Decision Framework for Incorporation of Sustainability into Army Environmental Remediation Projects

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Overview of Presentation

- Definitions of Sustainable/Green Remediation
- Background and Structure of Army Decision Framework
- When and How
- Incorporation Strategies – Current and Future
- Path Forward – Corps/Army/DOD

Definition – Green Remediation

The practice of considering all environmental effects of a remediation strategy (i.e., the remedy selected and the implementation approach) early in the process, and incorporating options to maximize the overall environmental benefit of cleanup actions (US EPA)

Army Sustainability (from Army Strategy for the Environment 1-Oct-04)

- **Definition of Sustainability (from Army Strategy for the Environment 1-Oct-04**): A strategy that "simultaneously meets current as well as future mission requirements world-wide, safeguards human health, improves quality of life, and enhances the natural environment"
- **Green remediation is part of the larger picture of incorporating sustainability into Army environmental remediation, with sustainability one of the decision variables**

USACE Decision Framework

- Purpose: To provide a roadmap for Army project teams and contractors to
  - Consider
  - Incorporate
  - Document

  sustainable practices throughout the cleanup process

Decision Framework Structure

- Decision flow chart, step by step directions and references.
- Starts with existing platforms that are inherently sustainable
- Covers complete remediation process
  - Planning
  - Investigation
  - Remedy Selection
  - Remedy Implementation
  - Remedy Operation and Maintenance
  - Site Closeout

Platforms

- **Planning –** Technical Project Planning (TPP)
- **Investigation-** TRIAD
- **Remedy Selection –** National Contingency Plan (NCP)
- **Remedy Design –** Predesign/Value Engineering Study Checklists
- **Remedy Construction –** Green Remediation Best Management Practices
- **Remedy Operation and Maintenance –** Remedial System Evaluations
- **Site Closeout –** Army Waste Minimization Policy and Guidance

TPP – Project Direction

- **Inherent sustainability in TPP**
  - Project planning through site closeout, including site reuse
  - Inclusion of all stakeholders
- **Core TPP Questions: Can/Should Sustainability Be Incorporated**?
  - Contract allows?
  - Staffing adequate?
  - Funding available?
  - Schedule allows?
  - Scope justifies?

Contract Considerations – Can Sustainability Be Incorporated

Contract type	Existing	Future
Fixed Price	Yes	Yes
Cost Reimbursement	Yes	Yes
Performance Based	Cost –effective sustainability measures, i.e. energy conservation	Yes

Contractual Mechanisms –
How to Make Sustainability Performance-Based

- **Performance incentive – a percentage of contract**
- **In proposal submittals, contractor**
  - Identifies resources for sustainability incorporation
  - The amount each resource will be incorporated
  - The weighting for each resource within the overall incentive
- **Contract awarded on technical merit, sustainability incorporation one evaluation criteria**
- **Contractor awarded portion of incentive based on % of sustainability actually incorporated.**

Example

- **Identification of resources and sustainability incorporation in proposal**
  - Water – 30% use of non-potable water
  - Energy – 30% renewable energy
  - Waste minimization – 65% diversion
- **Incentive calculation**
  - 0.25 water + 0.5 energy + 0.25 waste (weighting factors could be supplied by the government in SOW)
  - Assume contractor achieves 20% non-potable water use, 25% total energy renewable, 50% waste diversion
  - % incentive awarded= 78%

TPP - Can Sustainability Be Incorporated?

- **Adequate Funds?**
  - Minimal funds in identification (review of contractor proposal)
  - Can use option for implementation if funds uncertain
  - On-going projects - cost effective procedures can be suggested
- **Adequate Staffing?**
  - Knowledge and time to review technical merit of sustainability in proposal
  - Oversight of sustainability implementation and approval of performance – part of general contract oversight
- **Schedule allows?**
  - New contracts – no expected schedule limitations as sustainability incorporated into proposal submittal process.
  - If on-going, may be limited – cost effective measures can still be incorporated

TPP - Should Sustainability Be Incorporated?

- Does scope of project merit a sustainability evaluation?
  - Small?
  - Routine?
- Even if small or routine, can incorporate sustainability through rules of thumb. Examples:
  - Energy-saving sheds
  - Reuse of equipment/buildings
  - Use of native plants for landscaping
  - Recycling

TPP – How to Incorporate Sustainability

- **Site information worksheet - Identify needs specific to sustainability**
- **Examples:**
  - Reuse of existing equipment/buildings?
  - In-situ technologies data collection, both active and passive
  - Design optimization?
  - Operation and maintenance optimization?
- **Needs translated to data needs worksheets (risk, remedy, compliance, and responsibility)**

Site Investigation - TRIAD

- **Inherent sustainability in TRIAD**
  - Decrease in uncertainty through better characterization- remedy more efficient
  - Use of real-time field investigative tools – less energy intensive, less waste
- **Current recommended approach – use of TRIAD with additional questions to consider sustainability in performing the site investigation**
  - Passive sampling devices?
  - Drive point devices vs. permanent wells?
  - Additional data necessary for evaluation of sustainable technologies?
- **Future approach – use of site investigation sustainability tools to directly compare investigation options**

