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Date August 7, 2010

Dear Sam Coleman, Al Armendariz, Admiral Zukunft, and Governor Jindal,

The Governor of Louisiana was presented a letter describing the devastation of BP's deep Horizon oil spill in the Gulf and its effects to the Louisiana coastland, and wetland regions; from James A Watson Rear Admiral USCG, and Sam Coleman, since he signed the letter. This letter shows some inability of the people and groups involved in this letter to fully comprehend the mode of bioremediation from start to finish. This letter was delivered to me, by Sanford Phillips, of LA DEQ at a meeting with the LA Attorney General on July 29, 2010.

In order for any scientist to review any mode of bioremediation they would first need to be capable of understanding the process of how a single celled organism adjusts to an influx of highly concentrated amounts of hydrocarbons into their environment. Then secondly how these organisms utilize hydrocarbons as a food source from start to finish. Without knowing these biochemical reactions it would be impossible to understand what mode of bioremediation is most acceptable.

The group was composed of scientist from EPA, NOAA, H-SERT, scientist from LSU, University of Louisiana Lafayette, University of New Orleans, Tulane University, and Southern University. This letter depicts past EPA experiences with Bio augmentation, and a type of bio stimulation.

Based on the literature published by EPA Bio augmentation is very limited in its capabilities, which is understandable, when you understand what happens to live single celled organisms when they come in direct contact with hydrocarbons, or any toxic material. The most negative aspect associated with bio augmentation in numerous foreign countries is the unintended consequences of using non indigenous organisms. While hydrocarbon degraders are ubiquitous, the problems and adjustment to high concentrations of oil is exacerbated by the addition of dispersants, that increase the toxicity of the oil, which thwarts degraders ability to proliferate, and utilize hydrocarbons as a food source.

The letter is somewhat contradictory in that the definition of bioremediation points to what is required for the maximum rate of bioremediation to occur, when it states “the rates and growth of degraders can be maximized by ensuring that concentration of nutrients (specifically nitrogen and phosphorus) and oxygen are present”, so the letter divulges what is required for maximum bioremediation. The letter goes on to state that “oil spills result in a huge influx of carbon into the impacted environment” this is proof you would need to add nutrients to the encroached eco system to balance the required nutrients for maximum bioremediation.

The contradictory part arises when the letter states that “these scientist also recognize that, in general, significant levels of nutrients in the form of nitrogen and phosphorus are likely to be present in the soils of Louisiana wetlands, and adding additional nutrients might offer little or no benefit to the eco system”. It is improbable to believe, there is significant levels of N and P, to balance the required nutrients needed for the elevated levels of carbon being deposited into the Gulf Coast environments. These eco systems tend to move toward equilibrium, and when you introduce large amounts of carbon it must be adjusted accordingly, for maximum bioremediation to occur.

This letter also states that an important aspect of the “BP spill is the fact that much of the oil reaching the shoreline is a stable water-in-oil emulsion that acts quite differently from no-emulsified oil that has not undergone the same type of weathering” This is a problem on several fronts. This means the carbon in the type of hydrocarbons present in the Gulf Coast environment is less available than would be otherwise. This means the less available pathways to the carbon will result in the oil persisting for an extended period of time, and causing the Gulf Coast eco system to be disrupted needlessly.

The letter further states, that “attention should also be given to bioremediation products having additives that may make the oil more bio available to sensitive aquatic life stages, thereby posing a greater risk”. Dispersants, is exactly what the EPA claimed do this, and the EPA approved the use of dispersants. However a product that makes the oil more bio available and causes the oil to float would alleviate the risk to aquatic species, and by brining the oil to the surface allows more oxygen to be available, which reduces any oxygen problems.

This letter did not mention OSE II or the means that OSE II promotes safe effective bioremediation. The EPA, NOAA and the scientist of this letter, seem to be suggesting that OSE II is the only means to remediate the BP dispersed oil and return the environment to pre spill conditions.

It would be hard for any scientist that understands the process involved for a hydrocarbon degrader to have a concern with the use of OSE II. OSE II emulates mother nature’s process exactly. When an oil spill inundates a particular area

hydrocarbon degraders react in several ways. First of all the hydrocarbon degraders that do not come into direct contact with the toxic oil react in several ways. Initially degraders separate themselves far enough to survive the toxic effects of oil, which is why you cannot directly apply bacteria to toxic oil. Next the surviving degraders react by releasing bio surfactant and enzymes. This is a painstaking and very time consuming process. These surviving degraders must release a quantity of bio surfactants and enzymes to a level that will affect the molecular structure of the hydrocarbons (detoxify hydrocarbons, and allow bound carbon to be accessed), in order to utilize hydrocarbons as a food source. Once there has been a sufficient amount of bio surfactants and enzymes released (keep in mind hydrocarbon degraders have to carry out life cycles and reproduce as well) the hydrocarbons /oil will become detoxified enough for the degraders to digest the hydrocarbons to CO₂ and water.

