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EnviroZine
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Oil Spills – The Burning Question

News that an oil tanker has capsized, run aground or collided with another ship immediately raises concerns about the devastating effects of the oil spill on shorelines, waterfowl and wildlife. Containing the oil spill as soon as possible can greatly reduce the impacts on the environment. Tests now show that controlled burning, once perceived as doing more harm than good by releasing harmful pollutants into the air, can actually be the best way to combat the problem.

A helicopter takes air samples over a burning oil slick as part of a field experiment to determine the emission levels from controlled burns

Despite the negative visual connotation of a thick black smoke plume, on-site burning has been proven through extensive laboratory and field testing to be a fast, effective and often environmentally acceptable oil-spill countermeasure. Burns rapidly reduce the volume of spilled oil, decrease or eliminate the need to collect, store, transport and dispose of large volumes of recovered material, and shorten response time-thereby reducing the chances of a spill spreading and harming aquatic or shoreline wildlife.

Yet concerns over atmospheric emissions, and a lack of understanding about combustion products and the combustibility of oil on water, have greatly limited its application. Over the past decade, an international group of scientists has been studying the various aspects of diesel and crude-oil burning. The focus of their efforts has been on measuring emissions to air and water. They have developed concentration prediction equations for more than 150 compounds or emission categories from numerous small burns and a major large-scale open-water burn. The equations are used to calculate safe distances and emission levels for various burn sizes.

Results of these tests show that levels of most substances released through the in-situ burning of crude oil are below human health limits—even within 500 metres downwind of the burn. As a matter of fact, if the oil were burned as a fuel source—as usually intended—it would generally emit higher total levels of pollutants to the atmosphere than it would in an in-situ burn.

Fast Facts

Burns are often used as an oil-spill countermeasure in the Arctic, on muskeg, swamps, and remote shorelines with no vegetation.

An international group of scientists and spill response specialists have done extensive lab tests and more than 45 large-scale burns over the past 10 years to study various aspects of diesel and crude-oil burning.

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If in-situ burning had been used on the 1989 *Exxon Valdez* spill off the coast of Alaska as the primary countermeasure, scientists estimate that over 60 per cent of the spill would have been destroyed quickly–compared to the actual clean-up cost of $2 billion over two years.

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The soot and residue is mostly made up of carbon with several hundred other chemicals present in very low concentrations. The residue itself is mostly unburned oil, which is sticky and fairly easy to recover using mechanical or manual techniques.

Contrary to what many people think, most if not all oils will burn on water if the slick thickness is at least two to three millimetres. Usually burning in situ requires slick containment, as oil spreads rapidly to a thickness of just a fraction of a millimetre on the open sea. Lightweight and fire-resistant containment booms are used to concentrate oil slicks so they will ignite easily and continue to burn efficiently.

Mobile instruments record the type and quantity of pollutants emitted at various distances from an experimental oil-spill burn.

Scientists hope that increased scientific and operational knowledge along with better awareness of the economic and environmental benefits of in-situ burning will increase the acceptability of this oil-spill countermeasure option-not only in North America, but around the world.

The Burning Question

In the Thick of the Slick

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Bréco deterring buoy (Bird scarer)

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What is the procedure for cleaning up oil spills? What equipment is used?