RMP REGIONAL MONITORING PROGRAM FOR WATER QUALITY IN SAN FRANCISCO BAY

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RMP Sources Pathways and Loadings Workgroup Meeting

May 26-27, 2021 (teleconference)

Meeting Summary

Advisors	Affiliation
Tom Jobes	Independent
Jon Butcher	Tetra Tech

Attendees:

- Alicia Gilbreath (SFEI)
- Bonnie de Berry (EOA/SMCWPPP)
- Bryan Frueh (City of San Jose)
- Chris Sommers (SCVURPPP / EOA)
- Don Yee (SFEI)
- Jay Davis (SFEI)
- Jon Konnan (EOA/SMCWPPP)
- Kelly Moran (SFEI)
- Lester McKee (SFEI)
- Lisa Austin (Geosyntec Consultants)

- Lisa Sabin (SCVURPPP / EOA)
- Luisa Valiela (EPA)
- Melissa Foley (SFEI)
- Nina Buzby (SFEI)
- Paul Salop (AMS)
- Rebecca Sutton (SFEI)
- Richard Looker (SFBRWQCB)
- Setenay Frucht (SFBRWQCB)
- Tan Zi (SFEI)

The last page of this document has information about the RMP and the purpose of this document.

Day 1

1. Introduction

Melissa Foley began the meeting by reviewing remote meeting etiquette and noting that the workgroup advisors would get precedent during the discussion period. She also did a land acknowledgement referencing the indigenous communities on whose land the RMP operates. The workgroup advisors Dr. Jon Butcher and Tom Jobes introduced themselves, and Melissa noted that the third advisor, Dr. Barbara Mahler, was involved in a car accident and was unable to attend.

While going over the agenda for each day of the meeting, Melissa also provided background on the Bay RMP and WG structure, as well as how special studies factor into the greater program budget. Related to the available funding, Melissa explained that the 2022 budget is somewhat in

flux due to the Status & Trends redesign efforts. She also noted the increasing amount of cross-workgroup collaboration that occurred in the proposal writing process.

2a. Information: Review of Management Questions

Richard Looker provided context from a regulatory perspective and reminded the group of the 2020 meeting's emphasis on the transition away from legacy contaminants and growing need to integrate with other workgroups. Based on these changing needs, Richard suggested that the update/revise the management questions in the near future.

While reviewing the existing SPLWG management questions (MQ), Richard provided his take on where the group is relative to each question's goals. For MQ1 (POC loads and concentrations), Richard explained that the group is likely in the finishing stages of PCB sampling and is beginning to ramp up on CEC monitoring efforts. For MQ2 (identify high leverage areas), Richard wondered if this question needs to be revamped for CECs. It is possible that this question is not important for CECs because they are more ubiquitous than legacy contaminants. For MQ3 (trends), the workgroup is making progress on the modeling front, which will help to assess trends over time. MQ4 (management opportunities in source areas) may need to be refined for CECs; the workgroup has some PCB info that is being used to address those issues. Finally, Richard highlighted MQ5 (impacts of management actions) as a tricky one for the RMP because it is a big question that requires a substantial investment that is bigger than the RMP. Richard suggested that the dynamic regional watershed model may help assess change over time for some management actions (land-use change), but the model may be too large scale to capture changes from smaller-scale actions such as PCB removals. Richard also suggested the group think about this question in the context of CECs and how management interventions could be represented in the model.

2b. Information: Overview of Related Stormwater Program Activities and Objectives

Chris Sommers continued the discussion by providing the stormwater perspective, and similar to Richard, acknowledging the program-wide transition to less focus on legacy pollutants and greater focus on CECs. Chris then reviewed various stormwater interests like trash monitoring, watershed-specific pollutants, green stormwater infrastructure (GSI), and others. Chris also acknowledged the efforts going on outside of the RMP related to stormwater interests and specific information needs related to CECs. Specifically, Chris showed the group a matrix of the proposed studies for 2022 and how they related to information needs.

Melissa Foley then referred to Richard's comment on updating the management questions, noting that there would not be time to do so during the meeting. However, she explained that the ECWG presented a proposal to update the CEC strategy, which could play into SPLWG question updates.

Scientific Updates on Current Projects

3a. Scientific Update: Stormwater Monitoring

Alicia Gilbreath reviewed the stormwater monitoring activities that involved a record number of efforts but also notable obstacles from drought conditions and pandemic challenges. She noted that given the poor rain conditions of the past season, SFEI hopes to conduct all the same stormwater monitoring activities with the addition of a study in Old Alameda Creek. Related to monitoring efforts, Alicia asked the group for their perspectives on how to continue monitoring and how to proceed with the growing CEC focus.