The EPA had obvious problems with proving non indigenous bacteria could remediate toxic oil. You kill living organisms when you apply them directly to toxic substances. Bio stimulators/Fertilizers have trouble maximizing bioremediation since it is virtually impossible to get the N and P levels balanced with the amount of available carbon in the spilled hydrocarbons. The EPA's experience with fast release fertilizers resulted in a large fish kill in the Delaware river when lead EPA research and development scientist Al Venosa Cincinnati Ohio, applied fertilizer in a large amount, which in turn nitrified the water and resulted in a large fish kill. However, the EPA's experience with slow release fertilizer has been better, the only draw back is the simple addition of Nitrogen and phosphorus, has been better than doing nothing but just minimally better.

The EPA has had great success with remediating oil that was similar to the BP Gulf oil spill in regards that it was less amenable oil to degradation due to weathering. The letter stated the BP oil is now less amenable oil to bioremediation. The letter did not mention OSE II, or its complete form of bioremediation. However the EPA has had actual experience with OSE II on a spill and they know OSE II makes oil more bio available. The EPA also knows through its own toxicity testing of OSE II, especially the nine (9) toxicity performed at Gulf Breeze laboratory by Hap Prichard, that there is no concern to aquatic life with the application of OSE II. The fact that OSE II causes oil to float, which was proven when the EPA required the OSEI Corporation to do a swirling flask dispersant test on with OSE II, proved OSE II causes oil to float. This alleviates the concern of adversely affecting aquatic species since the oil is held on the surface, which gives aquatic species room to escape oil or to avoid oil altogether.

The fact that OSE II emulates mother nature's process exactly means, to not use OSE II, is the same as rejecting doing nothing or adding nutrients, except for one aspect. OSE II carries out the same processes that would be carried out if you did nothing at all, OSE II carries out the same processes as nutrients or bio stimulation, which is only slightly faster than doing nothing at all, which this letter deems

acceptable. The separating aspect between OSE II, and bio stimulation is the speed at which the OSE II's more complete remediation occurs. Bio surfactants are used in all three, enzymes are utilized in all three, and nutrients are utilized by all three to complete cellular life cycles, and reproduction.

The difference is that a given area inundated with hydrocarbons will cause the death of hydrocarbon degrader numbers, coupled with the lack of nutrients, and other constituents, which slows remediation as well. OSE II solves all of these problems. OSE II offers no, non-indigenous bacteria. OSE II has bio surfactants at a level that will reduce the molecular structure of the hydrocarbon to allow its digestion, once the molecular structure of oil is broken down, OSE II reduces toxicity, adhesion, smell, diminishes fire hazard, and causes hydrocarbons to float. OSE II has enzymes that are developed in the manufacturing process to make sure there are, enough protein binding sites for the rapid conversion of indigenous bacteria over to the detoxified hydrocarbons. Finally OSE II contains the right balance of nutrients that include balancing the carbon being made available for digestion by the bio surfactants, and enzymes, for absolute maximum bioremediation to occur. Since OSE II is mixed with water from where the spill has occurred, then OSE II is enhancing indigenous bacteria, therefore OSE II is the most complete bioremediation system, which is why OSE II is the most proficient bioremediation process.

The letter mentioned doing nothing, which will merely allow a second Valdez to be established. Doing nothing, which is what was carried out for the majority of the Valdez spill, has taught everyone that the oil will persist for over 20 years and longer. Is BP going to pay damage claims for over 20 years? Adding nutrients only slightly increases the remediation process time, but either of these two options just allows for hydrocarbons to remain in a given area for a protracted time period, and this allows toxic oil to adversely affect a given area for an extended time period.

OSE II's complete bioremediation process allows for the rapid digestion of hydrocarbons to CO₂ and water. OSE II is the most efficient means to return any eco system to pre spill conditions. OSE II has been utilized on 14 separate successful demonstrations for the BP oil spill, and has proven over and over to be capable of remediating this BP oil, in less than 14 days after application of OSE II. This means limiting environmental damage over all other processes, which reduces clean up costs, and will allow businesses to carry out their intended functions, in less time than any other clean up option.

There are some conflicting statements in this letter, however it makes the case for the use of OSE II. This coupled with the review by the Coast Guard, which generated a letter to the FOSC to take action with OSE II for this spill. Four of the five Gulf states have directly requested the use of OSE II. It seems everyone wants and expects OSE II to be used to clean up whatever oil is left to be cleaned up in this spill on water, and in the marshes, or on the beaches!

Steven Pedigo

Chairman/CEO OSEI Corporation

CC Peggy Hatch, Beau Brock, Sanford Phillips,