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Practical response for volatile fuel spills on water (or land)

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Most published doctrine for diesel, gasoline or jet fuel spills on water is the simple recommendation that nothing can be done because the contaminant is light and spreads immediately, and the volatile compounds vaporize off over the next minutes or hours. The reality is that dispersed fuel like diesel can coalesce into droplets and travel with wave action. It can also adhere to suspended sediments which can then settle to the seafloor. And after the lighter constituents vaporize, compounds left behind are concentrated toxins. In areas where contamination is ongoing like a fuel station near a shoreline where sediment is more prevalent, the contamination can be measurable.The prevalent thinking is that indigenous microbes can remediate residuals in one to two months so damage is not likely to be persistent. This thinking, however, can be countered by the fact that these fuels are exquisitely and acutely toxic to flora and fauna, especially in shallow or shoreline areas. Die-off is fast and furious at a micro and macro level. There is currently a high acceptable level of loss of life by regulatory bodies, yet the authors of this report have proven that die-off can be significantly mitigated with timely intervention.

A broad-spectrum, adequately concentrated hydrocarbon-degrading natural exogenous microbial consortium can be ready for immediate deployment to remediate the spilled volatile contaminant. In addition to protecting a higher percentage of flora and fauna from toxins, health benefits would also be realized by the humans in the vicinity since fumes would be eliminated very quickly.Microbes that eat oil and petroleum distillates work at the surface level – the interface where oil molecules are accessible, and water and oxygen are also readily at hand. Since diesel and gasoline are so light and thin, the microbes easily devour their way right through it. The odors are gone almost immediately after the biotreatment contacts the spill. And the microbes attach to the petroleum molecules and follow them wherever they go – a significant benefit where strong currents spread a plume. The microbes stay attached until the pollutant is consumed – metabolized at the molecular level.

Tactical methods of treatment will be discussed through scenario-based drill examples, including 1) typical spill types (example, ongoing fuel dock drips and spills) 2) application methods (example, surface spreading, and/or mix and spray) and 3) challenging scenarios (example, contaminated water with fast-moving currents, fouled beaches or rocky or vegetated shorelines.) 4) methods for soil and hard surface spills can be addressed as well, given the close parallels.

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