Scientific Advisory Committee Summary
"Stability and Resurfacing of Dispersed Oil"

The Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) has participated in many chemical dispersants projects to determine the dispersibility of Alaska North Slope crude oil and effectiveness of dispersants poised for deployment in Alaska during the next major oil spill. One area of research of interest to PWSRCAC is the potential for dispersed oil to resurface. The purpose of the report entitled "Stability and Resurfacing of Dispersed Oil" is to provide an overview of resurfacing of chemically dispersed oil.

Dispersants, which are mixtures of solvents, surfactants, and other agents, are used to remove oil slicks from the surface of the water by breaking up the oil into fine droplets. A successful application will result in the fine oil droplets mixing into the water column where they can be carried off by currents and subjected to natural processes such as biodegradation of oil by bacteria. The bacteria metabolize the oil in much the same way humans convert food into energy which reduces the volume of dispersed oil in the marine environment.

Resurfacing occurs when oil that has been broken apart by a chemical dispersant coalesces and resurfaces. Resurfaced oil may or may not form into a slick. Resurfacing is of concern because it is well known that chemically dispersed oil destabilizes after the initial dispersion. This report discusses the importance of this destabilization process.

The phenomenon of resurfacing oil is the result of two separate processes: destabilization of an oil-in-water emulsion and desorption (leaching) of surfactant from the oil-water interface which leads to further destabilization. The author of the report, Dr. Merv Fingas, reviewed the literature for oil dispersants as well as surfactants, to provide examples of studies and models as well as data from experiments and calculations relevant to the issue of resurfacing. Also discussed in detail are several factors that affect resurfacing such as temperature, salinity, and water energy.

It is the assessment of the Scientific Advisory Committee that resurfacing of chemically dispersed oil is an important aspect to the use of chemical dispersants that has not been well-defined or studied. A common argument for the use of chemical dispersants is to keep oil off environmentally sensitive areas. However, due to the potential of resurfacing, impacts cannot be so well-defined. The oil may simply resurface and impact another environmentally sensitive area.

In addition to the other research and literature reviews supported by PWSRCAC, this report adds to the growing body of knowledge that no experimental or at sea-trial evidence exists that indicates the common dispersants stockpiled in Alaska will be very effective in combating Alaska North Slope crude oil spilled in Prince William Sound.