

**REGIONAL MONITORING PROGRAM FOR WATER QUALITY
SUMMARY OF WORKSHOP ON OPTIMIZING STATUS AND TRENDS
MONITORING
September 12th, 2006**

Attendees:

Brian Anderson, UC-Davis
Mike Connor, SFEI
Jay Davis, SFEI
Bridgette DeShields, BBL/WSPA
Russ Flegal, UC-Santa Cruz
Naomi Feger, RWQCB
Ben Greenfield, SFEI
Andy Gunther, AMS
Tom Hall, EOA
Dane Hardin, AMS
Rainer Hoenicke, SFEI
Andy Jahn, Consultant
Jim McGrath, SFEI Board Member
Aroon Melwani, SFEI
Trish Mulvey, SFEI Board Member
John Oram, SFEI
Michele Pla, BACWA
Richard Looker, RWQCB
Sarah Lowe, SFEI
Francois Rodigari, EBMUD
Paul Salop, AMS
Genine Scelfo, UC-Santa Cruz
Meg Sedlak, SFEI
Chris Sommers, BASMAA/SCVURPPP
Karen Taberski, RWQCB
Dave Tucker, City of San Jose, BACWA

1. Introduction

Mike Connor opened the meeting with introductions and brief outline of the goals of the meeting.

2. Why Evaluate Status and Trends Elements?

Meg Sedlak outlined five reasons for evaluating Status and Trends (S&T) elements. First, our understanding of the Bay is changing. As examples, she mentioned the increase in phytoplankton blooms and the fact that the Bay is largely becoming erosional. Second, management of the Bay is changing (e.g., increase in wetland restoration and decrease in dredge disposal). Third, the regulatory focus is changing from water to biota

(e.g., the recent mercury TMDL in which fish and bird eggs are monitoring targets). Fourth, there are many pilot studies and special studies (PS/SS) which have been completed and which are ready to incorporate into S&T. Lastly, S&T elements have not been evaluated recently (as compared to the PS/SS which are evaluated annually.)

Francois Rodigari commented that in the process of prioritizing Status and Trends, it would be useful to know the regulatory priorities.

3. The Big Picture: Addressing RMP Objectives and Management Questions

As part of a short presentation on the RMP Objectives and Management Questions, Jay Davis developed a spreadsheet showing how well information on PCBs, mercury, and PBDEs in a variety of matrices were able to answer RMP Objectives and Management Questions. This spreadsheet is included in the appendix to this document (Item 3 Addressing Management Questions). It was observed that RMP Objective 3 (Sources Pathways and Loadings) and Objective 4 (Exposure and Effects) are largely addressed through PS/SSs. Chris Sommers noted that many of the questions under Objective 3 were being addressed by groups outside of the RMP. Andy Gunther noted that the list of chemicals and matrices was not comprehensive; Mike Connor indicated that the table was a tool to show how well (or poorly) S&T was able to answer the important questions. Tom Mumley commented that the missing S&T pieces cannot be addressed by simply reallocating resources within the program. Chris Sommers and Karen Taberski liked the idea of grouping the program elements by pollutant for this assessment.

Jay noted that the results of the interactive poster from the Annual Meeting suggested that respondents placed a priority on describing sources pathways and loadings and measuring exposure and effects. The results of the poster are included as an Appendix.

4. The Big Picture: Budgetary Strategies for Optimizing Status and Trends Monitoring

Ms. Sedlak reviewed the RMP budget which is approximately \$3.5 million and the annual average S&T budget which is approximately \$1.5 million. She indicated that approximately \$360,000 was funding for USGS to conduct sediment dynamics (\$250,000) and hydrography studies (\$110,000). The \$250,000 is a pass through from the US Army Corps directly to USGS. Because the RMP has limited control over the USGS funding, Ms. Sedlak suggested that this funding not be reviewed. Karen Taberski and David Tucker recommended that the \$110,000, which is not a pass through, be considered as part of the redesign.

