



RMP Emerging Contaminants Workgroup Meeting

April 11-12, 2019
 San Francisco Estuary Institute
 4911 Central Avenue, Richmond, CA

Meeting Summary

Science Advisors	Affiliation	Present
Lee Ferguson	Duke University	Yes
Kelly Moran	TDC Environmental	Yes
Derek Muir	Environment and Climate Change Canada	Remote (phone)
Heather Stapleton	Duke University	Yes
Bill Arnold	University of Minnesota	Yes
Miriam Diamond	University of Toronto	Yes

Attendees

Robert Wilson (City of Petaluma)
 Abigail Noble (DTSC)
 Anne Cooper Doherty (DTSC)
 Eunha Hoh (San Diego State University)
 Erica Kalve (SFBRWQCB)
 Heather Bischel (UC Davis)
 Mary Lou Esparza (CCSD, Central San)
 Simret Yigzaw (City of San Jose)
 Holly Wyer (CA Ocean Protection Council)
 Luisa Valiela (EPA, Region 9)
 Karin North (City of Palo Alto)
 Tum Mumley (SFBRWQCB)
 Shoba Iyer (OEHHA)
 Jennifer Teerlink (CA DPR)
 Lorien Fono (BACWA)
 Artem Dyachenko (EBMUD)
 Terry Grim (Cambridge Isotope Laboratories)
 Heather Peterson (SFPUC)
 Charles Wong (University of Winnipeg)
 Keith Maruya (SCCWRP)
 Anne Hansen (City of San Jose)
 Dawit Tadesse (SWRCB)

Maggie Monahan (SFBRWQCB)
 June-Soo Park (DTSC)
 Miaomiao Wang (DTSC)
 Richard Looker (SFBRWQCB)
 Eric Dunlavy (City of San Jose)
 Reid Bogert (San Mateo Pollution Prevention)
 Bill Mitch (Stanford University)
 Dave Williams (BACWA)
 Jay Davis (SFEI)
 Alicia Gilbreath (SFEI)
 Melissa Foley (SFEI)
 Rebecca Sutton (SFEI)
 Liz Miller (SFEI)
 Don Yee (SFEI)
 Ila Shimabuku (SFEI)
 Diana Lin (SFEI)
 Nina Buzby (SFEI)

Remote Attendees:

Simona Balan (DTSC)
 Chris Sommers (BASMAA)

Remote Attendees (contd.)

Denise Greig (California Academy of Sciences)

Greg LeFevre (University of Iowa)

Ed Kolodziej (University of Washington)

Richard Grace (SGS AXYS)

Lisa Sabin (Santa Clara Stormwater; BASMAA) Scott Coffin (SWRCB)

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

DAY ONE - April 11

1. Information: Introduction and Goals

Melissa Foley began the meeting with a brief background on the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) by outlining the program's goals, history, management questions, and monitoring structure. Melissa then gave a quick introduction of the Workgroup advisors, and allowed time for everyone in the room to introduce themselves.

Melissa's presentation outlined the goals of the meeting and noted the financial context behind special studies funding. The current Multi-Year Plan includes studies that amount to 150% of the available budget. The meeting participants were advised that only the top ~70% of prioritized studies will likely receive RMP core funds. Melissa then gave a short overview of the ECWG daily agendas and related each item to the overarching meeting goals.

2. Discussion: CEC Strategy Update

Rebecca Sutton gave an update on CEC efforts and strategy, including an overview of current activities, monitoring priorities for Low and Possible Concern contaminants, as well as future plans. Additionally, meeting attendees welcomed a new ECWG team member: Liz Miller.

Rebecca's outline of current CEC activities categorized efforts into three strategic elements: (1) targeted monitoring work, (2) learning from others/sharing expertise, and (3) non-targeted analysis (NTA) monitoring. Multiple projects were noted for each element. As an example of targeted monitoring work, the meeting participants were presented with preliminary data from the 2019 pilot stormwater monitoring. Rebecca also noted a few deliverables that would be finalized in the near future, such as the NTA factsheet describing the 2016 RMP study on Bay water and wastewater.

The tiered risk framework is less prescriptive regarding follow-up monitoring recommendations for contaminants in the Low and Possible Concern categories. Meeting participants were asked to react to SFEI's rationale to deprioritize or continue to periodically monitor specific contaminants. All such recommendations were posed in a strategy memo circulated to the workgroup prior to the meeting.

