Welcome to the CLU-IN Internet Seminar

NARPM Presents...Redux of NARPM 2011 Greener Cleanups Sessions: An RPM's Primer

Sponsored by: U.S. EPA Office of Superfund Remediation and Technology Innovation

Delivered: April 17, 2012, 1:00 PM - 3:00 PM, EDT (17:00-19:00 GMT)

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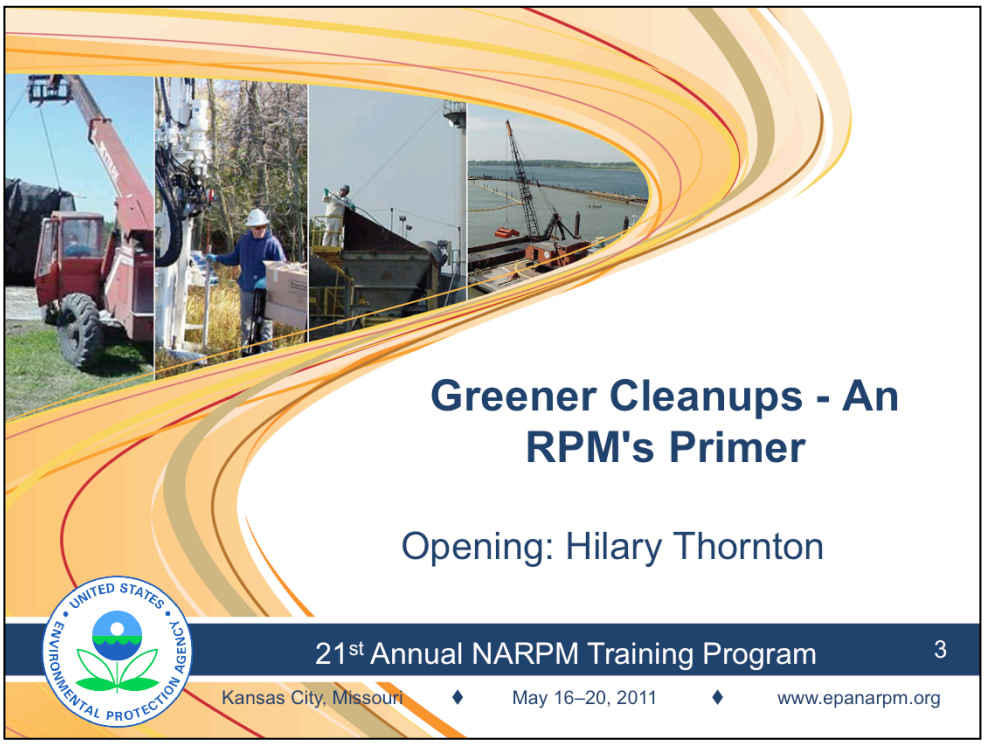
Visit the Clean Up Information Network online at www.cluin.org

Although I'm sure that some of you have these rules memorized from previous CLU-IN events, let's run through them quickly for our new participants.

Please mute your phone lines during the seminar to minimize disruption and background noise. If you do not have a mute button, press *6 to mute #6 to unmute your lines at anytime. Also, please do NOT put this call on hold as this may bring delightful, but unwanted background music over the lines and interupt the seminar.

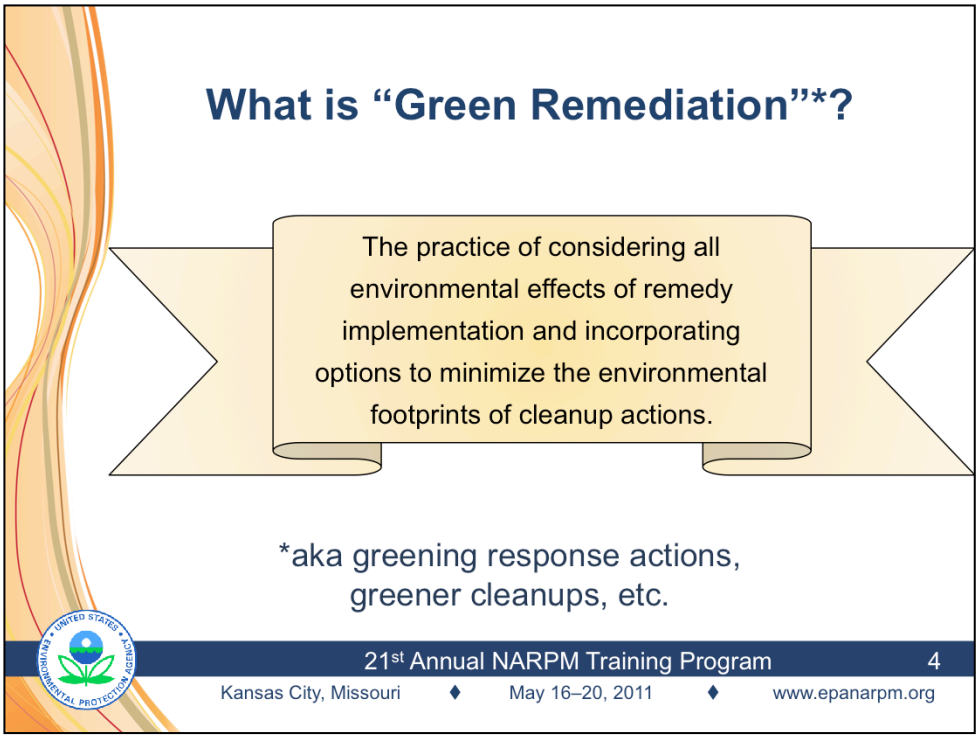
You should note that throughout the seminar, we will ask for your feedback. You do not need to wait for Q&A breaks to ask questions or provide comments. To submit comments/questions and report technical problems, please use the ? Icon at the top of your screen. You can move forward/backward in the slides by using the single arrow buttons (left moves back 1 slide, right moves advances 1 slide). The double arrowed buttons will take you to 1st and last slides respectively. You may also advance to any slide using the numbered links that appear on the left side of your screen. The button with a house icon will take you back to main seminar page which displays our agenda, speaker information, links to the slides and additional resources. Lastly, the button with a computer disc can be used to download and save today's presentation materials.

With that, please move to slide 3.