Ms. Sedlak indicated that there were three options with regard to the budget: stay the course in which the existing S&T and RMP budgets remain unchanged; increase the funding to RMP (and S&T); or reallocate funding within the RMP (e.g., increase the pool of money dedicated to PS/SSs and decrease the amount available for S&T or visa versa).

Chris Sommers requested that analysis be completed to see how much money could be saved by reducing the number of analytes. Mike Connor suggested long-term monitoring of copper/nickel and funding for it could be folded into the RMP..

Trish Mulvey recommended that a Regional Monitoring Program for watersheds be developed. Karen Taberski endorsed this idea. Michele Pla indicated that BACWA preferred regionalizing data needs rather than segregating monitoring needs and ideas.

Jim McGrath commented that there was an equity issue with regard to the sources of contaminants: tributaries (large source of contaminants from Delta and watersheds); dredgers (reduction in source of materials); and legacy contaminants (no readily identifiable potentially responsible parties). Andy Gunther commented on how unique the program is with its local funding and perhaps an effort should be made to obtain State and Federal funding.

Action items: SFEI to determine potential savings by reducing analyte list. SFEI to include USGS hydrography (\$110,000) element in the redesign process.

5. The Process for Redesigning S&T

Ms. Sedlak outlined the goals for the day: to discuss and prioritize existing S&T elements, to discuss potential budget options; to identify areas where additional information is needed. Ms. Sedlak stated that for each element, a brief synopsis of the regulatory context, the important concepts, recent highlights, and potential design options would be presented. Ms. Sedlak stated that a second workshop would be held in November to complete the existing element discussion and to discuss new PS/SS which are ready for inclusion.

Ms. Sedlak also noted the important of long-term data sets for discerning trends. She also noted that there are tremendous variations in precipitation both within any given year and across years.

6. Water Chemistry

Jay Davis indicated that TMDL targets are shifting from a focus on water to a focus on biota (e.g., PCBs and Hg) and it may be possible to shift either the frequency of monitoring or the number of stations. The existing water sampling design was largely driven by copper in the South Bay and having sufficient data to discern whether the segment was below the threshold. With the revised copper water quality objective, it is necessary to have so many stations located in this area for this purpose. In addition, for several chemicals such as PCBs, much of the water column exceeds the threshold and will likely exceed it for an extended period of time. It may not be necessary to measure these chemicals every year.

A power analysis was conducted to determine the optimum frequency and number of stations based on an ability to detect trends or threshold exceedances with 80 percent power. Jay summarized the results of the power analyses in a table (Item 6 in agenda package and included in this summary). The chemicals that were chosen to evaluate were those with CTR exceedances. With a reduction of sites to 3 per segment (20 stations), 80% power to detect trends and exceedances of thresholds is still achieved. Dr. Davis recommended that the program shift from 31 stations to 20 stations with a potential

savings of \$120,000. Andy Gunther noted that the ability to detect the trends and threshold exceedances was based on 80% power – he requested that the data also be provided for 95% power.

Tom Mumley indicated that the forthcoming selenium TMDL would likely focus on fish and bird targets. The cyanide site-specific objective would require a regional ambient trigger.

Russ Flegal suggested that a study needs to be conducted across the channel to determine trace element remobilization from sediment. With regard to the recommendation of reduced frequency, Andy Gunther indicated that there maybe logistical difficulties (e.g., loss of institutional knowledge) if the span is too great. Naomi Feger indicated that water data are needed every two years for the 303 (d) listing. Tom Mumley recommended that SFEI evaluate the cost of reducing the frequency of expensive analytes. Don Yee recommended using one river site rather than two. There was some concern about whether the RMP was sampling the same water in the case where stations are close together and the sampling was moving along the tidal flow.

Dave Tucker wanted staff to make sure that we are not losing anything by altering the design set in place in 2002.

