

Dispersant Background and Frequently Asked Questions

Effective June 19, 2010

I. Role of Dispersants in the Spill Response

- ❖ Some of the oil that is being released the well site can be contained and recovered with booms and skimmers, or burned, when the weather is good and sea is calm. But it is difficult to capture all of the oil with these methods. Dispersants are used to break up the remaining surface oil before it can drift onto shore.
- ❖ Dispersants are a mixture of materials that break the oil into small particles that disperse through the water column, making it easier for the material to be diluted and to biodegrade. BP has received approval by the Coast Guard and EPA to apply dispersants on the water surface, and underwater at the well site nearly 50 miles offshore.
- ❖ Dispersants principally are used to prevent oil sheen from reaching the shore; generally they are not applied within 3 miles of shore.
- ❖ By removing oil from the water surface, dispersants reduces the risk of harm to seabirds and other species and the shoreline from the impacts of oil sheens atop the water. By diluting and dispersing oil far from shore, they reduce the risk that oil will wash onto sensitive shoreline habitats.
- ❖ This does not mean that the oil will have no impact on the environment -- some areas will be impacted. BP is working in cooperation with the Coast Guard, EPA, NOAA and other natural resource trustees to conduct extensive sampling of a wide variety of resources on and off shore, to monitor the potential effects of the spill and dispersants in the air, water and on land. Those data will be used to identify areas that are affected by the spill and need to be cleaned up and restored. It will be used to identify any natural resources -- such as fish, whales, sea turtles, or species -- that need to be restored (replaced). BP will be in a position to move forward proactively with cleanup and restoration, once the emergency response has been completed.
- ❖ We also hope to learn more about dispersants from this experience. Our initial tests show that when we apply dispersants underwater at the well site, we can use much smaller amounts of dispersant than we would need at the surface, and achieve the similar results. They also show that we can use dispersants underwater in good or bad weather, day or night, when other methods of containment can't be used. That kind of information might be helpful to other companies in the future.

FAQs

1. What are dispersants?

Dispersants are mixtures of solvents, surfactants and other additives that break up the surface tension of an oil slick or sheen and make oil more soluble in water. Dispersants do not remove oil from the water, but break up the oil slick into small droplets. These droplets disperse into the water column (or depths), where they may then break down further in the environment.

2. How do they help in the event of an oil spill?

Dispersants are used to minimize the environmental impact of an oil spill. By breaking up the oil sheen, dispersants are an approved method of response to an oil spill or release; they are regarded as one of the best ways to protect certain wildlife and to keep an oil sheen from reaching shore. Dispersant usage has been shown to reduce overall environmental impacts at the sea surface and shore in certain spills. (1993 Braer spill off Scotland, 1996 Sea Empress spill off Wales).

3. What eventually happens to the dispersant after it is applied and combines with oil?

Generally, when dispersants are deployed on the surface of spilled oil, the oil is broken up into tiny droplets that immediately sink below the surface where they continue to disperse. Under the current conditions, as BP presently understands them, the dispersant and associated oil become substantially diluted shortly after application. Most of the mixture will degrade within days to weeks given mixing conditions of wave and wind actions. Harmful effects, if any, from the dispersant would be expected to be localized to the areas close to application. Oil and dispersant taken up by fish generally would be expected to be metabolized within a matter of days to months. BP will be monitoring the behavior and degradation of the dispersant chemicals and oil. While the half-life of the dispersant is approximately in the days-to-weeks range, it is recognized that some elements in crude oil degrade more slowly, and degradation and other processes affecting half-life may be slower at depth.

4. Who makes the decision to use dispersants?

The federal government oversees the use of dispersants. Dispersant use has to be authorized by the Federal On-scene Coordinator. Dispersants can only be used in specified areas. The National Contingency Plan contains a list of pre-approved dispersants and their approved applications.

5. What are the trade-offs that have to be considered?

A decision to use dispersant involves balancing the risks to certain animals and plants at the water surface and in shoreline habitats against the potential risk to other organisms in the water column and seafloor. To minimize the risk to organisms, the National Contingency Plan restricts surface dispersant use to areas at least 3 miles offshore and where the water is greater than 30 feet deep. Approval would need to be obtained to apply a dispersant less than 3 miles of shore. BP is conducting unprecedented levels of monitoring to evaluate the potential effects on organisms in the deeper water column from subsurface dispersant use and to enable government decision-makers to make more informed judgments about balancing the risks of subsea dispersant application, surface application, and the risks of having undispersed surface oil slicks.

6. What regulations have to be followed?

The use of dispersants should be consistent with the National Contingency Plan, which is the federal government's blueprint for responding to both oil spills and hazardous substance releases.

