



## APPLICATION INSTRUCTIONS

### General

CRS™ is a liquid amendment to 3D Microemulsion that provides ferrous iron ( $\text{Fe}^{2+}$ ) to the reductive dechlorination process, thus enabling *In Situ* Chemical Reduction (ISCR) pathways for contaminant destruction. The material is added in a prescribed ratio to the 3D Microemulsion mixture before injection. Exact ratios and mixing quantities should be obtained from your Regenesis representative.

### Material Handling and Safety

CRS™ is a neutral-pH material made from very low toxicity ingredients. However, as with all chemicals, CRS™ should be handled, used, and disposed of safely in accordance with its Material Safety Data Sheet (MSDS) and in compliance with local and federal regulations.

### Product Mixing and Application

CRS contains reduced ferrous iron ( $\text{Fe}^{2+}$ ) and will oxidize slowly to ferric iron ( $\text{Fe}^{3+}$ ) in air. To maximize the reducing capacity of the solution, exposure to air should be minimized prior to injection of the material. Therefore, it is important that the drums CRS is delivered in stay closed and air-tight until CRS is ready to be added to 3D Microemulsion.

Two methods are recommended for mixing and application of CRS with 3D Microemulsion:

- 1) Direct batch mixing
- 2) Controlled metering with a Dosatron™ chemical dispenser

These two options are outlined below:

#### **I. Method 1 - Direct batch mixing of CRS:**

- 1) Obtain recipe for emulsion preparation and CRS addition from REGENESIS
- 2) Dilute 3D Microemulsion with the prescribed quantity of water



**REGENESIS**

Advanced Technologies for Groundwater Resources

REGENESIS / 949-366-8000 / [www.regenesis.com](http://www.regenesis.com)



- 3) Stir drum of CRS for 30 seconds with a vortex mixer at a mild turbulence setting to ensure solution homogeneity without air entrainment
- 4) Transfer the prescribed quantity of CRS into the 3D Microemulsion batch
  
- 5) Mix the emulsion and CRS batch using a vortex mixer – note: care should be taken to:
  - i. Minimize direct exposure and entrainment of air
  - ii. Mix periodically to maintain homogeneity of batch
- 6) Inject the final mixture directly into the treatment zone

**II. Method 2- Controlled Metering using a Dosatron™ chemical dispenser:**

- 1) Obtain recipe for emulsion preparation and CRS addition from REGENESIS
- 2) Dilute 3D Microemulsion with the prescribed quantity of water
- 3) Stir drum of CRS for 30 seconds with a vortex mixer at a mild turbulence setting to ensure solution homogeneity without air entrainment
- 4) Assemble injection setup to incorporate the Dosatron chemical metering system
- 5) Inject the diluted batch of 3D Microemulsion using the Dosatron unit to meter the CRS solution into the 3D Microemulsion at the prescribed ratios



**REGENESIS**

Advanced Technologies for Groundwater Resources

REGENESIS / 949-366-8000 / [www.regenesis.com](http://www.regenesis.com)