OIL SPILL EATER INTERNATIONAL, CORP.

P.O. Box 515429
Dallas, Texas 75075
Ph: (972) 669-3390
Fax: (469) 241-0896
Email: oseicorp@msn.com
Web: http://www.osei.us

March 23, 1990

OIL SPILL EATER II
BIODEGRADATION TESTS
CONCLUSIONS

These tests were conducted by the University of Alaska in Fairbanks, AK. The first test was on a heavy-end hydrocarbon (Hexadecane), which is left over once the light-ends volatize off. The mineral nutrients in nature refers to the use of Alaskan Sea Water used to perform the test. At 50 to 1, it shows good reduction and if the test would have continued another 48 hours, the results would have been substantially increased. The OIL SPILL EATER II has a good food source for bacteria and there was more food source than sea water ratio to grow a large colony quickly; therefore, the bacteria engulfed the food sources in the OSE II and slowly converted to hydrocarbons. Once all the OSE II food source runs out, then the only food source left are the hydrocarbons—so they switch over to stay alive. At 1 to 500 and 1 to 1000 absolute biodegradation was proven, the bacteria colonized quickly and ran out of food source because they started with less food source. The bacteria switched over quickly and a dramatic reduction in hexadecane was accomplished.

The second test was run on Naphthalene using minerals and nutrients (Alaskan Sea Water). Naphthalene is a polynuclear aeromatic hydrocarbon and are harder to break down than heavy-end hydrocarbons and they are the most toxic. These tests also show that OIL SPILL EATER II is a very effective means of mitigating naphthalene, a PAH which EPA's Dr. Al Venosa deems the hardest target compounds to Bioremediate!

By: Steven R. Pedigo
Chairman

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OIL SPILL EATER II

A PROTEIN POWER PACKAGE

The lack of knowledge about biological treatment of hydrocarbons has led to slow acceptance of proven methods of Bioremediation, particularly with respect to oil spills. However, following the EXXON VALDEZ incident, the U.S. Environmental Protection Agency undertook the first major governmental effort to use biological methods for site remediation. Although the early results are mixed, EPA is to be commended for its efforts which included application of a French Product (Inipol EPA 22) to enhance microbial degrading of weathered crude oil from beaches. Inipol has been described as "Popeye's Spinach" supplement to enhance the rate and extent of hydrocarbon degradation by naturally occurring microbial populations. The Inipol formulation probably does enhance the growth of hydrocarbon degradation bacteria (although this has not been clearly shown in the field portion of the EPA Study), but suffers in that it contains the potentially toxic solvent, 2-butoxyethanol.

There are many other agents which have potential to stimulate hydrocarbon removal from contaminated environments. These range from the solvent based cleaners and dispersants to simple water soluble inorganic fertilizers. One such product that has shown great potential for enhancing hydrocarbon biodegradation in standardized laboratory tests at the University of Alaska Fairbanks is OIL SPILL EATER II. If Inipol is a "Popeye's Spinach" formulation for hydrocarbon degrading micro-organisms, OIL SPILL EATER II is a "Protein Power Package" of mineral nutrients, enzymes and a carbon source concentrated in a non-toxic oleophilic surfactant. The surfactant base dissolves into hydrocarbon matrices with the aid of protease and amylase enzymes that act as micro-surface cleaners. The mineral nutrients enhance growth of natural hydrocarbon degrading micro-organisms with the pulse of easily metabolized carbon to quickly increase bio-mass. The high bio-mass, then begins to degrade hydrocarbon substrates and to product biosurfactants until the hydrocarbon substrate is depleted.

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In the aftermath of the EXXON VALDEZ Oil Spill, researchers from the University of Alaska evaluated the potential for naturally occurring micro-organisms to biodegrade oil contaminated beaches. Their studies showed that while natural micro-organisms have the potential to biodegrade both linear alkanes and aromatic hydrocarbons, their numbers and related metabolic activities can be substantially increased. In standard laboratory tests, these researchers showed that the marine formulation of OIL SPILL EATER II diluted into artificial seawater containing a consortium of micro-organisms and hydrocarbons from Prince William Sound, Alaska will degrade Hexadecane—300% faster than the same consortium amended with mineral nutrients and hydrocarbons without OIL SPILL EATER II.

By: Dr. Ed Brown
University of Alaska

DEB/AJL

OIL SPILL EATER CONCENTRATE
MINERALIZATION OF HEXADECANE BY A MICROBIAL CONSORTIUS FROM PRINCE WILLIAM SOUND, ALASKA (1)

Sample	Mineral Nutrients in nature HO OSE	Mineral Nutrients in nature 1/50 Dilution of Oil Spill Eater II	Mineral Nutrients in nature 1/500 Dilution of Oil Spill Eater II	Mineral Nutrients in nature 1/1000 Dilution of Oil Spill Eater II	Mineral Nutrients in nature 1/10 Dilution of Oil Spill
Hexadecane Transformation (I transformed to CO2) Mean of 3 trials	16	19.3	50	43.7	0
		Need more time so bacteria can use up molasses & convert to Hydrocarbon	300 increase proven efficacy Should totally eliminate Hydrocarbons		

1. Consortius was incubated for 70 hours with 100 mg of labeled hexadecane per sample.

Test Conducted at University of Alaska-Fairbanks

OIL SPILL EATER II CONCENTRATE
Mineralization of Naphthalene by a Microbial Consortius From
Prince William Sound, Alaska (1)
Alaskan Seawater

Sample	MINERAL Nutrients in nature No OSE	MINERAL Nutrients in nature 1/50 Dilution of Oil Spill Eater II	MINERAL Nutrients in nature 1/500 Dilution of Oil Spill Eater II	MINERAL Nutrients in nature 1/1000 Dilution of Oil Spill Eater II
N A P H T H A L E N E Transformation (% transformed To CO_2 Mean of 3 trials	3	29	46	27
		More time would have been allowed for the bacteria to completely use up the molasses and completely convert to hydrocarbon for its food source	1 5 3 3 % increase p r o v e n efficacy s h o u l d t o t a l l y eliminate raphthalene hydrocarbons	

1. Consortium (Alaska Sea Water) was incubated for 51 hours with 100 mg of labeled Naphthalene per 10 ML sample.

Test conducted at the University of Alaska
1/9/90