BACWA
BAY AREA
CLEAN WATER
AGENCIES

Executive Board Meeting
AGENDA
Friday, June 21, 2019, 9:00 a.m. – 12:30 p.m.
SFPUC, Hetch Hetchy Room, 13th Floor

	Agenda Item	Time	Pages
	ROLL CALL AND INTRODUCTIONS	**9:00 AM**	
	PUBLIC COMMENT	**9:03 AM**	
	CONSIDERATION TO TAKE AGENDA ITEMS OUT OF ORDER	**9:04 AM**	
	CLOSED SESSION	**9:05 AM**	
1	Public Employee Release Gov't Code 94957(b)(1)		
	CONSENT CALENDAR	**9:30 AM**	
2	May 17 2019 BACWA Executive Board Meeting Minutes		3-10
3	April 2019 Treasurer's Reports		11-20
	APPROVALS & AUTHORIZATIONS	**9:35 AM**	
4	Approval: Chair Authorization to Amend HDR Contract to update Group Annual Report		
5	Approval: Extension of Biosolids Research Contract with Dr. Ryals		21-36
6	Approval: Extension of Chlorine Residual BPA Contract with EOA		37-47
7	Approval: Approval of Contract with Carollo Engineers for FY20 AIR Committee Support		48-54
8	Approval: FY20 Staff Consulting Amendments/Agreements		55-57
9	Approval: TDC Environmental, LLC FY20 Consulting Agreement Amendment for BAPPG Support		58-62
10	Approval: Stephanie Hughes Consulting Agreement Amendment for BAPPG Support		63-66
11	Approval: Selection of BACWA Chair & Vice-Chair for FY20		67
	OTHER BUSINESS - POLICY/STRATEGIC	**9:45 AM**	
12	Discussion: Nutrients		
	a. Regulatory		
	i. Nutrient Removal by Water Recycling Request for Proposals	LINK	
	ii. Nature Based Solutions Kickoff meeting		
	iii. Group Annual Reporting Worksheet	LINK	
	b. Technical Work		
	i. Updated on the Nutrient Management Strategy Science Plan	LINK	
	ii. Advance Funding for the Science Program		
	c. Governance Structure		
	i. Debrief from May 2019 Nutrient technical Workgroup meeting		68-83
	ii. Nutrient Management Strategy Steering Committee Meeting #21 Debrief	LINK	84-85
13	Discussion: Progress Report on the Chlorine Residual Basin Plan Amendment		
14	Discussion: Debrief from Joint Meeting with the Water Board on 5/20/19		86-88
15	Discussion: Draft agenda for Joint Meeting with the Water Board on 7/18/19		89
16	Discussion: Debrief from SFEI Microplastics Workgroup Meeting on 5/22	LINK	90-142
17	Discussion: State Water Resources Control Board Toxicity Provisions Update	LINK	
18	Discussion: SSS WDR Listening Session Summary	LINK	
19	Discussion: Enterococcus sampling proposal		143-145
20	Discussion: Update on Ethoxylated Surfactant study		146-147
	OTHER BUSINESS - OPERATIONAL	**11:00 AM**	
21	Discussion: Basis for Nutrient Surcharge in FY21		
22	Discussion: Short Term Utility Fire Prevention Power Outages		
23	Discussion: State of the estuary Conference Agenda	LINK	151-155
24	Discussion: Representative for ReNUWIt Stormwater meeting July 25/26		156-157
25	Discussion: Consideration of Support for the Bay Area Chemical Consortium	LINK	158-166

26	Discussion: Recruitment for BACWA Administrative Support			
27	Discussion: Fire Reclamation Study Advisor			166-167
28	Discussion: BACWA speaker for Regional Monitoring Program Annual meeting			168-170
29	Discussion: Pre-Pardee planning			
30	Discussion: Public Policy Institute of California Request for Support		LINK	171-173
31	Discussion: Committee Sucession Plan			174
32	Discussion: Meeting Schedule for FY20			175
	REPORTS		**12:10 PM**	
33	Committee Reports			176-182
34	Member Highlights			183-193
35	Executive Director Report			194-195
36	Regulatory Program Manager Report			
37	Other BACWA Representative Reports			
	a. RMP Technical Committee	Mary Lou Esparza, Nirmela Arsem		
	b. RMP Steering Committee	Karin North; Leah Walker; Eric Dunlavey		
	c. Summit Partners	Dave Williams; Lori Schectel		
	d. ASC/SFEI	Dave Williams; Amit Mutsuddy; Karin North	LINK	
	e. Nutrient Governance Steering Committee	Eric Dunlavey; Eileen White; Lori Schectel		
	e.i Nutrient Planning Subgroup	Eric Dunlavey		
	e.ii NMS Technical Workgroup	Eric Dunlavey		
	f. SWRCB Nutrient SAG	Dave Williams		
	g. NACWA Taskforce on Dental Amalgam	Tim Potter		
	h. BAIRWMP	Cheryl Munoz; Linda Hu; Dave Williams		
	i. NACWA Emerging Contaminants	Karin North; Melody LaBella		
	j. CASA State Legislative Committee	Lori Schectel		
	k. CASA Regulatory Workgroup	Lorien Fono		
	l. ReNUWIt	Jackie Zipkin; Karin North		
	m. RMP Microplastics Liaison	Nirmela Arsem		
	n. AWT Certification Committee	Maura Bonnarens,		
	o. Bay Area Regional Reliability Project	Eileen White,		
	p. WateReuse Working Group	Cheryl Munoz;		
	q. San Francisco Estuary Partnership	Eileen White; Dave Williams		
	r. CPSC Policy Education Advisory Committee	Coleen Henry		
	s. California Ocean Protection Council	Lorien Fono		
	t. Countywide Water Reuse Master Plan	Karin North		
	u. BayCAN	Dave Williams, Lorien Fono	LINK	
38	**SUGGESTIONS FOR FUTURE AGENDA ITEMS**		**12:27 PM**	
	NEXT MEETING		**12:28 PM**	
	The next regular meeting of the Board is scheduled for July 19, 2019 from 9:00 am to 12:30 pm at EBMUD, 2nd Floor Large Training Room, 375 11th Street, Oakland, CA.			
	ADJOURNMENT		**12:30 PM**	

ROLL CALL AND INTRODUCTIONS
Executive Board Representatives: Lori Schectel (Central Contra Costa Sanitary District); Amit Mutsuddy (San Jose); Eileen White (East Bay Municipal Utility District); Jacqueline Zipkin (East Bay Dischargers Authority); Amy Chastain (SFPUC).

Other Attendees:

Name	Agency/Company
Amanda Roa	Delta Diablo
Eric Dunlavey	San Jose
Alina Constantinescu	LWA
Mike Falk	HDR
Dave Richardson	Woodard & Curran
Azalea Mitch	City of San Mateo
Nirmela Arsem	EBMUD
Yuyun Shang	EBMUD
David Williams	BACWA
Lorien Fono	BACWA
Sarah Deslauriers	Carollo
David Senn	SFEI

PUBLIC COMMENT
None.

CONSIDERATION TO TAKE AGENDA ITEMS OUT OF ORDER – The Executive Director asked if anyone wished to take an item out of order or if any BACWA Representative wished to present a report or request BACWA direction on an issue out of order.

CONSENT CALENDAR
1. Item 1 - Public Employee Discipline/Dismissal/Release Gov't Code 94957(b)(1). The Executive Board met in closed session. There was no report-out.

2. April 19, 2017, BACWA Executive Board Meeting Minutes – The approved minutes will be posted on the BACWA website.

3. February 2019 Treasurer's Reports and Financial Summary – A Financial Summary Report, along with Treasurer's Reports for March 2019, were included in the Packet. A copy of the FY19 Budget as of March 31, 2019, (75% of the fiscal year) was included. It, along with the Summary, provides the Board with a concise overview of the Fund Balances and the current status of the Annual Budget and points out any variances in the budget to date.

Consent Calendar items 1 and 2: *A motion to approve was made by Lori Schectel and seconded by Eileen White . The motion was approved unanimously.*

APPROVALS & AUTHORIZATIONS

4. Approval: BACW Policy on Committee Responsibilities – The Executive Director gave an overview of the Proposed Policy, noting that a draft had been included in the April 19, 2019, Executive Board meeting packet.

Item 4*. A motion to approve was made by Amy Chastain and seconded by Eileen White .The motion was approved unanimously.*

5. Approval: Contract with SFEI for Nature Based Solutions Study for Nutrient Reductions – A Board Action Request and Contract, including Scope of Work, were included in the Packet. The Executive Director gave an overview of the proposed contract, and explained that BACWA is sole sourcing this contract with SFEI due to the value added by leveraging their existing, ongoing, work on operational landscape units. He stated that the funds would be paid under a lump sum contract, with quarterly progress reporting and tracking of percent complete. SFEI plans on using some the $500K for subcontracting with an engineering firm that will provide engineering and cost estimation services for identified projects.

Item 5*. A motion to approve was made by Jackie Zipkin and seconded by Amit Mutsuddy. The motion was approved unanimously.*

6. Approval: Amendment to TDC Environmental Contract – A Board Action Request and Contract Amendment were included in the Packet. The Executive Director gave an overview of the request noting that there would be no change to BAPPG's overall budget.

Item 6*. A motion to approve, following the inclusion of the above noted reference, was made by Jackie Zipkin and seconded by Amit Mutsuddy . The motion was approved unanimously.*

7. Authorization: Executive Director Approval of Legal and IT Amendments for FY 20. The Executive Director noted that he has authorized amended contracts for FY1 20 with BACWA's IT provider, Cayuga Systems, as well as with Regulatory legal support with Downey Brand, and with Executive Board legal support with Day Carter Murphy.

8. Authorization: Chair Approval of Agreement with SFEI for Enterococcus Study – A Chair Approval Request and Consulting Agreement were included in the Packet to authorize SFEI to complete work on the Enterococcus Monitoring Plan.

OTHER BUSINESS-POLICY/STRATEGIC

Agenda **Item 9 –** Discussion: Nutrients

a. Regulatory
    i. Debrief on San Francisco Water Board meeting – Three BACWA Board members attended and provided testimony at the 2nd Nutrient Watershed Permit adoption hearing on May 8, 2019. There were no objections raised to the Permit with all comments by the Water Board members and staff being very complimentary of the Permit negotiation process and the relationship with BACWA and its members. The Water Board thanked the members for their constructive comments at the hearing.
    ii. Review of Request for Proposals for Recycled Water Study – A draft RFP soliciting proposals for consultant support of the Nutrient Load Reduction by Water Recycling was included in the packet. A selection committee made up of one Board member, the ED, the RPM and two Recycled Water Committee members will be assembled to evaluate proposals. They will review and issue the RFP by May 31. The first permit deadline for the study is December 1, 2019 for the Scoping Plan submission to the Regional Water Board. BACWA intends that the Evaluation Plan be combined with the Scoping Plan and submitted at the same time.
    iii. Approach to Contract Management of the Nature Based Solutions (NBS) Study – There was a discussion about how to provide oversight for the NBS study. The ED proposed that a scaled back contract management group be convened who would oversee the project at quarterly in-person meetings. The Executive Director has put together a list of potential participants in this group from all the subembayments, but is still waiting to hear back from potential participants from San Pablo Bay.

b. Technical Work – Science Manager Update – The Science Manager gave a presentation on the Science Plan Update. He showed slides demonstrating good correlation between model outputs for chlorophyll a, and observed data for model validation. Models show large variability within small geographical regions for both nitrate and chlorophyll a. The Science Manager showed proposed sites for new moored sensors to get the greatest benefit. He showed slides of relative abundance of *Alexandrium*, a harmful algal toxin, and described how there may have been previous errors in taxonomy classification, explaining discontinuities in the data over time. There was a discussion about how these tools could be used to help regulators evaluate the need for management actions.

c. Governance Structure –
    i. Update on Alternatives for Continuation of the USGS Monitoring Program – The Science Plan Manager gave some updates on potential options for replacement of the USGS monitoring program. He posted slides on the Status of the Program and the timeline for potential continued involvement by USGS. BACWA and its members have submitted letters to Congress urging continued funding for the program. He showed a range of funding scenarios to split costs between the RMP, USGS and

NMS, as well as potential costs of working with other collaborators than the USGS.

Agenda **Item 10 –** Planning for Annual Meeting with BAAQMD - Sarah Deslauriers, consultant support for the AIR Committee, a proposal for potential topics for the annual meeting between BACWA and the Air District, as well as key staff at the Air District. See slides. A Board Member suggested leaving a section of the Agenda for the Air District to report on upcoming items that they're working on.

Agenda **Item 11 –** Discussion: Chlorine Residual Basin Plan Amendment Update – The ED gave an update on the progress of the Chlorine Residual BPA work. EOA has asked the Board for feedback on whether there is interest in also amending the Basin Plan to implement the new bacterial objectives, as well as removing oil and grease as a POTW monitoring parameter at the same time. The Board agreed to discuss these issues with Regional Water Board staff at the 5/20 joint meeting.

Agenda **Item 12 –** Discussion: Water Board Joint Meeting on 5/20/19 Draft Agenda – The Agenda for the May 20, 2019 meeting was included in the Packet. PFAS monitoring will be added to the CEC portion of the agenda. A Board member suggested that the wetland item be moved to directly after the nutrient item.

Agenda **Item 13 –** Discussion: Collection System Requirements in NPDES Permits. A sample from a member's NPDES permit reissuance letter was included in the packet. The Regional Water Board is requesting that agencies submit information on their collection systems that is already provided in their SSMPs. This issue will be raised with the Regional Water Board staff at the 5/20 meeting.

Agenda **Item 14 –** Discussion: Key legislation updates. SB332 was held in suspense, but will probably reappear during the next legislative cycle. SB69, the Ocean Acidification Bill, passed out of Appropriations with amendments, likely without denitrification requirements. The language will be available around 5/21/19. SB1672, the CASA-sponsored wipes bill was held over to be a two-year bill.

Agenda **Item 15** – Discussion: Preparation for the Upcoming Microplastics Workshop.
The microplastics strategy is being discussed at an all-day workshop on May 22 at SFEI. The packet for that meeting was included in as a link in the BACWA Executive Board packet. Microplastics may be moved to moderate concern on the tiered risk framework. They have found that stormwater is a very significant source of microplastics to the San Francisco Bay, with higher loads than municipal wastewater. Nirmela Arsem, BACWA's representative to the microplastics workgroup, gave an update on the method-related problems quantifying microplastics and differentiating them from natural materials. There will be a workshop in October at the David Brower center where SFEI will invite the media. A Board member noted that they feel that end-of-pipe treatment isn't the answer and we should be considering source

control. BACWA will put together a Fact Sheet outlining POTWs' position on microplastics.

Agenda **Item 16 –** Discussion: Update on the SWRCB Toxicity Provisions. The RPM gave an update. POTW representatives from around the State met with State Water Board staff to discuss concerns with the proposed provisions. State Water Board staff said that they are considering allowing agencies to use the reduced monitoring frequency based on historical toxicity data. However, they generally do not want to make significant changes to the October 19, 2018 draft. A revised draft will be available May 31, followed by two staff workshops this summer.

Agenda **Item 17** – Discussion: Participation in the Ethoxylated Surfactants Investigation. The ED gave an update, noting that SFEI is seeking POTW participants for a study on ethoxylated surfactants. BACWA is working with them to identify potential volunteers, but would like to understand their needs better to avoid always sampling for CECs at the same, largest POTWs.

Agenda **Item 18** – Discussion: Approach for Completing Analyses Needed for the Enterococcus Investigation. The ED noted that BACWA is developing a sampling plan with SFEI, then will work to put together a contract with Cel Analytical to do the analyses via the membrane filtration method. SFPUC has volunteered the use of their boat and crew for sample collection.

OTHER BUSINESS-OPERATIONAL

Agenda **Item 19** – Discussion: History of Wastewater Treatment in the Bay. A link to the 2007 article was provided in the packet.

Agenda **Item 20 –** Discussion: TIN as the basis of the nutrient surcharge. The ED proposed continuing the higher rate of nutrient surcharge for this one last fiscal year. The RPM added that there are other timing issues to consider when switching from TN to TIN as the basis for the surcharge, as well as the time lag between the data and the invoicing year. A board member expressed concerns about changing the timing. This will be reagendized to discuss further at the June Executive Board meeting.

Agenda **Item 21 –** Discussion: Review of the Regulatory Matrix. A link was provided in the packet to the updated Regulatory issues matrix.

Agenda **Item 22** – Discussion: Interface of Biosolids Committee with Bay Area Biosolids Coalition – The Executive Director described the overlap of personnel and activity between BABC and BACWA's Biosolids committee. Because BABC's long term future is uncertain, it was recommended that BACWA's Biosolids committee be maintained, but put on the backburner. There will not be regularly scheduled meetings, but it will continue to develop the Solano County Generators Report and the BACWA Biosolids Survey.

Agenda **Item 23** – Discussion: Responses to the Request for Qualifications/Proposals for Committee Supporting in FY20 – The RPM reported that BACWA received two proposals for AIR committee support, and a consultant was chosen by the selection committee. Four qualifications submittals were received by BAPPG in response to the RFQ for outreach support, and the selection committee decided to issue a full RFP to the top two firms.

Agenda **Item 24** – Discussion: Planning for Recognition at the CASA Executive Director's Retirement – The ED proposed that BACWA develop a plaque and resolution in support of the CASA ED's service, to be presented at a CASA meeting later this year.

REPORTS

Agenda **Item 25** – Committee Reports – BACWA Committee Reports were included in the Packet.
AIR Committee: No meeting
BAPPG Committee: No meeting
Biosolids Committee: No meeting.
Collections Committee: A report from the April 25, 2019 meeting was included in the packet.
Lab Committee: A report from the April 17, 2019 meeting was included in the Packet.
Operations & Maintenance – InfoShare Group: A report from the April 24, 2019 meeting was included in the packet.
Permits Committee: No meeting.
Pretreatment Committee: No meeting.
Recycled Water Committee: No meeting.

Agenda **Item 26** - Discussion: Member Highlights - Executive Board Representatives (Board) were given an opportunity to provide updates from each of the Principal agencies. Non-principal members were also given an opportunity to report out on behalf of their agencies. No actions were taken on the report-outs.

Members :
San Jose - They did a sensitive species screening, and fathead minnow (not *Ceriodaphnia*) was identified as the most sensitive species.
San Mateo – They have awarded the first phase of their expansion project and expect groundbreaking in September.
EBMUD – There will be a conference call for the California QMS workgroup. CAL and CVCWA are considering litigation on the proposed ELAP updates.

Agenda **Item 27** - The **Executive Director's (ED) Report** for April 2019 along with the Board Calendar, and BACWA Action Items, were included in the Packet. It was noted that 97 of 99 action items from FY19 have been completed.

Agenda **Item 28** - The **Regulatory Program Manager (RPM) Report** for April 2019 was included in the Packet.

Agenda **Item 29 - Other BACWA Representative Reports** – BACWA Representative were given an opportunity to provide updates. No actions were taken based on the reports.

a. RMP-TRC: Mary Lou Esparza, Nirmela Arsem – No report.
b. RMP Steering Committee: Karin North; Leah Walker; Eric Dunlavey – No report
c. Summit Partners**:** Dave Williams; Lori Schectel **–** No report.
d. ASC/SFEI: Eileen White; Dave Williams; Amit Mutsuddy; Karin North – The Board meeting packet was included as a link.
e. Nutrient Governance Steering Committee: Eric Dunlavey; Eileen White; Lori Schectel; Jacqueline Zipkin – No report.
    i. Nutrient Planning Subgroup: Eric Dunlavey
    ii. NMS Technical Workgroup: Eric Dunlavey
f. SWRCB Nutrient SAG: Dave Williams – No report.
g. NACWA Taskforce on Dental Amalgam: Tim Potter – No report.
h. **BAIRWMP:** Cheryl Munoz, Linda Hu, Dave Williams – A Committee Meeting Summary Report from March 25, 2019 was included in the Packet.
i. NACWA Emerging Contaminants: Karin North, Melody La Bella – No report
j. CASA State Legislative Committee: Lori Schectel – No report.
k. CASA Regulatory Workgroup – Lorien Fono – A link to the May meeting packet was included.
l. ReNUWIt: Jackie Zipkin; Karin North – No report.
m. RMP Microplastics Liaison: Nirmela Arsem – No report.
n. AWT Certification Committee: Maura Bonnarens – No report.
o. Bay Area Regional Reliability Project: Eileen White– No report
p. WateReuse Working Group: Cheryl Munoz – No report.
q. San Francisco Estuary Partnership – Eileen White; Dave Williams – No report
r. CPSC Policy Education Advisory Committee – Doug Dattawalker – No report.
s. California Ocean Protection Council – Lorien Fono – No report.
t. Countywide Water Reuse Master Plan - Karin North; Pedro Hernandez – No report.
u. BayCAN: Bay Area Climate Adaptation Network - David R. Williams; Lorien Fono – No report.
v. CHARG: Coastal Hazards Adaptation Resiliency Group – Jacqueline Zipkin – No report.

Agenda **Item 30 - SUGGESTIONS FOR FUTURE AGENDA ITEMS**. It was proposed that a speaker on the PFAS issue be invited.

