Green and Sustainable Remediation

Areas of Expertise
- Tools and Metrics for Evaluating Remedial Alternatives
- Green Technologies for Site Assessment and Cleanup
- Adaptive Site Reuse
- Policy, Guidance, and Procedure Development

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Overview
The cleanup of contaminated property is necessary and beneficial, but the process can be energy and resource-intensive, and result in numerous unintended impacts. Growing awareness of the need to decrease greenhouse gas emissions and use less energy and other resources has led to heightened demand for green technologies and integrating sustainability into the site remediation process. Utilizing Green and Sustainable Remediation (GSR) approaches to the cleanup of a site allows for the careful evaluation of remedial actions to minimize their impact on the environment and surrounding community and to identify the optimal solution.

AECOM is collaborating with government, academia, and industry to develop new approaches for site remediation that integrate sustainability considerations which minimize the environmental footprint of the site remediation process, and develop economic opportunities and community assets through site reuse. In addition, AECOM applies its expertise in climate change impacts and resiliency to ensure remedies are protective into the future.

Our Approach
AECOM incorporates key sustainability elements into our remediation projects such as:

- **Adaptive Site Reuse.** Understanding the future plan for a site provides an opportunity to integrate the site cleanup with the design of site structures, landscaping and other features.

- **Carbon Footprinting.** Determining the carbon footprint of each remedial alternative provides a basis to compare their relative impacts.

- **In Situ Approaches.** Treating or solidifying contaminants in-place eliminates impacts resulting from excavation and transport.

- **Renewable Energy.** Using solar or wind power to operate remedial equipment provides direct reductions in energy use and greenhouse gas emissions.

- **Stakeholder Engagement.** Engaging the community in the remedial planning process through public forums makes the process transparent and allows designers and developers to capture ideas and issues.

Key Reference Material
- SURF USA - http://www.sustainableremediation.org/
- Illinois EPA Greener Cleanups - http://www.epa.state.il.us/land/greener-cleanups/index.html
- **Material Recycling.** Separating and recycling of concrete, metal, and other materials reduces the amount of materials that have to be managed.

- **Habitat Areas and Plantings.** Constructing natural habitats as a part of the cleanup provides an environmental benefit for the community.

**Areas of Expertise**

**Tools and Metrics for Evaluating Remedial Alternatives.** Quantitative analysis of the environmental impacts of remedial alternatives provides a strong basis for comparing alternatives, as well as identifying how remedies might be improved and optimized to reduce impacts. These quantitative measures include carbon emissions, energy and resource consumption, habitat impacts, as well as worker and community risks and air impacts. AECOM has developed a variety of quantitative tools for estimating the environmental footprint of remedial actions, and we utilize these tools during feasibility studies to improve the evaluation of remedial alternatives.

**Green Technologies for Site Assessment and Cleanup.** There are many opportunities to reduce the environmental footprint of a site remediation project while achieving the required risk reduction. In situ approaches and processes that harness or utilize a natural process (e.g., intrinsic biodegradation or phytoremediation) typically consume less resources and energy than traditional “dig and haul” or “pump and treat” options. Alternatively, a combination of technologies, the use of renewable energy, or the substitution of one material for another, could produce the most sustainable approach. We have identified a comprehensive set of technologies including sampling techniques that minimize investigation-derived wastes and other site assessment-related impacts, and low-impact remediation approaches, that ultimately reduce the ‘footprint’ of remedial actions.

**Adaptive Site Reuse.** Considering the potential end uses of a site during the remedy selection process often results in better informed decisions and a more sustainable cleanup. Aspects of the remedy can also become part of the site infrastructure, thereby reducing material consumption and energy use of the overall site development. Examples include the use of foundations for future structures to securely cap contaminated soil, recycling on-site demolition material, and integrating stormwater management and climate change resiliency into the long term site plan, all of which result in lower site redevelopment costs and provide ongoing environmental and community benefits.

**Policy, Guidance, and Procedure Development.** Policy changes and new regulatory programs are emerging which embrace green and sustainable remediation. AECOM has worked with government and industry to develop tailored policies and guidance that enable us to ‘build’ sustainability into our remediation projects. We are currently working at the state and private industry level to develop guidance and procedures to implement cost effective approaches that reduce the footprint of remedial investigations and remedial actions. We are also involved in several industry groups that strive to impact environmental policymaking so that GSR is widely accepted and applied during the site remediation process.

**Key AECOM Attributes**

- **Interstate Technology and Regulatory Council (ITRC).** AECOM is actively involved with ITRC developing key guidance documents on GSR to be used as a reference by states, government, defense and private practitioners.

- **ASTM.** AECOM is a key contributor to the development of the ASTM Standard Guide for Greener Cleanups.

- **International Organization for Standardization (ISO).** AECOM is a contributing author to the Draft ISO Guidance on Sustainable Remediation.

- **Wisconsin Remediation and Redevelopment (WISRR) Program.** AECOM assisted with the development of a guidance manual that provides performance metrics to aid in quantifying the effects of sustainable remediation techniques.

- **Illinois EPA Greener Clean-Ups Program.** AECOM developed the greener cleanup matrix used in Illinois to assist in the selection of sustainable practices that can be applied to site assessment, planning and design, and cleanup.

- **Sustainable Remediation Forum (SURF).** AECOM is Sponsor and contributor to SURF which promotes the use of sustainable practices during the remedial action with the objective of contributing to the balance of economic viability, conservation of natural resources and biodiversity, and the enhancement of the surrounding community.