The following discussion focused primarily on the balance between reconnaissance and monitoring efforts to support the watershed model. Jon Butcher expressed interest in both reconnaissance sampling and monitoring to support modeling. He questioned whether there were other types of indicator monitoring in use that perhaps would be more efficient (e.g., biota indicators could be easier than sampling storms). It was noted that the passive sediment samplers have been in greater use since they were piloted by this program a few years ago, and the PMU studies have included both surface sediment sampling and small fish (with relative site fidelity). Don noted that biotic exposure is not typically used as a trigger for further investigations, and the CECs team is more interested in things that are slightly less persistent and don't dovetail with biotic accumulation.

Tom Jobes shifted the discussion to suggesting that interpretation of the data could potentially be improved by stratifying the data by storm size to better compare it. The ADA was then mentioned as a tool to do just that. It was acknowledged that overall the dataset is challenged by so few sites having multiple samples, especially samples from the same station representing different sized storm events, and Chris Sommers noted the inherent challenges in sampling, let alone sampling only for representative sized storm events.

The discussion ended with Richard Looker expressing Tom Mumley's sentiments that SPLWG work should be shifting away from reconnaissance monitoring and towards monitoring to support the modeling efforts. Tom Jobes agreed.

3b. Scientific Update: Regional LSPC Model Development to Support Watershed Loads

Tan Zi presented an update of the multi-year modeling implementation plan. Last year he completed the hydrologic modeling setup and is currently in the second phase developing the sediment model, which will be complete by the end of the year. The next step is to start POC simulations for Hg and PCBs, which is the proposal he will present on day two. He then dove further into describing the status of the sediment model as well as explaining some technical aspects of the model (e.g., # of watersheds, simulation time period, sediment classes) and

general modeling approach split between land and in-stream processes. He noted that a revised land use dataset (ABAG) is expected to be completed by the end of the year; however, the impacts of using the older ABAG dataset should not make huge differences in the sediment modeling but newer data will be useful for POC simulations next year. He finished his update reviewing the proposed calibration criteria for the flow and sediment models. The literature has quite high standards and asked the group if there are any other criteria that have been used.

In the post-presentation discussion, Jon Butcher warned that the criteria Tan proposed from the literature was based on reproducing monthly loads in larger streams in the midwest, whereas it would be hard to reproduce those calibration criteria in smaller, flashier streams. He said it is less important what the calibration certainty is and more about how the model gets used - the uncertainty needs to be understood by the users. Tom Jobes agreed. Chris Sommers and Lisa Austin both shared local examples of useful modeling despite such high uncertainty occuring.

Jon Butcher finished the discussion noting how important it is to find additional lines of evidence, such as roughly predictive sediment exchange or potentially even geomorphology data from the channels. The model should describe channel vs. upland erosion processes. To ensure success of the model, Tan will need to make sure everyone is on the same page on how to deal with uncertainty after completing the calibration.

3c. Scientific Update: Advanced Data Analysis

Lester McKee and Lisa Sabin presented on the Advanced Data Analysis, which takes a detailed dive in interpreting the reconnaissance monitoring data in relation to runoff characteristics, runoff, land-use distributions, and congener profiles. Lester reviewed the basics of the analysis, using two primary methods:
1) Computing rank comparisons for each watershed's storm yield, which provides three indicators (yield, particle concentration, and water concentration) to apply to a weight of evidence approach for management decisions/actions, and
2) Aroclor method with four steps to identify PCB aroclors present in each sample and in what amounts

He then presented a decision tree classification and suggested that about ¼ of the sites could be considered sampled under "benign" conditions, which leads to the question of whether larger storms might produce higher concentrations and thus these might be good sites for re-sampling since the data could be a false negative.

Lisa Sabin presented on how the municipalities are using such data from the ADA work; it is used to support identification of high/low priority catchments that are contributing elevated PCB stormwater loads, and the aroclor data provides information on potential sources within a catchment. She then provided a comparison example between the current prioritization method and utilizing ADA outputs. She also noted that an important remaining question is in how to identify low-priority catchments, and how low of an indicator measurement is low enough to knock it out of consideration for further investigation.

There was no time for additional discussion.

3d. Scientific Update: Integrated Monitoring and Modeling Strategy

Lester began this presentation explaining the project motivations and expectations and noting the goal of the item was to get input on the roadmap development related to the project. Kelly Moran then went on to describe how we want to integrate the watershed modeling and monitoring work to maximize effectiveness, and that this kind of strategy was particularly important for pollutants such as CECs because of the high analytical costs. Tan proceeded to present on the suggested workflow of the project, which is to look at management questions to identify data gaps and whether monitoring or models can answer/fill those gaps and how monitoring/simple modeling efforts could then inform more dynamic models. Lester then presented the questions up for discussion:
- What are the group's thoughts on how watershed modeling can help address the ECWG and SPLWG management questions?
- What is the correct road map/plan for sediment/PCB/Hg? and
- What are the most important near-term questions for modeling?

