

DIOXIN SYNTHESIS REPORT

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ESTIMATED COST: \$40,000
OVERSIGHT GROUP: Dioxin Strategy Team

Proposed Deliverables And Timeline

Deliverable	Due Date
Task 1. Simple mass budget model	Mar 2015
Task 2. Simple bioaccumulation model	Mar 2015
Task 3. Draft and final report	Sep 2015

Background

San Francisco Bay was placed on the State of California's 303(d) list of impaired waters in 1998 as a result of elevated concentrations of dioxins and furans (commonly referred to as 'dioxin') in fish. RMP studies of contaminants in Bay sport fish conducted every three years since 1994 have found that dioxin concentrations have remained unchanged over this time period and in some species, continue to greatly exceed screening values for human consumption. The available information for dioxin in the region was synthesized in a conceptual model/impairment assessment report in 2004 for the Clean Estuary Partnership. That report highlighted limited data and significant uncertainties and gaps in our understanding of spatial and temporal distributions of dioxin in Bay waters and sediments, and in estimated loading rates via various pathways. Data on dioxin in ambient open bay sediments has been roughly doubled since then, and the number of water locations characterized increased ten-fold. Dioxin in wetland sediment cores has also been characterized, suggesting a drastic decrease from recent (post WWII) past concentrations, whereas open Bay cores show more uniform distributions, with concentrations in upper sections higher than in very deep pre-industrial sediments, but generally similar to current surface sediment concentrations. Additional information on loads from pathways such as atmospheric deposition and stormwater runoff has been collected.

Together this information will be synthesized to update our understanding of environmental distributions and processes of dioxin, with the aim of addressing the priority dioxin management questions (described below) and identifying remaining data needs or gaps/uncertainties.

Applicable RMP Objectives and Management Questions

The work synthesized in the report addresses the following RMP Objectives and Management Questions:

MQ.1 Are chemical concentrations in the Estuary at levels of potential concern and are associated impacts likely?

- Are the beneficial uses of San Francisco Bay impaired by dioxins?

MQ.2 What are the concentrations and masses of contaminants in the Estuary and its segments?

- What is the spatial pattern of dioxin impairment?
- What is the dioxin reservoir in Bay sediments and water?

MQ.3 What are the sources, pathways, loadings, and processes leading to contaminant-related impacts in the Estuary?

- What is the relative contribution of each loading pathway as a source of dioxin impairment in the Bay?

MQ.4 Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased?

- Have dioxin loadings/concentrations changed over time?

MQ.5 What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?

- What future impairment is predicted for dioxins in the Bay?

Approach

The available (past and new data collected over the last several years) information will be applied to a simple one-box mass budget model and to a simple bioaccumulation model (both previously applied to PCBs and other organics) to identify and prioritize remaining data gaps and/or conflicts with current conceptual models and expectations, in order to evaluate the needs for and possible designs of future monitoring and modeling efforts.

Reporting

Results of applied models and associated monitoring data in various matrices for the estuary will be reported as a RMP Technical Report, to be delivered in the third quarter of 2015.

Proposed Budget

Estimated costs for each of the elements are presented. Even if data are not applied to numerical mass budget and bioaccumulation models, information will still need to be considered in the context of conceptual models of contaminant processes and fate/ bioaccumulation, so costs for the first two tasks will be reduced (roughly halved), but not eliminated.

Task	Estimated Cost
Application of data to mass budget	\$10,000
Application of data to bioaccumulation model	\$10,000
Draft and final report	\$20,000
Total	\$40,000