



## **Environmental, Health & Safety :: Environmental Management**

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### **Chementator: A faster way to decontaminate soil**

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Liberty Engineering (Hamburg, N.Y.; [www.libertypsa.com](http://www.libertypsa.com)) has developed a bioremediation system that fully removes carcinogens from soil in 90 days. The process is based on microbial oxidation of organic compounds by *petrophylllic pseudonomads* in an oxygen-rich environment. The bacteria are specifically isolated for their affinity to metabolize heavy hydrocarbons, aromatic compounds and organic solvents. Bio-stimulation of the carcinogen killers is a key component of this new system, which is achieved by adding specific nutrients for the indigenous bacteria in an oxygen-rich environment, as well as bio-augmentation of bacteria selected for affinity to the specific contaminants. The contaminants are metabolized into biomass, water and carbon dioxide free of traces of hydrocarbons, toxins or pathogens. Since the utilization of aliphatic hydrocarbons by microorganisms is an aerobic process, organic material is processed up to 15 times faster than with the use of anaerobic digesters, says the firm.

Liberty Engineering utilizes skid-mounted gas sparge equipment with microbes batch fed to a water tanker prior to distribution to the soil. The water tanker contains oxygenated feed water that has been dissolved at the required temperature for bio-augmentation. The sparger features an integral recirculation and oxygen injection system, as well as controls to meter the required O<sub>2</sub>-to-H<sub>2</sub>O ratio. Depending upon the amount of rainfall, approximately 70,000 gal of water is needed for each 90-day treatment in order to achieve the target soil moisture content of 10 – 15%.

The cost of complete bioremediation in a single season ranges from \$16,000 for a small project (5,000 tons of soil), to \$15-million for 4.5-million tons of soil. The process is now fully commercialized and can be completed either ex-situ or onsite. The most recent demonstration, completed last month at a 1.5-acre site, exhibited full remediation in just under 90 days at a cost of \$300,000.