



RMP Sources Pathways and Loading Workgroup Meeting Summary
May 30th, 2019, 9:30am - 4:30pm

In attendance:

WG Member	Affiliation	Representing
Dan Cain	USGS	Science Advisor
Barbara Mahler	USGS	Science Advisor
Dan Wang	CDPR	Project Advisor
Tom Jobes	Independent	Science Advisor
Chris Sommers	EOA	SCVURPPP, Stormwater Agencies
Lisa Sabin	EOA	SCVURPPP, Stormwater Agencies
Bonnie De Berry	EOA	SMCCWP, Stormwater Agencies
Richard Looker	SFB Regional Water Quality Control Board	Water Board
Lucile Paquette	CCCWP	CCCWP, Stormwater Agencies
Luisa Valiela	EPA Region 9	USEPA
Lisa Austin	Geosyntec	CCCWP, Stormwater Agencies
Dale Bowyer	SFB RWQCB	Water Board
Bridgette DeShields	Integral Consulting	RMP TRC, Refineries
Ryan Mayfield	City of San Jose	BACWA
Bryan Freuh	City of San Jose	BACWA
Paul Salop	Applied Marine Sciences	
Peter Mangarella	Retired	
Jim Scanlin (Remote)	ACPWA	Stormwater Agencies

SFEI/ RMP Staff:

Jay Davis, Jing Wu, Lester McKee, Alicia Gilbreath, Don Yee, Melissa Foley, Ila Shimabuku, Jen Hunt, Rebecca Sutton, Matthew Heberger, Scott Dusterhoff

1. Introduction

Jay Davis welcomed participants, summarized the meeting agenda, and allowed for introductions. He gave a special thanks to the science advisors and welcomed new SPL advisor Tom Jobs.

2a Information: Review of management questions

Richard Looker provided the Water Board's broader perspective on the Sources, Pathways, and Loadings Workgroup (SPLWG) management questions and direction for the next few years. Richard acknowledged the SPLWG was born out of a need to understand the origins and transport of legacy contaminants in the Bay and commented on the success and importance of work conducted by the workgroup to date. But as science and management needs have evolved, the SPL has arrived at a point of evolution: not only do these needs to understand legacy contaminants persist, but they are being joined by additional and equally-important needs to understand several other emerging pollutants such as sediment, contaminants of emerging concern (CECs), and nutrients. So now may be the time to take a step back and consider how to best organize and combine efforts to encompass all needs relevant to Sources, Pathways, and Loadings work and support all priority management questions. This could include supplementing observational work by investing more in modeling that addresses all relevant contaminants, organizational shifts toward sharing oversight with other workgroups, and more work to inform managers on the efficacy of Green (Stormwater) Infrastructure (GSI). Essentially, the Water Board wanted to call attention to the need to strategize in order to ensure that future SPL efforts are balanced appropriately to address legacy and emerging contaminants. Regarding integration between the workgroups, Jay commented that there is a lot of crossover going on between RMP staff during internal meetings and through meeting attendance (Don, Rebecca and Scott are here today). So it's not completely broken, but there is room for improvement.

Discussion then focused around how PCB work will need to be lessened or combined with other efforts in order to make resources available for emerging issues. When asked about his lack of mention of the word "trends," Richard responded with a general comment of de-emphasis on trends (or a willingness to slow down on trends) and focus at least an equal effort for developing the modeling for estimating loads of a broad variety of pollutants, not just PCBs and PCB trends. Rebecca Sutton provided a description of the multi-year effort currently underway to monitor a slew of CECs in stormwater, including non-targeted analysis, per- and polyfluoroalkyl substances, organophosphate esters, ethoxylated surfactants, and bisphenols. Rebecca also mentioned past work done to monitor microplastic in stormwater and the 2020 proposal the Microplastic Workgroup put forward to develop a microplastic conceptual model that is focused on understanding stormwater.

