Bay RMP Technical Review Committee Meeting

December 9, 2021

Meeting Summary

Attendees (all participants remotely attending)

TRC Member	Affiliation	Representing	Present
Yuyun Shang	EBMUD	POTW	**Yes**
Mary Lou Esparza	Central Contra Costa Sanitary District	POTW	**Yes**
Tom Hall	EOA, Inc.	POTW	**Yes**
Ross Duggan	City and County of SF	CCSF	**No**
Anne Hansen Balis	City of San Jose	POTW	**Yes**
Bridgette DeShields*	Integral Consulting	Refineries	**Yes**
Chris Sommers	BASMAA (EOA, Inc.)	Stormwater	**Yes**
Shannon Alford	Port of San Francisco	Dredgers	**No**
Richard Looker	SF Bay Regional WQCB	Water Board	**Yes**
Luisa Valiela	US EPA	US EPA-IX	**Yes**
Ian Wren	Baykeeper	NGOs	**Yes**
Tessa Beach	US Army Corps of Engineers	USACE	**No**

Staff and Others

- Jay Davis - SFEI
- Melissa Foley - SFEI
- Paul Salop - AMS
- Tan Zi - SFEI
- Bryan Frueh - City of San Jose
- Don Yee - SFEI
- Martin Trinh - SFEI

1. Introductions and Review Agenda

Melissa Foley opened the meeting with a round of introductions and previewed the upcoming agenda. Of note are science updates from the modeling and nutrients teams, updates on the Status and Trends (S&T) redesign, and an overview of the 2022 workplan.

2. Decision: Approve Meeting Summary from September 22, 2021, and Confirm/set Dates for Future Meetings

Melissa asked the group for any final comments on the September meeting summary. Receiving no comments, she continued to confirm the dates for upcoming meetings. The Steering Committee meeting dates are set for January 26, 2022, and April 27, 2022. The Technical Review Committee will meet on March 23, 2022, and June 15, 2022. The later June meeting will allow members time to adequately review the workgroup proposals. Chris will find an alternate to fill his position, but can be reached during the review period.

Action Item:

- Update calendar invites for June 15, 2022, TRC meeting (Martin Trinh, December 16, 2021)

Decision:

- Ian Wren motioned to approve the meeting summary. Chris Sommers seconded the motion. The motion was carried by all present members.

3. Information: MYP and SC Meeting Summary from October 20, 2021

Melissa reviewed the October MYP and SC meetings, noting that this year's MYP meeting was a higher-level overview, rather than the normal more in-depth review of the budget and workgroup special studies. An emphasis was placed on incorporating studies that address management drivers, as indicated in the management table (page 6 of the MYP). The Water Board is helping update the TBD designations on the management table. Cross-workgroup coordination is also a key focus area, with emphasis on improving efficiency and streamlining the sharing process. Project proposals will be more targeted and vetted by advisors before being presented to the workgroups. In light of cross-workgroup coordination and the changing focus of the SPL Workgroup, in particular, the advisors for the Sources, Pathways, and Loading (SPL) and Microplastics workgroups are being reviewed.

For 2022, the RMP will follow the current format of five workgroup meetings, with the PCB and STLS strategy teams meeting as needed. Each of these groups will conduct a strategy update before the 2024 plan is released. The Emerging Contaminants Workgroup will conduct a strategy update and the Sediment Workgroup will develop a workplan in 2022. In 2023, the SPL

workgroup will conduct strategy and management question updates. The PCB workgroup updates the PCB strategy at the annual workgroup meetings, with an eye on the TMDL review in 2028. The Microplastics Workgroup will wait to receive guidance from the state before deciding when to conduct a strategy update. There is an ongoing discussion about including microplastics on the 303(d) list, which could spur the need for additional microplastic data. The Sediment Workgroup will update their management questions in 2023, following the workplan development. The two management questions of particular interest address dredging-related issues. Developing strategies will require additional staff time and funding than is currently planned in the budget. Melissa will report to the Steering Committee in January on her conversations with workgroups about the two-year outlook of these efforts. Strategies will develop as workgroup structures evolve, such as the SPL Workgroup assisting with the new Emerging Contaminants Workgroup's focus on stormwater.