Lester also explained the timeline for reporting on these efforts (draft sep 2021).

Jon Butcher kicked off the discussion suggesting that the RMP should stay updated on what is happening in the Puget Sound where they are asking a lot of the same questions.

Richard recalled that one of the management questions - looking at big versus small loads for CECs - may need reframing, and that it may not be ambitious enough. Kelly clarified that the big vs. small question is more about whether or not the contaminant is worth considering in the stormwater context, relative to other sources.

Chris Sommers pointed out that the geographical scale should be considered, in part because the elements of the landscape/landscape features can change and whether assumptions are too broad.

Lester reminded the group of the iterative conceptual model development process; the conceptual model was refined for legacy contaminants as management questions got more detailed, and this will likely be the same case with CECs.

4. Proposals: Introduction

Melissa introduced the proposal presentation process, laying out that on Day 2, the group was going to see five proposals specifically for SPLWG, two of which were originally planned as SEP proposals, but which were upgraded due to additional carryover funds from last year's

stormwater efforts being available. An additional seven proposals would be presented from the ECWG and MPWG that have a nexus with stormwater work, as well as potential for SPLWG oversight on the projects. It is not the role of SPLWG to rank-prioritize these other proposals, rather the RMP is asking for the group to identify any potential red flags from a technical perspective. Finally, not being presented, are other workgroup modeling studies from PCB and SedWGs that are also interconnected with SPLWG efforts. This is the most integrated group of studies ever!

5. Other Workgroup Proposals with Connections to SPLWG

CECs in stormwater: A multi-year study that was supposed to end in WY2021, but lack of rain necessitated continuation. This is a reconnaissance effort screening for contaminants from broad chemical classes.

Stormwater CECs monitoring strategy: This strategy is intended to develop a long-term approach, with the idea that it is efficient to spend money now in program planning to save money down the line. Another goal is to prioritize contaminants for monitoring and develop a sampling design approach that can answer management questions. The proposal for this study is requesting early release of funds to be able to have more to show at the 2022 ECWG meeting.

Ethoxylated Surfactants Study: Intended to fill in data gaps by investigating a longer list of chemicals and potential sources in wastewater.

Non-Target Analysis study in stormwater: intended to identify new contaminants for follow up monitoring. This has been done once in-Bay water during a wet season; the workgroup suggested focusing this effort on stormwater.

Tire strategy: Particles and their contaminants wear/wash off into storm drains and surface water. This proposal is to develop a short-term RMP strategy related to tires that is a cross-workgroup effort to identify data gaps.

Tire Particle Contaminant Fate/Transport: This study is not being funded by MPWG, but Kelly still shared this because it highlights a key data/information gap related to tire particles. Leaching potential is directly related to particle surface area, and we are currently unsure what tire particle sizes have the largest surface area (whether it's the smallest ones that are transported in the air, or the larger, heavier ones that are falling on the road).

QUESTIONS/COMMENTS:
Bonnie de Berry commented that green stormwater infrastructure isn't intentionally designed for tire particles but is likely capturing tire particles anyway. Kelly responded that bioretention can likely catch particles, but it is unknown what will happen to the contaminants/chemicals associated with those tire particles.

Chris voiced that these are all good studies, and it's going to be a challenge in funding everything.

6. Recap of Day 1 and Expectations for Day 2

The floor was opened for any additional questions/comments that remain related to project updates from earlier in the meeting.

Chris Sommers said he was not attending meeting day 2, and encouraged thorough consideration on the transition to greater CECs focus, keeping a critical eye on "where we are going" and to keep in mind previous experiences with Hg and PCBs. He felt all the proposals are worth doing, but it's more about how we want to address future priorities.

Related to the modeling presentation, Richard thought the delay of ABAG data will have the greatest impact on POC simulations, and wondered if it undercuts the possibility to calibrate the model? Tan said he didn't think there would be much effect on the sediment calibration, but he could do some recalibrating if there are large differences. With regards to the modeling proposal timeline, because of this delay, it is somewhat ideal to spread the modeling effort over two years, as Tan would much prefer to use the new ABAG dataset.

Melissa ended the day reminding folks to review the proposals in preparation for tomorrow's discussion.

Day 2

1. Introduction

Melissa provided a quick recap of the previous day (project updates and going over cross-workgroup proposals) and then gave an overview of the second day goals, which are to discuss proposals and then rank them. Prioritization would help the TRC to narrow down a number of studies to fit the actual funds available. One thing for the group to keep in mind is the option to scale/reduce study budget or phase over multiple years

2. Proposals
a. Proposal: Stormwater Monitoring for Continued Reconnaissance and to Support Modeling

Alica presented this proposal and noted the requested budget for the study is only $43K because of $100K carryover from WY 2021 due to a rainy season with few sampleable storms. The objectives of this study, which compete with each other to some extent, are to characterize

concentrations, resample sites with insufficient data based on the results of the ADA work, and to provide more verification/calibration data for the Regional Model. She then showed a matrix outlining the objective, sampling method that would be used to meet that objective, and what the measurement outputs would support. She also outlined the approximate number of sites for each sampling method "option." She also noted that the reconnaissance sampling work does allow for CECs sampling piggy back.

