

About

Dispersants are chemical agents used to break up oil into smaller droplets throughout the water column. Dispersants are applied to surface oil floating on water, or below the surface closer to an uncontrolled release of crude oil from a well blowout source. This series of fact sheets details monitoring requirements and how to apply the collected data to inform the use of dispersants under **Subpart J of the National Contingency Plan (NCP)**.

Description of the Requirement

The responsible party must use standard operating and quality assurance procedures to collect:

- A representative set of **ambient background** water column samples in areas not affected by the discharge of oil, at the closest safe distance from the discharge as determined by the On-Scene Coordinator, and in all directions of likely oil transport considering surface and subsurface currents.
- A representative set of **baseline** water column samples at depths and locations affected by the oil discharge before dispersant application.
- Daily **dispersed oil plume** water column samples at depths and locations where dispersed oil is likely present, considering surface and subsurface currents, oil properties, and other relevant discharge conditions.

Refer to the regulatory requirement in the Code of Federal Regulations (CFR): **40 CFR 300.913(b)**.

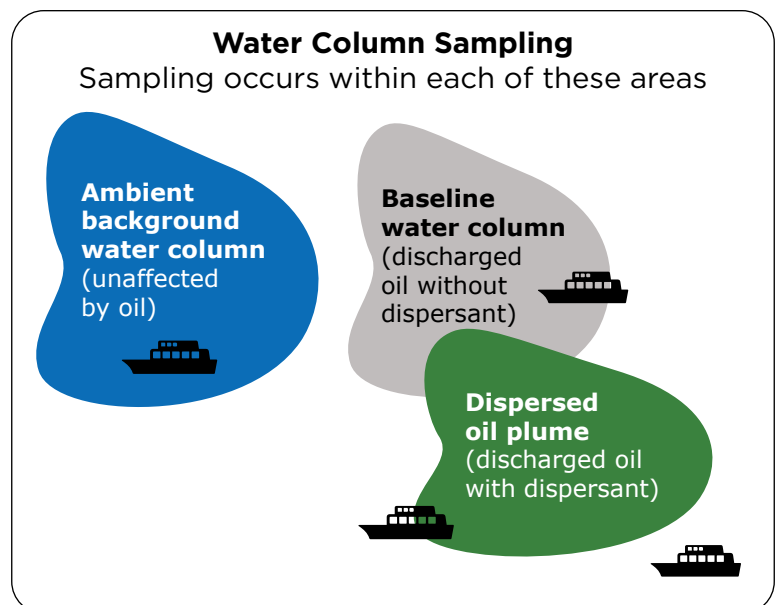
Water Column Sampling

Water column sampling captures water samples from selected positions in the water column to characterize:

- **Ambient background** conditions present in the location(s) unaffected by the oil discharge.
- **Baseline** conditions present in the location(s) affected by the oil discharge but where dispersant has not been applied.
- **Dispersed oil plume** conditions present in the location(s) affected by the oil discharge where dispersants have been applied.

Data obtained from water column sampling provide information on how the oil discharge, any associated underwater plume, and local environmental conditions change over time (Figure 1). Responders should consider water currents, oil properties, other existing sources of petroleum hydrocarbons, discharge scenario and geometry, and other relevant incident-specific conditions.

Figure 1: Water column sampling locations can vary both spatially and temporally throughout the event.



Credit: EPA

Water Column Sample Analyses

Water column samples are used to assess general water conditions and describe the behavior of oil within the water column. These data include oil droplet size distribution, fluorometry and fluorescence, dissolved oxygen, total petroleum hydrocarbon chemistry, methane (as applicable), heavy metals, turbidity, water temperature, pH, and conductivity. A Conductivity, Temperature, Depth (CTD) rosette instrument package can be used to collect water samples from various depths (Figure 2).

Using Water Column Data

Understanding the fate and concentrations of oil in the water column is critical to ensure decision makers have the information necessary to authorize or modify dispersant operations. Water column sampling provides reference data points for comparison throughout the response.

- **Ambient background** sampling characterizes water conditions unaffected by the discharged oil and serves to check instrument performance.
- **Baseline** data informs physical dispersion, reduces potential uncertainties when evaluating dispersant effectiveness in the field, and supports decisions regarding dispersant use.
- **Dispersed oil** plume sampling provides evidence of the dispersed oil plume's behavior, including delineating plume boundaries, and informs predictive fate and transport modeling.

Baseline and ambient background data can be compared with data from daily samples of the dispersed oil plume to evaluate dispersant effectiveness or changes in environmental conditions that may warrant a change in dispersant use.

▶ Decision Points for Responders

Monitoring and understanding water column conditions can help the On-Scene Coordinator identify circumstances, that may warrant an evaluation of dispersant use, including whether dispersant application should begin, continue, continue with modifications, or cease. Examples of conditions to look for include:

- Significant variation in the chemically dispersed oil droplet size ranges from that of physically dispersed oil, indicating potential dispersant effectiveness.
- Changes in the affected water column environmental conditions (e.g., decrease in dissolved oxygen) that may impact marine organisms.

Figure 2: CTD rosette illustrating sampling bottles (top of structure) and submersible sensors (bottom of structure).



Credit: EPA

Additional Resources

NCP Product Schedule Technical Notebook

A compilation of product bulletins summarizing data requirements and test results for dispersant products listed in EPA's NCP Product Schedule. The Technical Notebook includes information on dispersant application methods, toxicity and effectiveness, and physical properties.

Oil Spill Emergency Response – Monitoring the Use of Dispersants Fact Sheets

- Conductivity
- Dispersant Monitoring Quality Assurance Project Plan
- Dissolved Oxygen (Subsurface)
- Heavy Metals
- *In Situ* Fluorometry and Fluorescence Signatures
- Methane (Subsurface)
- Oil Droplet Size Distribution
- pH
- Total Petroleum Hydrocarbons
- Turbidity
- Water Temperature

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