

PS/SS: PBDE Summary Report

Estimated Cost: \$35,000
Oversight Group: Emerging Contaminant Work Group
Proposed by: Susan Klosterhaus, SFEI

Background

A PBDE Conceptual Model/Impairment Assessment (CM/IA) report was completed in 2007 to address concerns regarding the bioaccumulation, fate, and potential toxicity of polybrominated diphenyl ethers (PBDEs) in San Francisco Bay (Werme et al. 2007). The report concluded that elevated PBDE concentrations in sport fish and wildlife suggested possible impairment but that a definitive statement was not possible without defined standards (e.g., fish screening values). The report also identified a need for additional PBDE monitoring data in the Bay, particularly information on watershed loading. At that time, only a few years of occurrence data were available.

As a result of incorporating PBDEs into routine monitoring, the RMP now has over ten years worth of occurrence data for San Francisco Bay. New information on the potential for toxicity to Bay wildlife and humans eating contaminated Bay fish is also available. This information includes the release of California sport fish contaminant goals (Klasing and Brodberg 2011) and a bird egg injection study (Rattner et al. 2011), which have largely resulted in decreased concern for PBDE impairment in the Bay. A report that summarizes the current status of PBDE concentrations is needed to communicate to RMP participants, environmental managers, and other researchers that concerns over elevated concentrations in Bay wildlife are being addressed and that available information suggests there is currently no basis for regulatory action.

Study Objective and Applicable RMP Management Question

The objective of this effort is to draft a report that summarizes the current status of PBDEs in San Francisco Bay. This study would address the following RMP management question (MQ):

MQ1. Are chemical concentrations in the Estuary at levels of potential concern and are associated impacts likely?

- A: Which chemicals have the potential to impact humans and aquatic life and should be monitored?
- B: What potential for impacts on humans and aquatic life exists due to contaminants in the Estuary ecosystem?

Approach

SFEI staff will collaborate with the San Francisco Bay Regional Water Quality Control Board to develop the report. The report will include the following elements:

1. Bay occurrence data – The report will include a summary of the following RMP PBDE datasets, including concentration trends over time and congener profiles:

- Surface waters (2002-2011)
- Sediments (2002-2012)
- Deployed bivalves (2002,2003,2005,2006,2008,2010,2012)
- Sport fish (2000,2003,2006,2009)
- Cormorant and tern eggs (2002,2004,2006,2009,2012)

The report will also include the most recent information on the potential for BDE 209 to degrade to more toxic, lower brominated congeners.

2. Relevant toxicity information – The report will compare Bay occurrence data to available toxicity thresholds, including the California sport fish contaminant goals (Klasing and Brodberg 2011), the bird egg injection study funded by the RMP (Rattner et al. 2011), and the Canadian environmental quality goals (Environment Canada 2010), among others.

3. Occurrence data for PBDE replacements – The report will include a short summary of the work to date regarding the occurrence of the PBDE replacement compounds in the Bay.

Budget

Data formatting and analysis	\$15,000
Draft report	\$15,000
Final report	\$5,000
Total	\$35,000

References

Environment Canada. 2010. Risk management strategy for polybrominated diphenyl ethers (PBDEs). Chemicals Sectors Directorate, Environmental Stewardship Branch. Final revised: August 2010.

Klasing, S. and Brodberg, R. 2011. Development of fish contaminant goals and advisory tissue levels for common contaminants in California sport fish: polybrominated diphenyl ethers (PBDEs), Pesticide and Environmental Toxicology Branch Office of Environmental Health Hazard Assessment California Environmental Protection Agency.

Rattner, B., Lazarus, RS, Heinz, GH, Karouna-Renier, NK, Hale RC. 2011. Apparent Tolerance of Common Tern (*Sterna hirundo*) Embryos to a Pentabrominated Diphenyl Ether Mixture (DE-71). San Francisco Estuary Institute, Final Report. December 2011.

Werme, C., Oram, J, McKee, L, Oros, D, and Connor, M. 2007. PBDEs in San Francisco Bay, Conceptual Model/Impairment Assessment. Prepared for Clean Estuary Partnership. July 31, 2007.