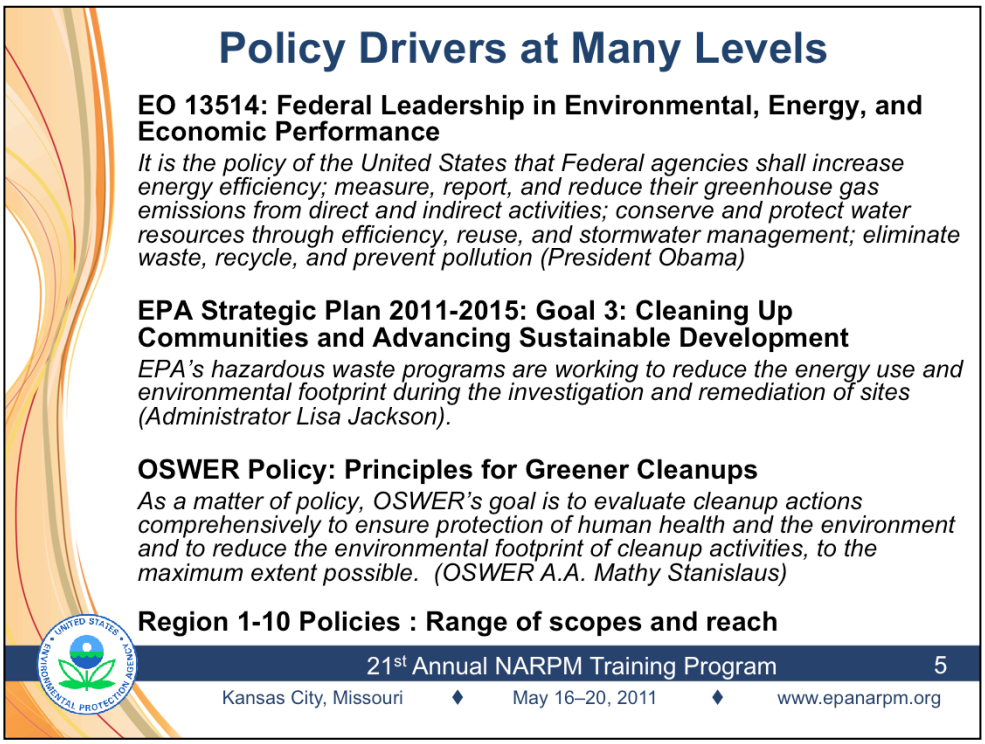
Greener Cleanups - An RPM's Primer

Opening: Hilary Thornton



Notes:

What is "Green Remediation"?: Green Remediation is the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprints of cleanup actions. While preventing and cleaning up contamination is inherently "green", the terms green cleanup, greener cleanup, and green remediation are used by EPA OSWER cleanup programs interchangeably. It is the thought of the EPA OSWER Greener Cleanup Principles that all cleanup approaches, and all elements of the cleanup process, can be optimized to enhance their overall environmental outcome; therefore, green remediation involves more than merely adopting a specific technology or technique.



Sub-objective 5.2.1: Prevent Pollution and Promote Environmental Stewardship.

By 2011, reduce pollution, conserve natural resources, and improve other environmental stewardship practices while reducing costs through implementation of EPA's pollution prevention programs.

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Goal 1: Clean Air and Global Climate Change

Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced. Reduce greenhouse gas intensity by enhancing partnerships with businesses and other sectors.

Objective 1.3: Protect the Ozone Layer

Strategic Targets:

- By 2015, reduce U.S. consumption of Class II ozone-depleting substances to less than 1,520 tons per year of ozone depleting potential from the 2003 baseline of 9,900 tons per year.

Objective 1.5: Reduce Greenhouse Gas Emissions

Sub-objective 1.5.1: Buildings Sector.

By 2012, 46 MMT of carbon equivalent will be reduced in the buildings sector (compared to the 2002 level).

Sub-objective 1.5.2: Industry Sector. By 2012, 99 MMT of carbon equivalent will be reduced in the industry sector (compared to the 2002 level).

Sub-objective 1.5.3: Transportation Sector

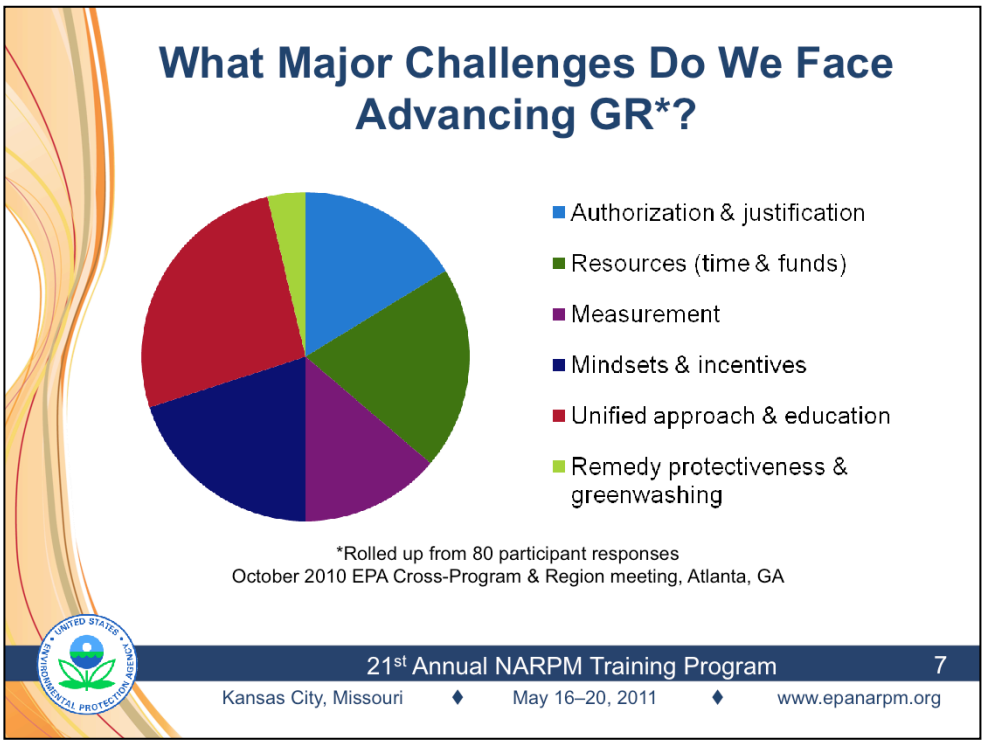
By 2012, 15 MMT of carbon equivalent will be reduced in the transportation sector (compared to the 2002 level).

OSWER
Principles for Greener Cleanups

Consistent with existing laws and regulations, it is OSWER policy that all cleanups:

- Protect human health and the environment
- Comply with all applicable laws and regulations
- Consult with communities regarding response action impacts consistent with existing requirements
- Consider recommended five core elements

An incremental improvement in the implementation of our mission



Notes:

What are the major challenges we face in advancing GR?: When this question was recently posed to EPA Regions and Programs, the six common responses were:

-Authorization and justification

-Resources (time and funds)