For both the Low and Possible Concern monitoring rationale tables, attendees suggested adding a column that outlines possible management outcomes that would be aided by continued monitoring. Additionally, there was discussion that some chemical classes (e.g., personal care and cleaning products, PFAS) may be too broad. Suggestions included: 1) adding CAS (Chemical Abstracts Service) registration numbers specific to individual chemicals within the classes; 2) creating more explicit subcategories; 3) creating two sets of tables, one that includes more technical chemical names and another with communication-friendly descriptions; and/or 4) adding explanatory footnotes to the existing tiered risk framework.

Comments that differed from the rationale SFEI presented to deprioritize or continue to periodically monitor specific contaminant are as follows. Meeting participants agreed with the suggestion to off-ramp pyrethroid monitoring in the Bay, with a note that they still are a concern in tributaries; possibly continuing PBDD/F monitoring given recent wildfires; and not deprioritizing paraffin monitoring. Meeting attendees arrived at this final suggestion because only short-chain paraffins have been targeted for analysis in the Bay and medium- and long-chain chlorinated paraffins are used in large volumes globally.

In the discussion of Possible Concern contaminants, Miriam Diamond questioned the efficacy of targeted analysis of compounds given the large number of contaminant degradates and emerging replacements, giving the example of the PFAS class. She noted that it might be worth investigating analytical methods that allow species group detection, e.g., total organic halogens (TOX). The TOP assay for PFAS and total organic fluorine measurements (TOF) were suggested examples. Lee Ferguson suggested the following two analytical techniques were some of the best current options if these by-class analyses were to be pursued: (1) a jump in sensitivity using a cryoprobe with high-field nuclear magnetic resonance to quantify PFAS at a ng or lower level; and (2) coupling fluorine mass-defect-based detection against a superset database generated from annotating PubChem to identify PFAS that are lacking existing chemical standards, i.e., GenX ether compounds. This discussion ended with the idea that such efforts will be dependent on how chemical classes are defined and what level of specificity is needed to accurately support management actions.

The lists of Low and Possible Concern contaminants include many contaminants without proposed monitoring actions, pending new data specifically related to toxicity. Rebecca Sutton noted that looking into predictive toxicology resources would be beneficial for filling these gaps and informing future contaminant listing suggestions. Rebecca highlighted two existing methods - ECOSAR and in vitro high-throughput screening assays - that could be helpful. Additionally, Rebecca suggested holding a webinar on predictive toxicology with top experts to inform workgroup members, and help establish next steps. Meeting attendees were supportive of this idea and suggested including the following toxicity tools: the EPA Chemistry and ToxCast Dashboards, Chemical Hazard Data Commons, and the ToxEVAL R-package (Derek Muir suggested ToxPi GUI via email). Tom Mumley was in support of the webinar, but noted that it should be treated as a stepping stone to developing a more robust toxicology strategy.

Discussion around study prioritization led the group to deliberate on the trade-off between prioritizing moderate concern contaminant monitoring and having less resources for exploratory

work. The group decided that contaminant persistence, toxicity, and relevance to management action are important factors to consider during prioritization. Miriam Diamond suggested considering persistence as a key parameter (Derek Muir also noted this approach via email).

3. Information: Bisphenols (BPs) and Organophosphate Esters (OPEs; Flame Retardants) in Bay Water

Ila Shimabuku presented recent results on organophosphate esters (OPEs) and bisphenols from the 2017 RMP Status and Trends Water Cruise. Members of both these contaminant classes are endocrine disrupting, high production volume chemicals that are included on California's Prop 65 list and used in a wide variety of applications. OPE and bisphenol (specifically BPA and BPS) compounds were detected in open bay waters. Data were considered semi-quantitative due to field replicate discrepancies.

A member of each of the classes (TDCPP and BPA) was detected at levels comparable to or exceeding existing protective thresholds. She recommended that given these results, in addition to the lack of knowledge concerning toxic effects and environmental fates as well as expected increases in use trends, both OPEs and bisphenols merit classification as moderate concern. Anne Cooper Doherty noted that DTSC has management categories that include bisphenols due to the human health concerns associated with the compounds. The group discussed knowledge gaps in the domestic production and commerce of bisphenols. There was also discussion on long-term trends and other monitoring results for OPEs. Lee Ferguson and Derek Muir noted that TCPP and TPhP have been detected in drinking water and out in the open ocean, respectively. Heather mentioned that OPE use is increasing, which supports monitoring as moderate concern contaminants. The group mentioned TDCPP is being phased out of furniture, while TCPP is used in housing insulation. Meeting participants and workgroup members supported the listing of both compound classes as moderate concern.