ANNOUNCEMENTS: The next regular meeting of the Board is scheduled for June 21, 2019 from 9:00 am to 12:30 pm at SFPUC, 13th Floor, Hetch Hetchy Room, 525 Golden Gate Ave, San Francisco, CA.

To receive a copy of any materials provided to the Board at a BACWA Executive Board meeting contact Lorien Fono at lfono@bacwa.org.

The meeting adjourned at 12:51 pm.

Fund Balances
In FY 19 BACWA has three operating funds (BACWA, Legal, and CBC) and two pass-through funds for which BACWA provides only contract administration services (WOT & Prop 84).

BACWA Fund: This fund provides the resources for BACWA contract staff, its committees, and other administrative needs. The ending fund balance on April 30, 2019 was $ 1,341,952 which is significantly higher than the target reserve of $191,875 which is intended to cover 3 months of normal operating expenses based on the BACWA FY19 Budget. $ 155,428 of the ending fund balance is shown on the April Fund & Investments Balance Report as obligated to meet on-going operating line item expenses for BAPPG Committee Support, Legal services, IT services, Board meeting expenses, accounting services and BACWA contract staff support. This leaves an actual unobligated excess funds of $ 994,648.92 (i.e. actual fund balance of $1,186,524 less target reserves) as of April 30, 2019. As the details of the costs of the various regulatory requirements included in the next Nutrient Watershed Permit become better defined, these excess funds may be transferred to the CBC fund and used to offset potential Nutrient Surcharge increases to the BACWA members.

CBC Fund: This fund provides the resources for completing special investigations as well as meeting regulatory requirements. The ending fund balance on April 30, 2019 was $ 1,976,793 which is significantly higher than the target reserve of $1,000,000 which was approved by the BACWA Executive Board on December 21, 2018. $ 348,635 of the ending balance is obligated to meet line item expenses for completion of the Group Annual Report contract, the Chlorine Residual BPA work, and for technical support. This leaves actual unobligated excess funds of $628,158 (i.e. actual fund balance of $ 1,628,158 less target reserves) as of , 2019. Total Disbursements for FY19 from the CBC Fund include the Nutrient Voluntary Contribution of $200,000 and the Nutrient Watershed Permit payment of $880,000. In addition, an unscheduled advance payment of $200,000 was made in December 2018 towards the FY20 Nutrient Watershed Permit requirement. As the details of the costs of the new regulatory requirements in the 2nd Nutrient Watershed Permit become better defined, any excess CBC funds may be used to offset potential Nutrient Surcharge increases to the BACWA members.

Legal Fund: This fund provides for needed legal services. The ending balance was $300,000 which is at the target reserve of $300,000.

Budget To Actual
The BACWA Annual Budget includes all expected revenues as well as budgeted expenses. If needed, transfers can be made between the BACWA Fund and the CBC Fund in order to ensure adequate funds are available to complete all the work designated to be paid for by these two funds. It is important to achieve the anticipated revenues and not exceed the budgeted expenses on an annual basis in order to maintain the BACWA and CBC Fund balances at the levels projected in the 5 Year Plan.

Revenues as of April 30, 2019, 2018 (75% of the FY) are at 104.09% due primarily to timing of invoices, and to higher interest rates. The FY19 BACWA invoices were sent at the end of July 2018 and the end of August 2018 and all invoiced dues and fees have been received.

Overall Expenses as of April 30, 2019 (83.3% of the FY) are at 95.72% due to the timing of the Nutrient Surcharge payments required by the 1st Nutrient Watershed Permit, voluntary contributions to support additional science, and an advance payment for FY20 nutrient science funding. Additionally, BACWA is serving as an administrator for Biosolids & Climate Change Research in Agricultural Soils Project, which is an unbudgeted expense of $85,000 for which $30k was received in FY18 and $55k in FY 19.

Those needing additional explanation (i.e. either 10% over or under budget) are:

Administration: This category is 52.73% expended at 83.3% of the FY due to the timing of invoices.

Communication: This category is 52.66% expended at 83.3% of the FY due primarily to timing of invoices and lower than budgeted expenditures on website development and maintenance and IT support.

Legal: This category is 12.47% expended at 83.3% of the FY due to little need for legal support to date.

Committees: This category is 51.64% expended at 83.3% of the FY due to timing of invoices, and some committees not making use of planned budgets.

Technical Support: This category is 105.10% expended at 83.3% of the FY due to the timing of the payments for funding nutrient scientific program.

NOTE: An Alternative Investment in the amount of $300,000 purchased in December 2018 was called in January 2019. It will be replaced, but LAIF rates continue to be higher than Alternative Investments since the yield curve is negative out to 7 years.

BACWA BAY AREA CLEAN WATER AGENCIES

BACWA FY19 BUDGET	Line Item Description	FY 2019 Budget	Actuals Apr 2019	83.3% of Budget Actual % of Budget Apr 2019	Variance	NOTES
REVENUES & FUNDING						
Dues	Principals' Contributions	$496,837	$496,835	100.00%	-$2	**FY19:** 2% increase. (Diff due to rounding error)
	Associate & Affiliate Contributions	$182,144	$183,035	100.49%	$891	**FY19:** 2% increase. Assoc: $8,090; Affiliate: $1,600. 1 Coll Syst cancelled, 1 new Member
Fees	Clean Bay Collaborative	$675,000	$674,250	99.89%	-$750	Prin: $450,000; Assoc/Affil: $225,000
	Nutrient Surcharge	$800,000	$799,998	100.00%	-$2	Prin: $533,335; Assoc/Affil: $266,673
	Member Voluntary Nutrient Contributions	$0	$0		$0	
Other Receipts	AIR Non-Member	$6,800	$6,800	100.00%	$0	**FY19:** 5% increase (Santa Rosa)
	BAPPG Non-Members	$3,800	$3,801	100.03%	$1	**FY19:** 2% increase (Sta Rosa, Sac Reg'l, Vacaville)
	Other	$0	$55,000		$55,000	Biosolids & Climate Change Research in Agricultural Soils Project (Addl $30k received in FY18)
Fund Transfer	Special Program Admin Fees	$5,000	$5,000	100.00%	$0	**FY19:** BACWWE increase in FY19, may include Prop 84 Admin Fees for FY16, FY17, FY18, FY19 when closed out
Interest Income	LAIF	$20,000	$50,991	254.96%	$30,991	BACWA, Legal, & CBC Funds invested in LAIF
	Higher Yield Investments	$9,000	$7,708	85.64%	-$1,292	Alternative Investment Interest (Legal & CBC Funds invested in AltInv)
	Total Revenue	**$2,198,581**	**$2,283,418**	**103.86%**	**$84,837**	

BACWA FY18 BUDGET	Line Item Description	FY 2019 Budget	Actuals Apr 2019	Actual % of Budget Apr 2019	Variance	NOTES
EXPENSES						
Labor						
	Executive Director	$201,682	$151,261	75.00%	-$50,421	2.9% CPI (SF/Oakland/San Jose Metro Area Dec 2017)
	Assistant Executive Director	$90,526	$77,323	85.42%	-$13,203	2.9% CPI (SF/Oakland/San Jose Metro Area Dec 2017)
	Regulatory Program Manager	$119,815	$88,661	74.00%	-$31,154	2.9% CPI (SF/Oakland/San Jose Metro Area Dec 2017)
	Total	**$412,023**	**$317,246**	**77.00%**	**-$94,777**	
Administration						
	EBMUD Financial Services	$40,800	$20,873	51.16%	-$19,927	**FY19:** 2% increase
	Auditing Services (Maze)	$6,426	-$67	-1.04%	-$6,493	**FY19:** $6,300 Accrued from FY18 to FY19, less $1,870, $3,740 & $623 paid for FY18
	Administrative Expenses	$7,650	$6,156	80.47%	-$1,494	Travel, Supplies, Parking, Mileage, Tolls, Misc.
	Insurance	$4,590	$4,393	95.71%	-$197	**FY19:** 2% increase
	Total	**$59,466**	**$31,355**	**52.73%**	-$28,111	
Meetings						
	EB Meetings	$2,550	$1,702	66.75%	-$848	**FY19:** 2% increase. Catering, Venue, other expenses
	Annual Meeting	$10,200	$9,113	89.34%	-$1,087	**FY19:** 2% increase. Catering, Venue, other expenses.
	Pardee	$6,120	$5,608	91.63%	-$512	**FY19:** 2% increase. Catering, Venue, other expenses
	Misc. Meetings	$5,100	$4,753	93.20%	-$347	**FY19:** 2% increase. Hol & Comm Chair Lunch, Staff Mtgs, Fin Comm, Summit Ptnrs, CASA, NACWA Tech WS, Low Flow WS
	Total	**$23,970**	**$21,176**	**88.35%**	**-$2,794**	
Communication						
	Website Hosting (Computer Courage)	$750	$1,200	160%	$450	BACWA and BayWise web site hosting
	File Storage (Box.net)	$1,500	$720	48%	-$780	
	Website Development/Maintenance	$600	$0	0%	-$600	Domains, website changes
	IT Support (As Needed)	$2,600	$540	21%	-$2,060	
	Other Commun (MS, SM, Backup, PollEv)	$1,500	$1,484	99%	-$16	MS Exchange, Survey Monkey, CrashPlanPro, Carbonite, Doodle Polls, PollEv
	Total	**$6,950**	**$3,944**	**56.75%**	**-$3,006**	
Legal						

EXPENSES						
	Regulatory Support	$2,601	$195	7%	-$2,406	**FY19:** 2% increase
	Executive Board Support	$2,091	$390	19%	-$1,701	**FY19:** 2% increase
	Total	**$4,692**	**$585**	**12.47%**	**-$4,107**	
Committees						
	AIR	$51,000	$31,620	62%	-$19,380	Lunches included in budget but not in Carollo agreement
	BAPPG	$100,000	$77,444	77%	-$22,556	Includes CPSC @ $10,000 and Pest. Reg Spt. @ $15,000
	Biosolids Committee	$3,100	$206	7%	-$2,894	Includes WEF Conf
	Collections System	$1,000	$0	0%	-$1,000	
	InfoShare Groups	$1,200	$404	34%	-$796	funds for 2 workgroups (Asset Mgmt & O&M - Asset Mgmt on hiatus)
	Laboratory Committee	$6,100	$0	0%	-$6,100	Includes Tech Conf. & training funds
	Permits Committee	$1,000	$975	97%	-$25	
	Pretreatment	$7,500	$1,503	20%	-$5,997	Includes training funds & Factsheet not expended in FY18
	Recycled Water Committee	$1,000	$78	8%	-$922	
	Misc Committee Support	$45,000	$0	0%	-$45,000	$10,000 increase in FY19
	Manager's Roundtable	$1,000	$297	30%	-$703	
	Total	**$217,900**	**$112,527**	**51.64%**	**-$105,373**	
Collaboratives						
	Collaboratives					
	State of the Estuary (SFEP-biennial)	$20,000	$0	0%	-$20,000	Bienniel in Odd Fiscal Years. (Paid bienniely in odd fiscal years for even fiscal year conference)
	Arleen Navarret Award	$0	$1,000		$1,000	Bienniel in Even Fiscal Years (FY18 Budgeted Amount paid in FY19)
	FWQC (Fred Andes)	$7,500	$7,500	100%	$0	Dues unchanged in FY19
	Stanford ERC (ReNUWIt)	$10,000	$10,000	100%	$0	
	Misc	$5,000	$23,971	479%	$18,971	BayCAN FY19 Annual Membership ($1,500), Cerio Tox Whitepaper ($6,796), SFEI ED Donation ($100), ReNUWIt ($15k)
	Total	**$42,500**	**$42,471**	**99.93%**	**-$29**	
Other						
	Unbudgeted Items					
	Other	$0	$85,000		$85,000	Biosolids & Climate Change Research in Agricultural Soils Project ($30k rec'd in FY18, $55k recd in FY19)
		$0	**$85,000**		$85,000	
Tech Support						
	Technical Support					
	Nutrients					
	Watershed	$880,000	$1,080,000	123%	$200,000	Includes Adv Funding of FY20 payment. $200k paid in Dec 2018
	NMS Voluntary Contributions	$200,000	$200,000	100%	$0	
	Additional work under permit	$100,000	$12,132	12%	-$87,868	Increased at Board's request (LimnoTech, HDR add'l SOW's in FY19 - 2 Amendments)
	Opt/Upgrade/Annual Reporting Studies	$25,000	$25,652	103%	$652	**FY19:** Balance remaining on agreement at end of FY18 (Actual $25,652.20)
	Member Voluntary Nutrient Contributions	$0	$0		$0	
	Nutrient Workshop(s)	$20,000	$0	0%	-$20,000	Pilot Studies/Plant Review/Innovative Technologies
	General Tech Support	$51,000	$33,829	66%	-$17,171	**FY19:** 2% increase. EOA ChlResidBPA continues into FY19
	Risk Reduction	$10,000	$0	0%	-$10,000	$50,000 over 5 years (FY19-FY23) 2 Contracts for $25,000 each over FY19, 20, & 21
	Total	**$1,286,000**	**$1,351,613**	**105.10%**	**$65,613**	
	TOTAL EXPENSES	**$2,053,501**	**$1,965,918**	**95.73%**	**-$87,583**	
	NET INCOME BEFORE TRANSFERS	**$145,080**	**$317,500**			
	TRANSFERS FROM RESERVES	**$0**				
	NET INCOME AFTER TRANSFERS	**$145,080**				

Bay Area Clean Water Agencies
A Joint Powers Public Agency
Leading the Way to Protect our Bay

May 22nd, 2019

MEMO TO: Bay Area Clean Water Agencies Executive Board
MEMO FROM: Damien Charléty, Treasurer, East Bay Municipal Utility District
SUBJECT: Tenth Month FY 2019 Treasurer's Report

As required by section eight of the Joint Powers Agreement establishing the Bay Area Clean Water Agencies (BACWA) and California Government Code Sections 6500 et seq., attached is the BACWA Treasurer's Report for the period covering **July 1, 2018 through April 30, 2019** (ten months of Fiscal Year 2019). This report covers expenditures, cash receipts, and cash transfers for the following BACWA funds:

- Bay Area Clean Water Agencies (BACWA),
- BACWA Legal Reserve Fund (Legal Rsrv),
- Water Quality Attainment Strategy (WQA CBC),
- Water/Wastewater Operator Training (WOT),
- Prop84 Bay Area Integrated Regional Water Mgmt (PRP84)

BACWA Fund Report as of April 30, 2019

BACWA FUND BALANCES - DATA PROVIDED BY ACCOUNTING DEPT.

DEPTID	DESCRIPTION	FISCAL YEAR BEGINNING FUND BALANCE	TOTAL RECEIPTS TO-DATE	TOTAL DISBURSEMENTS TO-DATE	MONTH-ENDING FUND BALANCE	OUTSTANDING ENCUMBRANCES	MONTH-END UNOBLIGATED FUND BALANCE
800	BACWA	1,186,598	769,658	614,304	1,341,952	155,428	1,186,524
804	LEGAL RSRV	300,000	-	-	300,000	-	300,000
805	CBC	1,814,647	1,513,760	1,351,613	1,976,793	348,635	1,628,158
	SUBTOTAL 1	*3,301,245*	*2,283,417*	*1,965,917*	*3,618,746*	*504,063*	*3,114,682*
810	WOT	208,214	148,500	8,338	348,375	-	348,375
	SUBTOTAL 2	*208,214*	*148,500*	*8,338*	*348,375*	-	*348,375*
811	PRP84	117,907	1,791,393	1,791,393	117,907	-	117,907
	SUBTOTAL 3	117,907	1,791,393	1,791,393	117,907	-	117,907
	GRAND TOTAL	**3,627,367**	**4,223,310**	**3,765,648**	**4,085,028**	**504,063**	**3,580,965**

Top Chart: Reflects CASH on the Books — Includes Encumbrances
Bottom Chart: Reflects CASH in the Bank — Includes Payables (bills received but not paid)
Allocations: Priority for non-liquid investments

BACWA INVESTMENTS BALANCES - DATA PROVIDED BY TREASURY DEPT.

DEPTID	DESCRIPTION	FISCAL YEAR BEGINNING FUND BALANCE	TOTAL RECEIPTS TO-DATE	TOTAL DISBURSEMENTS TO-DATE	MONTH-ENDING FUND BALANCE	RECONCILIATION TO FINANCIAL STATEMENTS	MONTH-END RECONCILED FUND BALANCE	UNINVESTED CASH BALANCES	LAIF INVESTMENTS AMOUNTS	LAIF INVESTMENTS PERCENTAGE	ALTERNATIVE INVESTMENTS AMOUNTS	ALTERNATIVE INVESTMENTS IDENTIFIERS	ALTERNATIVE INVESTMENT INSTRUCTIONS AND NOTES
800	BACWA	1,186,598	769,658	614,304	1,341,952	26,906	1,368,859	783,052	585,807	26%	-		priority # 3 for allocation
804	LEGAL RSRV	300,000	-	-	300,000	-	300,000	-	-	0%	300,000	AR5	priority # 1 for allocation
805	CBC	1,814,647	1,513,760	1,351,613	1,976,793		1,976,793	-	1,676,793	74%	300,000	ME2	priority # 2 for allocation
	SUBTOTAL 1	3,301,245	2,283,417	1,965,917	3,618,746	26,906	3,645,652	783,052	2,262,600	100%	600,000		
810	WOT	208,214	148,500	8,338	348,375		348,375	348,375		0%	-		pass-through funds, no allocation
	SUBTOTAL 2	208,214	148,500	8,338	348,375	-	348,375	348,375	-	0%	-		
811	PRP84	117,907	1,791,393	1,791,393	117,907		117,907	117,907	-	0%	-		pass-through funds, no allocation
815	PRP50	-	-	-	-		-	-	-	0%	-		pass-through funds, no allocation
	SUBTOTAL 3	117,907	1,791,393	1,791,393	117,907	-	117,907	117,907	-	0%	-		
	GRAND TOTAL	**3,627,367**	**4,223,310**	**3,765,648**	**4,085,028**	**26,906**	**4,111,934**	**1,249,334**	**2,262,600**		**600,000**		
						verification	-	-	-		-		

To be used to cover Reconciliation to Financial Statements ($0)

Reconciliation to Trial Balance - accrual basis

Per Report above:

General		2,283,417
WOT		148,500
PROP		1,791,393
subtotal		**4,223,310**

Billings-Pending Receipts

4686	Mem Contrib	-
4687	Transfer	-
4690	Assoc Contrib	-
4696	Other	(54,786)
4731	State Grant	(0)
4732	Grant Retention	(16,597)
subtotal		**(71,384)**

Trial Balance Revenue Accounts

4411	Interest	(58,698)
4686	Mem Contrib	(1,319,585)
4687	Transfer	(5,000)
4690	Assoc Contrib	(183,035)
4696	Other	(810,813)
4731	State Grant	(1,597,316)
4732	Grant Retention	(177,480)
subtotal		**(4,151,926)**
Difference		**(0)**

BACWA Revenue Report as of April 30, 2019

FUND #	DEPARTMENT	JOB	REVENUE TYPE	AMENDED BUDGET	CURRENT PERIOD			YEAR TO DATE				UNOBLIGATED
					Admin & General	Contributons	Interest, Transfers,Others	Admin & General	Contributons	Interest, Transfers,Others	ACTUAL	
800	BACWA	0408511	Administrative & General	-	-	-	-	-		-	-	-
800	BACWA	1011099	BDO Member Contributions	496,837	-	-	-	-	496,835	-	496,835	2
800	BACWA	1011108	BDO Other Receipts	-	-	-	-	-		-		-
800	BACWA	1011109	BDO Fund Transfers	5,000	-	-	-	-		5,000	5,000	-
800	BACWA	1011117	BDO- Interest Income from LAIF	20,000	-	-	3,785	-		17,387	17,387	2,613
800	BACWA	1011133	BDO Assoc.&Affiliate Contr	182,144	-	-	-	-	183,035	-	183,035	(891)
800	BACWA	1014251	BDO Non-Member Contr BAPPG	3,800	-	-	-	-	3,801	-	3,801	(1)
800	BACWA	1014252	BDO Non-Member Contr AIR	6,800	-	-	-	-	6,800	-	6,800	-
800	BACWA	1014511	BDO-Alternative Investment Inc	9,000	-	-	-	1,800		-	1,800	7,200
800	BACWA	1014514	GBS-Meeting Support-Annual	-	-	-	-	-		-	-	-
800	BACWA	1015005	Biosolids&ClimateRsch-OtrRcpts	-	-	-	-	-	55,000	-	55,000	(55,000)
	BACWA TOTAL			**723,581**	**-**	**-**	**3,785**	**1,800**	**745,471**	**22,387**	**769,658**	**(46,077)**
805	WQA-CBC	1011099	BDO Member Contributions	675,000	-	-	-	-	674,250	-	674,250	750
805	WQA-CBC	1011108	BDO Other Receipts	800,000	-	-	-	-	799,998	-	799,998	2
805	WQA-CBC	1014511	BDO-Alternative Investment Inc	-	-	-	-	5,908		-	5,908	(5,908)
805	WQA-CBC	1011117	BDO- Interest Income from LAIF	-	-	-	10,410	-		33,604	33,604	(33,604)
805	WQA-CBC	1014528	BDO-Voluntary Nutrient Contrib	-	-	-	-	-		-		-
	WQA CBC TOTAL			**1,475,000**	**-**	**-**	**10,410**	**5,908**	**1,474,248**	**33,604**	**1,513,760**	**(38,760)**
	TOTAL			**2,198,581**	**-**	**-**	**14,195**	**7,708**	**2,219,719**	**55,991**	**2,283,418**	**(84,837)**