-Measurement

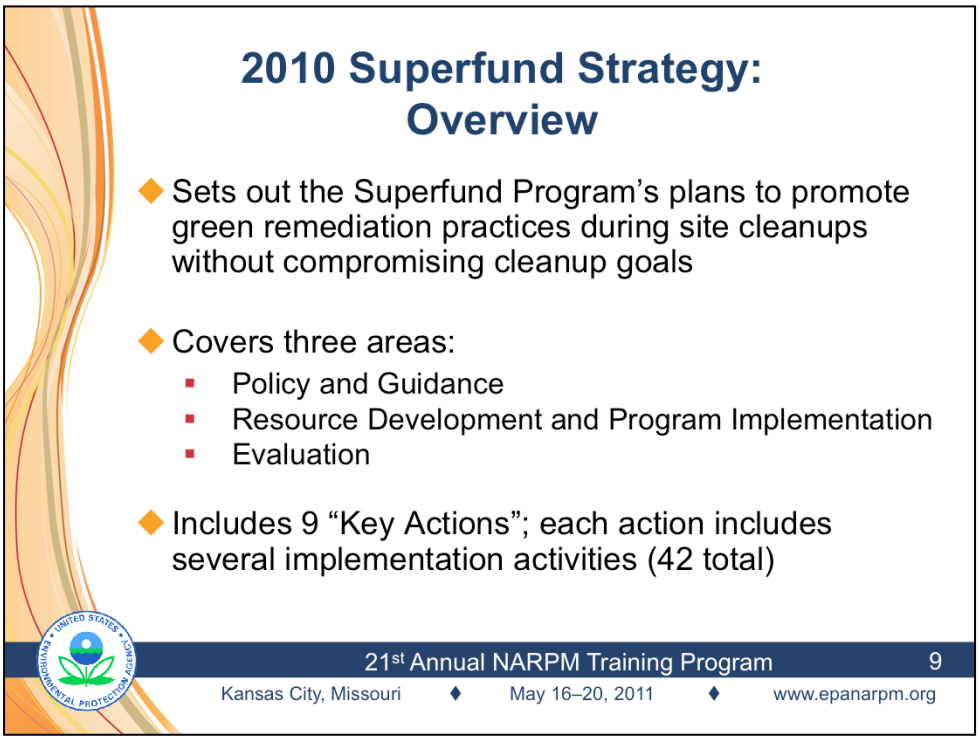
-Mindsets and incentives

-Unified approach and education

-Remedy protectiveness and greenwashing

Major Initiatives and Activities

- OSWER Principles for Greener Cleanups
- Superfund Green Remediation Strategy
- Voluntary green cleanup standard (ASTM)
- RE-Powering America's Land: renewable energy on contaminated lands
- Fact sheets, project profiles, conferences
- Regional initiatives
  - Engineering Forum,
  - Training/workshops
  - Pilot studies



Workgroup established per OD request in Summer 2008

Overall direction - develop "strategy" to advance and address green remediation in the Superfund Program and develop appropriate and relevant tools to implement the strategy

Workgroup comprised of HQ and Regional staff presented draft strategy January 30, 2009. Final draft Strategy June 30, 2010

Key Action Items

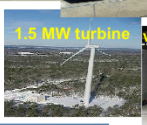
1. Clarify the role of green remediation in remedy selection and implementation
2. Develop a compendium of protocols and tools to help project and Program managers integrate green remediation practices
3. Identify options that enable use of green remediation practices
4. Address air pollutants and diesel emissions
5. Develop pilot projects to evaluate and demonstrate green remediation applications
6. ***Establish opportunities in contracts and assistance agreements to identify green remediation practices in selected remedies***
7. Communicate and share success stories and lessons learned among "implementers" across the Program and the public
8. Establish a roadmap for evaluating the environmental footprint of a cleanup at a project level
9. Evaluate the environmental footprints of Superfund cleanups at a programmatic level

Major Questions & Concerns

- How do I measure an environmental footprint?
- Remedy selection vs footprint mitigation
- What can we fund?
- What can we require?
- Is phytoremediation greener than dig & haul?
- We don't have the time or money
- It's not in my RAC SOW/Work Plan…
- Has anyone done it in Superfund?

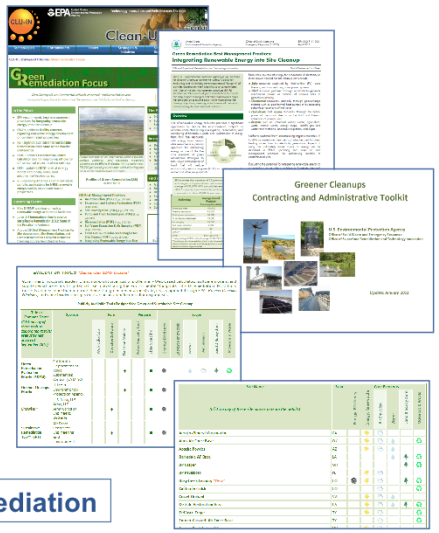
Sample of Superfund Applications

- Apache Nitrogen Products, Inc.
- Aerojet-General Corporation
- Fort Carson
- Frontier Fertilizer
- Massachusetts Military Reservation
- Operating Industries, Inc., Landfill
- NASA Jet Propulsion Lab
- Pemaco
- Re-Solve, Inc.
- Upper Arkansas River

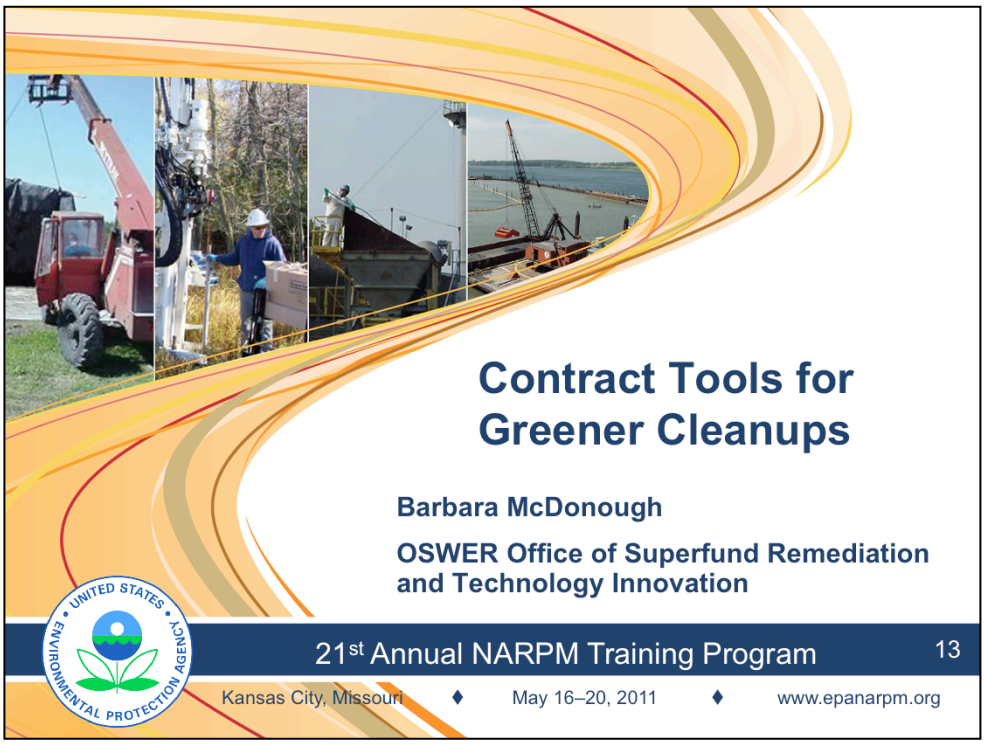


Resources & Tools

- Website
- BMP toolkit
- Contracting toolkit
- Footprint evaluation tools & examples
- Site profiles (28)
- HQ & regional policies or strategies
- News, training, & conferences



www.clu-in.org/greenremediation



Contract Tools for Greener Cleanups

Barbara McDonough

OSWER Office of Superfund Remediation and Technology Innovation

Highlights of the Contracting Approach

Pre-award activities

- Include green specifications in a solicitation, contract, or task order
- Consider performance-based contracts providing incentives and flexibility
- Use a work breakdown structure to clarify specific opportunities
- Establish reporting requirements for green strategies

