



Lower Duwamish Waterway Superfund Site

Polymeric Sampling Devices—Low Density Polyethylene Sampler (LDPE)

Summary

Media:	Sediment
Study Type:	Other
Technology:	Equilibration
Peer Reviewed:	No
Publication Date:	December 2021

Study Description

- Results are provided for the Lower Duwamish Waterway Superfund site (Port of Seattle, Washington) at 19 stations deployed and collected in 2014.
- LDPE passive samplers were deployed in sediment for analysis of polychlorinated biphenyl compounds (PCBs) as inputs to estimating concentrations in porewater and/or in water column above.
- Passive samplers were used to compare concentrations in sediment porewater and bottom water (water column just above sediment interface) and compute PCB flux in coordination with shear velocities determined by use of acoustic doppler current profiler.
- Actual concentrations were also compared to concentrations estimated using an inverse model, with differences being small. Implications for effects on food web modeling are discussed.

Remedial Phase

Passive samplers are used at the site as part of ongoing site activities, including evaluation of remediation pilot testing.

Outcome

Passive sampling concentrations in adjacent media (sediment porewater and water column) can be used to support flux measurement and direction determination. Sampling results in coordination with modeling efforts can be used effectively to develop whole-ecosystem distributions of constituents and also to identify areas with significant chemical sources or sinks (indicated by disagreement of model with sampling results).

Case Study Reference

Gschwend, Philip M., Eric E. Adams, Mandy Michalsen, and Katherine von Stackelberg. "Combining Mass Balance Modeling with Passive Sampling at Contaminated Sediment Sites to Evaluate Continuing Inputs and Food Web Responses to Remedial Actions." SERDP, December 17, 2021. https://serdp-estcp-storage.s3.us-gov-west-1.amazonaws.com/s3fs-public/project_documents/ER-2429_Final_Report.pdf.

Additional passive sampling work monitoring effectiveness of a remediation pilot study at the site is documented in a 2021 Pilot Study Report (Wood et al. 2021; Year 3 Monitoring Report – Enhanced Natural Recovery/Activated Carbon Pilot Study – Lower Duwamish Waterway <https://apps.ecology.wa.gov/cleanupsearch/document/106481>). Passive sampling is used as part of ongoing monitoring and performance metrics for remedial evaluation at the site in coordination with USEPA and Washington State Department of Ecology.