Green Remediation Focus

Minimizing the environmental footprint of site cleanup

A Profile in Using Green Remediation Strategies

Additional profiles available at www.clu-in.org/greenremediation

Upper Arkansas River
Leadville, CO

Superfund Removal

Cleanup Objectives: Began treating soil in 1998 through application of 100 dry tons (pellets) of biosolids to each of 20 target acres along an 11-mile stretch of the river

Green Remediation Strategy: Applied biosolids and assorted amendments

- Applied 100 dry tons (pellets) of biosolids to each of 20 target acres along 11-mile stretch of river
- Mixed biosolids with lime to reduce soil acidity, supporting increased plant viability and metal insolubility
- Seeded native plants and quick-growing ryegrass
- Added compost and woody material as additional plant nutrients
- Added wood chips to reduce nitrogen (nutrient) leaching
- Covered amended soil with native hay to promote plant growth and seeding

Results:

- Revegetated denuded acreages
- Reduced concentrations/bioavailability of zinc and other metals through bioremediation, phytoremediation processes, and solubility reduction
- Neutralized soil to levels supporting healthier ecosystems
- Reduced soil erosion, river channel degradation, and property loss
- Re-established communities of native plants such as white yarrow and tufted hairgrass

Property End Use: Agriculture and recreation

Point of Contact: Harry Compton, U.S. EPA Region 2

Due to the fluctuating water table and acidic conditions, Zn and Pb form soluble salts and wick to the surface of soil along the river during dry seasons. These conditions cause a metal salt crust to form on surface soil, with Zn concentrations as high as 90,000 mg/kg.

Varying amounts of woody material were mixed with the biosolids to achieve soil amendments favoring different native plant communities.

Following 10 years of growth, grasses installed in amended soil demonstrated a large root mass.

Biosolids from the Denver metropolitan area were applied at a rate of approximately 100 dry tons/acre and mixed with similar amounts of lime. Amendments were tilled into the soil to a depth of 12 inches.

October 2008 site visits showed healthy revegetation throughout soil amended areas.

Most biosolids/lime amended stream sides now exhibit 100% vegetative cover.

Upper Arkansas River
Update: December 2008
http://www.cluin.org/greenremediation/profiles/subtab_d13.cfm

United States Environmental Protection Agency
Office of Solid Waste and Emergency Response (5202P)

For more information:
www.cluin.org/greenremediation
Carlos Pachon (pachon.carlos@epa.gov)