During contract performance

- Request analysis of a cleanup's environmental footprint and options to reduce it
- Suggest that remedy screening include sustainability factors
- Ensure work plans document "GR" best practices and measures
- Ensure remedial objectives and long-term protectiveness prevail

Evaluating contractor performance

- Develop a green category for performance systems
- Apply green rewards for successful performance-based outcomes
- Consider use of green strategies when exercising contract options

Greener Cleanups
Contracting and Administrative Toolkit

U.S. Environmental Protection Agency
Office of Solid Waste and Emergency Response
Office of Superfund Remediation and Technology Innovation

Update: April 2011

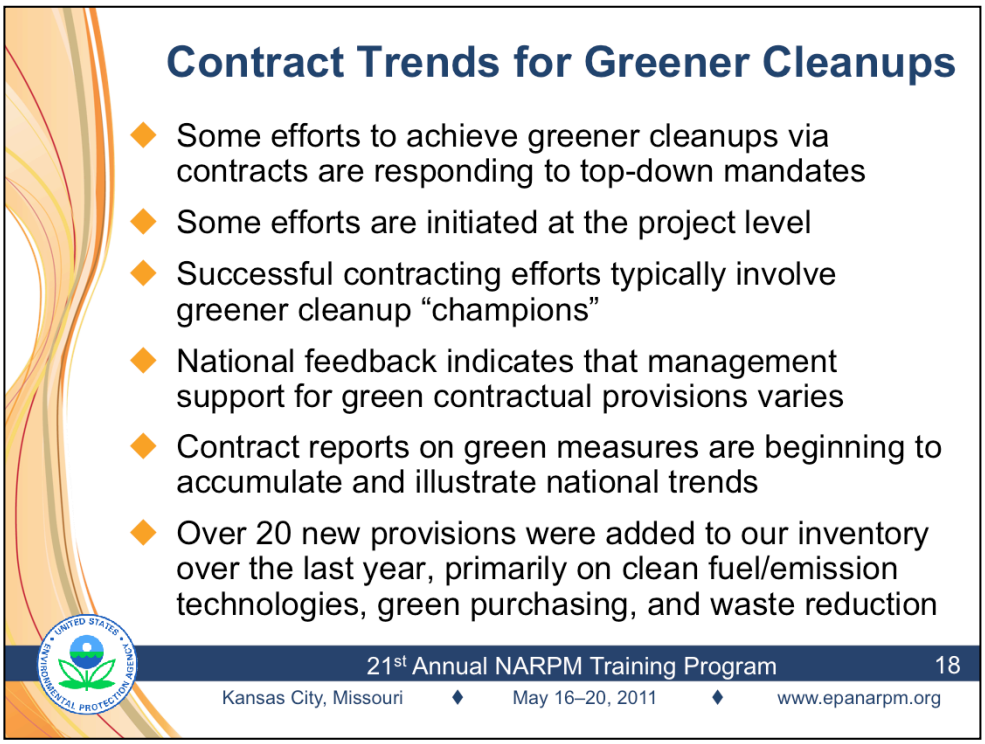
http://www.cluin.org/greenremediation

Overview of the Contracting Toolkit

- Launched at 2008 NARPM meeting
- Originally developed for use by Superfund RPMs, OSCs, and procurement offices
- Identifies opportunities throughout ERRS, START, RAC, ROC, ESAT, and RAC contracting stages
- Updated for annual OSC Readiness, NARPM, and POCO meetings in 2009 through 2011
- Currently cites specific language (42 provisions) already used in contracts executed by EPA regions, other federal agencies (Air Force, DOE, NASA, and USACE), and some states

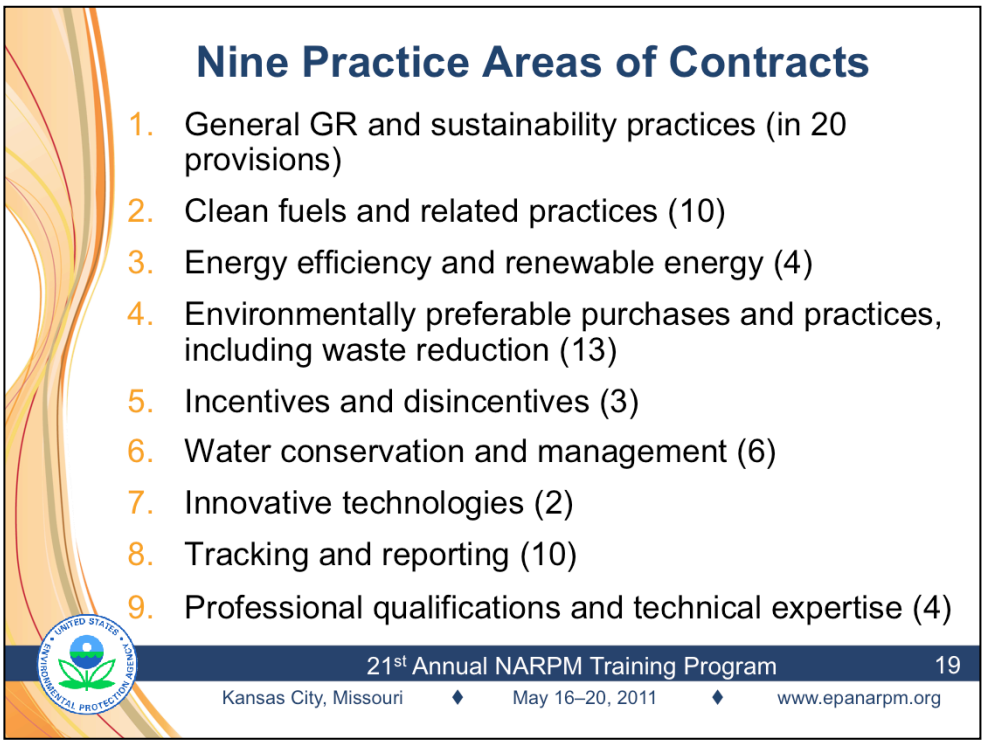
Overview of the Contracting Toolkit
(continued)

- Now includes language for other cleanup requirements (e.g. RCRA corrective measure studies) and administrative programs (e.g. brownfield grants)
- Highlights nine "practice areas" for greener cleanups
- Links to information on incentives, financing, and other decision-making tools
- Suggests "green building blocks" for innovative cleanup strategies
- Provides a potential model for private industry subcontracting and internal "sustainability" programs



Top Down Example: NY State - State contract guidance calls for a section in each cleanup contract on sustainability and green remediation which calls for minimizing environmental impacts (GHGs and energy consumption) and maximizing reuse, recycling, conservation, etc. The guidance lists many potential strategies to consider. Therefore, it is mandating that projects consider GR.