4. Information: Neonicotinoids and Degradates in Bay Water

Nina Buzby presented the 2017 monitoring results for neonicotinoids in Open Bay and South Bay Margins water samples. Imidacloprid was introduced in 1991 and continues to be the most widely used of the class. There are no neonicotinoid toxicity thresholds for marine settings, so freshwater-related thresholds were used as a point of reference.

Results showed one detection of imidacloprid in the Open Bay as well as three imidacloprid detections in margins samples. All detections were in Lower South Bay and were comparable to or exceeded freshwater toxicity thresholds for imidacloprid. The potential sources of imidacloprid were presented visually as a conceptual model. Hydrodynamic modeling using existing stormwater and wastewater monitoring data predicted similar levels in Lower South Bay during the dry season to those observed. The model also showed that concentrations in Lower South Bay are likely to be higher during the wet season. Nina suggested listing imidacloprid as a contaminant of moderate concern, while keeping the rest of the chemical class as Possible Concern compounds.

Workgroup members supported the proposed listing. Tom Mumley initially suggested noting that imidacloprid is a moderate concern in the LSB, and not to the whole Bay, so as not to overstate the concern for the contaminant class. However, others argued that because imidacloprid management action is currently underway *and* on a statewide scale, listing imidacloprid as moderate concern only in the LSB as opposed to Bay-wide would not affect any management actions and would be an unnecessary complication. Moreover, listing for the whole Bay would retain consistency with other classified contaminants as several contaminants are elevated in or only present in the LSB. Additionally, imidacloprid may be present in more than just the Upper and Lower South Bays during the wet season. This discussion led Tom to withdraw this suggestion. Jennifer Teerlink noted that these pesticides are already a focus at DPR and that a concerted monitoring effort from the RMP may not be as necessary. Lee mentioned that imidacloprid guanidine was detected in previous NTA analysis from Coyote Creek samples, but not Napa River samples. The meeting participants also commented on the benefits associated with the hydrodynamic modeling efforts, noting that similar approaches could be used in future work to help identify and prioritize monitoring strategies.

5. Information: Quaternary Ammonium Compounds (QACs) and Antibiotics in Bay Sediment

Bill Arnold, an ECWG advisor from the University of Minnesota, presented preliminary pro-bono analyses of RMP sediment samples for antibiotics and QACs. Bill highlighted the major classes of compounds identified in the sediment: sulfonamides, fluoroquinolones, tetracyclines, macrolides, BACs, DADAMACs, and ATMACs. Similar detections were observed in wastewater effluent and lake sediment samples in Minnesota.

Bill highlighted that detections are not necessarily cause for concern, given the high toxicity levels and sorption coefficients of these compounds, as well as their tendency to bio- or photodegrade. Miriam Diamond agreed with this sentiment, but noted that impacts may be greater for organisms that ingest particles with sorbed chemicals.

6. Information: Triclosan and Methyl Triclosan in Prey Fish

Diana Lin presented on levels of triclosan and methyl triclosan in small fish collected in 2017 from the Lower South Bay. There is concern surrounding the ubiquitous use of triclosan given the ability of the parent and its methylated transformation product to disrupt endocrine systems, and harm aquatic organisms. Since the previous 2011 RMP work to identify triclosan-related data gaps, new protective thresholds have come out, and evidence has emerged of bioaccumulation in fish via water and dietary exposures. Results showed that methyl triclosan concentrations were higher than triclosan. It is unknown whether triclosan is methylated prior to accumulation within fish, or whether methylation occurs in fish tissues. Diana showed that concentrations of triclosan and methyl triclosan measured in small prey fish suggested bioaccumulation through the food web, showed a clear spatial pattern with concentrations decreasing with distance from the San Jose outfall, and could be used to back calculate and

estimate equivalent “water” exposure concentrations that could be compared to water-based toxicity thresholds.

Diana suggested that periodic monitoring should be considered, as levels of the chemicals may not decrease as initially expected and, instead, increase. Meeting participants noted that the FDA is phasing out the use of such compounds in antibacterial hand soaps for consumers, but that triclosan has other applications (e.g., plastics), as well as exceptions for use in hospitals and restaurants. Diana commented that monitoring for these compounds could be added to future pharmaceutical monitoring efforts. A proposal will be presented on Day 2 for this type of add-on sampling.