Jon Konnan put in a plug for the need for continuing to dedicate adequate resources towards reconnaissance monitoring based on the general lack of samples used in ADA and model efforts. He noted that only one composite sample has been collected from most stations and suggested that in an ideal world we would have something like 3-5 samples per station, but acknowledged that unlikely to ever be achieved given the general lack of resources and storms to sample. He noted more PCBs data from both previously sampled and unsampled old industrial catchments would be valuable. Consistent with Water Board staff expectations, some countywide stormwater programs are trying to wrap up source property identification, and the PCB data would be particularly helpful towards that effort and to prioritize which catchments to focus our efforts given the limited resources available.

Richard responded that there is no guarantee that this reconnaissance monitoring is the best way to identify source properties. Richard also noted that the stormwater programs are ultimately responsible for collecting data to identify the catchments, so there is another source of funding (the municipalities) to do the re-sampling while there is not another source of funding (other than RMP) for the modeling needs and allowing CEC piggy backing. Richard pointed out that when determining the optimum design of monitoring strategy, we need to focus first and foremost on how best to address RMP management information needs. The RMP has spent a lot of resources in the past and still will spend some to help with identifying source areas, but this is just one information need among many, and the other RMP information needs need to take precedence now in designing the future monitoring strategy.

Richard liked the two options on the table that both included a combination of discrete and composite sampling. Alicia noted that we cannot piggy-back CECs sites on remote sampling, so we would have to do manual sampling wherever we wanted to piggy-back. It was asked if we could do discrete sampling for CECs and Alicia said the program is not yet ready to do that, although Lester noted we could take a composite sample for CECs at a site where we take discrete samples for PCBs. The challenge is that most sites of interest for discrete sampling have mixed-use watersheds that don't meet CEC site requirements - but there are a few sites that may meet both PCB and CEC needs.

Lisa Austin asked about North Bay sampling and also suggested that if we go with an option with fewer sampling locations, then Marin and Contra Costa counties would be the first priority areas. Alicia noted that it is tricky to distribute samples equitably.

While it was mentioned that we could determine the exact allocation of site numbers between different objectives, Melissa encouraged the group to come up with some guidance for the TRC on which options were highest priority.

b. Proposal: Regional Model Development to Support Watershed Loads and Trends

Tan presented a proposal on the next phase of the Regional Model effort, which is to model PCBs and Hg as a proof of concept for POC modeling and in anticipation of modeling less well-monitored pollutants such as CECs. The approach to developing the model will include two steps. The first is to parameterize the HRUs and secondly to conduct POC loading calibration and validation. The project deliverables would involve development of a presentation and report, and making the results/data publicly available. He presented two budgeting options including either a one year effort or a two year effort. The rationale for extending over two years is that we would be able to wait for the new ABAG land use layer to be completed, and we would have more POC data as well as the CECs conceptual model development to help inform future CECs modeling. The advantage of the one year effort is that we would have a quicker turnaround and opportunity to move our efforts along faster.

Richard Looker kicked off the discussion asking if Tan could complete a larger scope in the second year than what is currently being proposed if we went with the two year option. For example, could we also move into modeling select CECs? Tan responded that there are still a lot of unknowns with CECs, and we want to start with conceptual/simple models first, therefore we may not want to jump into modeling CECs with the Regional Dynamic Model. Discussion continued around making sure that the model is set up such that it can be used in the future for CECs, but noting that we will have even less data than what we are working with now for our more well-monitored POCs.

Conversation then shifted to discussing green stormwater infrastructure (GSI) and needing to be able to incorporate that data into the model to help explain changes in POC concentrations downstream and help inform calibration of the model.

Lisa Sabin indicated that information exists in the South Bay, but it is not necessarily all in one combined dataset. We will need to be a bit more specific on what exactly is needed and the level of detail required.

For example, Kelly noted that the mapping of control measures needs to include the type, since some types may be good for CECs control and others not.

Lisa Sabin responded that the control measures are focused on PCBs/Hg, so we would really need to specify what "control measures" other than GSI we would be interested in.

Lisa Austin also added that Contra Costa has a GIS database for redevelopment areas, noting that there are more trash controls than GSI.