7. What monitoring is required?

There is a formal monitoring plan, known as the Special Response Operational Monitoring Plan, which is conducted by the US Coast Guard's Gulf Strike Team. A variety of monitoring is conducted, including the effectiveness of the dispersants and the dispersant and oil in the water column.

8. Are dispersants toxic?

The toxicity of dispersed oil is principally due to some components of the oil itself. A number of laboratory studies on a range of test species have confirmed that where there is acute toxicity, it generally is not in the dispersant but in some naturally occurring components of oil. When dispersants are properly applied, the overall risk to wildlife from the chemicals in the dispersants is substantially less than the risks from the oil. At the standard application rates directed by the Federal On-scene Coordinator, and under the mixing conditions of the ocean, dispersants are not expected to cause significant harm to most marine organisms in most circumstances.

Methods are in place to determine if chemicals from oil and dispersants are present in seafood and if consumption of the seafood might pose risks to humans. The States and NOAA close fisheries if there are concerns about chemicals in seafood, and the FDA is monitoring seafood to determine when harvests may resume.

9. What impacts are these toxic chemicals having on the Gulf?

BP has a large team of environmental experts who are working closely with, and in cooperation with the US EPA, the Coast Guard, the State of Louisiana, and other agencies that are part of the response effort. We are sampling areas where we have observed dispersants or oil, and we are using that data to monitor potential effects to the environment. This data will be used to identify areas that need cleanup, and areas where we may need to restore natural resources, such as shoreline habitat, commercial and recreational fishing, birds, turtles, or marine mammals, to name a few. Extensive data is being collected so we can fully understand the impact of this incident on the environment, and establish the foundation for restoration work to begin quickly.

10. What are the long-term health effects on marine life and humans of using such large amounts of dispersants?

o Potential effects on marine life

When evaluating the potential effects on marine life from dispersant use, it is important to weigh those potential effects in comparison to the benefits from dispersant use. As EPA has said, “we know dispersants are generally less toxic than the oils they breakdown,” but the use of dispersants is an “environmental trade-off.” When dispersants are properly applied, the overall risk to wildlife from the chemicals in the dispersants is substantially less than the risks from the oil. When dispersants are properly applied, the overall risk to wildlife from the chemicals in the dispersants is substantially less than the risks from the oil. At the standard application rates directed by the Federal On-scene Coordinator, and under the mixing conditions of the ocean, dispersants are not expected to cause significant harm to most marine organisms in most circumstances. The use of dispersants helps reduce the amount of surface oil that might reach marshes and other sensitive shoreline habitats, and helps reduce the amount of oil that sea birds and other wildlife may encounter floating on the water surface.

BP and the governmental response agencies continue to conduct unprecedented sampling to evaluate the potential impacts from dispersant use in the subsurface. To date, that sampling has not shown significant short-term or acute toxicity to the species tested. BP will continue to work with NOAA and other agencies to collect more data and to evaluate potential impacts of the dispersed oil on a wider range of aquatic life.

The EPA, NOAA, USCG, and the University of New Hampshire (UNH) Coastal Response Research Center recently convened a panel of more than 50 scientific experts to evaluate Dispersant Use and Ecosystem Impacts of Dispersed Oil in the Gulf of Mexico. These experts also concluded that: “...use of dispersants and the effects of dispersing oil into the water column has generally been less environmentally harmful than allowing the oil to

migrate on the surface into the sensitive wetlands and near shore coastal habitats.”

- Potential effects on humans – Potential effects on humans theoretically could occur through inhalation of dispersants at or near the site where they are applied, or through consumption of seafood that is tainted with oil and dispersants. For both of these potential exposure pathways, measures are being taken to ensure that human health impacts are minimized.

Workers applying dispersants at sea, and those working with them and near them, have the personal protective equipment recommended by the dispersant maker. In addition, air monitors on these boats are used to measure and maintain exposure levels within safe occupational exposure limits.

Aerial application of dispersants has been limited to day light hours, with the goal of keeping any surface spray 2 or more nautical miles away from any boats in the vessels of opportunity program. To date, air monitoring on those vessels has not detected dispersant components in the air, or has shown exposures are within safe occupational exposure limits.

The EPA, NOAA, USCG, and UNH scientific panel report that the use of dispersants appears to reduce the concentrations of volatile organic compounds (VOC) released from oil into the air, and this reduces the potential for VOC inhalation by all persons who work with the weathered oil.

EPA also conducts extensive air monitoring along the shoreline, to protect members of the public. To date, EPA has not detected any dispersant components in the air, meaning there is no inhalation risk for people on the coastline. EPA also has not detected any increase in volatile chemicals associated with the oil spill along with coastline.

