



## Mixing Guidelines for GeoForm™ Soluble

GeoForm™ Soluble is engineered to generate reactive iron sulfide minerals when GeoForm Soluble Mix is combined with an organic hydrogen donor, such as PeroxyChem's ELS® products. The two components can be mixed together above ground to form a stable, soluble solution prior to distribution into the treatment zone. GeoForm Soluble is suitable for application through typical wells by direct push injection or other methods.

The equipment recommended to prepare GeoForm Soluble solution consists of a suitable water storage tank, a high viscosity transfer pump, and a submersible pump. If mixing ELS Concentrate with GeoForm Soluble Mix, an in-line high speed centrifugal pump or other high shear pump is recommended. Additional storage tanks and integral piping can be used depending on site specific conditions.

This document provides general guidelines for the preparation of a GeoForm Soluble solution prior to injection.

### Packaging

**Part 1:** Any of PeroxyChem's ELS products can be used:

- A. ELS Microemulsion: 5-USG, 38lb (17.24kg) pails, 55-USG, 420 lbs (190.51 kg) drums
- B. ELS Liquid Concentrate: 5-USG (42lb) pails, 55-USG (460 lbs) drums
- C. ELS Dry Concentrate: 44 lb (20kg) boxes

**Note:** Please review the product application guide for instructions for preparing an ELS emulsion.

**Part 2:** GeoForm Soluble Mix, delivered in 50 lb bags (22.7 kg)



Figure 1. ELS Microemulsion



Figure 2. Addition of GeoForm Soluble Mix to mixing tank

### General Mixing Guidelines

- A. The following is recommended guidance for mixing GeoForm Soluble Mix (Part 2) with ELS products (Part 1):
  1. Prepare anaerobic/dechlorinated injection water prior to adding GeoForm Soluble Mix. Anaerobic water can be generated by mixing a minimum of 2 ½ lbs. of sodium ascorbate per 1,000 gallons of water.
  2. Confirm both the ELS mass and the GeoForm Soluble Mix mass required for the volume of water to be injected.
  3. Add the predetermined volume of anaerobic water to mixing tank.
  4. Add the GeoForm Soluble Mix into mixing tank while circulating the water in the tank with a submersible pump or other recirculation system (this component will quickly go into solution when mixed in water). Some CO<sub>2</sub> gas may be generated during the mixing of this component as the included buffer reacts to maintain the proper pH



range (6.0 to 8.5 SU) in the injection water. Continue to mix for approximately 5 to 10 minutes or until any gas generation has stopped completely. If foaming is observed, it can be resolved by agitating the surface with use of a hand drill mixer or similar.

5. After GeoForm Soluble Mix (Part 2) has been completely blended and solubilized, it is time to add the prepared ELS product (Part 1):
  - a. If using ELS Microemulsion, add into the mixing tank while circulating water through the submersible pump or in line high shear pump.
  - b. If using ELS Liquid Concentrate, generate the ELS emulsion to the target injection concentration by metering the ELS Concentrate into the GeoForm amended anaerobic water just prior to the in-line high shear pump in the recirculation line. One pass through this pump should be sufficient to create the desired emulsion and blend the GeoForm Soluble Mix.

Note: Please contact us for more information if using ELS Dry Concentrate.

6. After the ELS emulsion has been completely mixed with the GeoForm Soluble Mix (several minutes) the solution is ready for injection. Although all the components will be in solution, it is recommended that the solution continue to be circulated occasionally prior to injection to keep the injection solution homogenous.

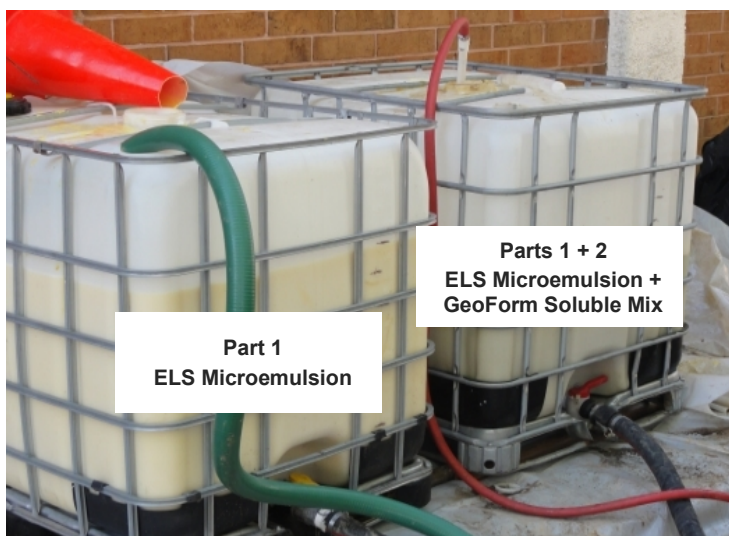


Figure 3. GeoForm Soluble comprised of ELS Microemulsion and GeoForm Soluble Mix

### **Health and Safety**

GeoForm Soluble is safe when handled properly in accordance with instructions for use and the SDS's. The SDS's are posted on our web site at: <http://www.peroxychem.com/markets/environment>. When working with GeoForm Soluble the use of standard personal protective equipment, including safety glasses, protective clothing and gloves are recommended. Additional safety equipment may be required for mechanical and site operations.

Please contact PeroxyChem for additional guidance.

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