Jon Butcher relayed that the practical implications of adding GSI to the model is challenging and would require delineating separate HRUs.

c. Proposal: CECs Remote Sampler Development and Pilot Testing

Alicia proposed a new project that entails developing a remote sampler that would work for CECs (because existing remote samplers are suspended sediment traps whereas CECs are more likely to be dissolved). The study would identify potential samplers, weigh up the pros and cons, choose and develop one and then pilot its use by collecting samples using the remote sampler side-by-side with manual collection and comparing the results. A likely candidate auto-sampler would be the ISCO, which collects whole-water samples but others would be considered before making a final decision. Development could involve modifying such a sampler and then blank testing the modified set up. The budget for the project would be dependent on the number of sites piloted. The project is time sensitive because WY2022 is the final ECWG CECs in stormwater effort and there is cost savings doing the two projects at the same time; the labor and analytical costs of the manually collected samples would be covered by the ECWG efforts.

In discussion, Lisa Austin was supportive and suggested the higher budget to allow for more pilot testing. She then asked if the decision on this proposal had a necessary connection with the reconnaissance monitoring proposal options and Alicia responded that it did not; the two projects would not necessarily need to share sites because, regardless of CEC piggyback on POC efforts, the CEC project would at least be sampling at six sites where the remote samplers could be deployed.

Richard asked Alicia to relay to the group why this project is useful. Alicia responded that the primary constraints in collecting samples are the number of storms per year and the staffing capacity, so using remote samplers that do not require staff to be present during the storm can expand the potential total sites we can sample.

Jon Konnan asked where things are at with the PCB remote sampling and how might those efforts inform development of CEC remote samplers. Alicia surmised that as legacy pollutant monitoring winds down, so will remote sampling for PCBs. However, we developed the remote efforts later in the process of legacy pollutant sampling, and now we can benefit from the foresight and we can develop and implement remote samplers towards the front-end of the CECs effort.

Bonnie asked about and Alicia reiterated that when the CECs and POC sampling efforts overlap at a site, the two sites share the labor costs for the sampling. Lester informed the group that the ADA project identified 36 sites that are candidates for resampling for PCBs. We could consider those sites to see which would be good for CECs too.

Bonnie asked about the logistics of deployment and Alicia responded that we haven't fully thought logistics through. Deployment of the ISCO will likely be more expensive than for the suspended sediment remote samplers. For example, we'll need to have some sort of vandalism protection and there will be a greater challenge in securing the tubing. Lester also noted that with the suspended sediment remote samplers, we don't have to ask for a permit, whereas we may need one for ISCO channel deployments depending on the site-specific type of vandalism proofing needed.

d. Proposal: Tidal Area Sampling Remote Sampler Development and Pilot Testing

Alicia began by saying this proposal was originally a SEP idea but it has now been elevated to a RMP proposal because there were extra carryover funds that could support an additional project. This project has a similar premise to the CEC remote effort, but in this case to develop and deploy a remote sampler that would be appropriate for sampling in tidally influenced areas. We normally have to sample upstream of high tide to prevent sampling Bay water, but there are many old industrial source areas that are within 2 km of the Bay margins, so the areas we most want to explore are often below the high tide mark. Sampling in tidal areas is possible but storm flow needs to align with the lower tide window in order to go out and sample tidal sites.

The idea for this proposal is to use a boat to access tidal sites and anchor a passive suspended sediment sampler in the water column along with a salinity probe. The salinity probe measurements would help us to interpret the results. The budget for this project is scalable based on the number of sites sampled.

Lisa Austin kicked off the discussion noting that Alameda County could benefit from this kind of sampling to help confirm estimates of loads based on street sediment data. She also mentioned a property she's interested in that discharges directly to the Bay and asked if it would be feasible to put a remote sampler in front of an outfall to the Bay? Alicia responded that if we are allowed to access the site, we could probably deploy a sampler but logistics could be challenging. In such a scenario, Lester warned that, at the scale of a single property or several properties, direct discharge to the Bay of a relatively small outfall flow may not lower salinity enough to allow for data interpretation with just a salinity probe. Don concurred that the salinity probe would not be helpful, but instead we could do a paired sample slightly upstream. For example, if a signal is similar to the nearfield average, we can assume that it is likely just background. But if we're seeing a difference at a factor of 5-10, then there is a higher likelihood of an upstream source.

Richard asked if we might be worried about the "sloshing" effect" (the contamination that is measured at the sampling location is actually sediment that was downstream previously and moved upstream of the sampling location on flood tide. This would be a confounding factor for the results). Lester agreed that there is a chance for false positives, but we haven't been able to

sample these areas so perhaps it's better than nothing? We can also use this "pilot" effort to explore what scales we can investigate.

Bonnie expressed her support because it is so challenging to sample these MS4s. She asked how the information would be captured in the modeling efforts? Tan said we would need to check watershed boundaries to see if the marginal areas are included, and if so, he could use the data to inform loading and as validation data. The model could also be potentially used to help select sites for deployment.

Jay noted that the congener profiles could also help distinguish between outfall/Bay or backwash PCBs.