	DEPARTMENT	JOB	REVENUE TYPE	AMENDED BUDGET	CURRENT PERIOD			YEAR TO DATE				UNOBLIGATED
					Admin & General	Contributons	Interest, Transfers, Others	Admin & General	Contributons	Interest, Transfers, Others	ACTUAL	
810	WOT	1011099	BDO Member Contributions	-	-		-	-	148,500	-	148,500	(148,500)
810	WOT	1011108	BDO Other Receipts	-	-	-	-	-	-	-	-	-
810	WOT	1011117	BDO- Interest Income from LAIF	-	-	-	-	-	-	-	-	-
	WOT TOTAL			**-**	**-**	**-**	**-**	**-**	**148,500**	**-**	**148,500**	**(148,500)**

	DEPARTMENT	JOB	REVENUE TYPE	AMENDED BUDGET	CURRENT PERIOD			YEAR TO DATE				UNOBLIGATED
					Admin & General	Contributons	Interest, Transfers, Others	Admin & General	Contributons	Interest, Transfers, Others	ACTUAL	
811	PROP 84			-	-	-	-	-	1,791,393	-	1,791,393	(1,791,393)
	PROP TOTAL			**-**	**-**	**-**	**-**	**-**	**1,791,393**	**-**	**1,791,393**	**(1,791,393)**
	Grand Total			**2,198,581**	**-**	**-**	**14,195**	**7,708**	**4,159,612**	**55,991**	**4,223,311**	**(2,024,730)**

BACWA Expense Detail Report for April 2019

EXPENSE TYPE	JOB	AMENDED BUDGET	CURRENT PERIOD ENC	CURRENT PERIOD PV	CURRENT PERIOD DA	CURRENT PERIOD JV	YEAR TO DATE ENC	YEAR TO DATE PV	YEAR TO DATE DA	YEAR TO DATE JV	OBLIGATED	UNOBLIGATED
LABOR												
AS-Executive Director	1011123	201,682	(16,807)	16,807	-	-	50,421	151,261	-	-	201,682	-
AS-Assistant Executive Directo	1011124	90,526	(7,589)	7,589	-	-	13,203	77,323	-	-	90,526	-
AS-Regulatory Program Manager	1011149	119,815	(10,208)	10,208	-	-	31,154	88,661	-	-	119,815	-
ADMINISTRATION												
AS-EBMUD Financial Services	1011125	40,800	(8,132)	8,132	-	-	19,927	20,873	-	-	40,800	-
AS-Audit Services	1014512	6,426	-	-	-	-	-	1,870	4,363	(6,300)	(67)	6,493
AS-BACWA Admin Expense	1011118	7,650	-	-	2,620	-	-	-	6,156	-	6,156	1,494
AS-Insurance	1011126	4,590	-	-	-	-	-	-	4,393	-	4,393	197
MEETINGS												
GBS-Meeting Support-Exec Bd	1014513	2,550	-	-	229	-	2,075	475	1,227	-	3,777	(1,227)
GBS-Meeting Support-Annual	1014514	10,200	-	-	-	-	-	-	9,413	(300)	9,113	1,087
GBS-Meeting Support-Pardee	1014515	6,120	-	-	-	-	-	-	5,608	-	5,608	512
GBS-Meeting Support-Misc	1014516	5,100	-	-	36	-	-	-	4,753	-	4,753	347
GBS- Meeting Support	1011122	-	-	-	-	-	-	-	-	-	-	-
COMMUNICATION												
CAR-BACWA Website Hosting	1014517	750	-	-	-	-	-	-	1,200	-	1,200	(450)
CAR-BACWA File Storage	1014518	1,500	-	-	-	-	-	-	720	-	720	780
CAR-BACWA IT Support	1014519	2,600	(225)	225	-	-	2,060	540	-	-	2,600	-
CAR-BACWA IT Software	1014520	1,500	-	-	59	-	-	-	1,484	-	1,484	16
CAR-BACWA Website Dev/Maint	1011116	600	-	-	-	-	-	-	-	-	-	600
LEGAL												
LS-Regulatory Support	1011107	2,601	-	-	-	-	2,406	195	-	-	2,601	-
LS-Executive Board Support	1011110	2,091	-	-	-	-	1,702	390	-	-	2,091	-
COMMITTEES												
AIR-Air Issues&Regulation Grp	1014253	51,000	(3,818)	3,818	228	-	19,390	30,610	1,010	-	51,010	(10)
BC-BAPPG	1011147	100,000	-	-	4,000	-	13,092	45,642	31,802	-	90,536	9,464
BC-Biosolids Committee	1011101	3,100	-	-	-	-	-	-	206	-	206	2,894
BC-Collections System	1011097	1,000	-	-	-	-	-	-	-	-	-	1,000
BC-InfoShare Groups	1011102	1,200	-	-	-	-	-	-	404	-	404	796
BC-Laboratory Committee	1011103	6,100	-	-	-	-	-	-	-	-	-	6,100
BC-Permit Committee	1011098	1,000	-	-	201	-	-	-	975	-	975	25
BC-Pretreatment Committee	1011146	7,500	-	-	-	-	-	-	1,503	-	1,503	5,997
BC-Water Recycling Committee	1011100	1,000	-	-	-	-	-	-	78	-	78	922
BC-Manager's Roundtable	1014777	1,000	-	-	186	-	-	-	297	-	297	703
BC-Miscellaneous Committee Sup	1011104	45,000	-	-	-	-	-	-	-	-	-	45,000
COLLABORATIVES												
CAS-Arleen Navaret Award	1012201	-	-	-	-	-	-	-	1,000	-	1,000	(1,000)
CAS-FWQC	1012202	7,500	-	-	-	-	-	-	7,500	-	7,500	-
CAS-Stanford ERC	1011969	10,000	-	-	-	-	-	-	10,000	-	10,000	-
CAS-CWCCG	1011148	-	-	-	-	-	-	-	-	-	-	-
CAS-PSSEP	1011112	20,000	-	-	-	-	-	-	-	-	-	20,000
CAS-Misc Collaborative Sup	1014521	5,000	-	-	15,000	-	-	-	23,971	-	23,971	(18,971)
BDO-Contract Expenses (PHARM)												
BDO-Contract Expenses (PHARM)	1014551	-	-	-	-	-	-	-	-	-	-	-
BIOSOLIDS & CLIMATE RESEARCH												
Biosolids&ClimateRsch-OtrRcpts	1015005	-	-	-	-	-	-	-	-	-	-	-
Biosolids&ClimateRsch-CntctExp	1015006	-	-	-	-	-	-	-	85,000	-	85,000	(85,000)
BACWA TOTAL		**767,501**	**(46,780)**	**46,780**	**22,559**	**-**	**155,428**	**417,841**	**203,063**	**(6,600)**	**769,732**	**(2,231)**
TECH SUPPORT												
WQA-CE Addl Work Under Permit	1014254	100,000	-	-	-	-	304,279	12,132	-	-	316,410	(216,410)
WQA-CE-Technical Support	1011127	51,000	(2,990)	2,990	-	-	44,357	33,829	-	-	78,186	(27,186)
WQA-CE CASA Chem of Concern	1011128	-	-	-	-	-	-	-	-	-	-	-
WQA-CE Opt-Upgrade Studies	1014255	25,000	-	-	-	-	-	25,652	-	-	25,652	(652)
WQA-CE Risk Reduction	1014023	10,000	-	-	-	-	-	-	-	-	-	10,000
WQA-CE-Nutrient WS Permit Comm	1014021	880,000	-	-	-	-	-	-	1,080,000	-	1,080,000	(200,000)
WQA-CE-Program Mgmt	1011131	-	-	-	-	-	-	-	-	-	-	-
WQA-CE Voluntary Nutr Contrib	1014529	200,000	-	-	-	-	-	-	200,000	-	200,000	-
Member Voluntary Nutrient Cont	1015014	-	-	-	-	-	-	-	-	-	-	-
Nutrient Workshops	1015015	20,000	-	-	-	-	-	-	-	-	-	20,000
TECH SUPPORT (CBC) TOTAL		**1,286,000**	**(2,990)**	**2,990**	**-**	**-**	**348,635**	**71,613**	**1,280,000**	**-**	**1,700,248**	**(414,248)**
GRAND TOTAL		**2,053,501**	**(49,770)**	**49,770**	**22,559**	**-**	**504,063**	**489,454**	**1,483,063**	**(6,600)**	**2,469,980**	**(416,479)**
WOT												
Administrative Support	1011142	-	-	-	-	-	-	-	-	5,000	5,000	(5,000)
BDO Contract Expenses	1011143	-	-	-	2,478	-	-	-	3,338	-	3,338	(3,338)
		-	**-**	**-**	**2,478**	**-**	**-**	**-**	**3,338**	**5,000**	**8,338**	**(8,338)**
GRAND TOTAL (BDO, CBC, WOT)		**2,053,501**	**(49,770)**	**49,770**	**25,038**	**-**	**504,063**	**489,454**	**1,486,401**	**(1,600)**	**2,478,318**	**(424,817)**

BACWA Revenue Report as of April 30, 2019

Prop 84

DEPTID	DEPARTMENT	JOB	REVENUE TYPE	AMENDED BUDGET	CURRENT PERIOD			YEAR TO DATE				UNOBLIGATED
					Admin & General	Contributons	Interest, Transfers,Others	Admin & General	Contributons	Interest, Transfers,Others	ACTUAL	
811	Prop84BayAreaIntegRegnlWtrMgmt	1011117	BDO- Interest Income from LAIF	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1011142	Administrative Support	-	-	-	-	-	58,069	-	58,069	(58,069)
811	Prop84BayAreaIntegRegnlWtrMgmt	1011691	Water Efficient Landscape Reba	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1011702	Sears Point Wtlnd & Wtrshd Res	-	-	-	-	-	1,138,500	-	1,138,500	(1,138,500)
811	Prop84BayAreaIntegRegnlWtrMgmt	1011705	Regional Green Infrastructure	-	-	-	-	-	194,925	-	194,925	(194,925)
811	Prop84BayAreaIntegRegnlWtrMgmt	1011706	Hacienda Ave Green St Improvem	-	-	-	-	-	194,077	-	194,077	(194,077)
811	Prop84BayAreaIntegRegnlWtrMgmt	1011707	WQ Improve Flood Mgmt & EP	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1011911	Stream Restoration w/Schools i	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012209	Water Efficient LRP	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012210	Bay Friendly Landscape TP	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012211	Weather Based Irrigation Cntrl	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012212	High Efficiency Toilet & UR	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012213	High Efficiency Toilet & UI	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012214	High Efficiency Clothes Washrs	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012215	Napa Co. Rainwater HP	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012216	Conservation Program Admin	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012218	Stream Restoration in North BD	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012219	Flood Infrastructure Mapping T	-	-	-	-	-	151,494	-	151,494	(151,494)
811	Prop84BayAreaIntegRegnlWtrMgmt	1012220	Stormwater Improvements & PBP	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012221	Richmond Shoreline & San PFP	-	-	-	-	-	18,360	-	18,360	(18,360)
811	Prop84BayAreaIntegRegnlWtrMgmt	1012222	Pescadero Integrated FRAH	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012223	Restoration Guidance, San FC	-	-	-	-	-	14,657	-	14,657	(14,657)
811	Prop84BayAreaIntegRegnlWtrMgmt	1012224	SF Estuary Steelhead MP	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	1012225	Watershed Program Admnstrtn	-	-	-	-	-	21,311	-	21,311	(21,311)
	PROP 84 TOTAL			**-**	**-**	**-**	**-**	**-**	**1,791,393**	**-**	**1,791,393**	**(1,791,393)**

BACWA Expense Detail Report for April 2019

Prop 84

DEPTID	DEPARTMENT	EXPENSE TYPE	AMENDED BUDGET	CURRENT PERIOD ENC	CURRENT PERIOD PV	CURRENT PERIOD DA	CURRENT PERIOD JV	YEAR TO DATE ENC	YEAR TO DATE PV	YEAR TO DATE DA	YEAR TO DATE JV	OBLIGATED	UNOBLIGATED
811	Prop84BayAreaIntegRegnlWtrMgmt	BDO Fund Transfers	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Administrative Support	-	-	-	-	-	-	-	58,069	-	58,069	(58,069)
811	Prop84BayAreaIntegRegnlWtrMgmt	BDO Contract Expenses	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Regional Green Infrastructure	-	-	-	-	-	-	-	194,925	-	194,925	(194,925)
811	Prop84BayAreaIntegRegnlWtrMgmt	Hacienda Ave Green St Improvem	-	-	-	-	-	-	-	194,077	-	194,077	(194,077)
811	Prop84BayAreaIntegRegnlWtrMgmt	Sears Point Wtlnd & Wtrshd Res	-	-	-	-	-	-	-	1,138,500	-	1,138,500	(1,138,500)
811	Prop84BayAreaIntegRegnlWtrMgmt	Bay Friendly Landscape TP	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Weather Based Irrigation Cntrl	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	High Efficiency Toilet & UR	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	High Efficiency Toilet & UI	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	High Efficiency Clothes Washrs	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Napa Co. Rainwater HP	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Conservation Program Admin	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Flood Infrastructure Mapping T	-	-	-	-	-	-	-	151,494	-	151,494	(151,494)
811	Prop84BayAreaIntegRegnlWtrMgmt	Stormwater Improvements & PBP	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Richmond Shoreline & San PFP	-	-	-	-	-	-	-	18,360	-	18,360	(18,360)
811	Prop84BayAreaIntegRegnlWtrMgmt	Pescadero Integrated FRAH	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Restoration Guidance, San FC	-	-	-	-	-	-	-	14,657	-	14,657	(14,657)
811	Prop84BayAreaIntegRegnlWtrMgmt	SF Estuary Steelhead MP	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Stream Restoration in North BD	-	-	-	-	-	-	-	-	-	-	-
811	Prop84BayAreaIntegRegnlWtrMgmt	Watershed Program Admnstrtn	-	-	-	-	-	-	-	21,311	-	21,311	(21,311)
	PRP84 TOTAL		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,791,393**	**-**	**1,791,393**	**(1,791,393)**

BACWA EXECUTIVE BOARD ACTION REQUEST

AGENDA NO.: 5

FILE NO.: 20-05

MEETING DATE: June 21, 2019

TITLE: Request for BACWA Executive Board Approval for Extension of Agreement with UC Merced

☐**RECEIPT** ☐**DISCUSSION** ☐**RESOLUTION** ☒**APPROVAL**

RECOMMENDED ACTION

Authorize extension of Agreement between BACWA and UC Merced from June 30, 2019 to December 31, 2019, for conducting research on beneficial use of biosolids.

SUMMARY

During the April 2017 Executive Board meeting, BACWA approved funding to support a targeted biosolids research project for the purpose of comparing biosolids amendments to traditional compost and synthetic fertilizer. In addition to the $10,000 provided by BACWA, $75,000 has been raised from four additional stakeholders: the King Foundation, the Bay Area Biosolids Coalition, the San Francisco Public Utilities Commission, and the Fairfield Suisun Sewer District for a total amount of $85,000. By Request of the Bay Area Biosolids Coalition, BACWA serves as the fund administrator for this research project. At the September 21, 2018 Executive Board meeting, BACWA approved a contract with UC Merced to administer the contract for this project. Project management has been conducted by staff from the San Francisco Public Utilities Commission.

While the research was scheduled to conclude by June 30, 2019, the UC Merced team is still processing samples and analyzing data. This process has taken longer than anticipated due to staff leave. Additionally, it has taken some time to hire a technician to assist with the research. The research team is confident the work can be concluded by December 31, 2019.

FISCAL IMPACT

This is a no-cost extension that would require a carry-forward of funds remaining on the contract from FY 19 to FY 20..

ALTERNATIVES

No alternatives presented, as SFPUC has approved the extension.

Attachments: Agreement between BACWA and UC Merced

Approved: _____ Date: ___June 21, 2019_____

Lori Schectel, Chair,
BACWA Executive Board

RESEARCH AGREEMENT

Between

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
UNIVERSITY OF CALIFORNIA, MERCED

And

BAY AREA CLEAN WATER AGENCIES

This Research Agreement ("Agreement") is entered into on this 21st day of September, 2018 (the "Effective Date") by and between THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, a California Constitutional corporation ("The Regents"), on behalf of its Merced campus ("University") and Bay Area Clean Water Agencies ("BACWA"), a joint powers agency which exists as a public entity separate and apart from its Member Agencies, created January 4, 1984 by a Joint Powers Agreement between Central Contra Costa Sanitary District, East Bay Dischargers Association, East Bay Municipal Utility District, the City and County of San Francisco and the City of San Jose, with a mailing address of P.O. Box 24055, MS 702, Oakland, CA 94623, ("Sponsor"), with respect to the facts set forth below.

WHEREAS, University is a non-profit organization engaged, in part, in researching ways to improve the science and management of human organics for climate change mitigation and efficient nutrient cycling in California.

WHEREAS, Sponsor desires to provide certain funding as part of University's research activities described above.

WHEREAS, the research project contemplated by this Agreement is of mutual interest and benefit to both the University and Sponsor and is consistent with the research and educational objectives of the University.

NOW THEREFORE, in consideration of the premises and mutual covenants herein contained, the parties agree as follows:

1. Statement of Work

University, through its Principal Investigator (as defined below), shall use reasonable efforts to perform the research activities set forth in and attached hereto as EXHIBIT A, which is hereby incorporated in full by reference (the "Research Program"). Any changes to the Research Program shall be agreed to by the parties in writing. Notwithstanding the foregoing, University makes no warranties or representations regarding its ability to achieve, nor shall it be bound to accomplish, any particular research objective or results.

2. Supervision of the Research Program

University's performance of the Research Program will be conducted by or under the direction of Professor Rebecca Ryals, (the "Principal Investigator"). In the event that Principal Investigator leaves University or becomes unable or unwilling to continue work under this Agreement University agrees to find a replacement Principal Investigator reasonably acceptable to sponsor, which acceptance shall not be unreasonably withheld. In the event that University fails to appoint a replacement Principal investigator reasonably acceptable to sponsor, Sponsor shall have a right to terminate this Agreement upon delivery

to University of written notice of intent to terminate pursuant to this Article 2, which notice must be delivered to University not less than thirty (30) days nor more than ninety (90) days after delivery by University to Sponsor of the name of the replacement Principal Investigator. Sponsor understands and agrees that Principal Investigator is the scientific contact for University but is not authorized to amend, modify or terminate the terms and conditions of this Agreement. Requests to amend, modify or terminate the terms of this Agreement must be directed to University's Office of Sponsored Research Services and must comply with the notice requirements of this Agreement.

3. Cost to Sponsor

The cost to Sponsor for University's performance hereunder shall not exceed $85,000. When expenditures reach the above amount, Sponsor will not be required to fund, and University will not be required to perform, additional work hereunder unless by mutual agreement of the parties.

4. Payment

The sponsor shall make a onetime advance payment of $85,000.00.

A check shall be made payable to The Regents of the University of California and shall be sent to:

University of California Merced
C/O Campus Cashiering
P.O. Box 2450
Merced, CA 95344

Payments should refer to both the Principal Investigator's last name and Sponsor's name.

University shall not be obligated to perform any of the research specified herein or to take any other action required under this Agreement if the funding is not provided as set forth in EXHIBIT C and in accordance with the payment schedule as set forth in this Article 5. Furthermore, should Sponsor fail to make the first payment to University in accordance with this Article 5, University shall have the right to immediately terminate this Agreement and this Agreement shall be null and void *ab initio*.

5. Supplies and Equipment

In the event that University purchases supplies or equipment hereunder, title to such supplies and equipment will vest in University. All capital equipment provided under this Agreement by Sponsor for use by university remains the property of sponsor unless other disposition is agreed upon in writing by the parties. If title to this equipment remains with Sponsor, sponsor is responsible for maintenance and repair of the equipment, insuring the equipment against damage or loss, and the costs of its transportation to and from the site where it will be used.

6. Reports

University agrees that within sixty (60) days following the last day of each calendar year during the term of this Agreement, University shall furnish Sponsor with a written report summarizing the results of the research included within the scope of the Research Program during the immediately preceding calendar year, including, but not limited to all data, conclusions, results, observations and a detailed description of all procedures. All such reports shall be treated as Confidential Information by Sponsor.

7. Inventions

7.1 Inventorship and ownership of any invention, result, discovery, know-how, biological material, software, information and/or data, whether patentable or not, conceived and reduced to practice during the performance of the Research Program developments or discoveries first conceived and actually reduced to practice in the performance of this Agreement (each a "Subject Invention") will be determined in accordance with applicable U.S. Patent Law and University policy.

7.2 The Regents shall retain sole ownership and title to Subject Inventions invented solely by University or its personnel and to all intellectual property rights related thereto. University shall, in the good faith exercise of its discretion, undertake reasonable efforts to preserve and maintain its ownership and title as University deems appropriate. Ownership of and title to Joint Subject Inventions shall be vested jointly in University and Sponsor, with each owning an undivided interest therein.