Project Level Example: NASA - The project was initiated by a project manager at the Jet Propulsion Lab who was interested in developing language that would apply "value" to green remediation along lines similar to "value engineering." The contractor was encouraged to develop and submit a Sustainable Engineering effort for a cleanup, including proposed metrics. The contracting officer reviewed, negotiated, and approved the effort. NASA made available 1% of the contract award amount for incentive payments to the contractor.



It is difficult to sort some items into a category neatly.

•There is a lot of overlap, and

•Some clauses are open-ended, allowing for almost any strategy

•#1: General GR

- •Some contract clauses contain general language that can be interpreted to mean almost any GR practice
- •Some detail many potential approaches/GR practices, essentially also accomplishing the same as first point. i.e., allowing almost any green strategy to be used.

Sample Contracting Language

- General green remediation and sustainability practices
  (START, EPA Region 3)

  As directed by the OSC/WAM, the contractor shall explore, evaluate and implement (where practicable) green cleanup strategies and applications in the performance of the requirements of this contract to maximize sustainability, reduce energy and water usage, promote carbon neutrality, promote industrial materials reuse and recycling …

- Clean diesel practices

  (ERRS, EPA Region 8)

  Contractor shall develop and implement a plan for using clean diesel practices for all on-road and off-road vehicles and equipment. At a minimum, the plan must …

- Incentives and disincentives

  (cleanup contracts, NASA)

  Sustainable Engineering: NASA will make available 1% of the contract award amount for incentive payments to the Contractor to encourage sustainable engineering efforts that support the goals of Executive Order (EO) 13423 …

Sample Contracting Language
(continued)

- Professional technical and management capabilities
  (technical services contract, Idaho DEQ)

  The relevant management experience and the technical experience capabilities of the proposer … shall be defined with respect to the following activities: planning and executing "green" site assessments and cleanups that incorporate resources reductions in … energy requirements, air emissions, water requirements …

- Renewable energy
  (RAC II, Region 9)

  The contractor shall evaluate all reasonably feasible renewable energy sources when conducting work related to selecting a cleanup remedy, constructing a cleanup remedy, and when optimizing an existing cleanup remedy.

- Environmentally preferable practices
  (Massachusetts DEP)

  Prior to selection of an equipment item(s), the contractor shall evaluate … using equipment that is energy efficient (i.e., electricity, gasoline, diesel, etc.) and/or has been produced using sustainable products; and equipment …

Sample Contracting Language
(continued)

- Environmentally preferable practices
  (START, EPA Region 7)

  The contractor shall, to the greatest extent practical, utilize environmentally preferable practices in their course of business. “Environmentally Preferable” is defined as products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose….

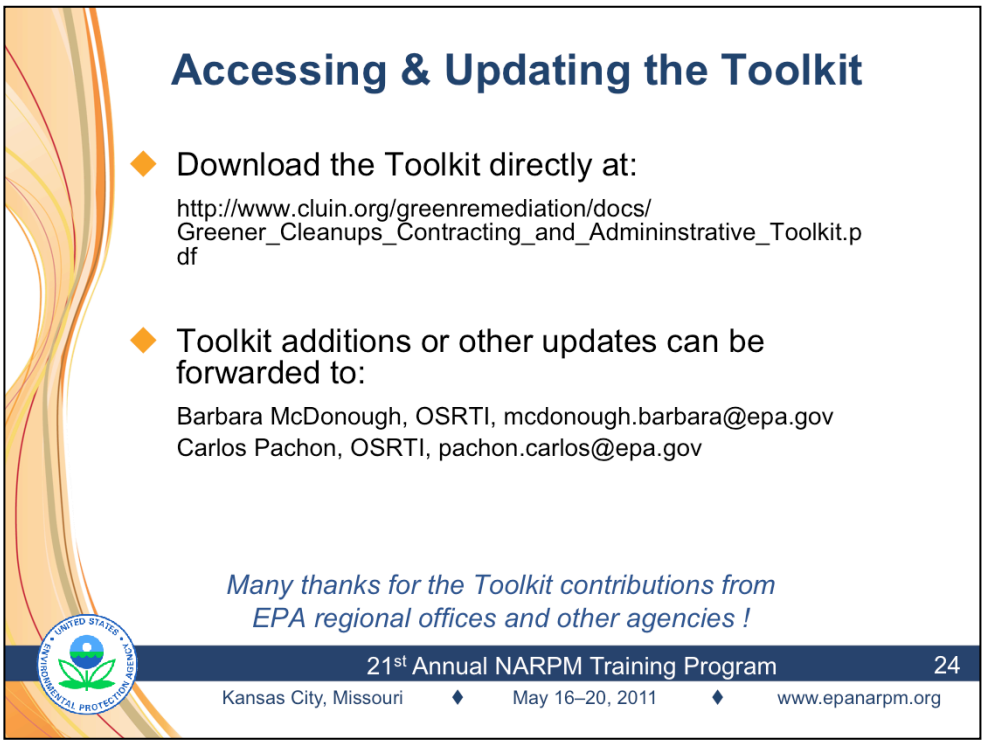
- Tracking and reporting
  (ERRS & START, EPA Region 6)

  The contractor shall provide a “green report” on reuse, recycling, waste streams reduction, and resource conservation as part of the monthly progress report.

Site	Period	Action	Volume	Estimated Cost Savings	Estimated Environmental Benefit	Comment or Cost Estimate
ABC Site	10/8	Salvaged metals	5,000 lbs	$300 income from sale	Reduced landfill burden	No additional cost

Ongoing OSRTI Efforts

- Update the (publicly available) Toolkit as new specifications evolve
- Use contracting mechanisms as a major tool for advancing greener cleanups and measuring progress
- Identify more opportunities to integrate greener cleanup specifications in programs outside of Superfund
- Work with ASTSWMO and ITRC in building greener cleanup specs within state programs
- Sponsor greener cleanup webinars on CLU-IN to provide training and foster private industry contributions



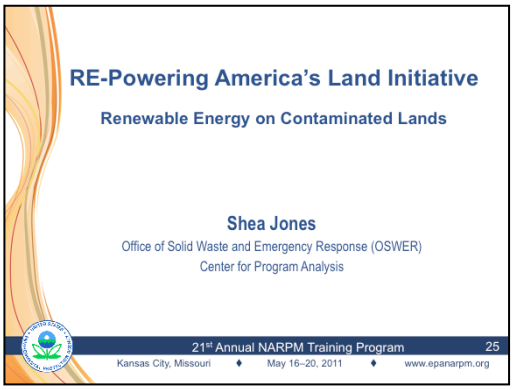
QuestionsHow can we foster consistent contracting support?