Jon Butcher said that they are dealing with similar problems in Seattle. They have data from marginal areas (mostly Boeing land) and have noted a lot of different PCB levels. It's hard stuff to put into a model, and it would be worth asking the people in Seattle who are working on this.

Participants noted that this project has a low budget proposal, yet we may need to do a lot of reconnaissance work that we should factor in. Alicia acknowledged this was really just an effort for a few sites, and Don concurred that this is more about proof of concept.

e. Proposal: Desktop analysis comparing hydrology results between the monitoring data, RWSM outputs, and SFB regional watershed model

Tan presented a proposal to compare the hydrology outputs of the RWSM (regional watershed spreadsheet model) and Regional Watershed Dynamic models. Each of these models was designed for different purposes, but there could be benefits to comparing them in order to provide insights on uncertainties in each model. This comparison exercise could also help us to identify potential data gaps. In this project, we would do comparisons between a few major tributaries to determine tributaries with higher confidence or uncertainty. This could end up giving us ideas on how to improve both models based on the reasons of poorer performance of each. It would also be good in the context of CEC modeling; if we use the RWSM for modeling CECs, we could rely on the tributaries that we have determined have "greater confidence" in the calibration process.

Melissa noted that it would be good to hear about the group's prioritization of this study, and if it is not prioritized for funding this year, can we list it as an SEP? We could also flag this as a backup desktop study if the region experiences another drought year and stormwater sampling does not use the full budget.

Lisa Austin began the discussion asking why do we care about the RWSM? Although it was an initial step, the stormwater programs are not likely to use it. She asked for more detail on how it will help to further develop the regional model. Additionally, we already know to some extent the

shortcomings of the RWSM. Tan responded that the CEC modeling won't start immediately with the dynamic model. It is not yet decided what model to use for CEC modeling initially, but it could be the RWSM. Also, the comparison can highlight differences between the models. It's possible that the RWSM performs better in some watersheds on an annual average scale than the regional watershed dynamic model.

Tom Jobes expressed a similar reaction to Lisa. Would it be useful towards the calibration? Improving both models based on each other doesn't make sense. Lester reminded the group that originally we were unsure whether we could use a dynamic model for PCBs. One value of the development of the RWSM was learning how to aggregate the land use classes, and that last year Jon Butcher was in support of keeping the spreadsheet model. In large part this is because the RWSM is $10K-$20K effort per analyte, whereas the regional watershed dynamic model implementation for a new contaminant is closer to $60K. Lester also mentioned that the RWSM can be used to generate potency factors that would be used as a starting point in the new regional watershed dynamic model.

Kelly questioned that if we don't want to continue using RWSM then what approach do we want to use for initial load estimates for CECs (ECWG wants to try to understand relative loads)? Tom Jobes said that highlighting the uncertainty in the regional watershed dynamic model for CECs may be pessimistic since there is also a lot of uncertainty in using the RWSM. While screening level assessment using a model like the RWSM prior to using a dynamic model makes sense, he's not sure if the RWSM is the appropriate screening tool. Jon Butcher stated that the primary purpose of the RWSM going forward should be to aid the further development of the regional watershed dynamic model.

Bonnie suggested we compare the regional watershed dynamic model to the output from RAAs that the county-wide stormwater programs have developed and Tan felt it would be more useful to compare PCBs/Hg rather than flow in this scenario. Then Bonnie suggested this effort just be rolled into the modeling proposal if being used for calibration of the Regional Model. Tan responded that he sees the project as a way to improve both models, so it's not just for the regional watershed model. Lisa Austin felt the focus should be on the regional watershed dynamic model and less about improving the RWSM and we should integrate this comparison as part of the budget for the regional model proposal. If we want to spend time, money, and effort improving the RWSM, then we should come back to SPLWG unless ECWG is paying for it.

Lisa asked whether the ECWG considered this proposal. Melissa reminded the group that at the level of the TRC, the funding really comes from a single budget and it is the work of the TRC to take considerations of all the WGs together. There is some play in how many of the lower priority studies (3-5) get funded. Melissa also noted that unfunded projects can go on the SEP list and are eligible for those penalty funds.

Kelly expressed that we are not looking to compare watershed to watershed loads of CECs, rather we are wanting to compare rough regional scale estimates of total annual stormwater and total annual wastewater loads.

f. Proposal: SEP project concept level proposals in a programmatic context

Alicia shared a bit about the process of SEP projects and that it is not guaranteed funding. She then showed the recent SEP projects that have been completed in the last five years and noted how it can be a significant funding source (e.g., $700K over the last five years).

Alicia relayed that one of the newly funded SEPs is for updating the RWSM by improving its calibration using an improved ABAG land-use layer and an updated precipitation data layer (1990-2020 normalized time period), and we should discuss in the context of the prior proposal whether we want to do the RWSM-Regional Watershed Dynamic Model comparison before making any changes or vice versa.

