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## OSEI Corporation Summary

### US department of Interior study on the Characteristics, Behavior, & Response Effectiveness of spilled Dielectric Insulating Oil in the Marine Environment

The US department of Interior through solicitation number: M08PS00094, award number: M09PC002 through their Bureau of Ocean Energy Management and enforcement (BOEMRE) the old minerals management name paid for a study of dielectric oils ability to be dispersed, skimmed and bioremediated.

Page 12 starts the discussion on OSE II, and it states

#### ***“Bioremediation Study***

This bioremediation effectiveness testing protocol (CFR, 1999) was designed to determine oils ability to naturally biodegrade by quantifying changes in the oil composition resulting from biodegradation.

An EPA National Contingency Plan (NCP) approved product, Oil Spill Eater II (Oil Spill Eater International, Corp.), was include in the experimental design. Bioremediation testing on Oil Spill Eater II (OSE II) has proven it to be effective at degrading highly-saturated crude oils in the laboratory. The following test flasks (labeled with unique identifiers) were prepared and set up on an orbital shaker at day 0 to reflect the following treatment:

#### **Table 3. Bioremediation Study Sampling and Analysis Matrix**

Treatment	No. of samples at sampling times	Total No. of analytical determinations				
Day 0	Day 7	Day 28	Microbial Counts	GC/MS	Gravimetric	
Control	3	3	3	9	9	9
Nutrient	3	3	3	9	9	9
Product*	3	3	3	9	9	9

Control = Oil + Seawater

Nutrient = Oil + Seawater + Nutrients

Product = Oil + Seawater + Nutrients + Product

\*A NCP approved product, OSE II

A detailed description of the test procedure can be found in the Code of Federal Register Title 40, Chapter 1 Part 300”.

The study shows OSE II is very effective at remediating the dielectric oil. The study has some problems in the way it was carried out limited the complete effectiveness of OSE II. For some reason unneeded nutrients were added to OSE II which increases the toxicity of the test flasks, which in turn slowed down the degradation rate.

The administrators of the test also added, non indigenous bacteria after the test was started, this also caused a slow down in degradation and prevented OSE II from showing 100% degradation rate of the dielectric oil in 28 days. When they introduced non indigenous bacteria they set up a competition between the OSE II enhanced natural indigenous bacteria, and the foreign, non indigenous bacteria added after the start of the test. While these bacteria are competing they are killing off each other fighting for the food source, the oil. This would lessen the amount of oil remediated at the end of the experiment, since some of the time is fighting for food source and being prevented from just digesting it to CO<sub>2</sub> and water.

The test however proved once again how effective OSE II is at remediating oil even dielectric oil. The results showed over a 67% reduction in the oil in 28 days. The reduction was exponential if you account for the slowdown due to the added bacteria, ( see the difference in remediation from day 0 to day 7 and from day 7 to day 28) so even with the adversities caused by the test administrators, it is easy to extrapolate, to understand OSE II would have only needed a few days more for 100% bioremediation of the oil, converting all of it to CO<sub>2</sub> and water.

This test also tested dispersants and mechanical skimming of the oil as well. The dispersants, Exxon’s corexit 9500 and 9527A respectively showed poor results as the temperature decreased. Once again however dispersants do not clean up oil, it disperses oil into the water column, which is the equivalent of spreading the impact of the oil into the area of the water where 60% of the marine species live, adversely effecting these species ability to survive.

The BP Gulf spill also proved that both corexits eventually sink oil to the seabed increasing the spills impact to an additional area killing these species and destroying their habitats. Then the Gulf spill proved that the sunken/dispersed oil then migrates to the shoreline, impacting yet another area, where the same oil has to be addressed a second time. This is an absolute needless destruction of natural resources, and species, with the use of these toxic dispersants. Both Corexits were also found to be very toxic and deleterious by themselves to marine and wildlife species as well as to seabed, water column and shoreline flora and fauna. The Woods Hole Oceanographic institute also discovered that both corexits prevents oil from degrading, which means these dispersants are going to increase the time the oils toxicity will effect the environment.

This study was performed due to the fact a spill could impact the Nantucket sound, Cape cod, and Martha's Vinyard area in the US. The EPA/RRT, federal, state, local governments, and residents now have a choice, mechanical skimming, that will only get somewhere between 2 to 8% of the oil, dispersants that increase the oils impact to several additional areas, killing species, and destroying natural resources, only to have to address the same oil once again, once it comes ashore. Or OSE II, the product who's successful testing since 1989, and once again with this study shows OSE II limits the impact of the spill to additional areas, will not harm species, and converts 100% of the oil to CO 2 and water eliminating any additional steps, while protecting the environment. OSE II is far more economical than mechanical or dispersants. OSE II is simply cheaper, safer, and more effective, at cleaning up 100% of a spill.

This test along with the large number of tests already carried out on OSE II since 1989, proves once again OSE II is very effective at remediating oil and converting oil to CO2 and water. This Department of Interior test, through BOEMRE will now prove there is only one way to effectively clean up a 100% of a spill, preventing secondary impacts of the spill, and eliminating the entire spill to a safe non toxic CO2 and water. This study shows by the choice of NCP products for this test, that the best product tested at LSU in cooperation with the US EPA, and BP, was OSE II so OSE II was the best product tested for the BP gulf spill!