PROPOSED REVISIONS TO RMP OBJECTIVES FRAMEWORK

GENERAL GOAL OF THE RMP

Collect data and communicate information about water quality in the San Francisco Estuary to support management decisions

See Glossary at end of document (xxnot constructed yet) for definitions of underlined terms.

CORE MANAGEMENT (LEVEL I) QUESTIONS

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

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

Notes

- Concentrations can be measured in water, sediment, or the food web.

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

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

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

CORE MANAGEMENT (LEVEL I) QUESTIONS AND ASSOCIATED LEVEL II QUESTIONS

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

Notes

- xx none currently

A. Which chemicals have the potential to impact humans and aquatic life and should be monitored?

- Screening level evaluation of chemicals through review of existing information
- Captures need to identify pollutants of concern, including new and emerging pollutants
- Does not suggest that RMP will be performing laboratory dose-response studies of emerging pollutants

B. What potential for impacts on humans and aquatic life exists due to contaminants in the Estuary ecosystem?

This question drives thorough evaluation of the most serious concerns
This includes concerns due to:

- individual pollutants of concern
- the synergistic or antagonistic effects of pollutant mixtures
- the interaction of pollutants with other stressors

Includes concerns at regional and local scales
Sub-question: What are appropriate thresholds for concern?

Includes goal of finding the most effective indicators of effects to support decision-making. Possible examples include:

- biomarkers in fish that link to effects at the population level
- abiotic surrogates of risk and exposure (e.g., methylmercury in water – if a link to uptake in the Bay could be established)

C. What are appropriate guidelines for protection of beneficial uses?

RMP has a role in <u>providing the information needed</u> in development of guidelines. Examples include:

- Effluent limits – CTR monitoring in support of permit development
- Water quality objectives – e.g., copper and nickel
- Sediment effects thresholds – e.g., studies to evaluate whether effects in the Estuary do occur at the 1 ppm PAH threshold being applied by NOAA

This does <u>not</u> mean that RMP will be independently evaluating or recommending water quality objectives and other guidelines.

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

Notes

- Concentrations can be measured in water, sediment, or the food web.

A. Do spatial patterns and long-term trends indicate particular regions of concern?

- Spatial patterns indicate regions of concern, but persistence of patterns over time is also a factor
- Includes goal of finding effective analytical methods and sampling designs and to identify the best chemical species to monitorXx

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

A. Which sources, pathways, and processes contribute most to impacts?

Includes goal of finding the most effective indicators of loadings to support decision-making. Examples of loading indicators include:

- TSS (already used extensively)
- Other potential indicators (bioaccumulation assays, SPMDs)

Implies need to understand:

- Mass loads – essential for TMDLs
- Speciation (availability) of different inputs
- Temporal dynamics
  - seasonality
- Spatial patterns
  - Local impacts
- Linkage to impacts calls for modeling

For all of the major pathways:

- Wastewater effluents
- Urban runoff
- Nonurban runoff
- Atmospheric deposition
- Delta outflow
- Dredging and dredged material disposal
- Remobilization from Bay sediment
- In-Bay cycling
- In-Bay hotspots
- Wetlands

Processes include:

- Net methylation within the Estuary
- Erosion of buried sediment
- Diagenetic remobilization

B. What are the best opportunities for management intervention for the most important contaminant sources, pathways, and processes?

This is focused on intervention points for pathways and processes within the Estuary (e.g., net methylation hotspots, other pollutant hotspots)

The following questions are included under this broader question:

- Where are/were the largest pollutant sources?
- What processes cause release of pollutants from these sources?
- What are the best points for management intervention between source areas and the Bay?

- What management strategies are expected to be effective?Xx

C. What are the effects of management actions on loads from the most important sources, pathways, and processes?

- xx

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

A. What are the effects of management actions on the concentrations and mass of contaminants in the Estuary?

- Includes characterization of inventory.
- Priority management actions to monitor include:
  - Source control (including chemical bans)
  - Wastewater and stormwater treatment
  - Habitat restoration
  - Pollution prevention

B. What are the effects of management actions on the potential for adverse impacts on humans and aquatic life due to Bay contamination?

Captures need for sustained monitoring of risk indicators to determine whether risks are reduced

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

A. What patterns of exposure are forecast for major segments of the Estuary under various management scenarios?

Includes goal of finding the most effective modeling approaches, including:

- Conceptual models
- Simple quantitative models (if appropriate)
- Complex quantitative models (if appropriate)

Implies need to predict:

- Future loads from important sources and pathways
- Losses through different mechanisms (outflow, degradation, etc.)
- Recovery of each Bay segment (which, in turn, implies the need for accurate models – conceptual and numeric – of pollutant fate)
- Future trends in estuarine processes. Important estuarine processes include:
    - sea level rise
    - changing river inflows
    - rising temperatures
    - changes in sedimentation patterns
    - food web shifts
    - exotic species invasions

Management scenarios include:

- Source control (including chemical bans)
- Wastewater and stormwater treatment
- Habitat restoration
- Development

B. Which contaminants are predicted to increase and potentially cause impacts in the Estuary?

- Captures need to identify emerging pollutants based on chemical properties and actual or proposed uses

GLOSSARY

XX TO BE ADDED