7.3 University and Sponsor acknowledge that University has received, and expects to continue to receive, funding from the United States Government in support of University's research activities. University and Sponsor acknowledge and agree that their respective rights and obligations pursuant to this Agreement shall be subject to the rights of the United States Government, existing and as amended, which may arise or result from University's receipt of research support from the United States Government, including but not limited to, 37 CFR 401, the NIH Grants Policy Statement and the NIH Guidelines for Obtaining and Disseminating Biomedical Research Resources.

7.4 University reserves the right to use for any research or educational purposes any Subject Invention, patent rights, biological materials, or research tools, without University being obligated to pay Sponsor any royalties or other compensation. In addition, university reserves the right to grant non-exclusive research and educational use licenses to other nonprofit or academic institutions to patent rights, biological materials, or research tools, without the other non-profit entity being obligated to pay Sponsor any royalties or other compensation. University shall have no obligation to notify or inform Sponsor of such use or licenses.

8. Disclosure of Inventions

After Principal Investigator submits an invention disclosure covering any Subject Invention to University's Office of Technology Development and that Subject Invention is assigned a case number by The Regents, University shall disclose such Subject Invention in writing to Sponsor (an "Invention Disclosure"). University shall use reasonable efforts to provide an Invention Disclosure that contains sufficient detail to (i) enable both parties to determine whether or not the particular invention is a University Subject Invention or a Joint Subject Invention; and (ii) enable Sponsor to evaluate the advisability of exercising the option granted hereunder with respect to such Subject Invention. All such Technology Disclosures shall be maintained in confidence by Sponsor.

9. Patent Rights and Licensing

9.1 Patent Rights shall mean (a) the U.S. patent application(s) directed to a Subject Invention; (b) the foreign counterpart applications of the respective application(s) referenced in sub-clause (a) above; (c) divisionals, substitutions (only those claims of such substitutions that cover the identical subject matter that is covered by the application for which it is substituted), and continuations of any applications referenced in sub-clauses (a) and (b) above; (d) any claim(s) of a continuation-in-part application of any application set forth in sub-clauses (a)-(c) above that covers the exact subject matter disclosed in the specification of the respective application(s) referenced in sub-clause (a) above; (e)the patents issued from the applications referenced in sub-clauses (a)-(c) above and any reissues, reexaminations, renewals

and patent term extensions of such patents; and (f) any claim(s) of a patent issued from a continuation-in-part application referenced in sub-clause (d) above that satisfies all of the requirements of sub-clause (d), and any claim(s) of a reissue, reexamination, renewal and patent term extension of a patent issued from a continuation-in-part application referenced in sub-clause (d) that satisfies all of the requirements of sub-clause (d); *provided*, *however*, that in all cases under sub-clauses (b) – (f) above, the Patent Rights include only the subject matter and claims contained in the items referenced in sub-clauses (b) – (f) that are entitled to the priority date of the respective application(s) referenced in sub-clause (a) above.

9.2 To the extent that University will have the legal right to do so, and provided Sponsor pays all direct and indirect costs of the Research Program including a proportionate share of all researcher salaries and benefits, Sponsor will have a time-limited first right to negotiate a license to the University's interest in any Patent Rights.

9.3 Subject to the terms of this Agreement and the reservation of rights specified in Sections 7.3 and 7.4, University hereby grants to Sponsor:

(a) an exclusive option (the "Option") to acquire an exclusive, worldwide license, including the right to sublicense under University's rights in the Patent Rights, to offer for sale, sell and have sold products, processes and Biological Material in the Field. In the event that a product, process or biological material utilizes a research tool, such research tool shall be made available to Sponsor solely on a non-exclusive basis.

(b) a non-exclusive, royalty-free, non-transferable license to make and use a Subject Invention solely for Sponsor's internal research purposes during the performance of the Research Program. Any transfer of materials to Sponsor under this Section 9.3(b) shall require the execution of a material transfer agreement.

9.4 Sponsor will notify University in writing within thirty (30) days of notice of a Subject Invention to Sponsor whether or not it wishes to secure an option or license to University's interest in the disclosed Subject Invention ("Election Period"). Sponsor will have ninety (90) days from the date of election to conclude such option or license agreement with University ("Negotiation Period"). Said option or license will contain reasonable terms, will require diligent performance by Sponsor for the timely commercial development and early marketing of all Subject Inventions subject to the license, and will include Sponsor's obligation to reimburse University's patent costs for all Subject Inventions subject to the option or license. In the event it is necessary in the opinion of University to file any patent applications to protect a Subject Invention during the Election or Negotiation Periods, Sponsor will reimburse patent costs incurred by University during such period(s). If such option or license negotiation is not concluded within the Negotiation Period or if Sponsor does not notify University of its wish to secure an option or license within the Election Period, neither party will have any further obligation to the other with respect to University's interest in the Subject Invention and the rights to such Subject Invention will be disposed of in accordance with University's policies.

9.5 University shall direct and control the preparation, filing and prosecution of patent applications and patents within the Patent Rights. Sponsor shall pay all fees and costs, and any and all future fees and costs associated with work performed by any independent patent counsel and related to the preparation, filing, prosecution and maintenance of the Patent Rights or relinquish any rights to the patent. Payment shall be made within thirty (30) days after Sponsor receives an invoice therefor. Failure of Sponsor to pay patent fees and expenses as set forth above shall immediately relieve University from its obligation to incur any further patent fees and expenses. Sponsor's obligation to pay all patent fees and costs incurred pursuant to this Agreement shall survive the termination or expiration of this Agreement. Sponsor shall have full rights of consultation with the patent attorney so selected on all matters relating to patent application(s).

10. Confidentiality

The term "Confidential Information" shall mean any and all proprietary information of University or Sponsor that may be exchanged between the parties at any time and from time to time during the term hereof. The fact that a party may have marked or identified as confidential or proprietary any specific information shall be indicative that such part believes such information to be confidential or proprietary, but the failure to so mark information shall not conclusively determine that such information was or was not considered confidential information by such party. Confidential Information shall also include any information which, given the circumstances surrounding the disclosure, would be considered confidential by the disclosing party. Information shall not be considered confidential to the extent that it:

a. Is publicly disclosed through no fault of any party hereto, either before or after it becomes known to the receiving party; or

b. Was known to the receiving party prior to the Effective Date, which knowledge was acquired independently and not from the other party hereto (including such party's employees); or

c. Is subsequently disclosed to the receiving party in good faith by a third party who has a right to make such disclosure; or

d. Has been published by a third party as a matter of right.

If Confidential Information is required to be disclosed by law or court order, the Party required to make such disclosure shall limit the same to the minimum required to comply with the law or court order, and shall use reasonable efforts to attempt to seek confidential treatment for that disclosure, and prior to making such disclosure that Party shall notify the other party, not later than ten (10) days (or such shorter period of time as may be reasonably practicable under the circumstances) before the disclosure in order to allow that other Party to comment and/or to obtain a protective or other order, including extensions of time and the like, with respect to such disclosure.

Because University is a public, non-profit educational institution and does not have identified resources to sustain liability for disclosure of information, Sponsor agrees that no financial liability shall attach to University in the event such disclosure occurs.

The parties agree that during the term of this Agreement, and for a period of five (5) years after this Agreement terminates, a party receiving Confidential Information of the other party will (a) maintain in confidence such Confidential Information to the same extent such party maintains its own proprietary information; (b) not disclose such Confidential Information to any third party without the prior written consent of the other party; and (c) not use such Confidential Information for any purpose except those permitted by this Agreement.

11. Publication

Sponsor acknowledges that it is the general policy of The Regents to encourage publication of research results in technical or scientific journals; and Sponsor agrees that University shall have a right to publish in accordance with its general policy. University will furnish Sponsor with a copy of any proposed written or oral publication (including manuscripts, abstracts, and oral presentations) at least thirty (30) days prior to submission for publication ("Review Period"). Upon written notification by Sponsor within the Review Period, University agrees to delete any of Sponsor's Confidential Information that appears in the publication. If it is determined that a patent application should be filed, University will delay

publishing such proposed publication for a maximum of an additional thirty (30) days in order to protect the potential patentability of any invention described therein.

12. Export Control

The parties acknowledge that, because University is an institution of higher education and has many foreign persons who are students, employees and visitors, University conducts its research activities as "fundamental research" under export control regulations (as set forth in ITAR 120.10(5) and 120.11, and EAR 15 C.F.R. 734(b)(3) and 734.7 through 734.11). Accordingly, the parties agree that Sponsor shall not provide University with any export-controlled proprietary data or technology.

13. Applicable Law

This Agreement shall be interpreted and enforced according to the laws of the State of California without application of its conflicts or choice of law rules. Both parties irrevocably submit to the jurisdiction of courts in San Francisco, California for any action or proceeding regarding this Agreement.

14. Notice

Whenever any notice is to be given hereunder, it will be in writing and sent to the Authorized Representative for the receiving party indicated below by certified mail or overnight courier, at following address:

University: University of California, Merced
Office of Sponsored Research Services
5200 North Lake Road
Merced, California 95343
Attn: Director

Sponsor: Bay Area Clean Water Agencies
P.O. Box 24055, MS 702,
Oakland, CA 94623
Attn: Director

15. Term and Termination

15.1 The Term of this Agreement shall commence on the Effective Date and shall continue for a period of three (3) years from the Effective Date. The Term may be extended following mutual written agreement by the Parties.

15.2 Either University or Sponsor may terminate this Agreement by giving sixty (60) days written notice to the other. Sponsor will pay University actual direct and indirect costs and non-cancellable commitments incurred prior to the date of termination and fair close-out related costs. If the total of such costs is less than the total funds advanced, the balance will be returned to Sponsor.

15.3 In the event that Sponsor fails to pay to University any payment in accordance with Section 4, University shall not be obligated to perform any of the research specified herein or to take any other action required under this Agreement and may terminate this Agreement immediately upon such non-payment, without any possibility for Sponsor to cure such non-payment. Termination pursuant to this Section 15.3 shall not relieve Sponsor of any liability under this Agreement.

15.4 In the event of the termination of this Agreement, Sections 6, 10, 13 and 17 shall survive such termination.

16. Publicity

Except as otherwise provided herein or required by law, no party shall originate any publication, news release or other public announcement, written or oral, whether in the public press, stockholders' reports, or otherwise, relating to this Agreement or to the performance hereunder without the prior written approval of the other party, which approval shall not be unreasonably withheld. Scientific publications published in accordance with Article 11 of this Agreement shall not be construed as publicity governed by this Article 16.

17. Indemnification

Sponsor shall defend, indemnify, and hold University, its officers, employees, and agents harmless from and against any and all liability, loss, expense (including reasonable attorney's fees), or claims for injury or damages arising out of its performance of this Agreement but only in proportion to and to the extent such liability, loss, expense, attorney's fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of Sponsor, its officers, agents, or employees.

University shall defend, indemnify, and hold Sponsor, its officers, employees, and agents harmless from and against any and all liability, loss, expense (including reasonable attorney's fees), or claims for injury or damages arising out of its performance of this Agreement but only in proportion to and to the extent such liability, loss, expense, attorney's fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of University, its officers, agents, or employees.

This Article shall survive the termination or expiration of this Agreement.

18. Excusable Delays

University will be excused from performance hereunder if a delay is caused by inclement weather, fire, flood, strike, or other labor dispute, acts of God, acts of governmental officials or agencies, terrorism, or any other cause beyond the control of University. The excusable delay is allowed for the period of time affected by the delay. If a delay occurs, the parties will revise the performance period or other provisions hereunder as appropriate.

19. Assignment

Neither party will assign its rights or duties under this Agreement to another without the prior express written consent of the other party; provided, however, that Sponsor may assign this Agreement to a successor in ownership of all or substantially all its business assets in the field to which this Agreement relates if such successor will expressly assume in writing the obligation to perform in accordance with the terms and conditions of this Agreement. Any other purported assignment will be void.

20. Amendments

No agreements, modifications, or waivers to this Agreement shall be valid unless in writing and signed by the authorized representatives of the parties.

21. Miscellaneous

21.1 Not a Partnership or Joint Venture. It is understood and agreed by the parties that the University is performing this contract as an independent contractor. The parties, by this Agreement, do not intend to create a partnership, principal/agent, master/servant, or joint venture relationship and nothing in this Agreement shall be construed as creating such a relationship between the parties.

21.2 Severability. Should any one or more of the provisions of this Agreement be held invalid or unenforceable by a court of competent jurisdiction, it shall be considered severed from this Agreement and shall not serve to invalidate the remaining provisions thereof. The parties shall make a good faith effort to replace any invalid or unenforceable provision with a valid and enforceable one such that the objectives contemplated by them when entering this Agreement may be realized.

21.3 Recitals & Headings. The recitals herein constitute an integral part of the Agreement reached and are to be considered as such. However, the captions and headings contained in this Agreement have been inserted for reference and convenience only and in no way define, limit, or describe the text of this Agreement or the intent of any provision.

21.4 No Waiver. The wavier by either party of a breach or default of any provision of this Agreement shall not constitute a waiver of any succeeding breach, nor shall any delay or omission on the part of either party to exercise any right that it has under this Agreement operate as a waiver of such right, unless the terms of this Agreement sets forth a specific time limit for the exercise thereof.

21.5 Independent Contractors. The relationship between University and Sponsor is that of independent contractors. University and Sponsor are not joint venturers, partners, principal and agent, master and servant, employer or employee, and have no other relationship other than independent contracting parties. University and Sponsor shall have no power to bind or obligate each other in any manner, other than as is expressly set forth in this Agreement.

21.6 Compliance with U.S. Laws. Nothing contained in this Agreement shall require or permit University or Sponsor to do any act inconsistent with the requirements of any United States law, regulation or executive order as the same may be in effect from time to time.

21.7 Headings. The headings for each article and section in this Agreement have been inserted for the convenience of reference only and are not intended to limit or expand on the meaning of the language contained in the particular article or section.

22. Entire Agreement

This Agreement, and EXHIBITS A through D, constitute the entire agreement and understanding between the parties and supersedes all previous agreements and understandings on the subject matter of this Agreement, if any. There shall be no amendments or modifications to this Agreement, except by a written document which is signed by both parties.

BAY AREA CLEAN WATER AGENCIES

By: _____

By: Lori Schectel
Title: BACWA Executive Board Chair
Date: September 21, 2018

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

By: Marcus Tucker

By: Marcus Tucker
Title: Post-Award Manager
Date: 9/10/2018

Scope of Work:
Exploring the Beneficial Role of Biosolids in Soil Health and Climate Change Mitigation in California's Agricultural Soils

Background:

Beneficial reuse of biosolids offers an enormous potential to recycle a large source of organic carbon and nutrients to soils. Research from the Marin Carbon Project showed that a one-time application of compost (derived from plant waste streams) to managed California grassland soils increases ecosystem carbon storage, boosts plant growth, improves soil's ability to hold water, and reduces life cycle greenhouse gas emissions. Further, microbial research on thermophilic decomposition of human waste conducted by Lawrence Berkeley National Labs Ecology Department has demonstrated the reduction of pathogens, harmful bacteria and reduction of pharmaceuticals and other compounds of emerging concern through the composting process.

Biosolids and biosolids-products (e.g. compost, liquid biofertilizer) may provide similar benefits, but there remain key questions about the ecological implications of this innovative reuse of human waste nutrients. Wastewater utilities understand that biosolids offer a source of nutrient-rich organic matter that can replenish soil organic carbon and boost plant growth, as well as potentially offset the use of synthetic fertilizers through the addition of slowly-releasing plant nutrients. Biosolids amendments offer great potential to enhance soil carbon sequestration and improve soil health across the State of California, yet experimental tests that quantify these benefits are sparse. Further, little is known about potential tradeoffs of land application of biosolids, such as soil nitrous oxide (a potent greenhouse gas) emissions or leaching of nitrate (a groundwater contaminant). The extent to which biosolids amendments impact these microbial processes that transform nitrogen and stabilize carbon needs to be thoroughly understood to optimize management practices to maximize soil health and minimize undesirable impacts on environmental and human health.

This proposal is a collaborative partnership between Dr. Rebecca Ryals at University of California, Merced and California-based sanitation agencies.

Objectives:

The broad goal of the project is to improve the science and management of human organics for climate change mitigation and efficient nutrient cycling in California. The *long-term objectives* of the proposed research is to initiate controlled field experiments across California's climatic regions in order to (i) advance the understanding about the potential of biosolids-based amendments to restore soil health in California's agricultural soils, (ii) quantify benefits to the climate from enhanced soil carbon sequestration and reductions to greenhouse gas emissions, and (iii) integrate observations in ecosystem-level nutrient fluxes with microbial communities and function in order to elucidate the mechanisms driving changes to soil health and carbon storage. To better inform field experiments, *immediate objectives* are to:

> **Objective 1**. Conduct a greenhouse experiment comparing the effects of biosolids amendments (pelletized, biofertilizer, compost) and synthetic fertilizer on crop production, nutrient losses, water retention, and carbon and greenhouse gas dynamics.
>
> **Objective 2.** Conduct an extensive sampling survey of soil carbon, nitrogen, and microbial communities in fields that have been amended with biosolids

Approach:
To achieve Objective 1, the research team began a pilot experiment in a greenhouse setting in September 2017. Treatments include pelletized biosolids, composted fecal matter, lystegro biofertilizer, and lystergro biofertilizer with biochar, as well as urea (a chemical fertilizer) and an unfertilized control. Amendments were applied at the same rate of available nitrogen (100 kg PAN/ha). The amendments were applied only once, and measurements are

made over at least three cropping cycles to determine the legacy effects of amendments. The team is measuring soil greenhouse gas emissions, soil carbon and nitrogen dynamics, soil microbial communities, nutrient leaching, and crop yields. High throughput DNA sequencing of 16S rRNA genes and targeted quantitative PCR (qPCR) measurements will be used on a subset of soil samples to measure microbial community composition and abundance, respectively, in order to determine which microbial populations are associated with different soil amendments. The preliminary results indicate that the organic amendments increase crop yields 2 to 3 times more than chemical fertilizer, and contribute to improvements in soil properties that increase the retention of water and nutrients.
To achieve Objective 2, the research team is currently coordinating with the SFPUC to identify field sites for a sampling campaign. Criteria for field selection include (1) at least one time application of biosolids, (2) a record of the amount and time of biosolids application, (3) an unamended comparison field with similar soil and management conditions. At each paired-site, the team will collect replicate (n = 15 per site) soil samples at four depth increments to a 1 meter depth (0-10, 10-30, 30-50, and 50-100 cm). Each soil sample will be analyzed for total soil carbon and nitrogen. Soil samples will also undergo a physical fractionation procedure to determine the stability of carbon pools in amended and unamended soils. Soil microbial biomass will be measured on a subset of samples as an indicator of biological mechanisms of carbon stabilization. The limitations to this survey are the lack of controlled experimental conditions through time and the exclusive sampling of Class A/B biosolids amendments, and absence of composted or novel biosolids amendments. However, this survey, along with results from the pilot greenhouse study, will provide key insights that will inform a large-scale field study. These initial data, observations, and partnership with state agencies will equip us with the knowledge and tools to design an efficient, novel, and management- and policy-relevant long-term biosolids research agenda.

Funding Sources:
A research budget is included with this proposed scope of work. A large portion (~83%) of funding needs for Objective 1 has already been met through in-kind support and grants from the lead project director, Dr. Ryals. She manages the Agroecology Lab at UC Merced that is outfitted with essential analytical equipment that will be used for this research.
In addition to in kind support, $85,000 has been raised by interested stakeholders across the San Francisco Bay Area, including wastewater utilities, non-governmental organizations and private industry.

Funding Source	**Funding Amount**
King Foundation	$15,000
Bay Area Biosolids Coalition	$50,000
Bay Area Clean Water Agencies	$10,000
San Francisco Public Utilities Commission	$5,000
Fairfield Suisun Sewer District	$5,000
Total	$85,000

Expected Outcomes:
Ultimately, this project aims to provide a better understanding of the role that biosolids soil amendments can play in mitigating climate change, improving soil health and to therefore further their recognition as a valued resource. The results of this study will provide important guidance for efforts to turn wastes into resources that improve soil health in California. Project deliverables will include (i) a peer-reviewed scientific article of the results from Obj 1 and Obj 2, (ii) a policy brief integrating project findings with local and state organics management plans, and (iii) presentations at scientific conferences and to public agencies. Throughout this research, we will engage with public utilities and other local stakeholders to ensure that the research questions and experimental design are scientifically robust as well as relevant to local policy and management needs. We hope that this project will serve as a demonstration and integration of co-benefits to sanitation and agriculture in the state of California.

Timeline:

April-May 2018	Collect funds from all stakeholders
May 2018	Identification of field sites; Field and laboratory preparation
May – June 2018	Collect soil samples in Sacramento, Solano, and Merced Counties

July - October 2018	Analyze soil samples for soil carbon, nitrogen, microbial biomass, and soil characteristics
August 2018	Complete final harvest of greenhouse experiment
August - December 2018	Microbial community analysis of soil in greenhouse experiment
October, 2018 – February, 2019	Laboratory fractionation of soil carbon pools
March – May 2019	Produce findings in a final report for distribution and ultimate publication in peer reviewed academic journal

EXHIBIT B
Reports

University shall provide Sponsor with a final technical report within ninety (90) days after the end date of this Agreement.