2b Information: Overview of related stormwater program activities and

objectives

Chris Sommers provided a stormwater agency perspective. He began by discussing the Municipal Regional Permit (MRP) which currently governs 76 municipalities in Alameda, Contra Costa, San Mateo, Santa Clara, and Solano counties. He explained that the MRP 2.0 is the current governing permit, and conversations are currently underway to clarify objectives for MRP 3.0 to be issued in 2021. Chris summarized the primary drivers and requirements under the MRP 2.0 and delved into a summary for one of the requirements: Reasonable Assurance Analysis (RAA). He provided an overview of Bay Area Stormwater Management Agencies Association's (BASMAA) current efforts to develop methodologies to predict loads reduction in response to proposed progressive management implementation over time, project timelines for completion, and the Water Board's involvement in the review process. Chris summarized the highest priority information needs for stormwater (not all are addressed by the RMP): (1) tracking green stormwater infrastructure (GSI) implementation, (2) understanding trends in pollutant loading to the Bay, (3) identifying additional pollutant source areas, (4) improved data analysis techniques, and (5) understanding CECs.

A brief discussion followed on the overlaps in RAA modeling and the proposed regional modeling effort, and public accessibility of GSI tracking products. Dale Bowyer commented on the need to show progress to prove to the public that resulting progress from the \$10 M being spent can be observed and proposed the idea to repeat the metal-pollutant sampling done in the 1990s as a proof of concept test for the efficacy of GSI. Limitations of the 1990s data for doing this analysis were discussed.

3. Information: Overview of proposed special studies

Jay Davis provided a brief history of the SPLWG (the RMP's longest-running workgroup) and reminded everyone that the overarching goal of the RMP and the SPLWG is to support management decisions. He gave a description of the RMP committee structure, current stormwater work, the RMP's special-study approval process, and the SPLWG's multi-year plan. He stated the aims for this meeting: to prioritize proposed 2020 special studies for RMP funding and update the Multi-Year Plan for the SPLWG. He also mentioned that each workgroup is encouraged to add up to three project ideas to the candidate list to receive Supplemental Environmental Project funds.

Richard Looker asked how stormwater work was currently discussed and vetted within other workgroups and whether there's a need to strategize additional organizational activities to coordinate project oversight. Chris Sommers recommended that, in the short term, RMP staff ensure all relevant project proposals and deliverables are distributed for review to any and all relevant and interested parties.

3a. Proposal: Reconnaissance characterization monitoring

Alicia Gilbreath provided an overview of past, current, and future pollutants of concern (POC) monitoring efforts, and presented recent findings. She provided an overview of reconnaissance sampling methods and challenges, use of passive sampling techniques, and concurrent stormwater projects in priority margin units and CEC sampling. She mentioned that the intention for POC monitoring is to best support anticipated management decisions. She highlighted the need to discuss how to best accomplish this goal within budget and presented five different options to do so.

Given the challenges associated with sampling tidal sites, Lucile Paquette and Chris Sommers recommended developing a list of tidal sites of interest to have prepared in the case of ideal sampling conditions. Participants discussed re-orienting the theme of POC work from understanding legacy contaminants to stressing how this work can be leveraged and combined with other high-priority stormwater efforts, e.g., CECs.

Action Item:

- Add language around leveraging stormwater efforts to meet overarching goals of the RMP to both the 2020 POC proposal and the 2020 CECs in Stormwater proposal. (Alicia Gilbreath and Rebecca Sutton, 6/3/19)

3b. Proposal: Trends Strategy - Modeling

Jing Wu began by stating the Small Tributaries Loading Strategy's (STLS) trends management question: what are the trends in concentrations or loads at small tributary locations on both a watershed and regional scale? Development of the proposed regional model for hydrology and suspended sediment would help to address this question and will be used as a basis for POC modeling in subsequent years. Jing walked through the model implementation plan and how the model would estimate the efficacy of GSI and source-control management actions. She concluded by presenting the project timeline, and soliciting input on the cohesiveness and completeness of the implementation plan and any concerns around hydrology, sediment, or POC modeling.