7. Information: Preliminary Results of Non-targeted Analysis of North Bay Fire-impacted Stormwater

Rebecca Sutton introduced the item as a preliminary look at the findings coming from the 2017 North Bay wildfires. Two groups - the Department of Toxic Substances Control (DTSC) and San Diego State University (SDSU) - conducted NTA on stormwater samples for polar and non-polar species, respectively. The monitoring occurred during two storms in Sonoma and Napa, and during one storm in Santa Rosa.

Miaomiao Wang presented the initial findings from DTSC, organizing the results into negative and positive ion clustering and summary information. After a brief explanation of the workflow, Miaomiao outlined various interpretation techniques such as evaluating the number of shared features between sites and clustering data by storm event. Pesticides, consumer products, phenols, phosphates, and surfactants were more abundant in the first storm compared to the second. Additionally, preliminary data revealed significant chemical profile changes between burnt and unburnt sites, as well as between storm events. Four PFAS were observed with high detection frequency: PFOS, PFHxS, PFBS, and PFOA.

Discussion after the initial presentation brought up further details about the storm sampling events. SFEI staff noted that the first storm was actually the first storm to hit the area after the fires (November 2017) but did not have the heaviest rainfall. The second storm, comparably, was not the second storm experienced (January 2018), but it was a large storm.

Eunha Hoh from SDSU then presented on her laboratory’s non-polar NTA work. Eunha clarified that all identifications were tentative and reference site levels from Sonoma and Napa were used to allow for comparison in Santa Rosa. Interpretations of the preliminary results showed that there was a low number of compounds shared between sites in each storm event. Eunha also highlighted compounds of interest at each monitoring location. Particularly, Napa and Santa Rosa showed many compounds that contain carbonyl groups and oxygen, suggesting evidence of combustion products. In general, a majority of the compounds identified contained oxygen; a majority were cyclic/aromatic; some compounds contained nitrogen; some are known combustion products; others are thought to be industrial in origin.

The discussion following Eunha's presentation brought up interest in the conditions of both the fires and storm events. Miriam Diamond noted that the extreme variance in temperature (i.e., the heat from the fire or cold from a storm) could have a unique influence on chemical compositions. Rebecca Sutton also noted that the rainfall pattern following the wildfires could have affected water quality. If the first storm event had been larger, it is possible that more chemicals at greater quantities could have been washed off the landscape.

DAY TWO - April 12

1. Summary of Yesterday and Goals for Today

Melissa Foley reminded meeting participants of what occurred during the previous day's meeting and allowed time for a second round of introductions. Melissa then informed the meeting participants that the current day's meeting would focus on a modeling strategy, recommendations for status and trends monitoring, and a review and prioritization of special studies proposals.

2. Discussion: CEC Modeling Strategy

Diana Lin outlined the short and long-term modeling goals for CECs. The proposed long-term modeling goal would involve developing a framework to assess and forecast sources, loads, concentrations, and temporal trends. In the short term, plans would focus on modular steps to integrate existing tools, such as conceptual models, box models, and spreadsheet models, into future projects.

Rebecca Sutton provided further details on these goals by identifying current and future examples of leveraging existing tools and efforts to identify relevant factors, data gaps, and temporal trends. Related to future ideas, Rebecca noted that it would be useful to refine tools and add capabilities that would make them better suited to CEC work. For example, altering the bay hydrodynamic spreadsheet model to include multiple inputs for stormwater, instead of just one, similar to how the model is currently set up to deal with wastewater treatment plants.

Rebecca then asked for comments from workgroup members, either at the meeting or in the form of later communication by email or phone. Miriam Diamond suggested entering OPE data into the hydrodynamic spreadsheet model, similar to what was done with neonicotinoids. Kelly Moran identified that the biggest gap in CEC modeling is the uncertainty in quantifying the amount of chemicals released by products. Kelly identified the benefit of drawing from DPR models as they are doing the bulk of such work for pesticides. Tom Mumley also noted the possible resource in SFEI's Nutrient Management Strategy modeling work and the importance of leveraging all available models and not just those previously used by SFEI.

