

DESIGN WATER TECHNOLOGIES



Continuous treatment for remediation systems

Environmental remediation sites will often experience frequent plugging in pumps, piping systems, air stripper towers and carbon filter beds due to precipitation of minerals and slime bacterial growths. This may occur in pumps or systems only and be totally independent of recovery wells. One time physical or chemical cleaning may work long term in some conditions.

Mineral Scale

In recovery systems, total dissolved solids may well exceed 5,000 mg/l. During pumping these dissolved minerals precipitate as a solid (mineral scale) due to velocity and pressure changes within the system. This can cause severe plugging in a system, creating higher operating pressures and diminishing returns on the treatment process. These precipitates are often complex, involving calcium carbonate scales, iron, manganese, sulfate and non-carbonate based scales. Physical cleaning can be difficult, costly, and suffer from frequent shutdowns. Chemical treatments can be expensive and frequent depending upon the longevity of the treatments.

Slime Bacteria

Naturally occurring, soil bacteria, ie. Pseudomonas, Aerobacter, or Flavobacter as well as other bacteria associated with hydrocarbons and contaminants found in aquifers may also be present in systems. These bacteria can produce large volumes of slime for reasons very similar to the those in recovery wells. Generally slime production is a protection device from: 1.) low nutrient levels. The contaminant and certainly the numbers of bacteria may effect nutrient levels. As numbers increase, nutrient levels decrease. Bacteria have a tendency to produce slime when nutrient levels are low. 2.) changes in velocity/pressures in a pumping system due to reductions in piping diameters, changes in directions, reductions created by valves, and treatment through stripper towers and filter beds. 3.) harmful chemicals like acids and chlorine.

Physical cleaning does not microscopically remove these bacteria. Chemical treatments may not be able to keep some systems operational with massive scale or biological problems. These treatments are often costly, inconvenient, frequent, and unsuccessful.

Constant Injection for Maintenance of Systems

Constant injection of a liquid called E.P.A.C. can be a viable cost option to prevent the precipitation of minerals and or the growth and attachment of bacteria within recovery systems, air stripper towers, or carbon filter beds. Minerals (total dissolved solids) can be carried in solution up to 60-70,000 ppm. E.P.A.C. is designed to be used with hydrocarbons without dangerous chemical reactions.

We recommended the well and or system be cleaned prior to the constant feed applications. This prevents the system from becoming totally plugged with debris and biology from the cleaning power of E.P.A.C. Please refer to our earlier references to cleaning systems in this brochure and our general brochure #617 for cleaning wells and systems with mineral scale and biological debris.

Product Dosage

Once the system is cleaned or new, the injection rate should start at one gallon per 40,000 gallons pumped. The dosage can then be adjusted accordingly. Each system will vary and dosages may range from as high as one gallon per 30,000 gallons pump to as low as one gallon per 70,000 gallons pumped. Monitor and adjust as needed until the system stabilizes.

Our recommendations for most systems would be as follows:

Time	Dosage Recommendations
First month	1 gallon per 40,000 gallons pumped
Second month	1 gallon per 50,000 gallons pumped
Third month	1 gallon per 60,000 gallons pumped
Fourth month	Monitor/continue to adjust accordingly.

Most chemical feed pumps are adequate for use with E.P.A.C. Physical properties of the product are as follows: Density 1.21 spg/ml @ 15.6° C., Viscosity 18.70 cP (mpa S), Weight is 10.0 lb. per gallon, pH 2.3.

Disposal

E.P.A.C. is totally biodegradable of which 85% is degradable in 9 days and the remainder in 27 days. The byproducts break down into carbon dioxide and water. The pH of the effluent may change slightly due to an increase in carbon dioxide in some systems. The product is non-bioaccumulating which means it does not accumulate in the environment to a toxic concentration.

Safety regulatory information

E.P.A.C. does not produce trihalo methanes as a byproduct in the treatment of bacteria, as occurs with chlorine and can be used with hydrocarbons without any dangerous chemical reactions.

The product is packaged in D.O.T. approved containers and can be shipped via normal freight, even UPS, without hazardous labeling required under 40CFR 172.101, Hazardous Materials Table.

All ingredients are listed on the TSCA Inventory. There are no hazardous substances for emergency release notification under SARA/TITLE III-CERCLA.

E.P.A.C. does not contain any chemicals for routine annual "Toxic Chemical Release Reporting" under SARA/TITLE III-Toxic Chemicals List, or any chemicals listed by California Prop. 65, for known carcinogens and reproductive toxins. Refer to the MSDS product sheets for further safety/regulatory information.

Lab Services

Water Studies and lab services are available to help determine the problem and design solutions. These include identification of mineral scale potential, corrosion problems, identification of bacteria that cause slime problems, odor, and corrosion. Please call or contact your "Unicid" distributor for information and prices.

Design Water Technologies

5920 Covington Road
Shorewood, MN 55331

Toll Free: 888-437-6426 | Phone: 952-474-4657 | Fax: 952-470-6637
email: designh2o@aol.com | www.designwater.com