DRAFT MEMORANDUM

August 22, 2005

To: RMP Technical Review Committee
From: Bruce Thompson, Jay Davis

Subject: Inclusion of Benthic Macrofauna in RMP Base Program

The RMP Benthic Pilot Study (BPS) was the first pilot study implemented by the RMP in 1994. It was conducted because the original RMP included no measures of biological effects on aquatic life, and such a component was believed necessary. All major estuary monitoring programs in the US include benthos and it is the most commonly monitored bioeffects component in US monitoring programs because benthic impacts are easily identified and understood (Stribling and Southerland, 1995). The BPS ended in 1997 because the Regional Board Staff had other priorites at that time. However, benthic sampling has been continued in the Estuary through 2004 (except 2002) by various other programs.

In 2003 and 2004, SFEI staff worked with SCCWRP on a project funded by the SWRCB that developed benthic bioassessment methods for use in California estuaries (Ranasinghe *et al*., 2004). SFEI and SCCWRP staff have subsequently developed sediment quality objectives (SQOs) for the SWRCB in 2004-05. The SWRCB will adopt regulatory SQOs in 2007. A draft policy document was presented to the Board, by staff, on August 5, 2005 (Beegan, 2005). That document included a framework for SQOs that was based on multiple lines of evidence, which included consideration of sediment chemistry, toxicity and benthos. This is a new regulatory approach that includes measurements of exposure and biological effects. The objective of State's SQO program is:

> "…to establish a condition that is considered protective, and then develop, refine and validate the tools so that the condition at a station can be measured relative to the protected condition. This program focuses on the linkage between three sediment related exposure receptor relationships:
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> · Benthic communities exposed directly to pollutants in sediment.
> · Human health exposed indirectly through fish and shellfish tissue.
> · Wildlife exposed indirectly through fish and shellfish tissue.
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> No other receptors are currently being considered for inclusion in this program. These three receptors were selected for the following reasons:
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> · Importance and ecological relevance
> · Linkage to polluted sediments
> · Knowledge and understanding of exposure and effects
> · Tools available to measure condition of receptors

The condition of these receptors could be used to determine if beneficial uses are at risk or protected relative to the condition of the sediment."

The SFBRWQCB will use SQOs for NPDES, 303(d), dredging, and remediation decisions. The RMP's role has been to provide Estuary-wide baseline data on sediment condition. The RMP currently includes sediment contamination and toxicity monitoring, but does not include benthic monitoring.

Since SQOs will become analogous to WQOs, we recommend that the RMP begin planning for the inclusion of benthic monitoring in the Estuary. Implementation could be achieved as outlined below.

Planning in 2006

- Establish a work group under the existing RMP EEPS structure. Workgroup members would include members of the Regional Board, SFEI staff, DWR staff, and interested RMP participants. The work group would review the work done to date by the SQO Science Team in preparing the SQO aquatic life assessment framework, draft objectives and a sampling plan for an RMP benthic component. Principles for this work may include:

    - The benthic component should be a RMP and DWR collaborative effort.
    - Random sampling in all Estuary assemblages (ala Thompson *et al.* 2000). consistent with the current RMP sampling design (Lowe *et al.,* 2005).
    - Use methods recommended in SWRCB SQO guidance. These methods are all well developed, including sampling, analysis, assessment tools.

- The product of this workgroup would be a concensus RMP benthic monitoring plan that has been reviewed by the EEPS Science Advisory Committee.

Implementation in 2007

- Benthic monitoring could be included in the 2007 RMP monitoring plan. This implementation would be coincident with adoption of SQOs by the SWRCB. This will assure that the Regional Board and San Francisco Estuary stakeholders can properly comply with implementation of the SQOs.

Proposed 2006 Budget and Schedule

Two meetings of the EEPS Benthic Work Team would be held to design and draft a RMP benthic monitoring component. SFEI / RMP staff time would be used to prepare for, and follow-up on meeting tasks and assignments. These meetings would be held in the first half of 2006. The draft monitoring plan would be submitted to the EEPS Science Advisory Panel by September 1, 2006 for review. A final plan will be submitted to the RMP TRC and SC for approval in the last quarter of 2006, so that implementation could occur in 2007.

This planning effort is estimated to cost approximately $10,000.

Long Term Budget Implications

The RMP benthic monitoring component will be determined by the work group and science reviewers. Therefore, we can only estimate long-term costs to RMP. Our best estimate at this time is three samples (minimum) in each of five Estuary benthic assemblages, for a total of 15 samples annually. DWR currently samples benthos in San Pablo, and Suisun Bays, and the Delta, and may be willing to provide their data from those samples, leaving the RMP to sample Central, and South Bays. Sample collection would occur during the normally scheduled RMP sampling cruises, adding minimally to sampling costs. Sorting and taxonomy of the benthic samples could be accomplished for approximately $3000 / sample. Data analysis, interpretation, and reporting would become part of the Pulse of the Estuary production and may require approximately 40 hours of staff time annually.

The above components suggest annual RMP costs of approximately $50,000.

References Cited

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Ranasinghe A., Thompson B., Smith R., Lowe S., Schiff K., 2004. Evaluation of Benthic Assessment Methodology in Southern California Bays and San Francisco Bay. Report to the SWRCB: RMP Technical Report 89.

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