

Shallow Subsurface Water Sampling Protocol for NRDA

Sampling Objectives

The focus of this document is collection of water samples by hand (i.e. without use of specialized sampling devices or equipment) in the shallow subsurface either by wading from shore or from a vessel. Water samples may be collected to support various objectives during a natural resource damage assessment. Samples may be taken in proximity to oiled biota to investigate an exposure pathway; beneath floating oil to determine the degree to which constituents are being released into the water column; to support exposure and transport modeling; to assist in evaluations of weathering and fingerprinting of oil; and for other reasons. This protocol does not address water sampling objectives; prior to collecting samples a plan should be drawn up that clearly establishes specific sampling objectives including the types and locations of samples to be collected. This protocol supports natural resource damage assessments by establishing the procedures that ensure sample integrity and the reliability of chemical characterizations as evidence in a damage assessment case. For detailed step-by-step instructions on how to collect various types of samples, refer to your sampling plan or other agreed upon SOPs.

Sample Volumes Required for Common Analyses

<u>Type of Analysis</u>	<u>Sample Volume</u>
PAHs (including alkylated PAHs) and TPH/THC	1 liter (collect two replicate 1-liter jars per station if possible)
Volatile Organic Analysis (VOA, sometimes BTEX)	40 ml (collect two 40 ml vials per station, if possible)

Sampling Equipment/Containers and Collection Methods

- Collect samples (wearing clean nitrile or other non-contaminating gloves) directly into the sample container from the water, to minimize risks of cross-contamination.
- Collect 1 liter water samples in glass containers with Teflon lined lids, certified clean for semi-volatile analysis. Amber glass is preferred to reduce light exposure, but not required. Leave headspace of about 1 inch; do not leave for prolonged periods in the light.
- To collect VOA samples, prior coordination with the receiving lab is recommended. Typically, 40-ml VOA vials preserved with 0.2 ml HCl should be obtained in advance from the lab; if not possible, obtain from a supplier that certifies them clean and pre-preserved for volatile analysis. When collecting VOA sample, fill vials so that they have no headspace or air bubbles remaining after lid is replaced.
- If oil or sheen is present, decontaminate everything that contacts the oil or sheen after each collection. Wash with laboratory-grade detergent and clean water, with a triple clean water rinse (distilled water from a local store is OK).
- Collect subsurface samples to characterize constituents present in particulate and/or dissolved state in the water column. Do not take samples from water surface to characterize water column concentrations (see separate protocol for collection of oil samples if the intent is to characterize floating oil).
- Containers for subsurface samples must be deployed and retrieved with the lid sealed so that the sample does not inadvertently include water surface constituents. Remove and replace the lid only at the sampling depth.
- Clear surface slicks prior to immersing sample container, but carefully so that the surface oil is not dispersed into the water column. Sweeping the area with sorbents is effective.
- On each trip, try to sample least oiled areas first, then more contaminated areas subsequently.

Preservation/Holding Times

- Immediately place all water samples into coolers and keep on ice (but do not freeze).
- 1 liter samples for PAHs and TPH/THC: These samples should be extracted by the lab within 7 days of collection. No preservative should be added. Keep samples at 4°C, and ship to the lab daily (if feasible) to maximize available time for processing by lab.
- 40 ml vials for VOA: These samples should be analyzed by the lab within 14 days of collection (and are only valid if pre-preserved vials are used as described above). Keep samples at 4°C, and ship to the lab daily (if feasible) to maximize available time for processing by lab.

Labeling / Documentation / Other Considerations

- Prepare sample labels following sample ID protocol provided in the instructions from the trustee data management team.
- If collecting a replicate water sample at each location as recommended above (i.e. as a backup in case of breakage or loss of containers during shipment and handling), both containers should receive the same sample ID (label the first container, “XYZ...1 of 2” and the 2nd container, “XYZ...2 of 2”) and both should be entered on the same line on the CoC form. If a sample is collected as a *duplicate* (not a replicate), it should receive a unique sample ID and be recorded on a separate line on the CoC form.
- Affix sample ID labels to each container and cover with clear tape wrapped around the entire container circumference.
- Preserve all original field notebooks, which should be signed and dated. If crossing out or correcting any entries, date and initial when making the changes. Documentation is critical; original records will be gathered and kept on file by the trustees.
- Record the presence of oil slicks, weather, wave conditions, etc. in field notes, which might suggest mixing of surface oil during sampling. Record GPS coordinates for each sample. Take photographs of the sampling locations and sample collection itself if possible; make sure each photograph or series can be later associated with the corresponding sampling locations (e.g. through use of GPS Photolink software or by keeping a detailed photo log). Do not delete or alter any photographs, the numbering sequence of photos uploaded from your camera must not have any gaps (see separate NRDA Field Photography Guidance).
- If collecting samples from a vessel, be aware of potential sources of contamination on the vessel (e.g. exhaust fumes, oily surfaces). Work up-wind of any exhausts. Segregate dirty/clean areas. Lay out clean substrates to work on and replace frequently.
- Ship known oil-contaminated samples separate from non-contaminated or low contaminated samples to reduce risk of cross-contamination.
- See related NRDA protocol documents for specific sample shipping and notification/ sampling documentation instructions.