Meeting attendees also discussed the importance of toxicological and conceptual models, both in the context of management actions, as well as for education and outreach tools. Miriam suggested creating a conceptual model for each chemical or class and mapping this information

onto a more generalized model that will help build upon knowledge of general processes. Tom recommended that an optimal level of effort (range of low to high effort) should be applied for each contaminant conceptual model, and that, as part of the CEC strategy, the CECs team should build, maintain, and develop the best conceptual models as more information is collected. Chris Sommers was in agreement with this idea, but noted that in order to truly inform monitoring strategies the models may need more detail. Tom also recommending considering use of empirical models because mechanistic models can be very challenging to develop and use.

3. Discussion: Status and Trends Monitoring Recommendations

Following the previous day's discussion of contaminants newly classified as Moderate Concern, i.e., bisphenols, OPEs, and imidacloprid, Rebecca Sutton presented recommendations for Status and Trends monitoring to the workgroup.

Because no strong regional trend was identified, suggested monitoring of OPEs and bisphenols would likely be Bay-wide. Discussion on these compounds focused on optimizing the analyte list to include a smaller subset of chemicals (i.e., TDCPP, BPA, BPS, BPF) if substantial savings could be made, and adding these to RMP Status and Trends water monitoring in both the open Bay and margins. The workgroup decided not to monitor imidacloprid in status and trends work, given the amount of work being done by other entities like DPR.

4. Information: Ongoing CEC Trend Monitoring by POTWs

Lorien Fono from Bay Area Clean Water Agencies (BACWA) presented on the group's efforts to develop a strategy to monitor CEC trends at POTWs. This work would include a database of treatment plant and service area characteristics as well as a plan for ongoing monitoring to capture trends. Both aspects would be beneficial given the ad-hoc aspect to WWTP selection/volunteering for current CEC studies. The intention would be to enlist RMP support for laboratory communication and data management, as well as to integrate the efforts within the CEC strategy, given RMP experience and past work with CECs in wastewater.

Lorien suggested that any POTWs interested in contributing to the monitoring strategy should contact her. Karin North noted that the entire ECWG should be given the opportunity to review the final monitoring strategy.

The discussion then moved to ancillary topics including POTW anonymity and possible crossover or intersection with microplastics work. The latter of these topics prompted a suggestion to have any ECWG participants contact SFEI if they have interest in receiving Microplastic Workgroup communications.

Diana Lin had a final note for the group during this item, asking for volunteers to participate in the RMP study of ethoxylated surfactants in wastewater and other matrices. The study was funded last year and Lee Ferguson, the analytical partner for the work, noted that it would be helpful to have greater diversity in treatment types.

5. Summary of Proposed ECWG Studies for 2020

SFEI staff outlined the five proposed special studies in order to provide context to the workgroup members and aid the upcoming prioritization discussion.

Rebecca Sutton informed the workgroup on the details related to the Emerging Contaminant Strategy proposal. Previous discussions related to incorporating toxicology and more modeling efforts suggested that the budget for this work may need to be increased. Tom Mumley noted that funds would likely need to be added to the 2019 strategy budget to begin work on a toxicology strategy.

Rebecca also informed the workgroup on the stormwater CECs proposal that would fund the second year of a multi-year study. Rebecca reminded the meeting attendees that the deliverables and significant data management for this work would come in the third year of this work, and dropping funding for the project now would result in a near-wasted year one effort.

Diana Lin presented a proposal on pharmaceutical monitoring in Bay water, wastewater effluent, and sediment samples. The work would build upon the 2017 study on pharmaceuticals in wastewater and include additional analytes. Diana noted that the bulk of the study's budget resulted from high analytical cost, but could be scaled up or down. An add-on possibility that was mentioned on Day 1 would be to screen for triclosan. The study would be somewhat time sensitive, in order to have enhanced comparability with the 2017 work. There was initial discussion as to whether study objectives should investigate differences in removal efficiencies from different wastewater treatment processes in order to inform management actions related to treatment. However, the group instead prioritized evaluating whether pharmaceuticals are of concern in the Bay, and discussion focused on study design and evaluating in-Bay temporal and spatial variation as well as possible leveraging opportunities. Because of the high budget, meeting participants suggested thinking about a modular organization in anticipation of a smaller funding amount.