Melissa suggested earlier feedback on special study proposals and strategies from our science advisors could generate more robust discussion across workgroups. Some suggested it might be more efficient to present once to a primary workgroup but, with workgroup meetings spread over two months, it could be hard to coordinate the timing between workgroups. Ian suggested highlighting specific studies at certain workgroup meetings. Melissa indicated that staff were starting to plan special study proposals as early as possible so coordination could happen across workgroups prior to all meetings. Thegroup expressed interest in reviewing high level project descriptions at the March TRC meeting. Chris indicated it would be helpful to receive a table with short project descriptions and rough budgets through email a month prior to the March TRC meeting, with Ian agreeing this will allow advisors to give more constructive feedback earlier in the process. Melissa suggested the TRC could also help identify potential connections between proposals before workgroup meetings rather than during, as has been done in the past.

Melissa followed the MYP meeting overview by reviewing the Steering Committee meeting. The SC approved the annual 3% fee increase in participant fees for the RMP for 2023-2025. The highlights of the 2022 Workplan and communications topics, such as the Annual Meeting, Update, Pulse, and Estuary News, would be covered in a later agenda item.

4. Discussion: 2022 Workplan Overview

Melissa began by reviewing the 2022 workplan and budget. The budget is nearly the same in 2022 as it was in 2021 as there were no fee increases. However, the expected revenue is different from the actual revenue because the amount contributed by dredgers was reduced by $200k to be more in line with likely actual revenue. The five-year Alternative Monitoring and Reporting Order from for the municipal wastewater dischargers expired in 2021; the Water Board issued a revised Order resulting in a $320k contribution earmarked for CEC studies. This new Order differs slightly from the previous version in that all entities are automatically enrolled and contributions will increase at the same rate as RMP core fees.

Melissa outlined the fiscal allocations for 2022. Similar to previous years, Special Studies and Status and Trends monitoring constituted just over half of the budget, totaling $1.1 million and $1 million respectively. Chris notified the group that the next version of the Municipal Stormwater Permit would require permittees to contribute an additional $100k for CECs. Bridgette inquired if these funds are earmarked for stormwater CECs specifically with Chris clarifying that these funds are more flexible but there is still a need for stormwater CECs data. Establishing a process to obtain these funds is ongoing. On a similar note, Luisa Valiela elaborated on this year's San Francisco Bay Water Quality Improvement Funds funding opportunity. Although competitive, the funding could support projects that funnel work through the RMP in many different categories. Luisa asked the group to think about ways to partner with the RMP to address data gaps or funding needs. Water quality is a high priority, with the strength of the proposal being more important than emphasis on any particular area. Luisa noted that some of the funds will be focused on diversity, equity, inclusion, and justice. Jay clarified with Luisa that the RFP would probably be released in March with another two months to submit proposals. If the RFP is released in March, successful applicants will be notified in June.

There is ~$200k unallocated in the 2022 budget, which the Steering Committee advised to leave unallocated for the time being, as the Status and Trends redesign and pilot studies will benefit from wiggle room as workplans solidify. In addition, these funds will likely be used to bolster Multi-Year Plan development and workgroup coordination. The S&T program budget for 2022 will cover wet season and limited dry season water sampling. There is a plan to collect and archive bivalves in 2022 pending further discussion; there is uncertainty about whether this will proceed but it has been included in the budget in the case it does. There will be a $400k pass through from Army Corps to the USGS, which constitutes their dredging fee, and is used to support the suspended sediment monitoring done by the USGS. Selenium monitoring will cost $127k; there is uncertainty if this will continue to occur annually or change to every two years. S&T sample archiving has been budgeted for $43k, reporting $10k, and interlab comparisons at $22k as the RMP shifts from academic labs to commercial labs. Melissa clarified the distinction between short-term and long-term archives. Short-term archives are stored for up to 10 years at -20 degrees C in Oakland to support CEC analyses, in particular, as well as interlab comparisons. The long-term archives are stored at NIST at colder temperatures (-150 degrees C in liquid nitrogen vapor) that support longer preservation times. Melissa concluded the agenda item by reviewing the special studies budget that had been approved by the Steering Committee in July. The distribution amongst workgroups was similar to previous years with Emerging Contaminants constituting $320k, Nutrients totaling $250k, SPL composing $193k, Sediment totaling $185k, PCBs constituting $108k, and Microplastics totaling $35k.

