

## Passive Sampling Methods for Contaminated Sediments: Practical Guidance for Selection, Calibration, and Implementation

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### ABSTRACT

This manuscript provides practical guidance on the use of passive sampling methods (PSMs) that target the freely dissolved concentration ( $C_{\text{free}}$ ) for improved exposure assessment of hydrophobic organic chemicals in sediments. Primary considerations for selecting a PSM for a specific application include clear delineation of measurement goals for  $C_{\text{free}}$ , whether laboratory-based “ex-situ” and/or field-based “in-situ” application is desired, and ultimately which PSM is best suited to fulfill the measurement objectives. Guidelines for proper calibration and validation of PSMs, including use of provisional values for polymer-water partition coefficients, determination of equilibrium status, and confirmation of non-depletive measurement conditions are defined. A hypothetical example is described to illustrate how the measurement of  $C_{\text{free}}$  afforded by PSMs reduces uncertainty in assessing narcotic toxicity for sediments contaminated with polycyclic aromatic hydrocarbons. The paper concludes with a discussion of future research that will improve the quality and robustness of  $C_{\text{free}}$  measurements using PSMs, providing a sound scientific basis to support risk assessment and contaminated sediment management decisions.

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