Prince William Sound Regional Citizens' Advisory Council
Scientific Advisory Committee
Dispersant Position Paper – April 26, 2006

I. Introduction

The primary oil spill response method in Alaska is mechanical containment and recovery. Another tool available to oil spill responders is chemical dispersants. Dispersants are a mixture of surfactants and solvents. When used, they are applied to an oil spill slick with the intent of breaking up the slick into smaller droplets that can be carried off by currents and biodegraded. Dispersant use is intended to prevent a surface oil slick from moving into sensitive environments such as the intertidal area.

II. Discussion

The Scientific Advisory Committee has made a concerted effort to understand the research and policy that drives dispersant decisions. There are three main issues that need to be fully addressed before an informed decision can be made by the regulatory community in Alaska to allow use of dispersants: effectiveness, the protection of the shoreline, and toxicity.

a. Effectiveness

It has not been demonstrated that the chemical dispersants (Corexit 9527 and Corexit 9500) stockpiled in the region are effective on Alaska North Slope (ANS) crude oil spills in Prince William Sound waters. There is little evidence that dispersants work on ANS crude in the temperatures and salinities found in Prince William Sound waters.

The sole application of dispersants in the region occurred during the *Exxon Valdez* oil spill and effectiveness was not successfully demonstrated. Other field studies (most notable the North Sea trials in the 1990s) are not applicable to the conditions found in Prince William Sound. Factors that limit the effectiveness of a given dispersant during a spill are complex and depend to some extent on unique and variable chemical compositions and physical properties of crude oil, as well as properties of the sea water such as temperature, salinity and mixing energy. The composition and physical properties of ANS crude oil in protected, low-salinity cold water environments such as those found in Prince William Sound suggest ANS is a poor candidate for treatment with chemical dispersants.

b. Protection of Shoreline

The main argument for the use of dispersants is that they may prevent an oil slick from reaching a sensitive shoreline. However, dispersants seldom, if ever, prevent all the oil from reaching the shore. The toxicity of this dispersant/crude oil mixture on the intertidal ecosystem has not been well studied. It is simply assumed that the damage to the shoreline by the undispersed oil slick would be worse than the damage that could be caused by dispersing the oil with chemical dispersants. It is widely known that the dispersed oil mixture is more toxic than either the dispersant or the oil alone. It is also widely acknowledged that the dispersed oil "cloud" in the water column will probably kill aquatic organisms. Furthermore, there are very few field studies looking at the long-term effects and bioaccumulation. There are too many unanswered questions to accept the argument that use of dispersants would cause no further adverse effects.

c. Toxicity

Chemical dispersants increase the amount of oil in the water column and introduce a new chemical mixture. The mixture of oil and dispersants is more toxic than each part individually and may enhance bioavailability and toxicity. Salinity and water temperatures found in Prince William Sound may add to this effect. The chemically dispersed oil may eventually make it to the beach in any case adding to the already lethal and sublethal effects of the oil.

d. Other Considerations

Lindgren, *et al*. presented the following table entitled *Pros and cons for the use of dispersants at oil spills*[1] which includes additional considerations.

PROS	CONS
• The oil does not remain on the water surface • Often the method that produces the fastest results • Compared to other methods, dispersants are most effective in weather conditions that create fast mixing water • Easy to apply • Prevents the oil from emulsifying • Grinds up the oil making natural decomposition easier • Seabirds and marine mammals can be saved • Prevents oil contamination of beaches	• Builds an oil cloud underwater and can produce harmful effects for aquatic organisms that would otherwise not have been affected • Not always effective on all oil types • Limited window of time for use (relatively short) • Application is only possible when the oil slick is visible • Must be used where water masses are large for dilution • Mixing of the oil and dispersants can be more toxic than each part individually • Few studies looking at long-term effects in the field • If the oil is not sufficiently dispersed, drops can coagulate again • Oil drops can settle • During beach clean-up, dispersants can increase the penetration of the oil into the sedimentation • Few field studies on the effects of bioaccumulation.

III. Conclusion

Until such time as chemical dispersant effectiveness is demonstrated in our region and it is shown to minimize adverse effects on the environment, the Committee does not support dispersant use as an oil spill response option. Mechanical recovery and containment of crude oil spilled at sea should remain the primary methodology employed in our region. The Scientific Advisory Committee will continue to monitor dispersant research and developments on behalf of the Prince William Sound Regional Citizens' Advisory Council.

[1] Lingren, C., H. Lager, J. Fejes. 2001. *Oil Spill Dispersants: Risk Assessment for Swedish Waters.* Stockholm, Sweden.