

Daramend® Reagent for Excavation Backfill and Trench PRB Shallow Groundwater Applications

INTRODUCTION

Daramend® reagent was originally formulated for surficial soil treatment via land farming techniques but is also frequently used in excavation/backfill applications to promote reductive dehalogenation of residual chlorinated solvents and their metabolites (e.g., cis-dichloroethane and vinyl chloride). The composition of Daramend with microscale ZVI and long-lasting organic carbon and nutrients from processed plant fiber provides performance and cost advantages to backfill and trench applications for treating shallow groundwater. Many soil mixing approaches, including simple excavator buckets and axial head mixers, can be used to achieve good distribution of the reagent. Daramend® is a cost-effective solution with approximate product costs of \$10 - \$20 per ton of treated backfill, while providing effective treatment usually lasting for five or more years.

This document provides information regarding common Daramend® treatment approaches for excavation backfills and trench style permeable reactive barrier (PRB) applications.

EXCAVATION BACKFILLS

Daramend® dosing can be calculated using site information such as groundwater geochemistry and velocity. If site specific data is not available, the typical dosage is 0.5% to 2% by weight of soil. Daramend® can be mixed directly into the soil using deep soil mixing equipment or mixed into an open excavation base where prior soil removal had been conducted. Daramend® is generally applied dry for these applications to enable easy mixing. In very windy conditions, a slurry may be prepared to minimize dust.



TRENCH-TYPE PERMEABLE REACTIVE BARRIERS

For PRB applications, Daramend® and sand should be thoroughly mixed before placement in the trench to ensure uniform treatment. We recommend thorough mixing of Daramend® reagent with sand/site soil and water to create a homogenous slurry. This can be accomplished using various types of soil mixing equipment including an excavator, a pug mill, or a cement mixer. Once a homogeneous slurry is created it can be transferred into the open trench to create the PRB.

PRBs constructed using dry reagent mixing is generally not recommended; the Daramend® will likely segregate from the sand or site soil due to varying material densities. In addition, trench PRBs constructed with standing water present will also run the risk of segregation of the Daramend® and the sand or site soil.

For any PRB installation technique, the permeability of the PRB fill material and any impact of the installation method must be considered. The relatively low Daramend® dosages typically used and the particle size of ZVI in the reagent are not expected to adversely impact hydraulic conductivity of the PRB.

HEALTH AND SAFETY

Daramend® is safe when handled properly in accordance with instructions for use and the safety data sheet (SDS). The SDS can be found on the Evonik webpage at <http://www.evonik.com/remediation>. When working with Daramend®, the use of standard personal protective equipment, including safety glasses, protective clothing and gloves is recommended. Additional safety equipment may be required for mechanical and site operations as indicated in each site specific .

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