EXHIBIT C
Payment Schedule

The sponsor shall make a onetime advance payment of $85,000.00.

A check shall be made payable to The Regents of the University of California and shall be sent to:

University of California Merced
C/O Campus Cashiering
P.O. Box 2450
Merced, CA 95344

Payments should refer to both the Principal Investigator's last name and Sponsor's name.

Budget

Principal Investigator: Becca Ryals							Budget Start Date:														
Sponsor: BACWA							Budget End Date:														
Project Title:																					
Salaries		***Monthly Rate***					***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Total***		**Personnel**	**#Personnel Per Yr**				
															Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
PI: Research							-	-	-	-	-	-		PI:					
Technician:							35,000	-	-	-	-	35,000		Research Technician:	1				
Postgraduate Staff							-	-	-	-	-	-		Postgraduate					
Career							-	-	-	-	-	-		Staff Career					
Undergraduate:		$ -					-	-	-	-	-	-		Undergraduate:					
TBN GSR-AY: TBN							-	-	-	-	-	-		TBN GSR-AY:	1				
GSR-Sumr: Named							-	-	-	-	-	-		TBN GSR-Sumr:					
GSR- AY Named							-	-	-	-	-	-		Named GSR- AY					
GSR-Sumr Other							-	-	-	-	-	-		Named GSR-Sumr					
Personnel Other							-	-	-	-	-	-		Other Personnel					
Personnel							-	-	-	-	-	-		Other Personnel					
Total Salaries							***35,000***	-	-	-	-	***35,000***			**# of Months Per Yr**				
Fringe	**2018**	**2019**	**2020**	**2021**	**2022**									**Personnel**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
PI:	4.8%	4.9%	5.0%	5.0%	5.0%		-	-	-	-	-	-		PI:					
Research Technician:	4.8%	4.9%	5.0%	5.0%	5.0%		1,715	-	-	-	-	1,715		Research Technician:	0.6				
Postgraduate	40.0%	42.0%	42.8%	43.6%	44.5%		-	-	-	-	-	-		Postgraduate Staff					
Staff Career	45.6%	47.8%	48.8%	49.7%	50.7%		-	-	-	-	-	-		Career					
Undergraduate:	4.8%	4.9%	5.0%	5.0%	5.0%		-	-	-	-	-	-		Undergraduate:					
TBN GSR-AY:	4.8%	4.9%	5.0%	5.0%	5.0%		-	-	-	-	-	-		TBN GSR-AY:					
TBN GSR-Sumr:	4.8%	4.9%	5.0%	5.0%	5.0%		-	-	-	-	-	-		TBN GSR-Sumr:					
Named GSR- AY	4.8%	4.9%	5.0%	5.0%	5.0%		-	-	-	-	-	-		Named GSR- AY					
Named GSR-Sumr	4.8%	4.9%	5.0%	5.0%	5.0%		-	-	-	-	-	-		Named GSR-Sumr					
Other Personnel							-	-	-	-	-	-		Other Personnel					
Other Personnel							-	-	-	-	-	-		Other Personnel					
Total Fringe							**1,715**	-	-	-	-	**1,715**			**% of Effort Per Month Per Yr**				
Total F & S							***36,715***	-	-	-	-	***36,715***		**Personnel**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
Equipment														PI: Research					
Equipment:												-		Technician:					
Equipment												-		Postgraduate Staff					
Equipment												-		Career					
Total Equipment								-	-	-	-	-		Undergraduate:					
Travel														TBN GSR-AY:					
Travel-domestic							1,950					1,950		TBN GSR-Sumr:					
Travel-Foreign												-		Named GSR- AY					
Total Travel							**1,950**	-	-	-	-	**1,950**		Named GSR-Sumr					
Participant Support														Other Personnel					
Stipends												-		Other Personnel					
Travel												-		**Inflation**	**1.03**				
Subsistence												-							
Other:												-							
Total Participant Support							-	-	-	-	-	-							
Subawards																			
Subaward 1												-							
Subaward 2												-							
Subaward 3												-							
Total Subawards							-	-	-	-	-	-							
Other Direct Costs															**Fall Semester # GSR**				
Materials/Supplies							44,335					44,335			**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
Publication Costs							2,000					2,000		Tuition	0	0	0	0	0
Consultant Services												-		Non-resident Supplemental	0	0			
Computer Services												-		Student Services Fee	0	0	0	0	0
Other												-		Health Insurance	0	0	0	0	0
Other: (Includes GSR Tuition & Fees)	**Fall**		**Spring**									-			**Spring Semester # GSR**				
Tuition	5,751		5751				-	-	-	-	-	-			**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
Non-resident Supplemental Tuition	-		-				-	-				-		Tuition	0	0	0	0	0
Student Services Fee Health	564		564				-	-	-	-	-	-		Non-resident Supplemental	0	0			
Insurance	1049		1468				-	-	-	-	-	-		Student Services Fee	0	0	0	0	0
Sub-Total Tuition & Fees							-	-	-	-	-	-		Health Insurance	0	0	0	0	0
Total Other Direct Costs							**46,335**	-	-	-	-	**46,335**			**Tuition Increase**			**1.1**	
Total Direct Costs							**85,000**	-	-	-	-	**85,000**							
Portion of Sub-award to be charged IDC												-							
MTDC (less equipment, Stdnt fees, & SK's > 25,000)							85,000	-	-	-	-	85,000							
Total Indirect Costs						0%	-	-	-	-	-	-							
Total Request							**85,000**	-	-	-	-	**85,000**							

NSF GSR Salary Totals Per Year					
Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Total**
-	-	-	-	-	-

BACWA BOARD AUTHORIZATION REQUEST

AGENDA NO.: 6
FILE NO.: 20.06
MEETING DATE: June 21, 2019

TITLE: Extension of agreement with EOA, Inc. for the technical assistance needed to support the Regional Water Board's staff in the adoption of a chlorine residual Basin Plan Amendment.

☐ **RECEIPT** ☐ **DISCUSSION** ☐ **RESOLUTION** ☒ **APPROVAL**

RECOMMENDED ACTION

Authorize a no-cost extension of Agreement between BACWA and EOA from June 30, 2019 to June 30, 2020, for technical assistance needed to support the Regional Water Board's staff in the adoption of a chlorine residual Basin Plan Amendment.

SUMMARY

BACWA is providing support to the Regional Water Board for the development of a Basin Plan Amendment to replace the 0.0 mg/L chlorine residual instantaneous effluent limit. The goal of the Regional Water Board and BACWA for this effort is to reduce the need for sodium bisulfite dosing (a dechlorination agent) in effluent.

On June 27, 2017 the BACWA Executive Director authorized an agreement with EOA, Inc. for the period of July 1, 2017 through December 31, 2017, to develop a scope of work for the technical assistance needed to support the Regional Water Board staff in the adoption of a chlorine residual Basin Plan Amendment. In November, 2017, BACWA reviewed the final scope of work with the Bay Area Regional Water Board staff and approved a not to exceed contract amount of $99,500.00 with EOA, Inc to complete the work with a contract expiration of June 30, 2019. This effort has taken longer than anticipated, and a contract extension is now required to complete the scope of work.

FISCAL IMPACT

This is a no-cost extension that would require a carry-forward of funds from BACWA's approved FY19 budget to its FY20 budget.

ALTERNATIVES

1. Do not approve the extension. This alternative is not recommended because without completion of the scope of work, the Regional Water Board will not adopt the Basin Plan Amendment.

Attachments:
Agreement

Approved:

_____ Date: _____

Lori Schectel, BACWA Chair

BAY AREA CLEAN WATER AGENCIES
PROFESSIONAL SERVICES CONTRACT

This PROFESSIONAL SERVICES CONTRACT, effective **December 15, 2017**, is between Bay Area Clean Water Agencies ("BACWA"), a joint powers agency which exists as a public entity separate and apart from its Member Agencies, created January 4, 1984 by a Joint Powers Agreement between Central Contra Costa Sanitary District, East Bay Dischargers Association, East Bay Municipal Utility District, the City and County of San Francisco and the City of San Jose, with a mailing address of P.O. Box 24055, MS 702, Oakland, CA 94623, and **EOA** ("Consultant"), a corporation doing business at **1410 Jackson Street, Oakland, CA 94612**, for professional services as described in Exhibit A attached hereto.
In consideration of the mutual covenants, stipulations and agreements, the parties agree as follows:

Description and Standard of Services to be Performed

1. Consultant will perform the Services as described by and in accordance with Exhibit A in a manner acceptable to BACWA.

2. Consultant shall not contract with or otherwise use any subconsultants, subcontractors or other non-employee persons or entities ("Subconsultants") to perform the Services without the prior written approval of BACWA. If Consultant and BACWA agree that Subconsultants shall be used, Consultant shall ensure Subsconsultants' compliance with all the terms and conditions of this agreement.

3. Consultant will exercise that degree of care in performing the Services in accordance with that prevailing among firms of comparable standing in the State of California ("Professional Standard"). Consultant will promptly correct or re-perform those Services not meeting the Professional Standard without additional compensation.

4. Consultant warrants that it is fully licensed, registered and otherwise fully authorized to perform the Services in the State of California to the extent applicable law requires such licensure, registration or authorization.

5. BACWA's review, approval, acceptance, use, or payment for all or any part of the Services hereunder will not alter the Consultant's obligations or BACWA's rights hereunder, and will not excuse or diminish Consultant's responsibility for performing all Services consistent with this Contract.

Payment for Services

6. BACWA will pay Consultant based on the rates in Exhibit B, up to a maximum amount payable of **$99,500.00**. Consultant will not exceed the maximum amount payable without obtaining prior written approval from BACWA.

7. Consultant shall submit invoices monthly. Invoices shall include the hours charged by each employee, a brief description of the work performed, and a description of costs for which Consultant seeks reimbursement and which are specified in Exhibit B.

8. Payments under this Contract will be due thirty (30) days after BACWA's receipt of invoices. BACWA may withhold from any progress or final payment any damages, backcharges or claims incurred or anticipated by BACWA to the extent caused by Consultant.

Document Ownership and Retention

9. Consultant will maintain all financial records relating to this Contract in accordance with generally accepted accounting principles and for at least three years following termination of this Contract. Consultant will grant BACWA and its representatives access upon request to all such records and all other books, documents, papers, drawings, and writings of Consultant that refer or relate to this Contract.

10. All drawings, specifications, reports, programs, manuals, and other work product of Consultant that result from this Contract ("Work Product") will be considered the exclusive property of BACWA. Consultant agrees that it will not use, disclose, communicate, publish or otherwise make available to third parties any products, analyses, data, compilations, studies, proposals, technical or business information, and any other information related to the Services provided to BACWA without BACWA's prior written approval.

Indemnification

11. To the fullest extent allowed by law, Consultant will indemnify, hold harmless, reimburse and defend BACWA, its Member Agencies, and each of their officers, directors, employees and agents from, for and against any and all claims, demands, damages, losses, expenses, liabilities and penalties, including but not limited to reasonable attorneys' and expert witnesses' fees, arising out of or relating to the Services but only to the extent caused by the negligent or other wrongful acts or omissions of Consultant or any person or entity for whose acts or omissions any of them are responsible, or by the failure of any such party to perform as required by this Contract.

Insurance

12. Consultant will purchase and maintain, at Consultant's expense, the following types of insurance, covering Consultant, its employees and agents:

a. Workers' Compensation Insurance as required by law, subject to a waiver of subrogation in favor of BACWA;

b. Employers Liability Insurance with a per accident value at $1,000,000, Policy Limit of $1,000,000 and Each Employee of $1,000,000, subject to a waiver of subrogation in favor of BACWA.

c. Comprehensive General Liability Insurance covering personal injury and property damage with a combined single limit, or the equivalent, of not less than $1,000,000.00 each occurrence, $2,000,000.00 general aggregate, and naming BACWA as an additional insured.

d. Business Automobile Liability Insurance with combined single limit coverage of not less than $1,000,000.00 aggregate for each claim, incident, or occurrence; and naming BACWA as an additional insured.

Assignment

13. Consultant will not assign or transfer any of its interest in this Contract, in whole or in part, without the prior written consent of BACWA. BACWA may assign this Contract and any rights relating to this Contract (including but not limited to its right to assert claims and defenses against Consultant) at BACWA's discretion.

Independent Contractor

14. Consultant will perform the Services as an independent contractor. Although Consultant will perform its Services for the benefit of BACWA, and although BACWA reserves the right to determine the schedule for the Services and to evaluate the quality of the completed performance, BACWA does not control the means or methods of Consultant's performance. Consultant is solely responsible for determining the appropriate means and methods of performing the Services, and Consultant's liability will not be diminished by any review, approval, acceptance, use or payment for the same by BACWA or any other party.

Termination of Contract; Suspension of Services

15. This contract shall automatically terminate on **June 30, 2019**. Either party may also terminate this Contract in whole or in part at any time for its convenience. For a termination for convenience, the termination will be effective thirty (30) days following receipt of a written notice of termination by one party from the other. BACWA may terminate this Contract in whole or in part for cause, in which event the termination will be effective ten (10) days after Consultant's receipt of BACWA's written notice and Consultant's failure during that period to cure the default.

Dispute Resolution

16. Consultant will give prompt written notice to BACWA of any claim, dispute or other matter in question, but in no event will Consultant give such notice later than ten (10) days after Consultant's becoming aware of the event or circumstance giving rise to the claim, dispute or matter in question.

17. All claims, disputes and other matters in question between BACWA and Consultant arising out of or relating to this Contract will be subject to alternative dispute resolution. If both parties agree to arbitration it will be conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association then in effect. Notice of the demand for arbitration will be filed in writing with the other party to this Contract and with the American Arbitration Association. Any arbitration arising out of or relating to this Contract will include, by consolidation, joinder or joint filing, any other person or entity not a party to this Contract that is substantially involved in a common issue of law or fact and whose involvement in the consolidated arbitration is necessary to achieve a final resolution of a matter in controversy therein. This agreement to arbitrate will be specifically enforceable by any court with jurisdiction thereof.

18. A demand for dispute resolution by either party will be made within a reasonable time after the claim, dispute, or other matter in question has arisen, and in no event will it be made after the date when institution of court litigation based on such claim, dispute or other matter in question would be barred by the applicable period of limitations. For all claims by BACWA against Consultant, the applicable period of limitations will not commence to run, and any alleged cause of action will not be deemed to have accrued (whether such action is based on negligence, strict liability, indemnity, intentional tort or other tort, breach of contract, breach of implied or express warranty, or any other legal or equitable theory), unless and until BACWA is fully aware of all three of the following: (1) the identity of the party(ies) responsible, (2) the magnitude of the damage or injury and (3) the cause(s) of the damage or injury. The contractual limitations period and discovery rule provided herein applies in lieu of any otherwise applicable statute or related case law.

19. The failure of either party to enforce any provision of this Contract will not constitute a waiver by that party of that or any other provision of this Contract.

Severability

20. BACWA and Consultant agree that if any term or provision of this Contract is determined to be illegal, in conflict with any law, void or otherwise unenforceable, and if the essential terms and provisions of this Contract remain unaffected, then the validity of the remaining terms and provisions

will not be affected and the offending provision will be given the fullest meaning and effect allowed by law.

Survival

21. All rights and obligations set out in this Contract and arising hereunder will survive the termination of this Contract (i) as to the parties' rights and obligations that arose prior to such termination and (ii) as is necessary to give effect to rights and obligations that arise after such termination but derive from a breach or performance failure that occurred prior to the termination.

This Contract constitutes the entire, legally binding contract between the parties regarding its subject matter. No waiver, consent, modification or change of terms of this Contract is binding unless in writing and signed by both parties.

The following documents are incorporated into and made a part of this Contract. Any conflicts between these documents and this Contract will be resolved in favor of this Contract.

Exhibit A – Scope of Work
Exhibit B – Budget Summary Table/Estimated Timing
Exhibit C – 2018 Fee Schedule

CONSULTANT: **EOA, Inc.**

1410 Jackson Street
Street Address

Oakland, CA 94612
City, State, Zip Code

94-2977419
Tax Identification No.

Consultant Signature *Date*

Name, Title

BACWA Signature *Date*

Jim Ervin, BACWA Chair

EXHIBIT A
CHLORINE RESIDUAL BASIN PLAN AMENDMENT
TECHNICAL ASSISTANCE SCOPE OF WORK

CHLORINE RESIDUAL PROBLEM DEFINITION

Task 1. Compile Recent POTW Chlorine Residual Excursion Information

Review CIWQS records from 1/1/2010 through 12/31/2017 and compile table of chlorine residual excursions reported with assessed minimum mandatory penalties (MMPs) in Region 2. Review excursion associated monthly self-monitoring report (SMR) transmittal letters in CIWQS records and summarize available information on chlorine residual event durations, causes, and actions taken to prevent similar events from reoccurring. Prepare summary statistics and graphical summaries of events from that period including frequency, magnitude and duration. Provide narrative summary and interpretation of causes of most frequent events and corrective actions required. Prepare estimates of recent total annual Bay area POTW dechlorination chemical usage from pooled chemical purchase program and estimates of ranges of excess chemicals added by POTWs to maintain consistent compliance with the 0.0 mg/L effluent limit. Prepare summary tables showing the reduction in dechlorination chemicals and costs that could occur if dosages were able to be reduced by 0.5 mg/L, 1.0 mg/L, or 2.0 mg/L, respectively.

Estimated Hours: 50

POTW WATER QUALITY BASED EFFLUENT LIMIT APPROACH

Task 2. Evaluate Alternative Approaches for Replacing the Basin Plan Table 4-2 Chlorine Residual Technology Based Effluent Limit with WQBELs Based on USEPA Ambient Water Quality Criteria for Chlorine (1984)

Conduct two meetings with RWB staff to evaluate alternative approaches for replacing the Table 4-2 Chlorine Residual instantaneous maximum technology based effluent limit water quality based effluent limits (WQBEL). Options include adding the saltwater and freshwater UPEPA 1-hour average and 4-day average chlorine WQC (below) as WQBELs to Table 4-2, including the EPA WQC elsewhere in the Basin Plan Implementation Plan (Chapter 4), or adopting the 1-hour average and 4-day average chlorine WQC as Water Quality Objectives in Basin Plan Chapter 3.

- Saltwater: **13 ug/L 1-hour average**; 7.5 ug/L 4-day average
- Freshwater: **19 ug/L 1-hour average**; 11 ug/L 4-day average

Based on the results of the two RWB meetings prepare summary of recommended approach for Basin Plan modifications and any additional guidance deemed necessary for calculation of WQBELs such as on use of deepwater and shallow-water discharge dilution credits. Prepare technical and regulatory rationale for why WQBELs should be expressed on a 1-hour basis instead of average weekly and average monthly, as is otherwise required by NPDES regulations for POTWs unless deemed impractical. Rationale should address the impracticality of adequately protecting aquatic life with weekly or monthly average limits based on the short-term exposure toxicity of chlorine.

Estimated Hours: 60

Task 3. Evaluate Approaches for Determining Compliance with a 1-Hour Average Limit Using Continuous Monitoring Data

Compliance with the current 0.0 mg/L instantaneous maximum effluent limit, for purposes of CIWQS reporting and MMP assessment, is determined based on 24-daily every hour on the hour readings per an agreement developed between the RWB and BACWA in 2004. The USEPA chlorine WQC is expressed as a 1-hour average value. The WQC needs to be translated into an NPDES permit effluent limit using SIP procedures, including dilution where applicable. The Basin Plan is silent on how to use continuous monitoring data for compliance determination (Section 4.7.3). The SWB draft Total Residual Chlorine (TRC) policy (June 2006) proposed an approach averaging 60 one minute readings every hour for compliance determination. The POTW community and instrumentation professionals deemed this to be infeasible given on-line monitoring system limitations.

The SWB April 2008 on-line field monitoring system report recommended a reporting frequency of every 5-minutes (averaging 12 readings per your). The Santa Ana RWB uses a compliance determination protocol based magnitude and duration of individual excursions and receiving water dilution. Evaluate alternative compliance determination protocols and develop draft potential language for inclusion in Basin Plan Section 4.7 Implementation of Effluent Limits.

Provide an analysis of implementing a potential 1-hour WQBEL as an instantaneous not-to-exceed value for compliance purposes in addition to evaluating alternative averaging period approaches. Evaluate how to address averaging values below a potential Reporting Level (DNQs) if one were to be established. Summarize pros and cons of the options and rationale for the apparent best alternative to implement.

Estimated Hours: 80

Task 4. Conduct Electronic Research for Examples of Minimum (Reporting) Levels Developed for On-Line Continuous Monitoring Chlorine Residual Systems

The SIP establishes MLs for evaluating compliance with priority pollutant based effluent limits. TRC is not a priority pollutant but is a toxic pollutant. MLs (RLs) have not been established for TRC measured by continuous on-line monitoring systems by the SIP or by this RWB. SIP section 2.4.3 provides general guidance for establishing an ML not contained in SIP Appendix 4. TRC WQBELs calculated using actual dilution credit, as is now done for total ammonia WQBELs, are unlikely to result in compliance problems for deep water dischargers. However, WQBELs calculated for shallow-water dischargers using zero dilution credit or limited dilution credit (e.g., Basin Plan Table 4-6 cyanide WQBEL allowed dilution credit) would likely result in widespread non-compliance in the absence of a technically defensible reporting level (RL) set at a level above the WQBEL. Conduct electronic literature search for examples of chlorine residual MLs/RLs established for on-line continuous monitoring systems, as distinguished from laboratory discrete sample analyses. Evaluate potential applicability of on-line continuous analyzer RL recommended in SWB April 2008 study. Summarize pros and cons of the options and rationale for the apparent best RL alternative to implement, or existing data gaps and recommended approach for additional data collection needed to develop a defensible RL.