LIsa Austin asked about the first project on the current SEP list that is about testing super composite samplers. Alicia explained that instead of collecting discrete samples a few times during a few storms like has been our study design in the past, this project proposal was to collect using automated samplers a large number of small subsamples throughout the season. Such a design could ensure we don't miss any storms that may export large episodic loads, and it could also save on analytical costs. Lisa asked if this was still useful in the context of PCBs, and also whether this might have application for CECs? Alicia said they hadn't considered doing this project for CECs since the idea initially was developed in 2017 when PCBs were a greater focus. Additionally, while PCBs have a year-long hold time, CECs typically have a shorter hold time so the design is not totally appropriate. Bonnie said some stakeholders still have an interest in learning about PCBs, and so she is in support of leaving it on the SEP list.

Lisa Sabin asked if we have looked into using passive samplers for CECs. Kelly responded that the idea has come up periodically, but nothing in the literature reports any passives that are ready to go for CECs.

Discussion then shifted to the SEP listing process. Melissa said it is possible to make changes to the SEP project proposals without going through the WG or TRC, but anything substantive should go through the WG for approval and then need to be ultimately approved by the TRC. If there are any new ideas for SEPs, the TRC meets each quarter and can review them. SPLWG can propose new SEPs at that time, but we would need to have the SPLWG sign off before bringing them to the TRC.

Lisa Austin brought up the question of whether we are allowed to put GSI effectiveness testing on the SEP list, and whether we could measure the effectiveness in addressing CECs. Melissa said no since GSI was outside of the RMP purview and would thus be a low priority of the program. Kelly said that, given the strong push to think about upstream impacts rather than treatments, the focus for CEC control would likely be more on source control than on the

traditional TMDL/monitoring approach and unlikely to focus on treatment controls. Lester also noted for the group that some data will be collected on CEC performance in GSI from an externally funded effort (WQIF project) with San Francisco.

3. Prioritization Discussions
a. Discussion (Open): Recommended studies for 2022

Nobody had any final technical questions about the proposals before the SFEI staff left the main meeting room.

b. Decision (Closed): Recommendations for 2022 special studies funding and SEP list

The following table shows the proposed projects and budgets that were discussed during to closed session.

Study Name	Asking Budget	Modified Budget	Priority	Comments on prioritization
Small Tributaries Loading POC Watershed Reconnaissance Monitoring	$43,000 ($100K Carryover)	$43,000	1	$100k carryover from previous years
Regional Model Development to Support Watershed Loads and Trends	$90,000 - $150,000	$90,000	2	Split into two years to take advantage of the ABAG land use update; total budget $150k (relying on guaranteed funding of $60k in year 2)
CEC Remote Sampler Development and Pilot	$30,000 - $36,000	$36,000	3	More timely than tidal remote samplers
RWSM and Regional Watershed Model comparison	$25,000	$25,000	6	In the initial discussion group suggested rolling into a bigger model proposal; somewhat duplicative and lower priority; add input from RAA models? Comparison is only for flow, which added to the lower priority
Tidal Area Remote Sampler Pilot	$25,000 - $50,000	$50,000	5	Could start the project with $35k in order to keep the study
CEC stormwater load model exploration		$25,000	4	Review and identify loads modeling needs for CECs (continuation of integrate modeling and monitoring strategy project for modeling)

In addition to prioritizing the presented special studies proposals, the group also discussed priorities related to aspects of the stormwater reconnaissance monitoring. With recent dry years leading to very little sampling opportunities, the group made a specific suggestion on how to

proceed if drought conditions continue. Their recommendations and comments are outlined in the table below:

Reconnaissance Sampling Options	Priority	Comments
all discrete (8) (no CEC piggybacking)		
remote (8)+ composite (8) (limited model application)		all composite sites will be CEC sampling criteria
composite (5)+ discrete (5) (CEC and model)	1	all composite sites will be CEC sampling criteria (ideal prioritization; storms will dictate exact locations to some degree)
remote (2) + composite (4) + discrete (4)	2 (backup for dry year)	all composite sites will be CEC sampling criteria; move to this option if we have limited storms in WY2022; possible addition of North Bay sample if rainfall locations drive changes

c. Report out on Recommendations

Bonnie began by thanking the proposal authors for their efforts. She then reported that there was not too much scaling back done to the budgets and went through the prioritization reasoning, e.g. the RWSM comparison is low priority because the hydrology of the RWSM is being updated. She also clarified that if that comparison work between the models was done, then the report should just cover the flow output.

There was a new study suggestion proposed by Richard and prioritized by the group. The effort was envisioned as a stepwise approach to developing needs for CECs modeling. The project should explore off-the-shelf methods to get screening-level loading estimates for CECs, using data that are going to be available soon. He noted that it would likely require some effort from ECWG folks, but it should be spearheaded by SPLWG interests.