With regard to seafood safety, methods are in place to determine if chemicals from oil and dispersants are present in seafood, and if consumption of the seafood might pose risks to humans. The States and NOAA close fisheries when there are concerns about oil or chemicals in seafood, and the FDA is monitoring seafood to determine when harvests may resume. Taste, odor and chemical risk thresholds are applied to determine whether seafood is safe to catch, market and eat.

12. Dispersants push the oil in the environment rather than removing it from the environment. This doesn't seem like a strategy that helps the environment.

Dispersants do transfer oil from the surface into the water column. Care is used to do this under conditions that allow rapid dispersion of the oil to low concentrations

that are unlikely to cause significant harm to marine life. When used properly, dispersants reduce the risk of environmental harm. Harm is more likely when surface oil is not captured in any boom, skimmer or other mechanical capture system, and is not otherwise dispersed. Surface oil poses known risks to birds, marine mammals, and the shoreline environment.

13. Aren't dispersants used to hide oil pollution and remove it from view? It seems like any oil that is not cleaned up will cause unseen harm.

The intent of dispersant use is not to hide the oil. The goal is to minimize the damage that would be caused by floating oil that cannot be captured in booms, skimmers or controlled burns, and that is not otherwise dispersed. Dispersed oil also degrades more readily than undispersed oil.

14. Doesn't the addition of dispersants just add toxic chemicals to an already polluted environment, poisoning marine life?

Dispersants or some of their ingredients may be toxic to certain aquatic species when tested in isolation. However, when they are used on an oil spill, they are applied to the water surfaces in small amounts over large areas, generally at a rate of 5 gallons per surface acre, in waters that range from approximately 10 meters deep near the Chandelier Islands to greater than 4,000 ft deep in proximity to the wellhead source. The dispersant quickly mixes with the water, and the resulting dispersant/oil particles are rapidly diluted and dispersed to low concentrations that fall below the acute toxicity threshold. Toxicity tests using samples of water taken around the well site at various depths, from near surface to very deep, do not show toxicity to the species tested. Additional tests will be performed with other species that may be more sensitive to oil or dispersants, to evaluate the potential risk to those species.

15. I've read that dispersants are unreliable because they don't always work. Why aren't you focusing on mechanical recovery?

Mechanical containment and recovery is being used at this site, but it is only effective in relatively calm seas and good weather, and it works best during daylight. Dispersants are an essential part of the response in other weather conditions, and dispersants can also be injected subsea at night. It is important to carefully assess the effectiveness of each method, and to use each where it is most effective and needed.

16. Isn't it true that the dispersant that you've been using was banned in the UK?

We are aware that two of the dispersant products that have been approved for use in the Gulf response -- COREXIT 9527 and COREXIT 9500 -- are not approved for use in the UK rocky shore tidal zone, due to concerns about the potential toxicity of

dispersants to limpets that are directly sprayed or exposed to the chemicals. UK regulators continue to allow the use of existing stockpiles of these COREXIT products away from rocky shorelines, with approval. The areas where BP is applying dispersants in the Gulf are not on or near the shoreline, and they have a different habitat, and US EPA and Coast Guard have approved both products for use in this area in this response.

BP is continuing to evaluate other approved dispersants for possible use at this site. EPA has asked BP to determine if there are other dispersants that are as effective as COREXIT, less toxic, and available in sufficient quantities for use. As BP completes its evaluation, it will update this document with further information about alternatives.

17. Do the dispersants bio-accumulate?

These substances have low potential to bioaccumulate. Although the Material Data Safety Sheets for one dispersant being used states that certain of its components have a potential to “bioaccumulate,” the known components of this dispersant are not expected to have a significant bioaccumulation risk, particularly given the rate at which dispersants are being applied in the Gulf (approx. 5 gallons/surface acre).

18. Are there less toxic or harmful dispersants available?

Corexit has been used because it was possible to obtain a large enough supply to meet the anticipated need for dispersant in the days immediately after the spill. BP identified 7 other possible alternatives. Some of these contain a nonylphenol polyethylene glycol ether, or compounds that are expected to degrade to nonylphenol (NP) once the dispersants are applied to the spill.

Considering the volume of dispersant that may be used in this incident, it is worth noting that NP is a potential endocrine disrupter identified by the U.S. EPA's Endocrine Disruption Screening Program, and the EPA has developed final marine acute and chronic water quality criteria developed for NP. NP also has been reviewed under the U.S. EPA's Great Lakes Binational Strategy, is on the OSPAR list of hazardous constituents for discharge into the sea, and is a priority hazardous pollutant under EU Water Directive. Although EPA has not routinely screened dispersants for NP content or risks, it may wish to do consider those risks here, based on the volume of dispersant that is needed.

Whether BP uses any of these identified possible alternatives, or any other alternative dispersant depends on whether the On Scene Coordinator and Regional Response Teams approve the alternative, and whether it is possible to get a reliable supply of the material that is large enough to meet all anticipated needs.