5. Discussion: Stakeholder Involvement in Integrated Modeling Project Advisory Group

Tan Zi gave the group an overview of the integrated modeling project being done by SFEI. For the past 20 years, SFEI has been linking empirical data to one-box models to predict Bay recovery. With the development of a dynamic watershed model, there is also a need to develop more advanced in-bay models with higher temporal and spatial resolution. Tan hopes this project can link, integrate, and advance modeling tools to better evaluate transport to and in the Bay.

Tan asked for volunteers to join an advisory group similar to the S&T redesign's Council of Wisdom (CoW). The CoW will provide technical input, in addition to management-level support, such as identifying modeling priorities: where to focus and what pollutants to focus on. Tan provided a brief timeline of the group's potential involvement, including meetings in February and May and a draft strategy review in the summer. Richard suggested bringing in a non-stakeholder with technical expertise in modeling, with Bridgette and Richard nominating Craig Jones. Jay notified the group that Craig was already a collaborator on the in-Bay modeling strategy and workplan, and is willing to be involved in this effort. Chris agreed technical expertise will help confirm if the models are making the right assumptions, with the CoW acting as a sounding board throughout the process. Richard thinks the group will allow for creative, out of the box discussions. Melissa suggested a similar process to the S&T Review such that experts react to ideas from stakeholders so the focus remains on informing management decisions. Chris, Richard, Ian, Yun, and Tom Hall expressed interest. Volunteers for this CoW will also be solicited from the Steering Committee in January.

6. Discussion: S&T Review Implementation

In this item, Melissa reviewed the revised Status & Trends design, incorporating all of the feedback provided throughout this redesign process. First, Melissa reviewed the different elements that make up the program, including pilot studies, core monitoring, and piggyback studies. Each matrix includes these three study types. For water, the RMP plans to continue S&T monitoring in the dry season for metals, and CTR parameters and aquatic toxicity at a reduced frequency (every 10 years). CECs will be added to dry season Bay-wide sampling in order to assess their status and trends. CEC wet weather pilot sampling will be added to evaluate the importance of the stormwater pathway at near-field stations while persistence will be evaluated at ambient stations. For the new wet season design, CECs will be sampled at four near-field stations after two storms per year for three years. For the ambient sites, samples from four fixed stations will be collected during the USGS nutrient cruises.Wet and dry season monitoring of CECs in Lower South Bay will allow for comparisons when different pathways are present. Finally, non-targeted analysis will be added to screen for CECs at the recommendation of the advisors, on a six to ten-year time frame. There is no defined design yet, but advisors advocated for the use of passive samplers in the wet season and a varied method of station selection.

For the sediment matrix, the outlined goals are the continued assessment of legacy contaminants trends, assessment of the status and trends for emerging contaminants, and testing conceptual models that indicate urban CEC concentrations decrease from near-field to margins to deep Bay stations. Other suggestions from the Science Advisors included increasing

the frequency of sampling from the current ten-year proposal, implementing sediment traps for CECs, aligning targeted sampling areas with stormwater sampling where possible, and reevaluating the need for benthic sampling. In the dry season, CECs (PFAS and bisphenols) and ancillary analytes will be sampled every five years at 12 stations targeted near inputs or key habitats for fish and birds. In the margins, CECs and ancillary analytes will be sampled every five years at 13 sites and every 10 years at 23 sites. Metals and PCBs will be sampled every ten years at 23 sites. In the open/deep Bay, CECs and ancillary analytes will be analyzed every five years at 17 sites, while metals, PAHs, and PCBs will be sampled every ten years. Based on recommendations from the Emerging Contaminants Workgroup, PBDE sampling will end in 2023 while fipronil and legacy pesticide sampling will cease immediately.

Melissa gave a brief review of the suggested designs for each biota type. Although many of the sampling frequencies are changing, Melissa noted the RMP would be willing to do additional monitoring in between the new longer stretches if there is a policy change that is expected to result in rapid changes in CEC concentrations. Connections will be made to sediment if possible.

The current design for sport fish sampling will remain largely the same: sampling every five years at seven core stations with the addition of PFAS to the regular suite of analytes. Legacy pesticides and dioxins will also be monitored each sampling round - biota are the only matrix still including pesticides (having been discontinued in water and sediment) and the only matrix including dioxins. PBDEs will undergo one more round of sampling. For bird eggs, the proposal is to maintain cormorant monitoring and discontinue tern monitoring. Sampling would be conducted every three years at three core stations throughout the Bay. Per the recommendation from the Emerging Contaminants Workgroup, PBDEs will be monitored in 2022 for a final time, while PFAS analysis will continue. Legacy pesticides will also be added. Advisors agreed that cormorant sampling would be sufficient for bird egg monitoring needs.