Dan Wang began the discussion by echoing challenges encountered by DPR associated with land use data and offered assistance by sharing an urban land-use data layer called "Parcel Map" which could be used to model site selection based on land-use percentages and characteristics. Dan also recommended using a statistical model to evaluate how refined the spatial scale should be, and mentioned that CDPR uses a catchment size of 3 km². Barbara Mahler recommended looking into the NWALT land-use data developed by James Falcone (USGS) which includes detailed urban land-use data for every 10 years starting in 1974. Tom Jobes addressed a concern about how to differentiate sediments from urban and non-urban land uses by describing common processes used by modelers to demonstrate generation and

transport of different sediments.

Concern was raised around the site scale of GSI implementation and how they can be best represented in the model in terms of their treatment areas and performance. As the model typically operates at a sub-watershed scale which is much larger than GSI scale, any GSIs within sub-watershed could be aggregated to have an overall performance.

Participants discussed the value of this model in relation to the RAA modeling efforts. Supporting a Bay-wide PCBs model comes from a need to provide a confirmatory check on the more detailed RAA modeling. The RMP trends model could be used to study questions not addressed by the RAA efforts as well as serve as a means of unifying these efforts. Additionally, this model will be developed for the intended purpose of understanding PCBs; using it for other contaminants in the future, however, will be equally important. This model is laying the foundation for application to any and all contaminants, which will eventually inform observational or modeling efforts needed to better understand target contaminants. Participants recommended subjecting the trends model to the same peer review process the RAA models undergo. Chris said that the RAA models and documentation would be made available to RMP staff for review in parallel to the review by the RMAA peer-review panel.

3c. Proposal: RMP stormwater monitoring strategy and trends monitoring

Lester McKee presented a proposal for a stormwater monitoring strategy and trends monitoring that could build upon a recently-funded SEP study aimed at quantifying stormwater flow and sediment flux to the Bay. This study led to the questions that generated the need for the current proposal: (1) what monitoring is needed to support SPL programmatic directions, and (2) how to optimize monitoring to support trends modeling and other uses? This proposal included three tiered options for PCB and Hg monitoring at 1, 2, or 3 sites to support the trends modeling needs.

Guadalupe, Zone 4, Sunnyvale East, Coyote Creek, and pump stations were discussed as possible locations for trends sampling. Site selection will depend on ability to combine contaminant, flow, and sediment monitoring and will ultimately be decided by the STLS.

3d. Proposal: Advanced data analysis

Lester McKee gave a brief status update on the deliverables and timeline associated with the Advanced Data Analysis (ADA) project. Lester summarized challenges encountered during the development of the yield method and the pilot application of the method in Guadalupe watershed. Jay Davis provided a brief overview of the congener method and highlighted his findings from the Pulgas Pump Station. The determination of a significant source area within this watershed provided confirmation that this area is a high priority for management action.

Lester then presented a \$50,000 proposal to continue and wrap up the ADA in 2020. These funds would be used to further refine these pilot applications and test them in a larger number of watersheds. Jay estimated about \$5,000-\$10,000 would be needed to finish off the congener profiling work. Lester commented that the \$50,000 for 2019 may be an overestimate of what is needed for phase 3 and it is possible that the whole project could be completed with the remaining 2019 funds. He suggested that the 2020 funds could be later reallocated to another project if needed.

Discussion then focused on whether and how this work is directly useful to managers. Some stakeholders mentioned how this work has been useful to date and how findings from this project will prove helpful in unanticipated ways. As progress in understanding broader stormwater issues is not always linear, the ADA project has and will provide findings to help uncover knowledge gaps that are not currently identified. It will inform future normalization methods and the understanding of how and why certain watersheds release certain pollutants. The results will help ensure that managers are not misled by misinterpretation of screening studies in the future. Dan Wang reaffirmed the unpredictable nature of pollutant loading by mentioning surprising results she got from using a statistical model to examine physical pollutant models.

Action Item

- Solicit further review from advisors on decisions and assumptions made in the development of the ADA methodologies. (Lester McKee, 8/1/19) (Note Barbara Mahler provided review comments on June 5th).

