



Keeping Brownfield Site Cleanups “Green”

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WHEN DESIGNING AND IMPLEMENTING A remedial program to address soil and ground water contamination at a Brownfields site, it is becoming increasingly important to evaluate more broadly the impacts planned cleanup procedures may have to local residents as well as the surrounding environment.

Regulatory agencies, adjacent property owners, and third-party stakeholder groups are starting to insist that a cleanup effort not only accomplish its intended goal of reducing the public and ecological risk a contaminated site poses to an acceptable level, but also that remedial procedures be performed in a manner that minimizes the more global (and politically unpopular) environmental impacts that are in the news (e.g., emissions of greenhouse gases and sustainability). The requirement for “green” cleanups is becoming more common, especially in those circumstances where public monies—grants, government loans, tax incentives—are being used by a developer or site owner.

One of the important developing facets of a Brownfield remediation and redevelopment program is an increased emphasis on sustainable or “green” remediation. A green remediation program should focus on assessing cleanup actions so as to reduce the demand placed on the environment during construction, otherwise known as the “environmental footprint” of the remedial effort, and avoid the potential for associated or collateral environmental damage. During its remedial evaluation process, the project consultant needs to examine the environmental impacts connected with:

- Air pollution caused by toxic or priority pollutants such as particulate matter and lead that is generated during excavation or on-site treatment of contaminated media;
- Soil erosion and nutrient loss as well as subsurface geochemical changes related to in-situ or ex-situ cleanup processes;
- Ecological diversity and population reductions that may be impacted by changes in land use or habitat destruction; and

- Emissions of carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), and other greenhouse gases during construction activities.

The project consultant needs to work with their client to identify opportunities to use less intrusive “green” cleanup technologies and to promote sustainability during investigation, design, construction, operation and monitoring phases of the project, regardless of the selected cleanup remedy. These can range from using photovoltaic systems to power submersible ground water pumps to incorporating special cover materials and mulches to minimize irrigation requirements and fertilizer losses for finished landscaping. EWMA currently is working with a food oil processing company to recover dissolved oils from its wastewater stream for re-use in a nearby co-generation facility, and we have developed innovative uses for the on-site reuse and stabilization of soil containing trace amounts of pesticides and PCBs.

Bioremediation (stimulation of indigenous, contaminant degrading bacteria to treat in situ contaminated soil and ground water), phytoremediation (uptake of contaminants by selected plant species), and below grade reactive barrier walls (that serve as passive, flow-through ground water treatment cells) are approaches that can be used to reduce or eliminate the more environmentally significant impacts associated with off-site transport and disposal of effected media. As cleanup technologies continue to advance and “green” remediation incentives (and potential penalties) evolve, we have found that a pro-active “green” remediation strategy offers significant potential for increasing net cleanup benefits, saving money, and expanding the universe of long-term property use or reuse options without compromising cleanup goals. ■

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