



## MICROBIAL BIOREMEDIATION



Bioremediation of industrial sites and petrochemical spillages often involves finding microbes that can gorge themselves on the toxic chemicals. This leaves behind a non-toxic residue or mineralized material. Researchers describe studies of a new microbe that can digest hydrocarbons.

Hydrocarbons/Oils that are found in natural reservoirs are derived from ancient algae and plant material. Oil is a natural product generated from organisms that long ago used sunlight as their energy source through the process of photosynthesis. The algae were buried deep in the Earth and heated at great pressure over millions of years. The resulting material is oil, which stores the energy generated by that ancient photosynthetic activity. Therefore, the components of crude oil are a great source of energy, not only as fuel to power internal combustion engines, but also as food for microbes. It is not surprising that microbes have evolved the ability to use oil as their food source. To metabolize or biodegrade the compounds for energy and use them as raw material for growth.

In bio-augmentation, the remediation of hydrocarbons is achieved by adding large amounts of petrophilic microbes, to a spill that change the hydrocarbons to carbon dioxide and water, without 'tailings'. This is possible because the microbes use parts of the hydrocarbons to maintain their own metabolic process.

The bacteria involved in the process of bioremediation are simply gluttonous microbes. These naturally occurring microbes are placed within the contaminated site in which they immediately begin to start breaking down the organic contaminant. This "breaking down" process consists of these microbes breaking the carbon chains of which make up all organic molecules. The microbes thus work on breaking down the carbon chains until the contaminant is eliminated and no longer an environmental threat. As a result of this process carbon dioxide and water are left behind as by-products with trace elements of fatty acids.

- **The Microbes attach themselves to the contaminants and reduce them to carbon dioxide and water.**
- **The microbial cultures continue enzyme production until all oil contaminants and other organic wastes are consumed.**
- **Our microbes can change the composition of oil and natural gas.**
- **Once the food source has been depleted, the remaining microbes then self-remediate.**
- **The result is clean water without traces of hydrocarbon.**

Spill-Chek Environmental has a team of trained personnel that can assist with any spill anywhere (even fly-in sites) without the need of large, expensive equipment, trucks, hauling and dumping fees. We can remediate on-site and remove hydrocarbons from surface, below ground and on water with our microbial technology and equipment.