3e. Proposal: SEP projects

Alicia Gilbreath quickly summarized the four project ideas proposed for SEP funding:

1. Soil profiling in bioretention to understand pollutant distribution in support of maintenance decisions
2. Estimating stormwater volumes in pump station watersheds to support reuse
3. Understanding BSM performance: infiltration rate field study
4. Improving BSM performance: water quality laboratory study

Workgroup participants clarified that, when approved, SEP projects are to be overseen by the RMP and should not stray from the traditional scope of the RMP. SEP projects should be necessary RMP projects that were only placed on the SEP list due to budget constraints. The workgroup decided all four proposed project ideas diverged from the core focus of the RMP and recommended they not be placed on the SEP project list. Two additional SEP project ideas were generated during Item 4 and are included in the SEP project idea table in Item 5.

4. Discussion: Recommended studies for 2020

Jay Davis started the discussion on prioritizing 2020 SPL special studies. He summarized the RMP's special-study approval process and mentioned that the planning budget for SPLWG is around \$400,000 with \$300,000 likely to be allocated. He encouraged the group to discuss proposals individually and cumulatively, and to consider strategies and creative ways that could aid in the approval process: budget reductions, phasing a project across several years, and sharing funding with other workgroups.

Participants began by recommending that the trends model be phased over two years with development of the hydrology model in the first year and suspended sediment model in the second year. Tom Jobs recommended reducing the number of hydrological calibration stations to 8-10 to reduce modeling effort and save money. The workgroup expressed the desire to involve Tom Jobs during model development process as much as possible. Dale Bowyer highlighted the responsibility of the stormwater community to understand and disseminate knowledge around the efficacy of stormwater management actions.

Dan Cain suggested to repurpose some of the POC funds to the trends monitoring. This idea was tabled for two reasons: (1) collaboration between the POC and CEC project and (2) efficiency associated with the \$100,000 price point for POC sampling. Bonnie De Berry highlighted the value of POC monitoring results and how they helped determine upland sediment monitoring locations to further search for contaminant sources. Dan Wang recommended using analysis of C14 or iodine as a source tracker to indicate whether samples were tidally influenced.

Richard Looker expressed resistance to trends monitoring that only assesses legacy contaminants and supports model development with a greater number of purposes in mind. Peter Mangarella questioned the feasibility of using monitoring to confidently detect trends. Lisa Austin didn't support monitoring Guadalupe watershed because the presence of a mining source makes it difficult to detect mercury trends for urban sources. Chris Sommers provided a success story in favor of trends monitoring: monitoring of diazinon trends demonstrated the efficacy of pesticide regulations and provided positive reinforcement which spurred the implementation of further management action. He argued that both trends modeling and monitoring are needed to reinforce the value of each other. Others agreed with the importance of monitoring to detect trends but commented on the lack of urgency for trends monitoring to happen in 2020. Richard asked to postpone the trends monitoring to future years and re-write the trends monitoring proposal as a SEP if sufficient RMP funding is not granted to cover this for 2020. Richard also suggested that the trends strategy be rebranded as an integrated watershed monitoring and modeling strategy (or something like this). The model development is broader than just trends of legacy contaminants so the current name is misleading. In the

course of model development taking place this year, RMP staff should identify data needs and use this information to develop an integrated modeling/monitoring strategy to bring to SPLWG next year as a special study. This integrated strategy should include monitoring and model development tasks that serve the needs of all consumers of the model Jing is developing (CECs, sediment, legacy). Lester agreed that postponing this study would not jeopardize the utility of any trends-monitoring findings, and would actually make time for the RAA modeling to further inform which sites are best-suited for trends monitoring.

Jay Davis asked whether participants would value monitoring aimed at investigating the validity of the ADA findings. Chris Sommers said that it would be interesting but is not an urgent priority. Chris stated that he was more interested in estimating how much change in pollutant loads can be expected based on existing and projected GSI development. This will help inform where to monitor. Lisa Austin suggested that comparing the yields estimated from the ADA method to a threshold is more valuable to managers than just re-ranking sites. She asked whether statistics could be used to evaluate this threshold, and whether it is possible to discuss this in the final chapter of the ADA report.

