



MICROBE-LIFT® Technology Cleans Up Petroleum Lagoon in Israel

Location: Oil Company, Jordan Valley, Israel

Background: Crude petroleum that had been collected from a transport spill was collected and deposited in a 100,000-gallon containment lagoon in the Jordan Valley, with the expectation that the petroleum would biodegrade over time.

Objective: After several months with little or no degradation observed, alternatives were evaluated to accelerate the petroleum breakdown. A recommendation was made to use bioremediation. After evaluating different microbial additives, **Ecological Laboratories** was contacted. **Ecological Laboratories** had utilized **MICROBE-LIFT®** technology very successfully in numerous petroleum clean-up applications.

Since the lagoon also contained municipal sewage there was adequate nitrogen and phosphorous present to provide the required nutrients for the petroleum degradation. In addition to the **MICROBE-LIFT®** formulation, FDG, a lipophilic surfactant, was applied to help solubilize the petroleum to make it more readily available to the microbes.



Fig. 1: The lagoon was not a pretty sight with oil scum over the entire surface.



Fig. 2: A close-up picture shows the extent of the oil and scum in the lagoon.

After inspection and evaluation of the lagoon, **Ecological Laboratories** developed a treatment plan as follows:

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|------------------------------|--|
| Day 1: | Add 300 mls. FDG (lipophilic surfactant)
Plus 600 mls. MICROBE-LIFT® formulation |
| Every three days thereafter: | Add 70 ml FDG & 150 mls. MICROBE-LIFT® formulation |
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Fig.3: Treatments were mixed with water and sprayed over the surface of the lagoon to provide maximum contact with the surface oil.

MICROBE-LIFT® Technology Cleans Up Petroleum Lagoon

Results:

After treatment, the water was dramatically cleaner with no visible oil scum on the surface.

The primary parameter for monitoring the crude petroleum breakdown was Total Petroleum Hydrocarbons (TPH). Other parameters tracked were Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Soluble COD, and Total Suspended Solids (TSS). Results from the outside lab testing of these parameters are shown below:

Initial, Pre-trial data (mg/l)					
BOD	COD	Soluble COD	TSS/TPH	TPH	
1,900	12,900	268	55,427	25,000	
After three weeks of treatment (mg/l)					
BOD	COD	Soluble COD	TSS/TPH	TPH	
568	4,900	268	1,750	2,915	
Percent removal in 3 weeks					
70%	62%		97%	88%	

After three weeks of treatment, a reduction of almost 90% of the TPH was observed. While 60-70% reductions in BOD and COD were observed. The BOD numbers were likely artificially low due to the lack of the seed's acclimation to petroleum, which is known to inhibit microbial activity. Soluble COD did not change, due to that fact that as soluble COD is broken down more is solubilized by a combination of the added surfactant as well as biosurfactants produced by the bacteria. Generally, after all of the non-solubilized petroleum is solubilized and broken down, the soluble COD will drop to non-detectable levels.

Based on the three-week analytical data and physical observations, no further analytical testing was performed to save added cost as no more petroleum was observed in the lagoon. The initiation of the degradation had been confirmed.

This was another highly successful application for the degradation of petroleum oil.

For more information on **MICROBE-LIFT®** Technology contact
Ecological Laboratories Inc.
www.EcologicalLabs.com
CS14204



Effectiveness of Microbe-Lift® Bacteria Mixture in Bioremediation of Petroleum Contaminated Soils at Mostardi-Platt Plant

January 4, 1993

Ecological Laboratories, Inc.
P.O. Box 132
Freeport, New York 11520

Attention: Mr. Barry Richter, President

Gentlemen:

Effectiveness of Microbe-Lift Bacteria Mixture in Bioremediation of Petroleum Contaminated Soils

MOSTARDI-PLATT ASSOCIATES, INC. (MPA) has prepared this letter to inform you of the preliminary results of a controlled experiment involving the full-scale field application of Microbe-Lift for remediation of petroleum contaminated soils. In this experiment, four relatively uniform soil cells, with volumes of approximately 30,000 cubic feet each, were to be remediated by bioremediation. The contamination involved was a heavy fraction of petroleum.

Three of the four cells have been treated using an application technique developed by MPA that incorporates the Microbe-Lift bacteria mixture, and the remaining cell was left in its natural state as an experimental control. No nutrients or enzymes were introduced to any of the four cells. The systems have since been closely monitored for indications of microbial decomposition of the petroleum product present in the soils. Data collected during the first two months of activity indicate a 78% increase in biodegradation of petroleum in the cells treated with Microbe-Lift, over the untreated cell. MPA will continue this experiment and inform you of the progress achieved using your product.

Sincerely,
MOSTARDI-PLATT ASSOCIATES, INC.

Douglas M. Waring
Environmental Engineer

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For more information on **MICROBE-LIFT®** Technology contact
Ecological Laboratories Inc.
www.EcologicalLabs.com
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