Estimated Hours: 30

BASIN PLAN AMENDMENT PREPARATION TECHNICAL ASSISTANCE

Task 5. Summarize Technical and Regulatory Analyses from Task 1 – 4 in Suitable Format for Development of Draft Basin Plan Amendment Documents

Compile technical and regulatory analysis information developed in Tasks 1 – 4 and organize it in a manner and format consistent for use as supporting text in a BPA example to be selected by RWB staff. Existing background information and language developed by SWB staff as part of their Draft 2006 *Total Residual Chlorine and Chlorine-Produced Oxidants Policy of California* used to the extent applicable to this TRC BPA. Draft BPA language will be developed based on close consultation with RWB staff.

Estimated Hours: 110

Task 6. Provide Technical Support for Completing CEQA Checklist and Related Portions of the Substitute Environmental Document (SED)

Coordinate with RWB staff to summarize the results of Tasks 1 – 4 in a format suitable for a CEQA project alternatives analysis, including the no project (no action) alternative and a draft economic assessment. Coordinate with RWB staff to determine if additional third party (CEQA consultant) assistance will be needed to complete portions of the CEQA checklist and SED. If needed, coordinate with RWB and BACWA to develop draft scope of work for CEQA consultant assistance to be funded separately by BACWA.

Estimated Hours: 30

Task 7. Water Board Coordination, Meetings, Document Reviews

Coordinate with RWB staff during the BPA technical support process to ensure staff remain apprised of project status and progress via phone, email, and in-person meetings. Help set-up and facilitate approximately quarterly coordination meetings. Provide drafts of work products to staff with sufficient advance notice to allow for their timely review and comment. Assumes project will be conducted over approximately an 18-month period from notice to proceed.

Estimated hours: 30

OPTIONAL FUTURE TASKS

Task 8. Coordinate Additional Studies to Develop Reasonable RL for POTWs

The intent of Task 4 is to identify from literature reviews and consultation with RWB staff a reasonable RL that could be applied to continuous on-line TRC monitoring systems for compliance reporting purposes. Adoption of a reasonable RL is essential for compliance by shallow-water discharges with TRC WQBELs. If Task 4 finds that insufficient information exists to select a reasonable RL, work would be initiated under this Task 8 to produce a workplan to develop the additional information stakeholders believe necessary to develop a reasonable RL. It is assumed that the focus of the workplan would be on coordinating additional field studies at representative POTWs to update and augment the work coordinated by SWB staff and reported

in the SWB 2008 Study "Investigation of Continuous Online Measurement of Chlorine and Sulfite in Wastewaters."

Coordinate with BACWA to identify POTW's with continuous monitoring chlorination and dechlorination systems to participate in the study and potentially contribute additional funding to support full implementation of this Task 8. Assumes that there would be a lead BACWA POTW to oversee the actual field study portion of the project at the volunteer POTWs. Coordinate with BACWA to develop a scope of work for a control system technology firm with expertise in chlorination and dechlorination control systems to assist in developing the workplan for this study and to provide as-needed technical support during the study. Goals of the study would be to collect sufficient on-line and ancillary bench-top data to support development of a reasonable RLs and associated data reporting frequencies for continuous on-line monitoring TRC compliance evaluation and reporting.

Estimated Hours: 100

Task 9. Supplemental RWB BPA Technical Assistance

The intent of Tasks 1 – 7 is to develop and then package the information needed to support the RWB staff in preparing a complete draft BPA package suitable for submittal to their Board for consideration of approval. There are multiple steps in the BPA development and approval process and there may be unexpected data collection or analysis requirements identified during the conduct of Tasks 1 – 7. This Task 9 would provide additional as-needed BPA technical assistance to RWB staff to help complete the TRC BPA process.

Estimated Hours: 100

EXHIBIT B
CHLORINE RESIDUAL BASIN PLAN AMENDMENT TECHNICAL ASSISTANCE
BUDGET SUMMARY TABLE / ESTIMATED TIMING

Task Descriptions	Hours	Budget ($)	Estimated Timing
Chlorine Residual Problem Definition			1 month
Task 1. Chlorine Excursions and Bisulfite Use	50	13,000	
POTW WQBEL Approach			5 months
Task 2. Basin Plan WQBEL Approaches	60	15,000	
Task 3. Compliance Determination Approaches	80	20,000	
Task 4. Reporting Limit (RL) Approaches	30	8,000	
BPA Preparation Technical Assistance			12 months
Task 5. BPA Technical/Regulatory Sections	110	28,500	
Task 6. SED Technical/Regulatory Sections	30	7,500	
Task 7. RWB Coordination	30	7,500	
Cumulative Total	390	99,500	18 months
Optional Future Tasks			
Task 8. Reasonable RL Additional Studies	100	25,000	
Task 9. Supplemental RWB BPA Assistance	100	25,000	

Environmental and Public Health Engineering

2018 FEE SCHEDULE

The following fee schedule covers personnel rates for EOA, Inc. staff.

Our charges are divided into two categories: personnel, and direct expenses. A new fee schedule is issued at the beginning of each year. Charges for all work, except where other arrangements have been made, are based on the new schedule of charges.

PERSONNEL

Personnel charges are for any technical, clerical or administrative work necessary to perform the project. Work tasks include geologic and environmental consulting, engineering and computer services, regulatory liaison, and report preparation. Personnel rates are as follows:

Personnel Category	Hourly Rates
Principal Engineer	$271
Managing Engineer/Scientist III	$263
Managing Engineer/Scientist II	$249
Managing Engineer/Scientist I	$238
Senior Engineer/Scientist III – Project Leader	$218
Senior Engineer/Scientist/Planner II	$200
Senior Engineer/Scientist/Planner I	$183
Associate Engineer/Scientist III	$174
Associate Engineer/Scientist II	$165
Associate Engineer/Scientist I	$141
Assistant Engineer/Scientist	$126
Technician	$111
Clerical/Computer Data Entry	$78

Charges for professional services are in increments of one quarter-hour. Depositions/legal testimony charged portal-to-portal, at 200% of standard rates, with a four-hour minimum charge. In accordance with California Civil Procedure 2037.7, where applicable, the minimum fee must be paid prior to commencement of testimony. Preparation for court cases is charged on a time-and-materials basis as outlined in this fee schedule.

DIRECT EXPENSES

Reimbursement for expenses directly related to services provided will be charged at cost plus 10%. Examples of such direct expenses include:

- Costs of sub-consultants or subcontractors
- Costs of special fees (insurance, permits, etc.)
- Costs of long-distance telephone, copying, drafting, blueprints, etc. (EOA copies charged at $0.10 each for B&W, $0.35 each for color. Large format $0.15/sq ft for B&W, $0.50/sq ft for color)
- Costs of color map production supplies (color ink and large format paper)
- Costs or rental of special equipment
- Costs of authorized travel and related expenses
- Automobile mileage directly related to services, at current IRS rate.

INVOICES

Invoices are prepared and submitted on a monthly basis, as either final or progress billings and are payable upon receipt unless prior arrangements have been made. Interest of 1-1/2% per month, or the maximum rate allowed by law, is payable on accounts not paid within 30 days.

BACWA EXECUTIVE BOARD ACTION REQUEST

AGENDA NO.: 7

FILE NO.: 20-07

MEETING DATE: June 21, 2019

TITLE: Request for BACWA Executive Board Approval for the Agreement with Carollo Engineers for AIR Committee Support

☐**RECEIPT** ☐**DISCUSSION** ☐**RESOLUTION** ☒**APPROVAL**

RECOMMENDED ACTION

Authorize agreement with Carollo Engineers to implement the Fiscal Year 2020 BACWA and Special Programs Budget and Workplan AIR Committee Support line item for a not to exceed amount of $75,000.

SUMMARY

The BACWA fiscal year (FY20) begins July 1, 2020. The BACWA Air Issues and Regulations (AIR) committee is supported by a consultant who plans and manages meetings, provides regulatory and technical updates, and facilitates coordination between POTWs and regulators. Following the expiration of the previous support agreement, BACWA solicited proposals for FY20 with the option of extending the agreement for an additional four years. A Request for Proposals was submitted to five prospective vendors and two proposals were submitted. Following a review by a selection committee made up of BACWA members, Carollo Engineers was chosen as the consultant who could best provide the required services.

FISCAL IMPACT

The funding for this contract is consistent with the Fiscal Year 2020 workplans and budget for BACWA and Special Programs.

ALTERNATIVES

Discontinue consultant support for BACWA's AIR committee. This alternative is not recommended, since member agencies have expressed the need for expert assistance on air issues that affect POTWs in the Region.

Attachments: FY20 Agreement with Carollo Engineers, Inc.
Carollo Engineers, Inc. Scope of Work and FY20 Rates

Approved: _____ Date: _____
Lori Schectel, Chair,
BACWA Executive Board

BAY AREA CLEAN WATER AGENCIES
PROFESSIONAL SERVICES CONTRACT

This PROFESSIONAL SERVICES CONTRACT, effective July 1, 2019, is between Bay Area Clean Water Agencies ("BACWA"), a joint powers agency which exists as a public entity separate and apart from its Member Agencies, created January 4, 1984 by a Joint Powers Agreement between Central Contra Costa Sanitary District, East Bay Dischargers Association, East Bay Municipal Utility District, the City and County of San Francisco and the City of San Jose, with a mailing address of P.O. Box 24055, MS 59, Oakland, CA 94623, and Carollo Engineers, Inc. ("Consultant"), a private corporation doing business at 2700 Ygnacio Valley Road, Suite 300, Walnut Creek, CA 94598 for professional services as described in any Exhibit A attached hereto.

In consideration of the mutual covenants, stipulations and agreements, the parties agree as follows:

Description and Standard of Services to be Performed

1. Consultant will perform the Services as described by and in accordance with Exhibit A in a manner acceptable to BACWA.
2. Consultant shall not contract with or otherwise use any subconsultants, subcontractors or other non-employee persons or entities ("Subconsultants") to perform the Services without the prior written approval of BACWA. If Consultant and BACWA agree that Subconsultants shall be used, Consultant shall ensure Subsconsultants' compliance with all the terms and conditions of this agreement.
3. Consultant will exercise that degree of care in performing the Services in accordance with that prevailing among firms of comparable standing in the State of California ("Professional Standard"). Consultant will promptly correct or re-perform those Services not meeting the Professional Standard without additional compensation.
4. Consultant warrants that it is fully licensed, registered and otherwise fully authorized to perform the Services in the State of California to the extent applicable law requires such licensure, registration or authorization.
5. BACWA's review, approval, acceptance, use, or payment for all or any part of the Services hereunder will not alter the Consultant's obligations or BACWA's rights hereunder, and will not excuse or diminish Consultant's responsibility for performing all Services consistent with this Contract.

Payment for Services

6. The contract will begin July 1, 2019. BACWA will pay Consultant based on the rates in Exhibit B, up to a maximum amount payable of $75,000.00. The term of this agreement shall not extend beyond June 30, 2020 but may be extended for additional one year terms at BACWA's discretion for an additional four years, ending June 30, 2024. If, upon reaching the end of the term of the contract, the Board elects to extend the contract, the amount of the extended contract will be negotiated at the time the contract is extended.
7. Consultant shall submit invoices monthly via email to Lorien Fono, Regulatory Program Manager, at lfono@bacwa.org. Invoices shall include the hours charged by each employee, a brief description of the work performed, and a description of costs for which Consultant seeks reimbursement and which are specified in Exhibit B.
8. Payments under this Contract will be due thirty (30) days after BACWA's receipt of invoices. BACWA may withhold from any progress or final payment any damages, backcharges or claims incurred or anticipated by BACWA to the extent caused by Consultant.

Document Ownership and Retention

9. Consultant will maintain all financial records relating to this Contract in accordance with generally accepted accounting principles and for at least three years following termination of this Contract. Consultant will grant BACWA and its representatives access upon request to all such records and all other books, documents, papers, drawings, and writings of Consultant that refer or relate to this Contract.

10. All drawings, specifications, reports, programs, manuals, and other work product of Consultant that result from this Contract ("Work Product") will be considered the exclusive property of BACWA. Consultant agrees that it will not use, disclose, communicate, publish or otherwise make available to third parties any products, analyses, data, compilations, studies, proposals, technical or business information, and any other information related to the Services provided to BACWA without BACWA's prior written approval.

Indemnification

11. To the fullest extent allowed by law, Consultant will indemnify, hold harmless, reimburse and defend BACWA, its Member Agencies, and each of their officers, directors, employees and agents from, for and against any and all claims, demands, damages, losses, expenses, liabilities and penalties, including but not limited to reasonable attorneys' and expert witnesses' fees, arising out of or relating to the Services but only to the extent caused by the negligent or other wrongful acts or omissions of Consultant or any person or entity for whose acts or omissions any of them are responsible, or by the failure of any such party to perform as required by this Contract.

Insurance

12. Consultant will purchase and maintain, at Consultant's expense, the following types of insurance, covering Consultant, its employees and agents:

a. Workers' Compensation Insurance as required by law, subject to a waiver of subrogation in favor of BACWA;

b. Employers Liability Insurance with a per accident value at $1,000,000, Policy Limit of $1,000,000 and Each Employee of $1,000,000, subject to a waiver of subrogation in favor of BACWA.

c. Comprehensive General Liability Insurance covering personal injury and property damage with a combined single limit, or the equivalent, of not less than $1,000,000.00 each occurrence, $2,000,000.00 general aggregate, and naming BACWA as an additional insured.

d. Business Automobile Liability Insurance with combined single limit coverage of not less than $1,000,000.00 aggregate for each claim, incident, or occurrence; and naming BACWA as an additional insured.

Assignment

13. Consultant will not assign or transfer any of its interest in this Contract, in whole or in part, without the prior written consent of BACWA. BACWA may assign this Contract and any rights relating to this Contract (including but not limited to its right to assert claims and defenses against Consultant) at BACWA's discretion.

Independent Contractor

14. Consultant will perform the Services as an independent contractor. Although Consultant will perform its Services for the benefit of BACWA, and although BACWA reserves the right to determine the schedule for the Services and to evaluate the quality of the completed performance, BACWA does not control the means or methods of Consultant's performance. Consultant is solely responsible for determining the appropriate means and methods of performing the Services, and Consultant's liability will not be diminished by any review, approval, acceptance, use or payment for the same by BACWA or any other party.

Termination of Contract; Suspension of Services

15. This contract shall automatically terminate on June 30, 2020. Either party may also terminate this Contract in whole or in part at any time for its convenience. For a termination for convenience, the termination will be effective thirty (30) days following receipt of a written notice of termination by one party from the other. BACWA may terminate this Contract in whole or in part for cause, in which event the termination will be effective ten (10) days after Consultant's receipt of BACWA's written notice and Consultant's failure during that period to cure the default.

Dispute Resolution

16. Consultant will give prompt written notice to BACWA of any claim, dispute or other matter in question, but in no event will Consultant give such notice later than ten (10) days after Consultant's becoming aware of the event or circumstance giving rise to the claim, dispute or matter in question.

17. All claims, disputes and other matters in question between BACWA and Consultant arising out of or relating to this Contract will be subject to alternative dispute resolution. If both parties agree to arbitration it will be conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association then in effect. Notice of the demand for arbitration will be filed in writing with the other party to this Contract and with the American Arbitration Association. Any arbitration arising out of or relating to this Contract will include, by consolidation, joinder or joint filing, any other person or entity not a party to this Contract that is substantially involved in a common issue of law or fact and whose involvement in the consolidated arbitration is necessary to achieve a final resolution of a matter in controversy therein. This agreement to arbitrate will be specifically enforceable by any court with jurisdiction thereof.

18. A demand for dispute resolution by either party will be made within a reasonable time after the claim, dispute, or other matter in question has arisen, and in no event will it be made after the date when institution of court litigation based on such claim, dispute or other matter in question would be barred by the applicable period of limitations. For all claims by BACWA against Consultant, the applicable period of limitations will not commence to run, and any alleged cause of action will not be deemed to have accrued (whether such action is based on negligence, strict liability, indemnity, intentional tort or other tort, breach of contract, breach of implied or express warranty, or any other legal or equitable theory), unless and until BACWA is fully aware of all three of the following: (1) the identity of the party(ies) responsible, (2) the magnitude of the damage or injury and (3) the cause(s) of the damage or injury. The contractual limitations period and discovery rule provided herein applies in lieu of any otherwise applicable statute or related case law.

19. The failure of either party to enforce any provision of this Contract will not constitute a waiver by that party of that or any other provision of this Contract.

Severability

20. BACWA and Consultant agree that if any term or provision of this Contract is determined to be illegal, in conflict with any law, void or otherwise unenforceable, and if the essential terms and provisions of this Contract remain unaffected, then the validity of the remaining terms and provisions will not be affected and the offending provision will be given the fullest meaning and effect allowed by law.

Survival

21. All rights and obligations set out in this Contract and arising hereunder will survive the termination of this Contract (i) as to the parties' rights and obligations that arose prior to such termination and (ii) as is necessary to give effect to rights and obligations that arise after such termination but derive from a breach or performance failure that occurred prior to the termination.

This Contract constitutes the entire, legally binding contract between the parties regarding its subject matter. No waiver, consent, modification or change of terms of this Contract is binding unless in writing and signed by both parties.

The following documents are incorporated into and made a part of this Contract. Any conflicts between these documents and this Contract will be resolved in favor of this Contract.

Exhibit A – Scope of Work
Exhibit B – Hourly Rates/Reimbursable Expenses

CONSULTANT: **CAROLLO ENGINEERS, INC.**

2700 Ygnacio Valley Road, Suite 300
Street Address

Walnut Creek, CA 94598
City, State, Zip Code
86-0899222
Tax Identification No.

Consultant Signature *Date*

Lydia Holmes, Vice President
Name, Title

BACWA Signature *Date*

Lori Schectel, BACWA Chair
Name, Title

EXHIBIT A

SCOPE OF WORK

Professional Services by Carollo

Task 1 - Quarterly Meetings with the AIR Committee
Under this task, it is assumed we will organize four formal meetings with the AIR Committee in each Fiscal Year. This includes coordination of meeting locations and preparation of agendas and meeting materials (e.g., handouts and presentation slides), and following each meeting with minutes. We will support AIR Committee meetings to present information on current air issues, facilitate discussions between members, and identify follow on action items. One of these meetings will be the annual BAAQMD-BACWA meeting to address issues of concern to AIR Committee members.

Task 2 - Track and Communicate Regulatory Issues, Technical Resources, and Grant Opportunities
This task is to allow for continued monitoring of regulatory agencies involved in developing air quality and climate change regulations that may affect Bay Area WWTPs, including but not limited to the BAAQMD, the San Francisco BCDC, the California Air Resources Board, and the U.S. Environmental Protection Agency. We will also track related and relevant technical resources and grant opportunities of interest to BACWA AIR member agencies. This task also includes preparation and distribution of informational material via e-mail to members to keep them informed of regulatory activities, and AIR Committee activities, between meetings.

Task 3 - Coordination and Communication with other WWTP Organizations and Regulators
When directed by the AIR Committee Chairs, we will participate in meetings with regulators, participate in member or regulator workshops and hearings, draft correspondence for AIR Committee member review and approval prior to submission, and perform other related activities. We will also coordinate with other WWTP organizations on issues of common interest. The purpose of this coordination is to share/exchange useful information, identify areas of joint interest, and prepare consistent or complementary responses on key issues, where appropriate. WWTP organizations whose objectives/interests coincide with the AIR Committee include SCAP, CVCWA, CASA, WERF, and NACWA. Activities may include conference calls, meetings, and exchange of published information.

Task 4 - Response on Special Assignments (Optional or As Needed)
This task includes performing special technical assignments under the direction of the AIR Committee Chairs (i.e., as needed). Special technical assignments may include coordinating a specialty workshop for the AIR Committee or general BACWA members, participating in AIR Committee strategy meetings, or performing other activities not included in Tasks 1-3.

EXHIBIT B

HOURLY RATES/REIMBURSABLE EXPENSES

Sarah Deslauriers	$215
Courtney Mizutani	$200

BACWA EXECUTIVE BOARD ACTION REQUEST

AGENDA NO.: 8

FILE NO.: 20-08, 20-09

MEETING DATE: June 21, 2109

TITLE: Approval of Fiscal Year 2019 Amendments to Contracts

☐RECEIPT ☐DISCUSSION ☐RESOLUTION ☒APPROVAL

RECOMMENDED ACTION

Authorize the approval of amendments to contracts to implement the Fiscal Year 2020 BACWA/CBC Budget and Workplan.

SUMMARY

The BACWA Fiscal Year 2020 begins July 1, 2019. In order to prevent a gap in core services, BACWA typically executes contracts for the coming FY before the end of June. The amendments summarized below ensure that, as of July 1, 2018 BACWA will have Executive Director (ED) and Regulatory Program Manager (RPM) services available. These service contracts were included in the BACWA FY 2020 workplan and budget and will become effective July 1, 2019. There are no benefits associated with the service contracts. All contracts have a term of one year and will terminate on June 30, 2020.