5. Decision: Recommendations for 2020 special studies funding

Project leads left the room and Chris Sommers asked the workgroup to prioritize the proposed studies. All four science advisors provided their input on the studies. Subsequent open discussion took place around the timeliness for each project. The workgroup arrived at the prioritization summarized in the following tables.

Study Name	Budget	Modified Budget	Priority	Comments
Small Tributaries POC Loading Program Management	\$40,000	\$40,000	1	
Small Tributaries Loading POC Watershed Reconnaissance Monitoring	\$100,000	\$110,000	2	Option E recommended because manual sampling allows for CEC piggybacking. Short memo recommended. Data QA every other year would save \$20,000, but upland source management relies on yearly data. Added \$10,000 to create a list of tidal sites to sample in the case of ideal sampling conditions.
Regional Model Development to	\$125,000	\$100,000	3	Hydrology modeling only in year 1. Suspended sediment modeling in year

Support the STLS Trends Strategy				2. The 2021 budget should include \$20K for external review by RAA team in 2021.
Advanced Data Analysis, Phase III	\$50,000	\$50,000	4	Placeholder; may be able to finish project with 2019 funds (\$5-10k needed to finish PCB congener analysis). Budget could be reduced by \$20k if needed.
RMP Stormwater Monitoring Strategy and Trends Monitoring	\$56.1k (1 sampling site); \$97.2k (2 sampling sites); \$136.4k (3 sampling sites)	\$56,100	5	Unclear how this serves the need of model development; will need trends data at some point in time to show concentrations and loads have decreased (not just in the model) but may not need to be next year. Guadalupe may not be the best option for urban Hg trends because of the mine. Opportunity isn't lost if Guadalupe is the only watershed monitored because it will be sampled by the District in 2020 and 2021 (sediment). May be able to outsource if needed; budget may be okay if community sampling in Guadalupe can pick up extra sampling. Bring to the TRC with as 56.1k (1-site option). ECWG may also have interest and could be interested in additional funds. This should be mentioned in the proposal brought to the TRC.

SEP Project Ideas		
Study Name	Budget	Comments
Monitoring at SEP sites	\$97,000	
Monitoring at trends sites	\$97,000	
Soil profiling in bioretention to understand pollutant distribution in support of maintenance decisions	\$58,000 – \$84,000	Outside the scope of the RMP
Estimating stormwater volumes in pump station watersheds to support reuse	\$200,000 – \$300,000	Outside the scope of the RMP
Understanding BSM Performance: Infiltration Rate Field Study (with potential improvement of lab procedures)	\$70,000 – \$250,000	Outside the scope of the RMP

Improving BSM Performance: Water Quality Laboratory Study	\$75,000 – \$350,000	Outside the scope of the RMP
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6. Report out

Chris Sommers welcomed project leads back into the room to review the prioritization tables.

He highlighted a few discussion points before adjourning:

- Participants were interested in whether the AD A budget could be reduced and whether funds could be approved as a placeholder and transferred to other projects, e.g. POC monitoring, if all of the \$50,000 is not necessary to finish the ADA tasks.
- The budget for the model development was reduced back to its original \$100,000 amount in order to reduce the total budget for all prioritized studies to \$300,000. This means that the additional \$20,000 to cover external review of the model development (suggested during Item 4) should be pushed to 2021 and would be done in conjunction with the addition of suspended sediment modeling.
- Rebrand the title of the trends strategy and the trends model to titles that reflect all relevant objectives, i.e., an *integrated* strategy to include the broader needs of any/all users of the model relating to CECs, sediment, and legacy contaminants.
- Further discussion should take place to strategize about how to best manage merging interests between workgroups and how to adequately combine stormwater efforts to serve the needs of each workgroup and the RMP as a whole.

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 the 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.