Ila Shimabuku outlined the monitoring proposal for bisphenols in sport fish tissue as part of the 2019 RMP Sport Fish monitoring. The motivations for such work included a lack of understanding of the environmental fates of bisphenols. The objectives of the study were to determine which bisphenols are present, if levels are of concern, and where to prioritize future efforts. The work would also determine if fish consumption is a pathway for human exposure. Meeting participants brought up concerns that sport fish tissue is not the highest-priority matrix, and that bioaccumulation and resultant risk may not be significant.

Diana Lin informed the workgroup of a proposal that was originally proposed by Meg Sedlak at the 2018 workgroup meeting. The study would aim to quantify concentrations of UV sunscreen compounds like oxybenzone in wastewater effluent. Sampling events would occur during the summer and winter to identify seasonal trends related to predicted use patterns. There was some discussion about the reason for monitoring effluent, and meeting attendees were reminded that

the initial proposal included other matrices, though last year's discussion reframed the scope of work to include only effluent.

6. Information: Characterizing the Mechanism of Toxicity of the Sunscreen Oxybenzone to Sea Anemones

Bill Mitch from Stanford University presented his work investigating the toxicity mechanism of oxybenzone to sea anemones. Sunscreens have been a hot topic recently because these compounds cause coral bleaching (expelling of symbiotic algae from coral polyps) and are toxic to coral larvae. Dr. Mitch explained that the toxicity mechanism of oxybenzone and its metabolites stems from their role as a photosensitizer; this results in the creation of free radicals. Bill's current work is focused on developing a method to quantify levels of oxybenzone and biometabolites, as well as attempting to synthesize biometabolites so they can be dosed directly to anemones. Takeaways from the work show that replacement sunscreen materials have similar structures to the metabolites of concern in Dr. Mitch's research.

Meeting attendees asked various technical questions, including impacts of mineral-based sunscreens. Bill Mitch noted that it's difficult to get information from manufacturers on what is actually used in the products, and therefore hard to make predictions of impacts.

7. Discussion of Recommended Studies for 2020 - General Q&A

Melissa Foley outlined the steps associated with special study prioritization. All RMP workgroups have been tasked with prioritization recommendations, which will be brought to the Technical Review Committee (TRC). The TRC will then determine what studies should be funded using the available budget. The RMP Steering Committee will then have the final say on what funding gets approved for 2020 work. Any remaining studies that are not approved may be eligible to go onto the Supplemental Environmental Project (SEP) list for future consideration. Tom Mumley also reminded the workgroup that there is \$270K available in Alternative Monitoring Requirement (AMR) funds that generally go to CEC projects.

Meeting attendees then took the time to ask any remaining questions while proposal PIs were still in the room. There was little discussion surrounding the strategy and stormwater proposals given the proposals' necessity and/or multi-year approach.

Pharmaceuticals

When discussing the pharmaceutical study, there were multiple suggestions for scaling the study by focusing on wastewater in order to make the budget more amenable to partial funding. There was also discussion on the possibility of utilizing NTA efforts or existing data. Because Lee Ferguson's lab is already handling a lot of RMP analytical work, it was suggested that SFEI look into other possible options for NTA work focused on pharmaceuticals.

Kelly Moran brought up the point that it would be tricky to inform any management response because there are few options related to managing pharmaceutical sources. Erica Kalve added to this, noting that the decision would be more focused on wastewater treatment investments, so

any guidance would likely be more useful to POTW infrastructure decisions. Karin North and Diana Lin suggested that the impacts of standard wastewater treatment processes on the relative persistence or susceptibility to degradation for some pharmaceuticals have already been investigated in the literature.

Bisphenols

The discussion concerning the bisphenol proposal continued to focus on topics brought up during Ila's initial presentation, including whether fish tissue is the best monitoring matrix for 2020 and that archiving tissue should be considered. There was general agreement that the proposal should be refocused on stormwater and effluent monitoring and take advantage of archived sediment; sport fish tissue could be archived for later analysis, as needed.

Sunscreens

There were additional comments that highlighted the data gap concerning direct bay exposure from human swimming and beach activities.

To scale down on cost, the workgroup suggested conducting only one sampling event during the summer to get an idea of the worst case scenario. This topic also led into a side discussion on the rationale for how many plants would ideally participate. Such comments reinforced the importance of BACWA's POTW strategy development, and also highlighted the opportunity for leveraging RMP studies. The workgroup recommended this study be recrafted as an add-on to the bisphenols proposal.

