



# INITIAL EVALUATION GUIDE FOR DISPERSANT USE

29 October 2015

(rev. 29 November 2016)

## Guidance for Evaluating:

1. Dispersant Potential Effectiveness
2. Dispersant Net Environmental Benefit Analysis (NEBA)
3. Dispersant Feasibility

## Dispersant Potential Effectiveness

**ACTION: Collect information on the oil and environmental conditions to evaluate whether dispersants are likely to be effective in the specific scenario.**

NOTE: These parameters change with time, therefore regular updates are required to determine the **window of opportunity** for dispersant use. For example, weathering increases oil density, viscosity and water content, and is therefore likely to result in dispersant application becoming ineffective with time.

### Optimal Oil Properties

Note that these figures are guidelines for optimal values based on past experience. A small scale test will help to confirm whether the specific oil is dispersible.

Oil Properties	Optimal values
Density/API gravity	>17 (see Figure 1, below)
Pour point	>10°F (approx. 5°C) above ambient temperature (see Figure 1, below)
Viscosity	<10,000cSt (see Figure 2, below)
Emulsification	<50% water content
Thickness	> 0.01mm / 10µm - aim for the thickest part of the slick, dispersants are not typically applied to sheen

Probability difficult or impossible to disperse	Medium weight material. Fairly persistent. Probably difficult to disperse if water temperature is below pour point of material.	Lightweight material. Relatively non-persistent. Probably difficult to disperse if water temperature is below pour point of material.	No need to disperse. Very light weight material. Oil will dissipate rapidly.
	Medium weight material. Fairly persistent. Easily dispersed if treated properly.	Lightweight material. Relatively non-persistent. Easily dispersed.	
API Gravity	17 .953	34.5 .852	45 .802

Figure 1 Optimum conditions for dispersant use (from RRT 6 Dispersant Pre-Approval Guidelines and Checklist, 2001)

Oil type/viscosity	Dispersant effectiveness
Light distillate fuels (petrol, kerosene, diesel oil)	Dispersant use not advised These oils will evaporate and naturally disperse quite rapidly in most conditions.
Oils with viscosity up to 5,000 cSt	Dispersant use is likely to be effective
Oils with viscosity between 5,000 and 10,000 cSt	Dispersant use might be effective
Oils with viscosity above 10,000 cSt	Dispersant use is likely to be ineffective (though success is reported on oils with viscosity greater than 20,000 cP)

Figure 2 Oil type/viscosity for dispersant use (from IPIECA/OGP Dispersants: Surface Application, 2015)

### Optimal Environmental Conditions

Note that these figures are guidelines based on past experience. A small scale test will help to confirm whether the specific oil is dispersible.

Condition	Optimal values
<b>Wind</b>	5 to 25kt
<b>Sea state</b>	The higher the energy the better, up to 5 m waves
<b>Visibility</b>	>3 miles
<b>Ceiling</b>	>1,000ft (300m)
<b>Light</b>	Daylight
<b>Water depth</b>	Typically, a water depth of > 10m is recommended/required to aid mixing

## Dispersant Net Environmental Benefit Analysis (NEBA)

**ACTION:** Collect and collate information to answer the following initial questions for a NEBA.

Question	Information source
<b>Where is the oil?</b>	Aerial observations, maps
<b>Where is the oil going?</b>	Trajectory modeling
<b>What will the oil do without dispersants?</b>	Fate and behaviour modeling
<b>What will the oil do with dispersants?</b>	Fate and behaviour / trajectory modeling with dispersant
<b>Is dispersant application likely to be effective? For how long?</b>	See Potential Effectiveness above, consider the window of opportunity for dispersant application
<b>How are dispersants likely to affect the fate and behaviour of the oil?</b>	Compare trajectory, fate and behaviour modeling. <ul style="list-style-type: none"> <li>• Consider location, size/area/volume, depth</li> <li>• Water surface, water column, benthos, shoreline</li> <li>• Evaporated, dispersed (natural/chemical), emulsified, stranded, etc.</li> </ul>
<b>What are the available options (including “do nothing”)?</b>	Consider: <ul style="list-style-type: none"> <li>• Permitted/authorized tactics (relevant agency/ies)</li> <li>• Availability of equipment (logistics)</li> <li>• Feasibility of tactics (operations)</li> <li>• Ability to operate safely (Safety)</li> <li>• Potential effectiveness (Operations)</li> </ul>
<b>What is our current knowledge on dispersants and other options?</b>	General information (e.g. ITOPF TIP, IPIECA guide, etc.) Relevant studies and past incidents (e.g. TROPICS, BIOS, etc.)
<b>What are the Resources At Risk?</b>	GIS, ESI, other environmental economic, and human use sensitivity data, ICS 232 Form Consider shoreline, sea surface, water column, benthos
<b>What are the potential impacts?</b>	Consider toxicity and physical (smothering) effects, using: <ul style="list-style-type: none"> <li>• Oil trajectory, fate, and behaviour data</li> <li>• Potential (modeled) concentrations</li> <li>• Toxicity data</li> <li>• Resources at risk</li> </ul> Consider operational restrictions e.g. avoidance of specific areas, depths
<b>How does dispersant application compare with other available options?</b>	Compare: <ul style="list-style-type: none"> <li>• Effectiveness</li> <li>• Impacts / Net Environmental Benefit</li> <li>• Feasibility</li> </ul>
<b>How can we effectively monitor dispersant effectiveness and impacts?</b>	Consider monitoring options: <ul style="list-style-type: none"> <li>• aerial observations</li> <li>• UV Fluorimetry</li> <li>• Sampling and analysis</li> </ul>

## Dispersant Feasibility

**ACTION:** Collect operational, logistical and safety information to evaluate whether dispersant application is likely to be feasible, and answer the following questions:

Question	Information required
<b>Is dispersant application likely to be safe</b>	Consider the Health and Safety of response personnel and the public (Safety Officer)
<b>Is dispersant application approved in the country/region of interest</b>	Check with the relevant authority/documents, consider depth, location, and other restrictions
<b>Have specific dispersants been approved for use in the country/region of interest?</b>	Check with the relevant authority/documents
<b>Are approved dispersants available for use?</b>	Check contractors/equipment lists
<b>What is the most appropriate platform for dispersant application</b>	Consider the conditions (spill source, location, volume) for the following options: <ul style="list-style-type: none"> <li>• Aerial</li> <li>• Vessel</li> <li>• Subsea</li> </ul>
<b>Is the necessary application equipment (pumps, sprays, vessels, aircraft, etc.) available for use?</b>	Check contractors/equipment lists
<b>Do the logistics allow for dispersant application</b>	Consider travel distances and transportation options for mobilization and application
<b>Can the dispersant be applied within the Window of Opportunity?</b>	Consider mobilization time, time to application