Lester asked why we would not try out the RWSM for estimating CEC loads first? Richard said the RWSM could be one of the method options, but asked if the overhead needed for RWSM is cost-effective? Is it even too complicated for the needs? Don Yee said he thought that the RWSM works as a tool for worst/best case scenarios and to assess order of magnitude loads. Lester reminded the group that the RWSM can be used in a variety of ways. For example, if the CEC data are not sufficient yet for calibrating a pollutant RWSM, the hydrology can be output in relation to any CEC conceptual model as long as there are spatial layers based on those conceptual models to overlay on the hydrology layer. Doing this would allow the flow from the calibrated hydrology component of the RWSM to be output in a manner most appropriate for combining with the CEC concentration data to generate loads. Richard warmed to the idea of exploring different ways of using the RWSM. Kelly relayed that Richard suggested some

literature review which could evolve into a more fleshed out project proposal for the coming year of what needs to be done on the RWSM or regional dynamic model. Richard asked if there were any lessons learned from microplastics RWSM modeling that we'd want to avoid with CECs. Jay added that the document from the project could detail how to use the RWSM most effectively, and in doing so could talk about the shortcomings of using it for microplastics. Lester warned (remarking on the PCB experience from 2006) that although we can get RWSM results for less money, we should really include funding for proper documentation that includes information on any caveats associated with the produced results so that, in say 5 years time, we can remember exactly how it was done.

Alicia and Melissa closed the meeting by expressing gratitude to the participants, advisors, and proposal writers.

Adjourn.

About the RMP

RMP ORIGIN AND PURPOSE

In 1992 the San Francisco Bay Regional Water Board passed Resolution No. 92-043 directing the Executive Officer to send a letter to regulated dischargers requiring them to implement a regional multi-media pollutant monitoring program for water quality (RMP) in San Francisco Bay. The Water Board's regulatory authority to require such a program comes from California Water Code Sections 13267, 13383, 13268 and 13385. The Water Board offered to suspend some effluent and local receiving water monitoring requirements for individual discharges to provide cost savings to implement baseline portions of the RMP, although they recognized that additional resources would be necessary. The Resolution also included a provision that the requirement for a RMP be included in discharger permits. The RMP began in 1993, and over ensuing years has been a successful and effective partnership of regulatory agencies and the regulated community.

The goal of the RMP is to collect data and communicate information about water quality in San Francisco Bay in support of management decisions.

This goal is achieved through a cooperative effort of a wide range of regulators, dischargers, scientists, and environmental advocates. This collaboration has fostered the development of a multifaceted, sophisticated, and efficient program that has demonstrated the capacity for considerable adaptation in response to changing management priorities and advances in scientific understanding.

RMP PLANNING

This collaboration and adaptation is achieved through the participation of stakeholders and scientists in frequent committee and workgroup meetings (see Organizational Chart, next page).

The annual planning cycle begins with a workshop in October in which the Steering Committee articulates general priorities among the information needs on water quality topics of concern. In the second quarter of the following year the workgroups and strategy teams forward recommendations for study plans to the Technical Review Committee (TRC). At their June meeting, the TRC combines all of this input into a study plan for the following year that is submitted to the Steering Committee. The Steering Committee then considers this recommendation and makes the final decision on the annual workplan.

In order to fulfill the overarching goal of the RMP, the Program has to be forward-thinking and anticipate what decisions are on the horizon, so that when their time comes, the scientific knowledge needed to inform the decisions is at hand. Consequently, each of the workgroups and teams develops five-year plans for studies to address the highest priority management questions for their subject area. Collectively, the efforts of all these groups represent a substantial body of deliberation and planning.

PURPOSE OF THIS DOCUMENT

The purpose of this document is to summarize the key discussion points and outcomes of a workgroup meeting.

Governance Structure for the
Regional Monitoring Program for Water Quality in San Francisco Bay

The Steering Committee consists of representatives from discharger groups (wastewater, stormwater, dredging, industrial) and regulatory agencies (Regional Water Board and U.S. Army Corps of Engineers). The Steering Committee determines the overall budget and allocation of program funds, tracks progress and provides direction to the Program from a manager's perspective.

Oversight of the technical content and quality of the RMP is provided by the **Technical Review Committee** (TRC), which provides recommendations to the Steering Committee.

Workgroups report to the TRC and address the main technical subject areas covered by the RMP. The Nutrient Technical Workgroup was established as part of the committee structure of a separate effort – the Nutrient Management Strategy – but makes recommendations to the RMP committees on the use of the RMP funds that support nutrient studies. The workgroups consist of regional scientists and regulators and invited scientists recognized as authorities in the field. The workgroups directly guide planning and implementation of special studies.

RMP strategy teams constitute one more layer of planning activity. These stakeholder groups meet as needed to develop long-term RMP study plans for addressing high priority topics.