

Greener Cleanups: How to Maximize the Environmental Benefits of Site Remediation

		feasibility considerations				benefits			
		cost	schedule	technical complexity	air	water	land	energy	
action	level of difficulty								
site assessment	Collect data necessary for site-specific risk assessment.	➤	●	●					
	Collect data necessary to evaluate recycling options for waste and debris.	✓	●	●					
	Collect data necessary to evaluate alternate treatment methods.	➤	●	●	●●				
Improves decision-making and helps to prioritize action.									
planning and design	Develop and quantify "base case" remediation scenario.	✓	●	●	●	Base case data allow comparison of "standard" cleanup with "greener" cleanup.			
	Organize site layout to meet operational needs and reduce excavation requirements.	✓	●●●	●	●	Reduces air emissions from on-site construction equipment and from trucking waste materials.	Reduces waste material requiring off-site disposal.	Reduces fuel use in on-site construction equipment and in trucking waste materials.	
	Use engineered barriers.	✓	●	●	●	Reduces air emissions from on-site construction equipment and from trucking waste materials.	Reduces waste material requiring off-site disposal.	Reduces fuel use in on-site construction equipment and in trucking waste materials.	
	Use permeable barriers.	➤	●	●	●●		Increase long-term permeability of site to reduce stormwater runoff.		
	Use institutional controls.	✓	●●●	●●●	●	Reduces air emissions from on-site construction equipment and from trucking waste materials.	Reduces waste material requiring off-site disposal.	Reduces fuel use in on-site construction equipment and in trucking waste materials. Reduces energy use in remediation systems.	
	Use site-specific risk assessments.	➤	●	●	●●	Reduces fuel use in on-site construction equipment and in trucking waste materials. Reduces energy use in remediation systems.	Reduces waste material requiring off-site disposal.	Reduces fuel use in on-site construction equipment and in trucking waste materials. Reduces energy use in remediation systems.	
	Use soil management zones.	✓	●●	●	●	Reduces air emissions from trucking waste materials.	Reduces waste material requiring off-site disposal.	Reduces fuel use in trucking waste materials.	
	Develop sequencing plan for work to integrate cleanup with construction.	✓	●●●	●●●	●●	Reduces air emissions from on-site construction equipment by combining project phases.	Reduces erosion.	Reduces waste material requiring off-site disposal and reduces interim fill requirements.	Reduces fuel use in on-site construction equipment by combining project phases.
	Identify salvage options for materials from existing structures.	➤	●	●	●			Reduces waste material requiring off-site disposal.	
	Identify recycling options for waste and debris, such as metal, C&D, slag, and tires	➤	●	●	●●			Reduces waste material requiring off-site disposal.	
	Consider reuse options for existing structures.	⬆	●	●	●●●	Reduces air emissions from demolition activities.		Reduces waste material requiring off-site disposal.	Reduces fuel use in on-site construction equipment and in trucking waste materials.
	Consider structural reuse of slabs or foundations.	⬆	●	●	●●●	Reduces air emissions from demolition activities.		Reduces waste material requiring off-site disposal.	Reduces fuel use in on-site construction equipment and in trucking waste materials.
	Evaluate active in-situ treatment systems, such as soil vapor extraction, enhanced bioremediation or air sparging.	⬆	●	●	●●●	Reduces air emissions from on-site construction equipment and trucking waste material.	Reduces erosion and potable water use.	Reduces waste material requiring off-site disposal.	
	Evaluate passive in-situ treatment methods, such as in-place oxidation or phytoremediation.	⬆	●	●	●●●	Reduces air emissions from on-site construction equipment and trucking waste material.	Reduces erosion and potable water use.	Reduces waste material requiring off-site disposal.	Reduces purchased energy use.
	Evaluate remediation technologies that permanently destroy contaminants.	⬆	●●●	●●	●●●	Reduces air emissions from on-site construction equipment and trucking waste material. Reduces future migration concerns.	Reduces future migration concerns.	Reduces future migration concerns.	
Perform a life-cycle analysis of cleanup plan.	➤	●	●	●●	Life-cycle analysis supports informed decision-making considering time, cost, remedy effectiveness, and environmental impact of the alternatives.				



- ⬆ High
- Medium
- ✓ Low
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- indicates a benefit may reduce cost, time, or technical complexity - the number of symbols indicates the relative amount of the reduction.
- indicates a benefit may add or reduce cost, time, or technical complexity depending on the project specifics.
- indicates a benefit won't likely impact cost, time, or technical complexity.

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Impose idling restrictions on construction equipment.	Low	●	●	●	Reduces air emissions from on-site construction equipment and from staged vehicles.			Reduces fuel use in on-site construction equipment and in trucking waste materials.
Use low-sulfur diesel fuel.	Medium	●	●	●	Reduces air emissions from on-site construction equipment and from staged vehicles.			
Use alternate fuels (biodiesel, E85).	Medium	●	●	●	Reduces air emissions from on-site construction equipment and from trucking waste materials.			Reduces use of petroleum products in on-site construction equipment and in trucking waste materials.
Use construction equipment with enhanced emission controls.	Medium	●	●	●	Reduces air emissions from on-site construction equipment and from staged vehicles.			
Sequence work to minimize double-handling of materials.	Low	●●●	●●●	●	Reduces air emissions from on-site construction equipment. Reduces nuisance dust from stockpiles.	Reduces erosion.		Reduces fuel use in on-site construction equipment.
Cover stockpiles with tarps, apply alternate dust-control measures, or vegetate stockpiles.	Low	●	●	●	Reduces nuisance dust from stockpiles.	Reduces erosion.		
Collect rain water for on-site use, such as dust control.	Low	●	●	●		Reduces potable water use.		
Implement a water conservation plan.	Low	●	●	●		Reduces potable water use.		
Capture and treat greywater for reuse.	Medium	●	●	●●		Reduces potable water use.		
Abandon rather than remove subsurface structures.	Medium	●●	●●	●●			Reduces waste material requiring off-site disposal. Reduces off-site fill requirements.	Reduces fuel use in on-site construction equipment and in trucking waste materials.
Crush existing structures to optimize scrap recovery and produce fill materials.	Medium	●	●	●			Reduces waste material requiring off-site disposal. Reduces off-site fill requirements.	Reduces fuel use in trucking waste material and fill material.
Grind waste wood and other organics for on-site use.	Medium	●	●	●			Reduces waste material requiring off-site disposal.	Reduces fuel use in trucking waste material.
Use recycled materials for fill.	Low	●	●	●			Reduces virgin fill requirements.	
Routinely evaluate treatment processes for optimal performance.	High	●	●	●●●	Reduces air emissions from treatment processes.	Reduces potable water use and waste water discharge from treatment processes.	Reduces waste material requiring off-site disposal.	Reduces purchased energy use.
Capture free product or emissions for on-site energy recovery.	High	●	●	●●●	Reduces air emissions from treatment processes.	Reduces waste water discharge from treatment processes.	Reduces waste material requiring off-site disposal.	Reduces purchased energy use.
Incorporate renewable energy sources, such as wind or solar, into treatment systems.	High	●	●	●●●				Reduces purchased energy use.
Use energy efficient systems and office equipment in job trailer.	Low	●	●	●				Reduces purchased energy use.

cleanup



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