The bivalve design will undergo a significant change, forgoing sampling in channel stations in favor of switching to archiving tissue from shore-based collections the Nutrient Management Strategy is conducting. Jay noted that samples will be useful for PAHs and CECs, using PAH data to establish a baseline for oil spills. Jay will coordinate with the stakeholders he contacted last year to help develop an appropriate monitoring/collection design.

Prey fish may be added to Status and Trends in the future. Species of interest include silverside, topsmelt, and sculpin. In the meantime, potential special studies will be considered through piggybacking onto other collection efforts such as in Priority Margin Units (PMU), in Lower South Bay with UC Davis fishing efforts, and in wetlands during restoration project fish monitoring. This will be done in a five-year cycle at 12 stations. Melissa noted there was a significant overlap with sport fish and near-field sediment stations. Status and Trends sampling will be focused at pathway-influenced near-field stations for CECs.

Harbor seals will follow this same format, beginning as a special study for eventual inclusion into Status and Trends, likely with sampling done every five to ten years, including a long analyte list. The RMP has collected seal tissue samples over the years, including live capture and archived tissue. A special study has been proposed for 2023 to inform longer-term designs. This would most likely be a two to three-year pilot study in conjunction with the Marine Mammal Center. The ultimate goal of this study is to include harbor seals in Status and Trends.

Melissa noted the budget she was presenting excluded the USGS sediment monitoring and nutrient sampling. Melissa presented a possible schedule for the revised sampling program. The group suggested doing the dry-wet season water sampling pilot in three consecutive years rather than every other year. Chris suggested that having an off year could be good to adjust and adapt based on the data. Becky Sutton informed the group that the new commercial labs for Bay water CECs are much quicker than the academic labs that are being used for stormwater, so evaluating the data before the next season would be possible..For the North Bay selenium project, a data review will be conducted following the 2022 sampling season to determine if future sampling needs to be done annually or biannually Jay clarified that bird egg monitoring will happen in 2022 using the budget from 2021.

Melissa reiterated that this will be an adaptive process as the program learns more about how variable CECs are in space and time, which will inform the frequency of sampling. Chris emphasized that there will never be enough resources, with the program having to focus on adaptation and review. The Council of Wisdom will most likely have to reconvene as pilot studies are conducted and data are collected. Jay added that the CECs design has been greatly improved, especially in the near-field, although still weak in the margins and for sediment frequency. Mary Lou inquired about the water budget with Melissa clarifying that the increase in overall budget for water was due to the inclusion of OPEs, PFAS, and bisphenols.

7. Discussion: AQUA-GAPS Project Continuation

Diana Lin of SFEI introduced the Aquatic Global Passive Sampling (AQUA-GAPS) project to the TRC. AQUA-GAPS is a global project that monitors the spatial and temporal trends in levels of persistent organic pollutants (POPs). Diana reviewed SFEI's past involvement in this project, using passive samplers to monitor POPs in the Bay. The past pilot study received $10k in funding from the RMP, which covered equipment, boating, and staff training and monitoring. Although the group is still analyzing the global dataset, the Bay generally ranks in the upper quartile of global results. The group found a weak correlation between passive and grab sampling results. Participating in this study would provide opportunities to gain experience with passive samplers as well as gain international exposure. Jay added that being able to place Bay emerging contaminants in a global context would be helpful. Don advocated for the use of passive samplers, provided the results were contextualized as they can give a good indication of the magnitude of concentration. Melissa added that this would be a low-cost opportunity to see if passive samplers would be a worthy long-term investment for the RMP. Bridgette spoke to Danny Wreibel's lab at Texas Tech about using passives for CECs. Jay confirmed for Mary Lou that passives can be used to inform our modeling efforts.

8. Presentation: Update on Nutrients Projects

Dave Senn of SFEI gave an update on various projects conducted by the Nutrient Management Strategy, including funding provided by the RMP. Concerned with both the current and long-term concentration of nutrients in the Bay, a key point of emphasis are nutrient sources

to various areas and how habitats respond to, and influence water quality, including chlorophyll, dissolved oxygen, and harmful algal blooms.