Contractor	Services	Contract Amount	File Number
DRW Engineering (Amendment #5)	Executive Director Services	$207,531.00	20-08
Lorien Fono (Amendment #3)	Regulatory Program Manager Services	$137,727.00	20-09

FISCAL IMPACT

The funding for these contracts is consistent with the FY 2020 Workplan and Budget for BACWA/CBC.

ALTERNATIVES

No other alternatives were considered for these contracts as the terms of these agreements are consistent with BACWA contracting policies.

***Attachments*:**

1. DRW Engineering Amendment #5
2. Lorien Fono Amendment #3

Approved: _____ **Date:** June 21, 2019

Lori Schectel, Chair
BACWA

AMENDMENT NO. 5
TO AGREEMENT BETWEEN
BAY AREA CLEAN WATER AGENCIES AND
David R. Williams (dba DRW Engineering)
FOR
Executive Director Services

This Amendment No. 4 is made this 21st day of June, 2019, in the City of Oakland, County of Alameda, State of California, to that certain agreement of July 1, 2014 by and between David R. Williams (dba DRW Engineering) and Bay Area Clean Water Agencies, (BACWA) (the "Agreement") in consideration of the covenants hereinafter set forth.

1. BACWA and DRW Engineering agree to a new contract amount of $207,531.00 for Executive Director Services.

2. BACWA and DRW Engineering agree to a new period of July 1, 2019 – June 30, 2020.

3. Except as herein expressly modified, the Agreement will remain in full force and effect.

BAY AREA CLEAN WATER AGENCIES

By _____ Date June 21, 2019
Lori Schectel Chair, Executive Board

David R. Williams (dba DRW Engineering)

By _____ Date June 21, 2019
David R. Williams, Executive Director

AMENDMENT NO. 3
TO AGREEMENT BETWEEN
BAY AREA CLEAN WATER AGENCIES AND
Lorien Fono
FOR
Regulatory Program Manager Services

This Amendment No. 2 is made this 21st day of June, 2019, in the City of Oakland, County of Alameda, State of California, to that certain agreement of July 1 , 2016 by and between Lorien Fono and Bay Area Clean Water Agencies, (BACWA) (the "Agreement") in consideration of the covenants hereinafter set forth.

1 . BACWA and DRW Engineering agree to a new contract amount of $137,727.00 for Regulatory Program Manager Services.

2. BACWA and Lorien Fono agree to a new period of July 1, 2019 — June 30, 2020.

3. Except as herein expressly modified, the Agreement will remain in full force and effect.

BAY AREA CLEAN WATER AGENCIES

By _____ Date June 21, 2019
Lori Schectel, Chair, Executive Board

By _____ Date June 21, 2019

Lorien Fono

BACWA EXECUTIVE BOARD ACTION REQUEST

AGENDA NO.: 9

FILE NO.: 20-010

MEETING DATE: July 21, 2019

TITLE: Request for BACWA Executive Board Approval for Amendment #1 to the Agreement with TDC for BAPPG Pesticide Regulatory Support

☐**RECEIPT** ☐**DISCUSSION** ☐**RESOLUTION** ☒**APPROVAL**

RECOMMENDED ACTION

Authorize Amendment #1 to the contract with TDC Environmental, LLC to track pesticide regulatory activities through the US EPA Office of Pesticide Programs (EPA) .and California Department of Pesticide Regulation (CDPR); provide key points for comment letters; communicate with pesticide regulatory agencies; and leverage opportunities to prevent pollution at the source through regulatory and/or policy actions, in an amount not to exceed $30,000 for FY20.

SUMMARY

At the June 15, 2019 Executive Board Meeting, the BACWA Executive Board approved a contract with TDC Environmental Inc. to provide support to BACWA/BAPPG on regulatory, technical, and outreach issues related to emerging contaminant priorities, with a focus on pesticides. The contract allows for up to four one-year extensions. Work under this contract is described in the attached Scope of Work, and will include the tracking of pesticide-related regulatory activities by the EPA and CDPR and making recommendations regarding regulatory participation and other follow-up steps, including recommending key points for comment letters, reviewing draft comment letters, setting up meetings with key staff at the pesticide regulating agencies to continue educating them about downstream wastewater impacts from their actions to register and/or re-register pesticide uses, and working to change the tools and information used in the registration processes to be protective of wastewater.

FISCAL IMPACT

The funding for this contract is consistent with the Fiscal Year 2019 workplans and budget for BACWA and Special Programs.

ALTERNATIVES

1. Discontinue consultant support. This alternative is not recommended since this work was included in BAPPG's approved FY20 budget and will assist BACWA with comment letters on important regulatory actions that can reduce wastewater pollution from pesticides and other products at the source. In addition, the staff at the San Francisco Regional Water Quality Control Board is supportive of this work by BACWA, and views this as part of the proactive approach it would like to see BACWA pursuing to prevent pollution at the source. The Regional Board dedicates staff resources to participate in BACWA's monthly Pesticide Steering Committee and also submits comment letters that echo BACWA's key points.

2. Select another consultant to conduct the work. This alternative is not recommended since the selected consultant has unique expertise and knowledge in the subject area desired for supporting BACWA, and was selected through a competitive process. No other consultant knows the pesticide regulatory process better nor has the contacts/relationships at the pesticide regulating agencies (EPA Region IX, US EPA and California Department of Pesticide Regulation) than Dr. Moran of TDC Environmental. As a result, BACWA/BAPPG achieves much more effectiveness and impact for a modest investment by retaining her firm for this work.

Attachments: FY19 Agreement with TDC Environmental, Inc.
FY20 Scope of Work and Rates

Approved: _____ Date:_____
Lori Schectel, Chair,
BACWA Executive Board

19-10 Date: 6/15/18

BAY AREA CLEAN WATER AGENCIES

CONSULTING AGREEMENT

TO:	Dr. Kelly Moran TDC Environmental, LLC 462 E. 28th Ave. San Mateo CA 94403	kmoran@tdcenvironmental.com (650) 627-8690
FROM:	David Williams, Executive Director BACWA PO Box 24055, MS702 Oakland, CA 94623	dwilliams@bacwa.org Phone: 925-765-9616 FAX: (510) 287-1351

RE: BACWA Agreement for FY19 with TDC Environmental, LLC to provide pesticide regulatory and technical support to the BAPPG Committee.

This Agreement covers professional services to be performed by TDC Environmental, LLC in order to provide support for: (1) tracking pesticide regulatory activities through the US EPA and California Department of Pesticide Regulation, providing key points for comment letters, and communicating with pesticide regulatory agencies; and (2) seeking opportunities to prevent pollution at the source. The work under this contract will be carried out under the supervision of Autumn Cleave of SFPUC (acleave@sfwater.org). The total cost of professional services to be performed by TDC Environmental, LLC is not to exceed $30,000. This contract will be funded under the BAPPG Committee line item.

This agreement may be extended for up to four additional one-year terms upon approval of the BACWA Executive Board and an amendment to this agreement.

This Agreement may be terminated by either party at any time for convenience with 30-day notice. In the event of termination by BACWA, BACWA shall pay TDC Environmental, LLC for professional and competent services rendered to the date of termination upon delivery of assigned work products to BACWA.

TDC Environmental, LLC shall submit invoices to the BACWA Project Managers for approval, who will then transfer the approved invoice to the BACWA Assistant Executive Director for payment. Invoices shall indicate hours associated with each task. Invoices will be paid within thirty (30) days of receipt.

BACWA AED E-mail: Sherry Hull shulll@bacwa.org

Approved:

By _____
Lori Schectel
Chair, BACWA Executive Board

Date: June 15, 2018

By _____
Dr. Kelly Moran
TDC Environmental, LLC

Date: June 15, 2018

BACWA EIN: 94-3389334

Scope of Work
TDC Environmental, LLC
Pesticide Regulatory and Technical Support
July 2019-June 2020

- Coordinate with BAPPG representatives to maintain a list of highest priorities pesticides for BACWA's attention (currently copper, silver, fipronil, imidacloprid, and pyrethroids). Periodically update (to the extent possible) a schedule of anticipated pesticide regulatory activities on these pesticides.
- Track pesticide-related regulatory activities by EPA and Department of Pesticide Regulation (DPR) that have significant potential to affect BACWA member agencies. Notify BAPPG of such items as they arise. Based on regulatory documents, relevant scientific information, and the regulatory context, make recommendations regarding regulatory participation or other follow-up steps. When so directed and as resources allow, provide key points for comments and review draft comment letters.
- Based on existing lines of communication with pesticide regulators and pesticide manufacturers (which are maintained for other clients), notify BAPPG of important information obtained through these contacts.
- Coordinate and provide scientific support for communications with EPA and DPR about wastewater pesticides discharges, wastewater pesticides monitoring, and improving wastewater pesticides predictive modeling to support registration decisions.
- Continue efforts to change EPA standard procedures that currently ignore the contribution of pet flea control products (spot-ons and collars) to wastewater.
- Continue follow-up up work to finalize new swimming pool, spa, and fountain product label language to direct owners to contact their local sanitation agency prior to discharging treated water.
- Continue follow-up work to secure POTW notification prior to applications of root control chemicals in wastewater collection systems.
- Coordinate scientific review with other agencies (DPR, Water Board) and work with other BACWA and member agency consultants to provide key points for comment letters for select, high-priority ecological risk assessments and risk management decisions. In 2019-20 these are anticipated to include: pyrethroids, fipronil, imidacloprid and other neonicotinoids, metam sodium (root control) and several swimming pool and pet flea control products.
- Obtain scientific information to support the above activities (recognizing that pesticides regulatory programs are science based). This may include attendance at scientific conferences, with prior review and approval by BACWA's Project Managers.
- Provide technical information to support BACWA's coordination with NACWA on Federal pollution prevention topics, including pesticides.
- Track TSCA reform implementation and support BACWA's coordination with NACWA on providing comments.

- Based on the above tasks, develop an agenda and materials for a monthly BACWA Pesticides Workgroup teleconference meeting to determine appropriate actions and to coordinate actions with NACWA and San Francisco Bay Regional Water Board staff. Provide staff support during the meetings and an action item list after each meeting.
- Provide technical and regulatory advice to support development of BAPPG program(s) or materials to address pesticides, such as planned pet flea control-related outreach.
- Upon request, provide responses to pesticide-related regulatory or scientific questions.

All work to be conducted by Kelly D. Moran, Ph.D. with the support of Tammy Qualls, P.E. In conjunction with similar work funded by CASQA, Ms. Qualls support activities (anticipated to involve <30% of total expenditures) will include tracking pesticides regulatory schedules, preparing periodic regulatory schedule updates, providing workgroup meeting staff support and action item tracking, and when so directed and as resources allow, providing key points for draft comment letters.

All services identified in this Scope of Work shall be compensated on a time and materials basis:

- Kelly D. Moran, Ph.D. – $210 per hour
- Tammy Qualls, P.E. – $160 per hour
- Direct costs – at cost

Total expenditures not to exceed $30,000.

Contractor

TDC Environmental, LLC
Kelly D. Moran, Ph.D., President
462 E. 28th Ave.
San Mateo CA 94403
650-627-8690
kmoran@tdcenvironmental.com

BACWA EXECUTIVE BOARD ACTION REQUEST

AGENDA NO.: 10
FILE NO.: 20-11
MEETING DATE: July 21, 2019

TITLE: Request for BACWA Executive Board Approval for Amendment #1 to the Agreement with Stephanie Hughes, ChE P.E. for BAPPG Support

☐**RECEIPT** ☐**DISCUSSION** ☐**RESOLUTION** ☒**APPROVAL**

RECOMMENDED ACTION

Authorize Amendment #1 to the contract with Stephanie Hughes to to provide professional training, prepare comment letters, and provide policy support in an amount not to exceed $16,000.00 for FY20.

SUMMARY

At the June 15, 2019 Executive Board Meeting, the BACWA Executive Board approved a contract with TDC Environmental Inc. to provide support to BACWA/BAPPG on regulatory, technical, and outreach issues related to emerging contaminant priorities, with a focus on pesticides. The contract allows for up to four one-year extensions. This agreement will provide support for: (1) training to professional groups (dental hygienists/assistants, plumbers, etc.) on mercury, copper and other relevant pollutants of concern to BACWA agencies; (2) preparing comment letters; (3) evaluating regulatory documents; (4) performing research related to controlling pollutants at their source; (5) continuing outreach to Veterinary Medical Associations and the general public related to pet spot-on flea treatments; and (6) providing policy support on pesticides, pharmaceuticals, and other pollutants of emerging concern..

FISCAL IMPACT

The funding for this contract is consistent with the Fiscal Year 2019 workplans and budget for BACWA and Special Programs.

ALTERNATIVES

1. Discontinue consultant support. This alternative is not recommended since this work was included in BAPPG's approved FY19 budget and will assist BACWA with executing effective outreach messages and search for new opportunities to inspire behavior change in target groups.
2. Select another consultant to conduct the work. This alternative is not recommended since BACWA conducted a competitive process which resulted in Stephanie Hughes being selected as the most qualified technical consultant.

Attachments: FY19 Agreement with TDC Environmental, Inc.
FY20 Scope of Work and Rates

Approved: _____ Date:_____
Lori Schectel, Chair,
BACWA Executive Board

19-09 Date: 6/15/18

BAY AREA CLEAN WATER AGENCIES

CONSULTING AGREEMENT

TO:	Stephanie Hughes, ChE P.E. 1445 Emory Street San Jose, CA 95126	steifehughes@yahoo.com (408) 499-9271
FROM:	David Williams, Executive Director BACWA PO Box 24055, MS702 Oakland, CA 94623	dwilliams@bacwa.org Phone: 925-765-9616 FAX: (510) 287-1351

RE: BACWA Agreement for FY19 with Stephanie Hughes, ChE P.E. to provide professional training (mercury and copper), prepare comment letters, and provide policy support (pesticides, pharmaceuticals, etc.).

This Agreement covers professional services to be performed by Stephanie Hughes, ChE P.E. in order to provide support for: (1) training to professional groups (dental hygienists/assistants, plumbers, etc.) on mercury, copper and other relevant pollutants of concern to BACWA agencies; (2) preparing comment letters; (3) evaluating regulatory documents; (4) performing research related to controlling pollutants at their source; (5) continuing outreach to Veterinary Medical Associations and the general public related to pet spot-on flea treatments; and (6) providing policy support on pesticides, pharmaceuticals, and other pollutants of emerging concern. These efforts will be carried out under the supervision of Autumn Cleave of the San Francisco Public Utilities Commission. The total cost of professional services to be performed by Stephanie Hughes, ChE P.E. is not to exceed $16,000. This contract will be funded by the BACWA Budget under the BAPPG Committee line item.

This agreement may be extended for up to four additional one-year terms upon approval of the BACWA Executive Board and an amendment to this agreement.

This Agreement may be terminated by either party at any time for convenience with 30-day notice. In the event of termination by BACWA, BACWA shall pay Stephanie Hughes, ChE P.E. for professional and competent services rendered to the date of termination upon delivery of assigned work products to BACWA.

Stephanie Hughes, ChE P.E. shall submit invoices to the BACWA Assistant Executive Director via e-mail along with approval by BAPPG. Invoices shall indicate hours associated with each task. Invoices will be paid within thirty (30) days of receipt.

BACWA AED E-mail: Sherry Hull shulll@bacwa.org

Approved:

By _____
Lori Schectel
Chair, BACWA Executive Board

Date: June 15, 2018

By _____
Stephanie Hughes, ChE P.E.

Date: June 15, 2018

BACWA EIN: 94-3389334

Policy, Regulatory and Professional Training Support for BAPPG

Fiscal Year 2018-19

Scope:

General Scope: (1) Conduct professional training, and (2) Provide research and regulatory support (including but not limited to pesticides, pharmaceuticals, and dental). Specifically:

Professional training: Conduct outreach to professionals, by reaching out to community colleges, union shops, and professional develop and training workshops. The focus is expected to be on dental mercury and other dental office wastes, but consultant should have the expertise and experience to also provide trainings regarding proper pharmaceutical disposal, hazardous material identification during building demolition, and copper plumbing BMPs. As part of this effort, consultant shall update contact database, communicate with contacts, and seek speaking engagements. Edit/update presentations as warranted per new regulatory context.

Policy Support and Comment Letters: Consultant will be on-call to develop regulatory letters, conduct literature reviews, or provide other technical support. Topics could include but are not limited to metals, pesticides, nutrients, salinity, and emerging constituents (such as PBDEs and PFOS) being reviewed by the Regional Board.

Communications: Prepare relevant outreach sections to the BAPPG Annual Report to be submitted to the BACWA Board of Directors. Participate in BACWA Pesticide Committee meetings. Present to BAPPG meeting once a year to provide significant update of technical topic. Provide outreach to Veterinary Medical Associations and the general public related to pet spot-on flea messaging.

Budget: The budget must not exceed $16,000 for FY 2018-19. The proposed budget breakdown is attached.

STEPHANIE HUGHES, ChE P.E.
Consulting Engineer / University Lecturer
1445 Emory Street, San Jose, California 95126

BAPPG: Professional Training
and Policy/Regulatory Support

Scope of Work and Cost Estimate for 2019-20

DATE: 24-May-2019

SCOPE OF WORK DESCRIPTION	BUDGET		TOTAL
	Rate: $190.00 **ODC**	**Hour Est**	
TASK 1. Professional training: Conduct outreach to professionals, by reaching out to community colleges, union shops, and professional develop and training workshops. The focus is expected to be on dental mercury and other dental office wastes, but consultant should have the expertise and experience to also provide trainings regarding proper pharmaceutical disposal, hazardous material identification during building demolition, and copper plumbing BMPs. As part of this effort, consultant shall update contact database, communicate with contacts, and seek speaking engagements. Edit/update presentations as warranted per new regulatory context. This scope assumes up to a total of 8 presentations.	$135	19.5	$3,840.00
Task 2. Policy Support and Comment Letters: Consultant will: * update flea/tick pesticide database (previously developed and updated in 2014-2016) to include new (or in-development) flea/tick pesticides, peer-reviewed research, and insights about alternatives. * continue to reach out to companion animal professionals (vets, groomers, pet rescue/ shelter entities) as well as social media / internet site authors to introduce the issue of flea control chemicals and direct people to the Baywise website * be on-call to develop regulatory letters, conduct literature reviews, or provide other technical support. Topics could include, but are not limited to, metals, pesticides, nutrients, salinity, and emerging constituents.		50	$9,500.00
Task 3. Communications. Prepare relevant outreach sections to the BAPPG Annual Reports to be submitted to the BACWA Board of Directors. Speak at one BAPPG meeting to provide significant updates of a technical nature (e.g. flea pesticide research findings). Participate in BACWA Pesticide Committee meetings		14	$2,660.00
Totals	**$135**	**84**	**$16,000.00**

www.stephaniehughes.net

THANK YOU FOR YOUR BUSINESS!

BACWA EXECUTIVE BOARD ACTION REQUEST

AGENDA NO.: 11

FILE NO.: 20-12

MEETING DATE: June 21, 2019

TITLE: Nomination and Election of BACWA Executive Board Chair and Vice Chair for FY20

☐**RECEIPT** ☐**DISCUSSION** ☐**RESOLUTION** ☒**APPROVAL**

RECOMMENDED ACTION

Board nomination and election of the BACWA Executive Board Chair and Vice Chair for FY 20.

SUMMARY

Section 7 of the Joint Powers Agreement establishing BACWA states that the agency shall designate a Chair and Vice Chair, chosen by the Executive Board, from the members of the Executive Board. These positions each have a one year term that coincides with BACWA's fiscal year. Historically, most BACWA Chairs and Vice Chairs are asked to serve for two consecutive terms.

Responsibilities of the Chair include signing contracts, approving payments, convening and presiding over Executive Board meetings, primary contact and oversight of the contractors serving as staff, and serving on the BACWA Finance Committee. Responsibilities of the Vice Chair include serving as the Chair in the absence of the regularly elected Chair and serving on the BACWA Finance Committee.

BACWA Leadership History

Timeframe	Chair	Vice-Chair
2000 – 2002	Chuck Weir (EBDA	Jim Kelly (CCCSD)
2002 – 2004	Jim Kelly (CCCSD)	Michael Carlin (SFPUC)
2004 – Feb. 2005	Michael Carlin (SFPUC)	Dave Williams (EBMUD)
March 2005 – June 2005	Dave Williams (EBMUD)	Bill Keaney (SFPUC)
July 2005 – June 2006	Bill Keaney (SFPUC)	Chuck Weir (EBDA)
July 2006 – May 2007	Bill Keaney (SFPUC)	Dave Williams (EBMUD)
June 2007 – June 2008	Dave Williams (EBMUD)	Dave Tucker (EBMUD)
July 2008 – March 2010	Dave Tucker (SJ)	Doug Craig (CCCSD)
April 2010 – June 2010	Dave Tucker (SJ)	Arleen Navarret (SFPUC)
July 2010 – October 2010	Arleen Navarret (SFPUC)	Ben Horenstein (EBMUD)
Nov 2010 – Feb 2013	Ben Horenstein (EBMUD)	Tommy Moala/Laura Pagano (SFPUC)
March 2013 – June 2015	Mike Connor (EBDA)	Laura Pagano (SFPUC)
July 2015 – June 2017	Laura Pagano (SFPUC)	Jim Ervin (SJ)
July 2017 – Feb 2018	Jim Ervin (SJ)	Lori Schectel (CCCSD)
March 2018 – June 2019	Lori Schectel (CCCSD)	Amit Mutsuddy (SJ)

FISCAL IMPACT

This action has no fiscal impact.