8. Discussion of Recommended Studies for 2020 - Prioritization

Tom Mumley solicited the group for any proposal ideas that hadn't yet been brought up at the meeting, and reminded everyone that costs for a predictive toxicology webinar would be added into the current 2019 CEC Strategy budget. Lee Ferguson brought up the idea of using the ChemTox tool to compare stormwater samples as something to implement down the line. Miriam Diamond proposed that this idea be a separate study with associated critical analysis and be brought forward in future years.

Karin North then summarized the last item's discussions, specifically the changes to the proposed studies that would need to be taken into account during prioritization. These included:

- Increasing the CEC strategy budget to include enough funds to cover conceptual modeling and toxicity work
- Request toxicology funds from the Steering Committee to be added to the current 2019 CEC strategy budget
- Add bisphenols to the list of analytes monitored in stormwater
- Focus pharmaceutical sampling to just Bay water and POTW effluent
- Alter bisphenol sampling to cover stormwater, LSB margins sediment archives, and wastewater effluent
- Tack sunscreen monitoring onto bisphenol wastewater effluent work and only conduct sampling during the summer

Any meeting participants that had presented a special study proposal to the workgroup were then asked to leave the meeting room.

9. Closed Session - Decision: Recommendations for 2020 Special Studies Funding

Following extensive discussion, studies were prioritized via a closed-door session. Studies are listed in order of priority with comments on how to alter and improve the studies summarized in the final column of the following table.

<https://docs.google.com/document/d/15c1MvQpfMC6m8rtLZFD8agUwAn8Xs-LPEJUugv6PgSQ/edit#>

10. Report out on Recommendations

After the closed door session proposal authors were invited back to the meeting to hear the final prioritization decisions. Karin North and Melissa Foley provided a brief summation of the suggestions discussed by the group to make proposals more modular and leverage efforts from other studies (i.e., conduct both bisphenol and sunscreen effluent monitoring together).

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).

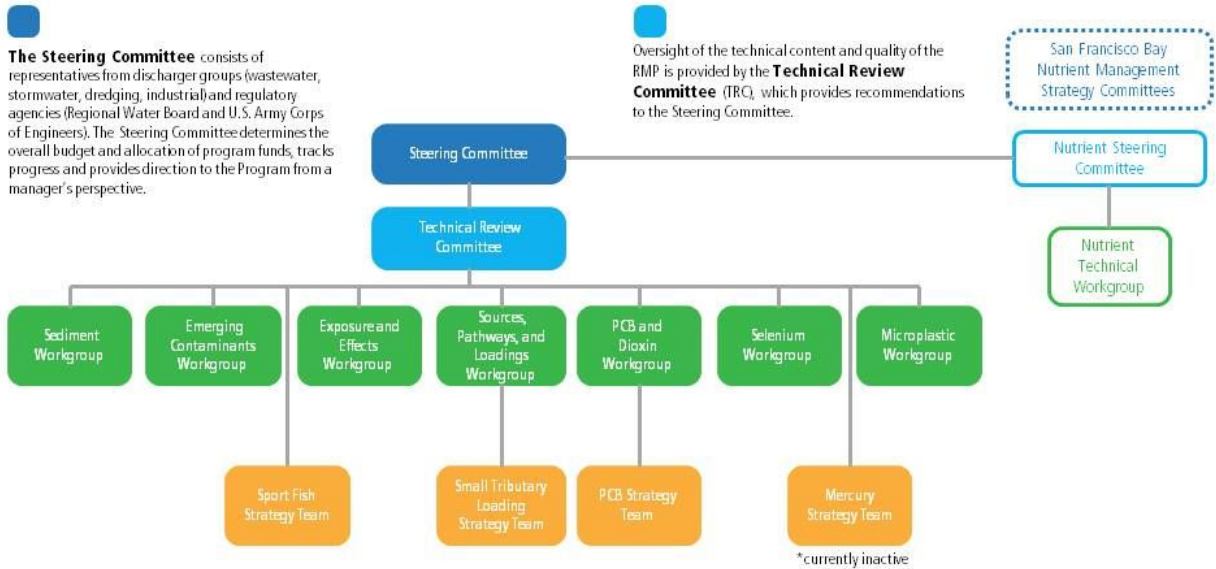
The annual planning cycle begins with a workshop in October in which the Steering Committee articulates general priorities among the information needs on water quality topics of concern. In the second quarter of the following year the workgroups and strategy teams forward recommendations for study plans 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.