It was noted that some of the fixed sites have value for regulatory purposes, and these should be retained.

Action item: Provide the power analysis results for 95% in addition to the 80% that was presented at the meeting. SFEI to evaluate reducing frequency of chemical analysis for certain analytes. SFEI to make sure that we are not losing anything by altering the design set in place in 2002. Consider evaluating the influence of tides on sampling

7. Sediment Chemistry

Meg Sedlak presented regulatory context, important concepts, recent highlights and recommended options for sediment chemistry. There are few sediment TMDL targets (e.g., Hg and PCBs – there is a water column sediment target for SSC); the Sediment Quality Objectives are forthcoming (scheduled to be promulgated 2008). While Russ Flegal has identified some trends in surficial sediments for Hg, trends would be most easily identified using cores in depositional areas.

There was some concern that the RMP was not adequately characterizing the margins of the Estuary and that insufficient information exists about these areas. Richard Looker stated that this would suggest that the Program should continue monitoring annually. The randomized design implemented in 2002 samples the margins.

Jim McGrath asked whether the data supported Jaffe's conclusion regarding erosion in the Bay. Because the program samples surficial sediment (top 10 cm), it is difficult to answer this with existing program. Collection of cores would be helpful.

Naomi Feger indicated that dredging permits need pooled sediment data. Sarah Lowe indicated that the existing number of sites (47 – 40 random and 7 fixed historical sites) had been chosen to provide coverage across the Bay and was not driven by power analysis. Because there was not much of a savings going to a reduced number of sites, the group advocated leaving the number of stations at 40.

Karen Taberski was concerned about the seasonality of the data and the fact that sediments are most toxic in the winter. Meg Sedlak proposed that the program be continued annually with the sampling to alternate between wet and dry seasons. Much of the group supported this idea. This would provide a good link to characterizing peak sediment toxicity, with a greater potential for successfully conducting TIEs to determine the cause of toxicity.

Richard Looker suggested that spatial variation in erosion and deposition be taken into consideration in the sampling of sediments. Jim McGrath supported the concept of stratifying ("biasing") our sampling of sediment. Mike Connor suggested sampling weighted by the distribution of fine sediments in the Bay.

Don Yee suggested reallocating the number of sites per segment based on the area of each segment.

Tom Mumley recommended that we capture the data being generated at many contaminated sites on the margin – this may reduce the amount of sampling needed for these areas from the RMP. This would be a data integration task.

Action item: Prepare a sampling plan with existing number of sites that is conducted annually and alternates wet and dry sampling. Evaluate a weighted scheme for sampling sediments that accounts for factors such as erosion/deposition status and grain size.

8. Episodic Toxicity

Meg Sedlak presented regulatory context, important concepts, recent highlights and recommended options for episodic toxicity. With the changing use of pesticides (shift from OP to pyrethroids), the episodic toxicity program has moved from water column toxicity to sediment toxicity. (Fewer sites have been associated with water column toxicity (see article in 2003 Pulse).) There is a narrative objective for toxicity (i.e., no numerical standard).

Chris Sommers indicated that RMP episodic work may duplicate the work anticipated under the municipal regional permit (MRP). As a result of the permit, BASMAA anticipates looking at 10 sites per year for aquatic toxicity (once during the wet season and once in the dry season) and ten sites per year for sediment toxicity during storm and dry seasons. Tom Mumley indicated that the permit was still under negotiation and that it wasn't clear exactly what would be required in the permit.

David Tucker suggested that it would be more appropriate for episodic toxicity to be a special study rather than a core element in S&T. Tom Mumley indicated that the Water Board would rather see it as a sustained part of the program than a special study.

Action item: Stay with the status quo pending TRC review of plan for 2007.

