystems
- Reduce, Reuse and Recycle Material and Waste
- Optimize Sustainable Management Practices During Stewardship

Green Cleanup Standard Initiative: 2009-2011 Timeframe



GCS: green cleanup standard
SDO: standard development organization



Key Questions for Your Input

- a. Are voluntary standards a viable approach?
- b. Are we targeting the right core elements?
- c. What should the boundaries be?
- d. Should the boundaries/standards apply to projects, practices, people?
- e. Will the market bear the costs?
- f. What incentives are needed?
- g. What certification approach might yield the best results?
- h. Is there an SDO we should reach out to?
- i. How should we measure results?

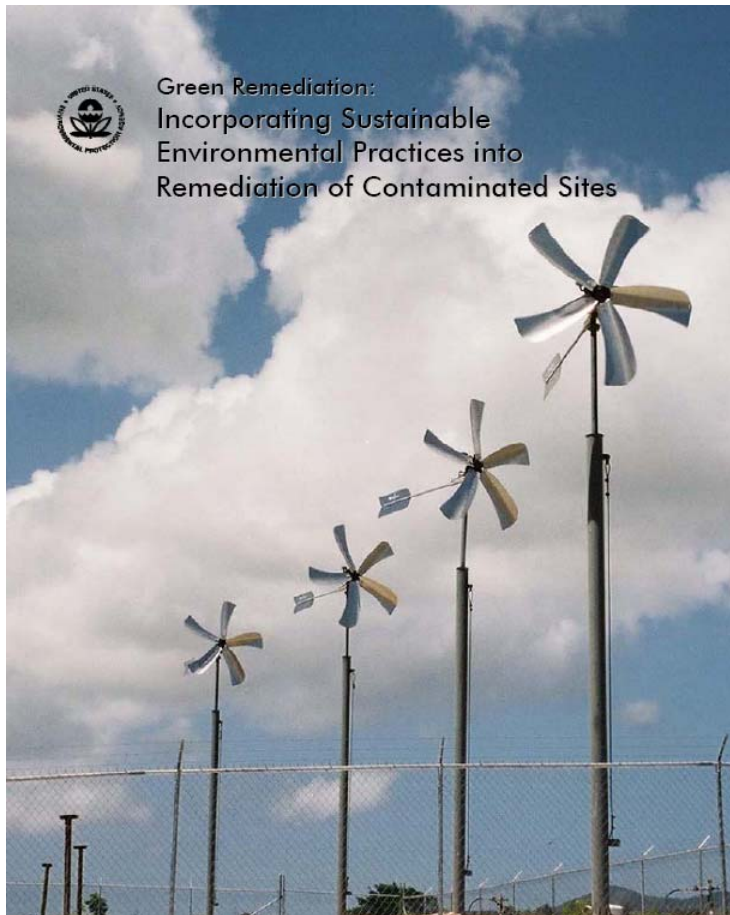


Take-Home Messages

- Act now, need not wait for policy changes or sophisticated tools to be developed
- Seek greening options at every stage of a site cleanup and redevelopment
- Be creative while also learning from others and share your experiences
- Stay involved – ASTM, ITRC, NEWMOA, ASTSWMO, clu.in.org/greenremediation



www.clu-in.org/greenremediation



Site Name	State	Core Elements						
		Energy Efficiency	Renewable Energy	Air Emission	Water	Land & Ecosystem	Materials & Waste	Stewardship
Altus Air Force Base	OK		☀️	💧	💧		♻️	
Apache Powder	AZ		☀️	💧	💧			🌐
Barksdale AF Base	LA				💧	🌲	♻️	🌐
BP Casper	WY					🌲	♻️	🌐
BP Paulsboro	NJ		☀️	💧				🌐
California Gulch	CO			💧			♻️	🌐
Crozet Orchard	VA		☀️	💧	💧			🌐
De Sale Restoration Area	PA		☀️	💧	💧	🌲	♻️	🌐
Former Carswell Air Force Base	TX						♻️	🌐
Former Ferdula Landfill	NY		☀️	💧				
Former Nebraska Ordnance Plant	NE		☀️	💧				
Former St. Croix Alumina Plant	VI		☀️	💧			♻️	
Fort Carson	CO		☀️	💧	💧		♻️	🌐



ASTSWMO: Greener Cleanups Task Force

- Facilitate cleanup decisions that increase the net environmental benefits of remediation, and in doing so, contribute to site sustainability.
- A cross-program task force representing CERCLA, RCRA, Tanks, Brownfields and Federal Facilities.
- Identify best practices and incentives for greener cleanups;
- Support State programs in their efforts to integrate these approaches into State remedy selection processes;
- Strengthen partnerships between the States and U.S. EPA to improve greener cleanup capacities; and
- Operate as a technical resource for other ASTSWMO task forces and sub-committees.

http://www.astswmo.org/resources_sustainability_greenercleanups.html



ITRC: Green & Sustainable Remediations Team:

Objectives (with some editorial liberty)

- How can we adopt GSR techniques to help better protect human health and the environment?
- Spotting greenwashing
- Development of a consensus technical and regulatory guidance document, at the national level, on how to incorporate green and sustainable approaches to environmental remediation.
- Development of surveys, data gathering and internet-based training modules for GSR approaches and their direct application at contaminated sites.
- How do we measure the GSR approaches success? What metrics do we use and how can we measure them?
- How do we promote the use and development of GSR technologies?

http://www.itrcweb.org/teampublic_GSR.asp

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