

## Solid-phase Treatment of Soils and Sediments Impacted by Organic Compounds

Daramend® reductive bioremediation reagent represents a superior biological treatment technology for solid materials impacted by recalcitrant organic compounds. Since the first application in 1991, variations of the technology have been successfully used to treat >10,000,000 tons of soil, sediment and other solid materials. Daramend® has treated soils containing chlorinated herbicides and pesticides, organic explosive compounds, and chlorinated VOCs at many sites throughout the world.



The Daramend® technology is uniquely advantageous because it can often be applied *in situ* without excavation, is typically applied at 1 to 3% (soil mass), and provides the *In Situ* Chemical Reduction (ISCR) benefits of very strongly reducing conditions (both biotic and abiotic degradation mechanisms), and near-neutral pH. Relative to traditional composting, Daramend® treatment results in significantly shorter treatment durations and eliminates bulking. From a sustainability perspective, because the Daramend reagent is composed of recycled iron and agricultural byproducts, the technology offers many benefits over “dig-and-dump” approaches.

### Benefits include:

#### Improves soil health

- Improves soil tilth and fertility, and reduces toxicity

#### Hydrophilic character

- Increases soil water holding capacity

#### Balanced range of nutrients

- Provides a broad range of major, minor, and micronutrients

#### Recalcitrant Contaminants

- Promotes remediation of most persistent contaminants in soils

### Potential Applications:

**In situ landfarming**

**Ex situ treatment cells or windrows**

**Shallow groundwater trench applications (as per EHC® ISCR Reagent)**

### Examples of Contaminants of Concern

#### ORGANIC EXPLOSIVES

TNT, RDX, HMX, Tetryl, Nitrobenzene

#### CHLORINATED VOCs

Ethenes, Ethanes, Methanes

#### CHLORINATED PESTICIDES

Dieldrin, Toxaphene, Mirex, Chlordane, DDT, HCH, and others

*For more information and detailed case studies, please visit our website.*