Dave gave an overview of the annual monitoring work the RMP contributes to, including $250k each to ship-based sampling and moorings. There was concern the USGS would pull funding for the ship-based work, but they have since continued to support the research vessel and captain. Dave highlighted recent work monitoring relative chlorophyll-a using satellite data from Sentinel-2. Dave also reviewed past products and data applications, including continuous data in Lower South Bay and South Bay. Dave then reviewed next steps for the Program, which include further developing collaboration/coordination with the USGS and regional partners, while opening the program to additional investigators and local labs. There is room in the budget for this, with the opportunity to bring on close collaborators such as grad students who are conducting thesis work. Coordinating more with the DWR would allow the NMS to support station measurement in the shoal. Luisa agrees that it is more comfortable to approach agencies rather than private or public tech entities.

9. Discussion: Communications Update

For this agenda item, Jay gave a brief review of various RMP communication products. For the 2021 RMP Update, there was less material available than usual as the RMP had just completed an Update in 2020. The design department provided a refresh, and new photos were incorporated once the recent water cruise was finished. Jay informed the Committee that hard copies would be made available upon request.

Recently, the RMP has engaged with many stakeholders, fulfilling information requests. Jay presented to the San Mateo County CCAG Stormwater Committee in October. In November, Jay presented to the Water Board on PCBs, which was followed by Mark Johnson who spoke on cleanup methods. These talks were followed by a presentation to the Contra Costa Clean Water Program Management Committee in mid-November.

Jay then gave a quick summary of attendee feedback following the 2021 Annual Meeting. A total of 552 individuals registered with 400 unique viewers tuning in at some point during the day. There were a maximum of 320 attendees at any one time during the meeting, and 60% of responders attended all sessions. Jay reviewed some positive comments from the survey, with many applauding the speakers and presentations. However, there were some calls for more audience interaction, especially in the context of a long, completely virtual meeting. Ideas such as including Kahoots (for virtual interaction) or more polls were discussed. A hybrid format seems most likely for future meetings. Melissa confirmed that the Brower Center will be able to support such a hybrid format. The Center has been reserved for October 13, 2022, with a mandatory vaccination requirement to attend.

For the upcoming Pulse, the group recommended having the 50th anniversary of the Clean Water Act as the theme. The Committee recognized this opportunity to address the nuanced impacts of the Act, including its successes and shortcomings. A smaller group will convene in January to continue this discussion. The December issue of the Estuary News is

being moved to February. Possible topics include tire chemicals and particles as well as a diversity, equity, inclusion, and justice view on RMP methods.

Ian asked the group how to increase the RMP's exposure and involvement in environmental justice efforts. Jay stated that SFEI is very open to these opportunities, but have been limited by budgeting in the past. This is anticipated to change in the future, with upcoming events such as the PFAS in Bay Fish Forum headed by Becky. Community groups will be involved in both the planning and event itself.

10. Information: Status of Deliverables and Action Items

Recently completed projects can be found in the agenda package bibliography and include the microplastics stormwater conceptual model and the Ocean Protection Councilreport focusing on microplastic sources to and pathways to urban runoff. Kelly and Diana will provide an additional fact sheet in late March after they receive additional data from CalTrans. The RMP 2021 water cruise was completed in early October despite some delays. Finally, the non-targeted fire monitoring summary for managers (and accompanying journal article) have been completed.

Projects that are on the verge of completion include the North Bay selenium and margins data management projects, the development of sediment bioaccumulation thresholds, and the sediment model calibration (watershed dynamic model). Jay is waiting for advice before completing the In-Bay modeling strategy. Finally, the Bay bathymetry report is awaiting internal review, but the data have been released. Ian thanked Melissa for providing clear and concise updates to all of the projects.

11. Discussion: Plan Agenda Items for Future Meetings

Melissa previewed topics of interest to discuss at future meetings. Following the January Steering Committee meeting, the TRC will discuss the Multi-Year Plan strategy update. Richard Looker inquired about the status of the ocean acidification cruise. Melissa informed the group that NOAA came into the Bay to collect carbonate chemistry samples in September and would follow up with the group on this in March.

12. Discussion: Plus/Delta

Despite the meeting's lack of eggnog and holiday chocolates, the group especially commended the science presentations from SFEI. Luisa applauded Dave and Tan's presentations while Mary Lou remarked that Melissa gave a great update on the S&T redesign. Overall, the group appreciated everyone's sustained effort and focus throughout the day.