9. Bivalves

Jay Davis indicated that bivalves represent one of the best trend indicators in the Bay. The RMP data coupled with the State Mussel Watch program has provided a continuous data set going back to the early 1980s. This data set has shown a decline in PCB concentrations. Jay recommended a reduced number of sites 7 versus 11. Paul Salop indicated that the savings would be relatively minimal (on the order of \$10,000) as that much of the cost is associated with the collection of bivalves and transplanting them. Meg Sedlak concurred. Andy Gunther cautioned on the risk of losing consistency in sampling methods under biennial or triennial designs.

Bruce Thompson made an argument for using resident bivalves, which provide the additional benefit of being useful in evaluating ecological risks.

Jim McGrath requested that the 95% power analyses be presented for bivalves and that any changes should be made only if we still retain 95% power.

Action item: Evaluate power reductions further with reductions in numbers of stations or frequency and better information on costs. Provide 95% power analyses.

10. Sediment Toxicity

Meg Sedlak presented regulatory context, important concepts, recent highlights and recommended options for sediment toxicity. Ms. Sedlak indicated that with the exception of 2004, the Bay frequently exhibits sediment toxicity. The causes of the toxicity are not well understood. Toxic Identification Evaluations (TIEs) suggest that a metal divalent cations are causing sediment toxicity in the north and south bays. In Grizzly Bay, copper has been implicated as the cause of sediment toxicity for bivalves.

Brian Anderson recommended that the work be conducted in the winter as it is very hard to get a strong enough signal in the summer to do TIEs. Brian recommended that winter sampling at the margins is the way to provide a good basis for TIEs. Brian stressed that he considers the amphipod test is more of a benchmark test with a stronger link to impacts, but this test has been less successful with respect to TIEs. The sediment-water interface test being considered by the State for SQOs yields very similar results to the elutriate test, but the elutriate test is easier.

Dave Tucker expressed interest in getting information on what was causing toxicity. Tom Mumley also indicated that it was important to determine the causes of sediment toxicity. Karen Taberski recommended that if the sediment chemistry moved to a

program of alternating seasons that the sediment toxicity program should be conducted in the winter of the same year as the sediment chemistry program.

Action item: Conduct in the winter biennially on the same years that sediment chemistry program is sampling in winter. Reduce number of sites to half (27 to 14).

11. Sport Fish

Jay Davis presented regulatory context, important concepts, recent highlights and recommended options for sport fish. Based on the current sampling design of five sites within the Estuary (Berkeley, Oakland, San Francisco, Richmond, and South Bay), it was noted that there was a gap for north Bay/Suisun. Jay Davis indicated that it was very difficult to obtain fish from this area, but the Fish Committee could reevaluate this given the possibility of de-listing this part of the Bay.

The general consensus from the group was that the sport fish are giving important information and that the program should remain with the status quo.

Action item: Stay with status quo of sampling every 3 years.

12. Wrap-up

Mike Connor summarized the meetings findings in a table which is presented below. Mike thanked all of the participants for coming.

Table 1
Summary of Recommended Options from the Redesign Meeting

Element	Existing Option		Recommended Option		Comments
	No. of Sites	Cost	No. of Sites	Cost	
Water Chemistry	31	\$460,000	20	\$340,000	Provide the power analysis for 95% in addition to the 80% that was presented at the meeting. SFEI to evaluate reducing frequency of chemical analysis for certain analytes and combining river sites.
Sediment Chemistry	47	\$190,000	47	\$190,000	Recommended sampling annually but alternating between wet and dry seasons.
Episodic Toxicity	variable	\$140,000		\$140,000	Recommended the status quo with the provision that the TRC review the proposed element for 2007.
Bivalves	11	\$100,000	Not yet clear		Evaluate power reductions further with reductions in numbers of stations or frequency and better information on costs.
Sediment Toxicity	27	\$100,000	14	\$85,000	Recommended reducing sites from 27 to 14.
Sportfish	5	\$83,000	5	\$83,000	Stay with the status quo. Fives sites conducted triennially.

**Appendix
Redesign Meeting Handouts**