Would more IAs with organizations (e.g. the current Region 2 - USACE IA) advance greener cleanups?

How do we measure performance?

How do we additionally clarify Superfund authority to pay and/or recover costs?

Should there be a match in enforcement documents?


RE-Powering America's Land Initiative
Renewable Energy on Contaminated Lands
Shea Jones
Office of Solid Waste and Emergency Response (OSWER)
Center for Program Analysis
21st Annual NARPM Training Program
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Kansas City, Missouri ♦ May 16–20, 2011 ♦ www.epanarpm.org

Presentation Topics

- What is RE-Powering America's Land Initiative?
- Why Focus on Renewable Energy Production on Contaminated Sites?
- RE-Powering Tools
- Feasibility Studies
- What's Next?

Renewable Energy on Contaminated Land

What is RE-Powering America's Land Initiative?

- Launched in 2008 to encourage siting renewable energy (RE) on contaminated lands, mining sites, and landfills
- Recognized potential redevelopment opportunities of these EPA tracked sites:
  - Superfund
  - Brownfields
  - Abandoned Mine Lands
  - RCRA – Corrective action
  - Landfills
- Mapped over 15 million acres to show RE potential

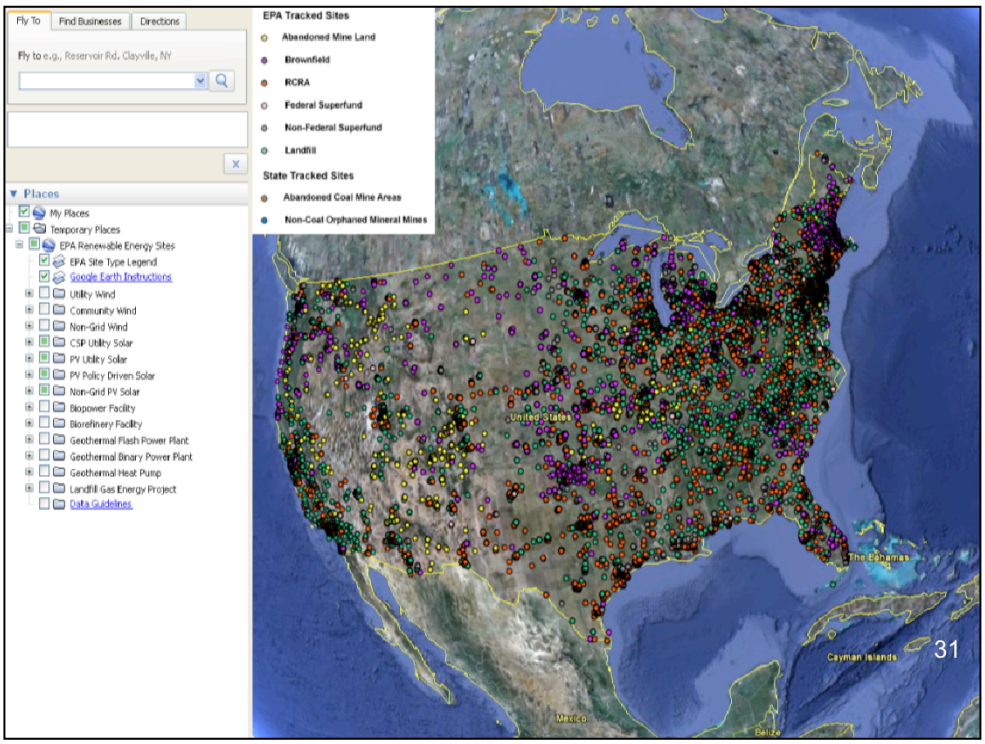
Why Focus on Renewable Energy Production on Contaminated Sites?

- **Many of these sites offer:**
  - Existing transmission lines, roads and railway
  - Potentially lower transaction costs
  - Improved public support and faster permitting/zoning
- **Siting renewable energy on these sites may:**
  - Provide clean energy for use on-site, locally, and/or to utility grid
  - Increase economic value for the property
  - Further environmental sustainability by maximizing land use
  - Reduce the stress on greenfields
  - Create local jobs

