

APPENDIX G. PASSIVE SAMPLER CALCULATIONS

1 Equilibrium Corrections for Freely Dissolved PCB Congener Calculations

Equilibrium corrections were performed as described in the surface water quality assurance project plan (QAPP) (Windward 2017). Calculations are presented in Attachment G-1.

Briefly, measured fractions of performance reference compounds (PRCs) lost after deployment were used to calculate a regression line between the model-estimated partitioning constant (K_D) and the octanol-water partitioning constant (K_{OW}) (Apell and Gschwend 2014). This K_{OW}/K_D fit was used to calculate the fractional equilibration for each polychlorinated biphenyl (PCB) congener using a PRC correction calculator accessed via a graphical user interface, as described by EPA et al. (2017).

Appendix C of the QAPP (Windward 2017) presents the physical and chemical properties that were used to correct for nonequilibrium conditions. PRC calculator default values were used for the properties of the PCB congeners. If a loss greater than 90% was observed for a PRC, then analytes with a K_{OW} lower than or equal to this PRC were assumed to be at equilibrium with surface water in that sampler (Gschwend et al. 2014).

2 References

- Apell JN, Gschwend PM. 2014. Validating the use of performance reference compounds in passive samplers to assess porewater concentrations in sediment beds. *Environ Sci Tech* 48(17):10301-10307.
- EPA, SERDP, ESTCP. 2017. Laboratory, field, and analytical procedures for using passive sampling in the evaluation of contaminated sediments: user's manual. EPA/600/R-16/357. February 2017 final web version (1.0). US Environmental Protection Agency, US Department of Defense, Strategic Environmental Research and Development Program, and Environmental Security Technology Certification Program.
- Gschwend P, Tcaciuc P, Apell J. 2014. Passive PE sampling in support of in situ remediation of contaminated sediments - passive sampler PRC calculation software user's guide. ESTCP Project ER-2000915. ESTCP.
- Windward. 2017. Baseline surface water collection and chemical analyses - quality assurance project plan. Final. Submitted to EPA on August 2, 2017. Lower Duwamish Waterway Pre-Design Studies. Windward Environmental LLC, Seattle, WA.