Remedy Selection - NCP Criteria

- **Current recommended approach – incorporate sustainability into nine criteria**
  - Air emissions- human health and environment
  - Human work risk – short term effectiveness
  - Implementability and Cost – use of natural resources (water, energy sources)
  - Public opinion – green spaces, contribution to community
- **Additions not currently regulated**
- **Future approach- technology sustainability evaluation tool (tools in development- waiting for one that is standard, complete, available, affordable)**

Remedy Implementation: Design – Pre-design and Value Engineering Design Checklists

- **Independent review checklists can include many sustainability aspects**
  - Recycling
  - Use of existing infrastructures and materials
  - Enhancement of remedies to promote ecological well-being
  - Reduced resource consumption
  - Life-cycle costs
- **Current recommended approach** – include checklists in project planning and contracts, consider VE study
- **Future approach**: Augmentation of check lists/VE study with additional sustainability aspects

Remedy Implementation – Construction

Green Remediation Best Management Practices

- **Reference EPA Green Remediation Primer and State of Illinois: Greener Cleanups Tool: How to Maximize the Environmental Benefits of Site Remediation**
- **Examples:**
  - Capture/reuse grey water
  - Impose restrictions on idling of machinery

Operation and Maintenance - Remediation System Evaluations

- **Include many sustainability aspects**
  - Cost/risk reduction
  - Reduction of site close-out time
  - Optimization of equipment operation and maintenance
  - Reduced resource (energy, water) consumption
- **Current recommended approach – incorporate RSE or equivalent process into the site remediation process**
- **Future approach – RSE checklist revised to include additional sustainability aspects (air emissions, renewable energy).**

Site Closeout

- Army policy (USACE Engineering and Construction Bulletin No. 2008-14, April 2008) – Minimum of 50% waste diversion – studies show this amount is cost effective.

Current recommended approach – use Army criteria as minimum

- Future approach
  - Site specific evaluation – more waste may be diverted
  - Incorporate green space, ecologically friendly practices, community reuse of site

Summary – Recommended Current Approach

- Use of existing Army platforms to incorporate significant sustainability
- Augmentation of platforms with specific sustainability “rules of thumb”.
- Piloting sustainability evaluation tools; waiting for fully-developed, available tool for stand-alone evaluation of remedial options on sustainability.

Future Approach

- Use newly developed sustainability evaluation tools.
- Score remedial options using modified EMS evaluation factors.
  - Mission Impact
  - Regulatory Impact
  - Environmental Impact (Sustainability)
  - Community Response

Future Approach - Modified EMS Scoring Matrix

Use on Any Remedial Phase to Compare Options

- Mission Impact, Regulatory Impact – Threshold criteria (need to meet to continue consideration)
- Community Response and Environmental Impact (Sustainability) – Balancing criteria
- Different weighting factors for each criteria can be used to represent relative importance.

Threshold Criteria	Rating Scale		Activity Level			
			High	Medium	Low	Rare
			4	3	2	1
Mission Impact	Enhances mission	4	16	12	8	4
	Compatible with mission	3	12	9	6	3
	Neutral	2	8	6	4	2
	Some obstacles	1	4	3	2	1
	Significant negative impact	0	0	0	0	0
Regulatory Impact	No regulatory constraint	4	16	12	8	4
	Preferred regulatory practice	3	12	9	6	3
	Accepted regulatory practice	2	8	6	4	2
	To be regulated	1	4	3	2	1
	Not permitted	0	0	0	0	0
	High			Low		
	Medium			Do not use		

Balancing Criteria	Rating Scale		Activity Level			
			High	Medium	Low	Rare
			4	3	2	1
Community Response	Incentives for inclusion	4	16	12	8	4
	Strongly in favor	3	12	9	6	3
	Mildly in favor	2	8	6	4	2
	No interest	1	4	3	2	1
	Against	0	0	0	0	0
Environmental Impact	High, beneficial	4	16	12	8	4
	Moderate, beneficial	3	12	9	6	3
	Low	2	8	6	4	2
	No impact	1	4	3	2	1
	Significant negative impact	0	0	0	0	0
	High			Low		
	Medium			Consider not using		

Path Forward –Decision Framework

- Draft decision framework completed March 2009, in internal EM-CX review.
- Peer and Corps/Army Headquarters review, June 2009; finalization of decision framework December 2009.

Path Forward - DOD/Army/Corps

- DUSD(I&E)/EM developing a policy memo - encourages Military Components to incorporate green/sustainable remediation in current and future remedial activities
- Army HQ supporting OSD in developing comprehensive DoD green/sustainable remediation policy; will head development of any Army-specific guidance
- Corps collaborating with Army HQ to incorporate decision framework into Army guidance and implement across Army cleanup sites
- Corps collaborating with Army Environmental Center in piloting optimization of current remedial systems including sustainability.

Path Forward - DOD/Army/Corps cont

- Corps developing joint contract template language with AEC.
- Corps revising independent review design/RSE checklists to identify existing sustainable practices and augmenting with additional practices
- Corps and Army working with other Federal agencies through the Federal Remediation Technology Roundtable Green Remediation Sub Committee in information sharing and joint tool development.

Questions

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