RE-Powering Tools

- Google Earth
  - Joint EPA-NREL venture produced interactive maps

- Technical assistance
- Success stories
- Case studies
- Liability fact sheet
- Fact sheet on siting RE projects while addressing environmental issues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Temporary Places
EPA Renewable Energy Sites
EPA Site Type Legend
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CSP Utility Solar
PV Utility Solar
PV Policy Driven Solar
Non-Grid PV Solar
Biopower Facility
Biorefinery Facility
Geothermal Flash Power Plant
Geothermal Binary Power Plant
Geothermal Heat Pump
Landfill Gas Energy Project
Data Guidelines
EPA Tracked Sites
Abandoned Mine Land
Brownfield
RCRA
Federal Superfund
Non-Federal Superfund
Landfill
State Tracked Sites
Abandoned Coal Mine Areas
Non-Coal Orphaned Mineral Mines
United States
The Bahamas
Cayman Islands
Mexico
Belize
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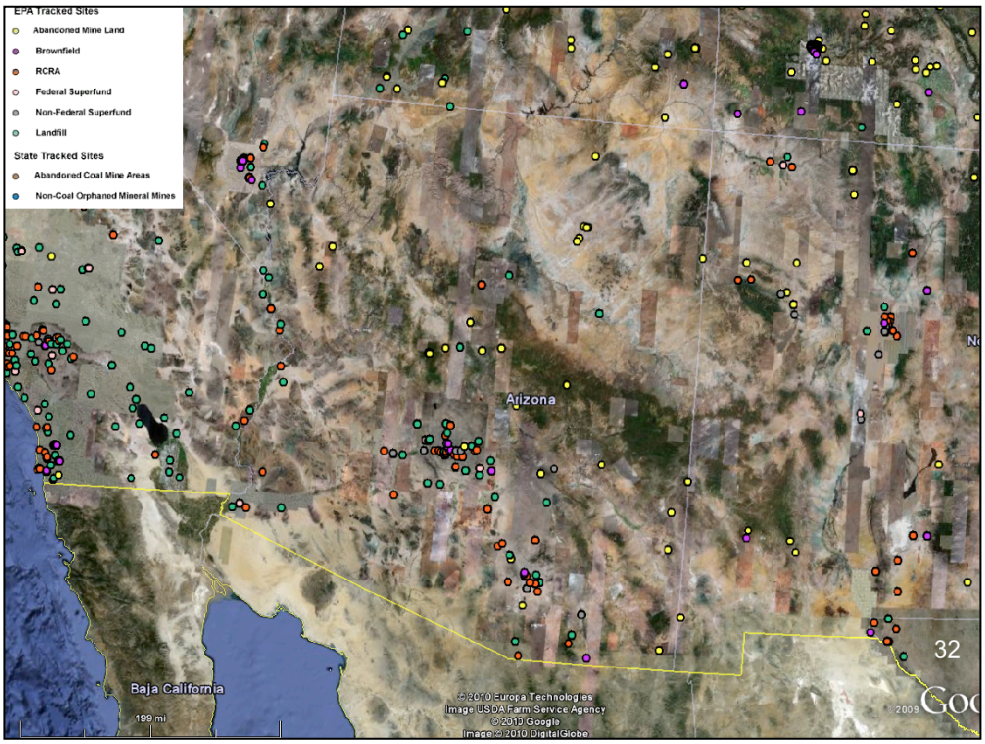
EPA Tracked Sites
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State Tracked Sites
Abandoned Coal Mine Areas
Non-Coal Orphaned Mineral Mines
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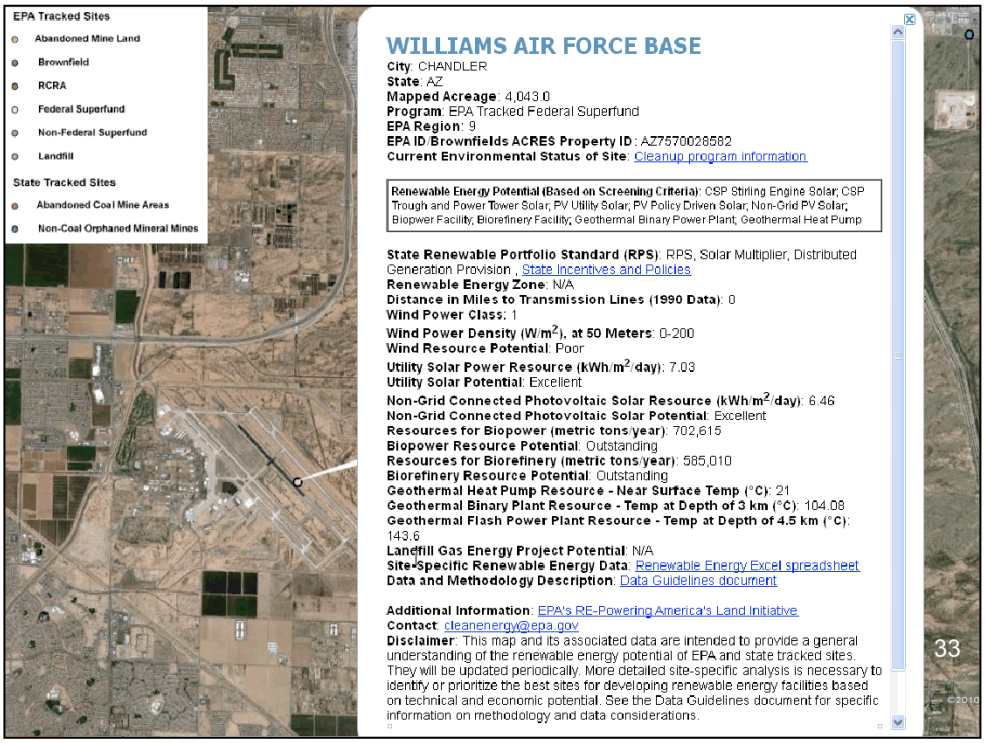
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Landfill
State Tracked Sites
Abandoned Coal Mine Areas
Non-Coal Orphaned Mineral Mines
WILLIAMS AIR FORCE BASE
City: CHANDLER
State: AZ
Mapped Acreage: 4,043.0
Program: EPA Tracked Federal Superfund
EPA Region: 9
EPA ID/Brownfields ACRES Property ID: AZ7570028582
Current Environmental Status of Site: Cleanup program information
Renewable Energy Potential (Based on Screening Criteria): CSP Stirling Engine Solar; CSP Trough and Power Tower Solar; PV Utility Solar; PV Policy Driven Solar; Non-Grid PV Solar; Biopwer Facility; Biorefinery Facility; Geothermal Binary Power Plant; Geothermal Heat Pump
State Renewable Portfolio Standard (RPS): RPS, Solar Multiplier, Distributed Generation Provision , State Incentives and Policies
Renewable Energy Zone: N/A
Distance in Miles to Transmission Lines (1990 Data): 0
Wind Power Class: 1
Wind Power Density (W/m2), at 50 Meters: 0-200
Wind Resource Potential: Poor
Utility Solar Power Resource (kWh/m2/day): 7.03
Utility Solar Potential: Excellent
Non-Grid Connected Photovoltaic Solar Resource (kWh/m2/day): 6.46
Non-Grid Connected Photovoltaic Solar Potential: Excellent
Resources for Biopower (metric tons/year): 702,615
Biopower Resource Potential: Outstanding
Resources for Biorefinery (metric tons/year): 585,010
Biorefinery Resource Potential: Outstanding
Geothermal Heat Pump Resource - Near Surface Temp (°C): 21
Geothermal Binary Plant Resource - Temp at Depth of 3 km (°C): 104.08
Geothermal Flash Power Plant Resource - Temp at Depth of 4.5 km (°C): 143.6
Landfill Gas Energy Project Potential: N/A
Site-Specific Renewable Energy Data: Renewable Energy Excel spreadsheet
Data and Methodology Description: Data Guidelines document
Additional Information: EPA's RE-Powering America's Land Initiative
Contact: cleanenergy@epa.gov
Disclaimer: This map and its associated data are intended to provide a general understanding of the renewable energy potential of EPA and state tracked sites. They will be updated periodically. More detailed site-specific analysis is necessary to identify or prioritize the best sites for developing renewable energy facilities based on technical and economic potential. See the Data Guidelines document for specific information on methodology and data considerations.
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RE-Powering Tools (continued)

- Screening decision trees for wind and solar
- Regional Training Sessions
  - 4/4/12: Decision tree overview in Region 2 (New York)
  - Additional sessions will be scheduled in person or via webinars
- Quarterly Webinar Series
  - First webinar held on 2/7/12 – Decision Tree Training (over 250 attendees)
  - Next webinar will focus on RE-Powering tools
    - CLU-IN: 5/22/12 at 2 PM

RE Feasibility Studies

- EPA partnered with NREL to evaluate the feasibility of siting renewable energy at contaminated sites
- 2009: 13 projects initiated
  - EPA Regional Offices suggested projects
  - Feasibility Study reports have been posted on our website
- March 2011: Request for applications
  - States, tribes, regional governments, and communities were eligible to apply
- November 4, 2011: Announced 26 new projects
  - 11 Brownfields, 5 Resource Conservation and Recovery Act (RCRA), and 10 Superfund sites

RE Feasibility Studies

- The analysis includes:
  - Determining the best renewable energy technology for the site,
  - The optimal location for placement of the renewable energy technology,
  - Potential energy generating capacity,
  - The return on the investment, and
  - The economic feasibility of the renewable energy projects.
- Helpful tool to use when seeking developers for a particular site

Example: Feasibility Study for the Stringfellow Superfund Site

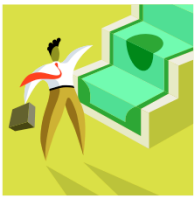
- Location: Riverside, CA
- Goal: Present the results of an assessment of the technical and economic feasibility of deploying a photovoltaics (PV) system
- Evaluation: The cost, performance, and site impacts of different PV options were estimated.
- Recommendation: A government-owned, ground-mounted PV system would be a technically and economically feasible option.
  - Also recommends financing options that could assist with the implementation of this system.

