

Advanced BioTech

Developer of MultiFIX™ and BioWorld Products™

Bioremediation Products

- Efficiently clean up hydrocarbon problems in water or soils.
- Sophisticated technology and product formulations that are very easy to implement at the clean up site.
- Developed to provide the necessary elements, compounds and substances in specific forms which allow microorganisms to reproduce and thrive in the contaminated area.
- Microbes are specifically selected based on the ability to survive the contaminated area and function to directly degrade hydrocarbon chains.
- Microbes produce enzymes and other substances that also break down the hydrocarbons.

The BioWorld Technology is the Most Effective!



Hydrocarbon Cleanup



Also available from BioWorld Products

- **Wastewater Treatment Products**
- **Algae Control Products**
- **Odor Control Products**
- **Agricultural – Soil Enhancement**

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Bioremediation Technology

BioWorld Advantages

- Sophisticated technology – easy to use
- Effective-fast cleanup versus natural attenuation
- Environmentally safe and natural treatment
- Easy to apply - no protective clothing required
- Low cost efficient methods
- Long-term solution for balanced ecosystem



What It Is

- BioWorld combines Bioenhancement and Bioaugmentation for effective Bioremediation processes
- BioWorld Bioenhancement: a biotech formulation of liquid compounds, vitamins, and minerals which maximize the ability of microbes to reproduce and thrive in the contaminated area
- BioWorld Augmentation: A group of specific microorganisms selected for each type of contaminant
- Note: BioWorld wants you to understand – it is not how many microorganisms are applied, it is how many reproduce in the contaminated area and the BioWorld Bioenhancement makes that happen better than any other commercial product

What It Does

- BioWorld Technology creates a situation where microorganisms directly metabolize contaminants and create enzymes for efficient conversion of contaminants
- Contaminants are converted to water, simple gases such as CO₂, proteins, fatty acids, elemental forms and other non-hazardous substances

Where to use

- Oil spills, weathered oil, tanks, drilling sites, refineries, ships, truck wash (sump)
- BioWorld technology for saltwater, freshwater, soil, sand, wood, metal, concrete
- BioWorld formulations are available for: Crude, processed or refined oils, gasoline, diesel, Bunker C, fuel oil, heating oils, benzene, kerosene, surfactants, amines, alcohols, esters, glycols, ketones, BTXE's, naphthalenes, phenols, aromatic and other hydrocarbons

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BioWorld Bioremediation Treatment uses a unique combination of bioenhancement compounds and mature strains of selected, naturally occurring microorganisms for the bioremediation of petrochemical wastes. The special Bioremediation Enhancer formulation maximizes the ability of the microbes to reproduce and thrive in the waste system. Hydrocarbon Digesting Microbes consist of various microbial strains and biochemical nutrients for refinery and petrochemical wastes. BioWorld Bioremediation Treatment is environmentally safe, non-hazardous, non-toxic, non-corrosive, nonflammable, and non pathogenic.

Bioremediation Enhancer

- #75014—1 gallon Bioremediation Enhancer
- #75064—6-gallons Bioremediation Enhancer
- #75250—250-gallons Bioremediation Enhancer

Hydrocarbon Digesting Microbes

- #32086—½-pound Hydrocarbon Digesting Microbes
- #32055—2½-pounds Hydrocarbon Digesting Microbes

Small Project Combination

- #82186—Hydrocarbon Treatment Unit (Includes 1-gallon Bioremediation Enhancer & ½pound Hydrocarbon Digesting Microbes)



Composition and Physical Properties

Liquid: Bioenhancement Compounds, Vitamins, Minerals, Amino Acids, Polysaccharides, Esters, Alcohols, Oils, Proteins, Organic Acids, Natural Liquid Enzymes, Organic Surfactants pH: 5.5 – 6.5

Boiling Point: 212°F/100°C

Freezing Point: 32°F / 0°C

Solubility in Water: 100%

Specific Gravity: 1.0028

Appearance & Odor: Blue; Floral Scent

Dry: Selected strains, natural enzymes on a bran carrier

Concentration: Maximum viable CFU/gram, strain and type dependent

Form: Free Flowing Powder

Color: Light Brown

Odor: Grain Like pH:

Neutral

Effective pH Range: 5 – 9

Effective Temperature Range: 50 – 110°F

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Example Project - Bunker “C” Fuel Oil Bioremediation



Old wooden fuel storage tanks were excavated
6,000 cubic yards of contaminated soil was
spread over a 4 acre area in treatment parcels
1 foot deep.



BioWorld Hydrocarbon Degrading Microbes
were activated prior to application – then
added to a water truck.



Technicians added BioWorld
Bioremediation Enhancement Products to a
4,000 gallon water truck.



Water and the BioWorld Technology were
applied to the contaminated soil in the
treatment parcels.

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The separate parcels were treated with the BioWorld Technology on a monthly basis.



A close up view of the soil shows water and BioWorld Product absorption.



The soil was frequently disced to promote mixing and aeration.



Some native plant life inhabited the site as the contaminant was degraded.



A cleanup level of 100 ppm TPH was achieved. The soil was covered with native plant life and could be safely used for cropland.

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Example Project - Tanker Sludge Bioremediation



A trucking company regularly washed their tanker units to eliminate cross contamination of various liquid products being transported. The wash water was stored in a metal storage tank prior to discharge into the municipal wastewater system.



BioWorld Bioremediation Enhancer, Hydrocarbon Digesting Microbes and General Blend Microbes were added several times to treat the mixed waste.

Note the sides of the tank – cleaned of sludge after treatment of BioWorld Products. Digestion of the mixed waste was visually apparent and a reduction in TPH and Oil/Grease concentrations was verified. The company saved substantially on wastewater discharge fees.

BioWorld Products used:

#75014 Bioremediation Enhancer

#32086 Hydrocarbon Digester Microbes

#36055 General Blend Microbes