Example: Feasibility Study for Landfills in Puerto Rico

- Goal: Present the results of an assessment of the technical and economic feasibility of deploying a PV system on brownfield sites (landfills) in the Commonwealth of Puerto Rico.
- Evaluation: The cost, performance, and site impacts of different PV options were estimated.
- Recommendation: Thin-film fixed-tilt technology is the most cost-effective system in terms of return on investment
  - Also recommends financing options that could assist with the implementation of this system.

What's Next?

- Expand the toolbox of resources for use by EPA staff, states, and stakeholders
  - Fact Sheet - Advantages for siting RE projects on contaminated land
  - Best Practices for Siting PV Solar on Landfills
  - Handbook on Siting RE Projects While Addressing Environmental Issues
- Clarify Liability Protections
- Add other sites to Google Earth Tool
- Partner with other Federal Agencies to promote RE-Powering



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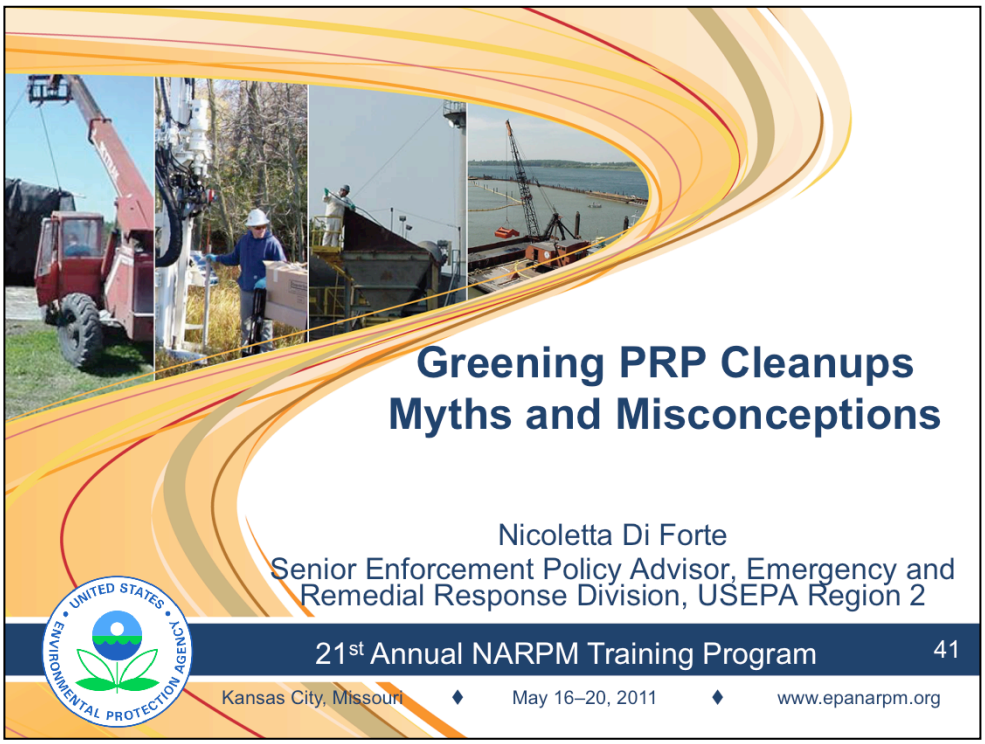
www.epa.gov/renewableenergyland



Greening PRP Cleanups
Myths and Misconceptions

Nicoletta Di Forte
Senior Enforcement Policy Advisor, Emergency and Remedial Response Division, USEPA Region 2

Region 2 *Clean and Green* Policy

The goal of the Region 2 Clean & Green Policy is to enhance the environmental benefits of federal cleanup programs by promoting technologies and practices that are sustainable.

The objectives are to:

- Protect human health and the environment by achieving remedial action goals
- Support human and ecological use and reuse of remediated land
- Minimize impacts to water quality and water resources
- Reduce air emissions and greenhouse gas production
- Minimize material use and waste production
- Conserve natural resources and energy

Touchstone Practices

These practices are the "point of departure" for Superfund cleanups, and will be standard unless a site-specific evaluation demonstrates impracticability or favors an alternative green approach.

- Use of 100% of electricity from renewable source.
- Clean diesel fuels and technologies
- Methane capture
- Material Reuse, Reduction or Recycling
- Harvesting Geothermal Energy during Pump and Treat Remedies

Myth # 1: We Do Not Have the Authority for Green Remediation

Authority exists in CERCLA and the NCP to address green remediation. For example,

- Specific authority for Sustainable Resource Management and Energy Recovery
- Ability to implement mitigation measures using Short-Term Effectiveness criteria – "Potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation" (NCP).

SSM and Energy Recovery

CERCLA makes a clear case for "Resource Recovery Technologies"

- 121(b) The President shall select a remedial action that is protective of human health and the environment, that is cost effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

  - RCRA 1003 "Resource Recovery" means the recovery of materials or energy from a solid waste.

Myth # 2: We Cannot Require PRPs to Perform Green Cleanups

- Region 2 has such a requirement (i.e. our *Clean and Green Policy*).
- We have successfully incorporated the policy into all remedial enforcement instruments.
- PRPs are complying with green remediation under UAOs.
- The public is entitled to equal protection regardless of the lead implementer (government or private).

Myth #3: PRP Green Remediation Means More MNA

- *Threshold criteria.* Overall protection of human health and the environment and compliance with ARARs (unless a specific ARAR is waived) are threshold requirements that each alternative must meet in order to be eligible for selection. (NCP)

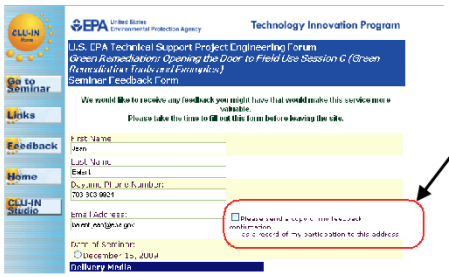
- Remedial actions in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances, pollutants, and contaminants is a principal element, are to be preferred over remedial actions not involving such treatment. (CERCLA)

Highlights of PRP-Lead Green Remediation

- GM Massena
  - Use of 100% of electricity from renewable source.
  - Clean diesel fuels and technologies
  - Material Reuse, Reduction or Recycling
- Brick Township Landfill Commercial Solar Array
- Rockaway Borough Solar Panels

Resources & Feedback

- To view a complete list of resources for this seminar, please visit the **Additional Resources**
- Please complete the **Feedback Form** to help ensure events like this are offered in the future



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