ALTERNATIVES

This action does not require consideration of alternatives.

NMS Nutrient Technical Workgroup (NTW) Meeting - May 24 2019

In FY2020, the NMS will enter into the second 5-year permit. In general, Permit#2 funding levels will be ~2x those in Permit #1(FY2015-2019). Over the past year NMS/SFEI staff have been working with the Steering Committee to identify priorities for Permit #2, and to revise the NMS Science Plan 2.0 for 2019-2024 to reflect those priorities.

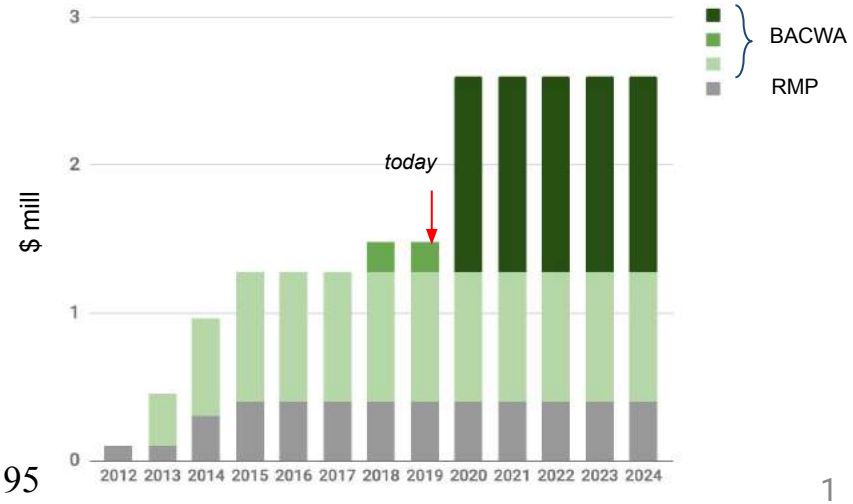
The projects that will move forward next year, as part of the FY2020 Program Plan, are based on the goals and timelines laid out in the Science Plan 2.0. A set of draft projects and priorities for FY2020 will be discussed at the May 24 NTW meeting.

Below is a set of high-level goals for the May 24 meeting, along with suggested resources or background materials.

Goals:

1. Technical feedback from stakeholders on slate of potential projects for pursuing NMS priorities in FY2020
   - Resources/Background:
     - Priorities informing project selection, based on Science Plan v2.0,
       - See summary slides below (from Dec 2018 and Mar 2019 SC meetings), **p. 2-12**
       - See draft Science Plan 2.0, including the more detailed appendices for Modeling and Biogeochemical Field Studies [included in the Agenda Materials Folder]
     - Draft set of potential FY20 Core Program Activities and Projects, **p. 13-16**

2. NTW feedback on Core Program and Proposed Project, in terms of alignment with Science Plan 2.0 goals. That feedback will be...
   - Incorporated into program plan materials shared with NMS-SC in advance of their June 14 meeting
   - Used to refine the FY2020 Program Plan



Science Plan 2.0: Program Priorities, 2019-2024

Focus Areas A: Complete by 2024 **(65% effort)**

- Nutrient cycling, transport, source attribution
- DO, chl-a deep subtidal
- DO, shallow-margin

Focus Areas B: Risky/Advanced Studies **(35% effort)**

- Mechanistic understanding of HABs
- More nuanced or advanced biotic endpoints:
  - DO / biota impacts, HAB wildlife impacts (chronic)
- Risk / future scenarios
- Coastal effects

Priority Program Areas

- Final Assessment Framework: chl-DO_deep, chl-DO_margins, HABs
- 'Basic' stable monitoring: chl-DO_deep, chl-DO_margins, HABs
- Modeling: solid on the essentials, within SFB

NMS Management Questions

1. What conditions would be considered adverse impacts or impairments?		
1.1	DO / chl in deep subtidals	
1.2	DO in shallow margin habitats	
1.3	HAB abundance, toxin abundance, Phytoplankton assemblage	
1.4	Coastal ocean	
2. Monitoring and condition assessment: Are adverse impacts impacts or impairment currently occurring?		
2.1	DO / chl in deep subtidals	
2.2	DO in shallow margin habitats	
2.3	HAB abundance, toxin abundance, Phytoplankton assemblage	
2.4	Coastal ocean	
3. How do SFB habitats respond to nutrient inputs -- dose:response?		
3.1	DO / chl in deep subtidals	
3.2	DO in shallow margin habitats	
3.3	HAB abundance, toxin abundance, Phytoplankton assemblage	
3.4	Coastal ocean	
4	Risk of Impacts under Future Scenarios (changing system behavior) (chl-a/DO, HABs)	
5. What are the contributions of individual nutrient sources to nutrient levels throughout SFB (f(space, time))?		
5.1	Magnitudes (± variability) of individual nutrient loads at point of entry (present, future)	
5.2	Magnitudes of nutrient transformations and losses within SFB, space/time variability?	
5.3	Contributions of individual nutrient sources to loads/concentrations in "subregions"?	
6. What management actions or load reductions are needed to prevent or mitigate current or future impairment?		
6.1	What reductions/changes are needed within subregions to mitigate impairments?	
6.2	What load reductions or other management actions can achieve the "local" effect(s)?	
6.3	Evaluating combinations of options: feasibility, effectiveness, cost-efficiency	

How will effort be distributed if we follow that prioritization approach?

approximate prioritization, 2019-2024

Priority level through 2024

- Highest
- High
- Moderate
- Low

Target Resource Allocation based on Proposed Prioritization

		Total over 5yrs	%(Science)	%(Science)	Annual Avg
1	Nutrient sources, cycling, fate	3500	23		700
2	Phytoplankton, DO, openBay	3000	20	65	600
3	Phyto/Productivity/DO margins	2000	13		400
4	HABs	2500	17		500
5	Coastal exports	1000	7	35	200
6	Future Scenarios	1000	7		200
	Program Management	2000	13		400
		15000			

*1000s of $

Total Revenue:

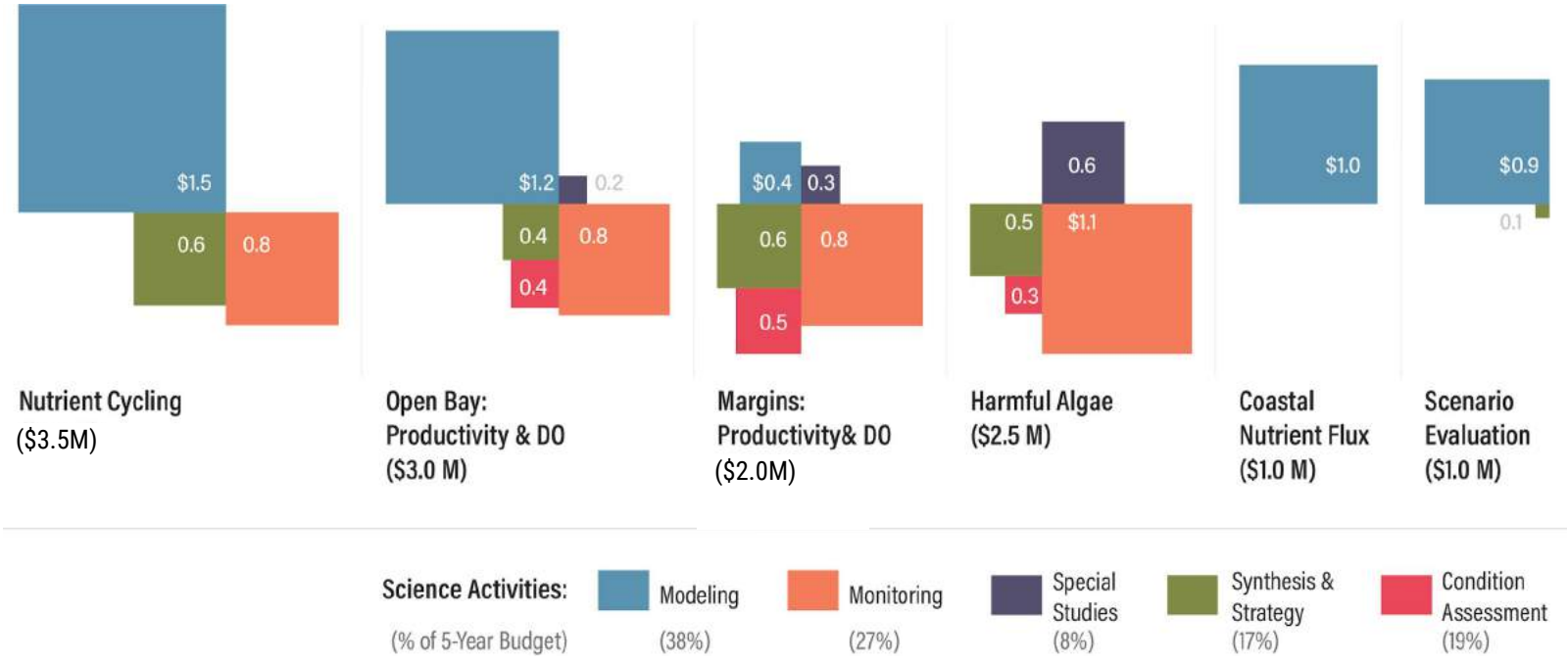
$12,500k: $2,200k/yr Permit + ~$300k RMP over 5 years

+$2,500k: other sources (e.g., fundraising, other partners)

$15,000k

Note: Overall funding distribution above (and more detailed below) assumes continuation of substantial USGS contribution, no large increases for creating a new program

Approximate/Target Funding Distribution -- Topic and Activity

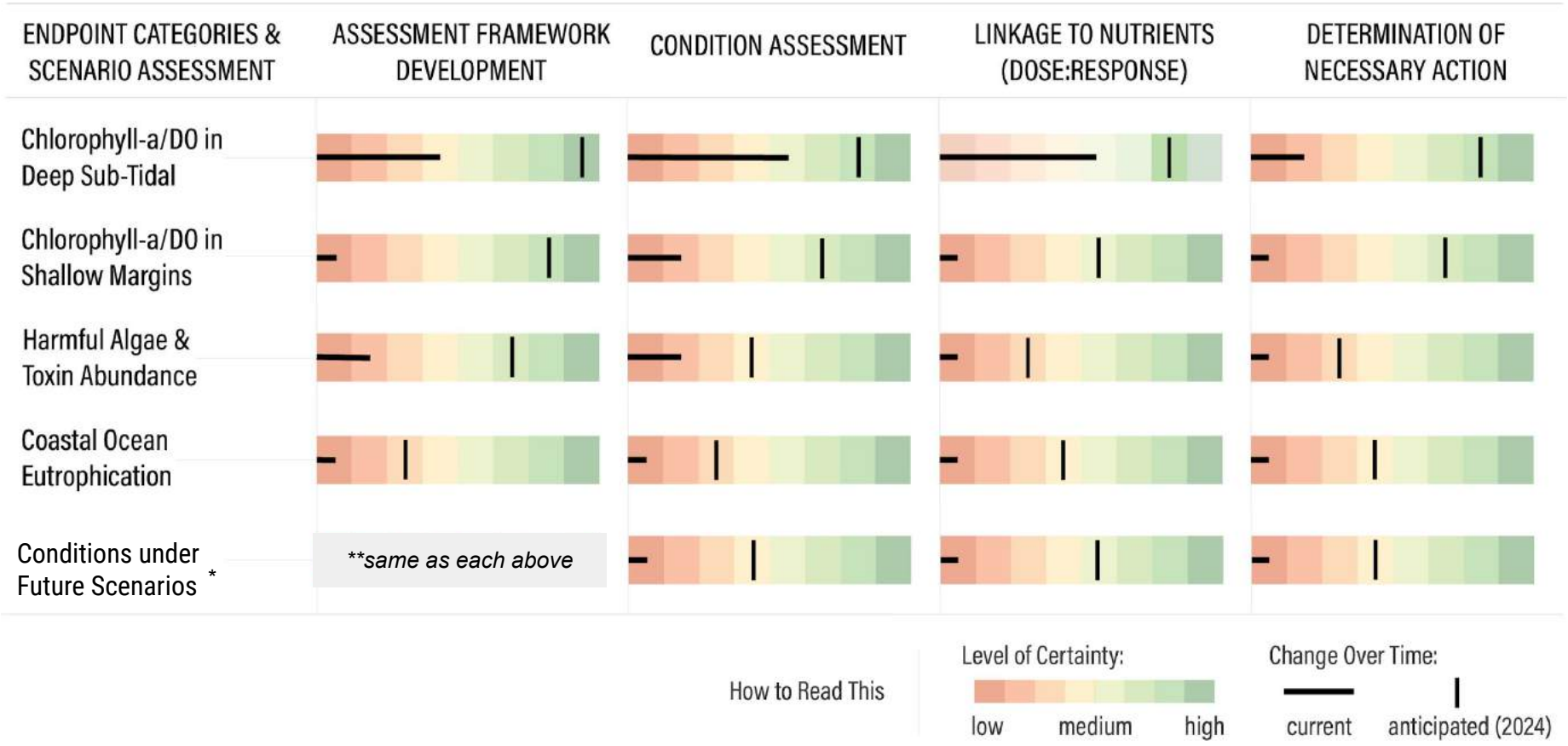


\+ $2M science program management/coordination

- For planning purposes, assumed total funding level of $15mill, distributed evenly over 5 yrs
  - This exceeds solid anticipated funding by $500k/yr
  - Fundraising efforts and other sources may fill this gap, and plan can be modified to prioritize projects of greatest need

Anticipated progress: What level of confidence or certainty are we aiming to achieve?

-- Varies by topic area (rows) and management question (columns)



* 'Future Scenarios' refers to conditions under scenarios when SFB's response to nutrients changes (i.e., changes in physical/biological forcings, leading to changes in 'dose:response'). SFB's response to nutrients could change with respect to any of the prior rows (e.g., chl-a/DO deep subtidal, or HABs),

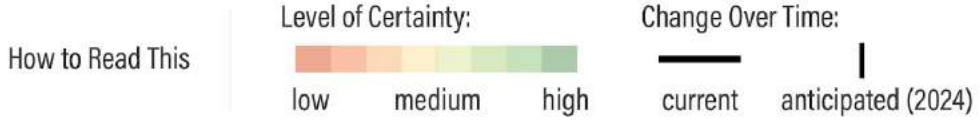
**We're assuming that the way we determine whether condition is good or bad (Assessment Framework) will remain unchanged.

Anticipated progress: What level of confidence or certainty are we aiming to achieve?

-- Varies by topic area (rows) and management question (columns)

Targeting high confidence levels for this program area

- Issue with the most available data, and most historic work and science foundation
- Progress relies heavily on modeling
- But...purposefully limited this to ‘current system behavior’



Anticipated progress: What level of confidence or certainty are we aiming to achieve?

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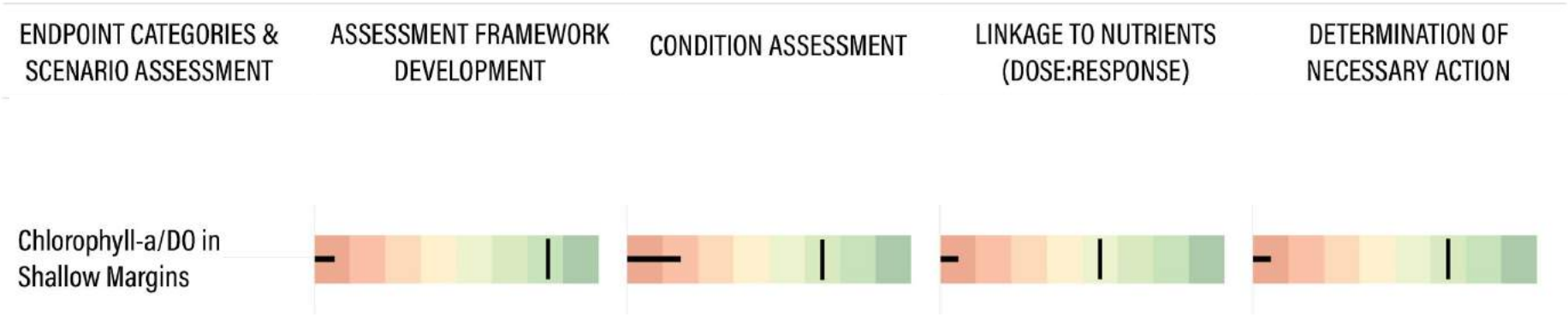
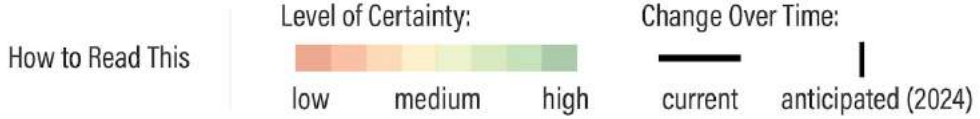


Lower Confidence than deep subtidal habitats.

- Historically...less well-studied. Most data is from past several years (via NMS)
- Extremely complex system: strong tides, strong biogeochemical gradients, restoration. Creates additional challenges for
  - Modeling
  - Observations



Anticipated progress: What level of confidence or certainty are we aiming to achieve?

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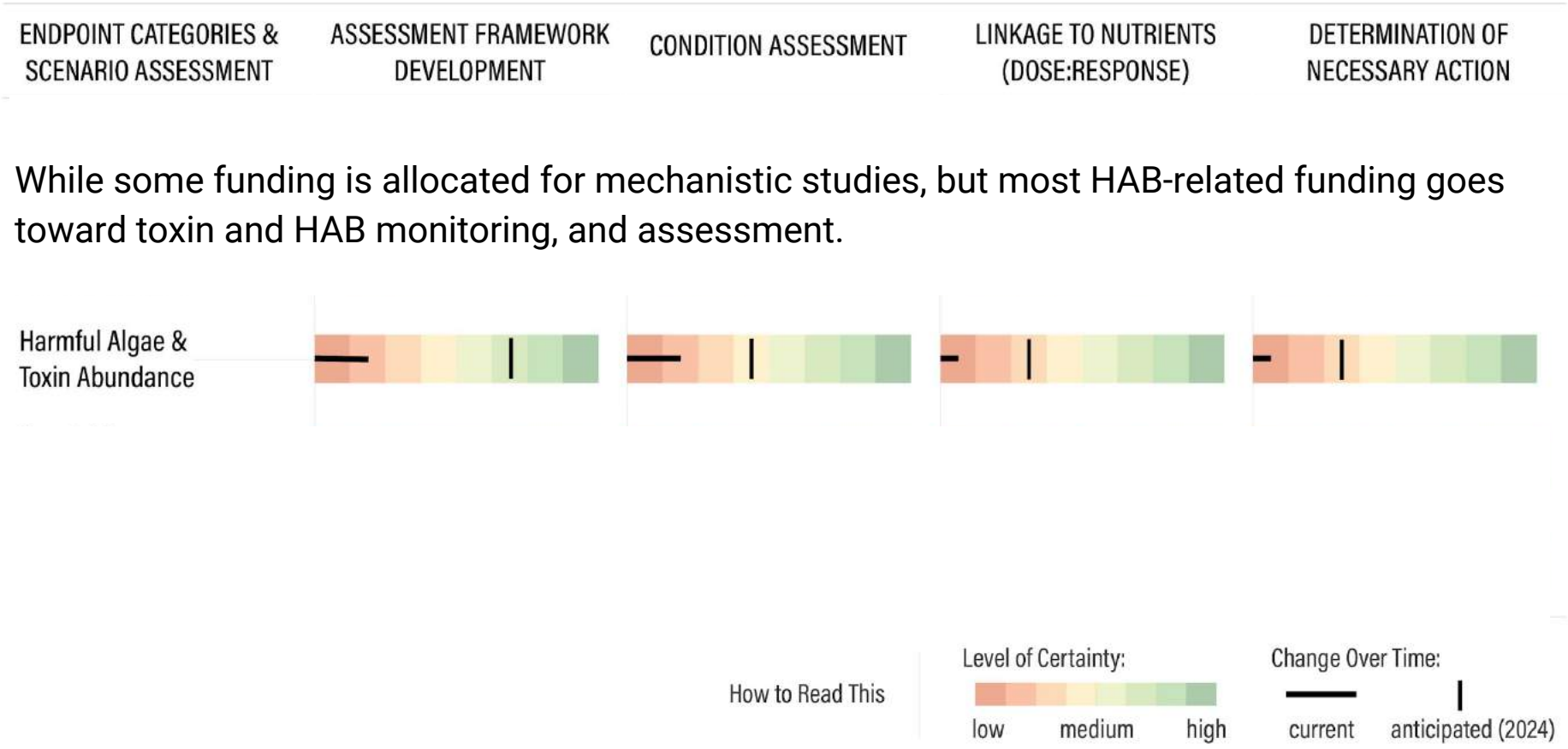


While some funding is allocated for mechanistic studies, but most HAB-related funding goes toward toxin and HAB monitoring, and assessment.

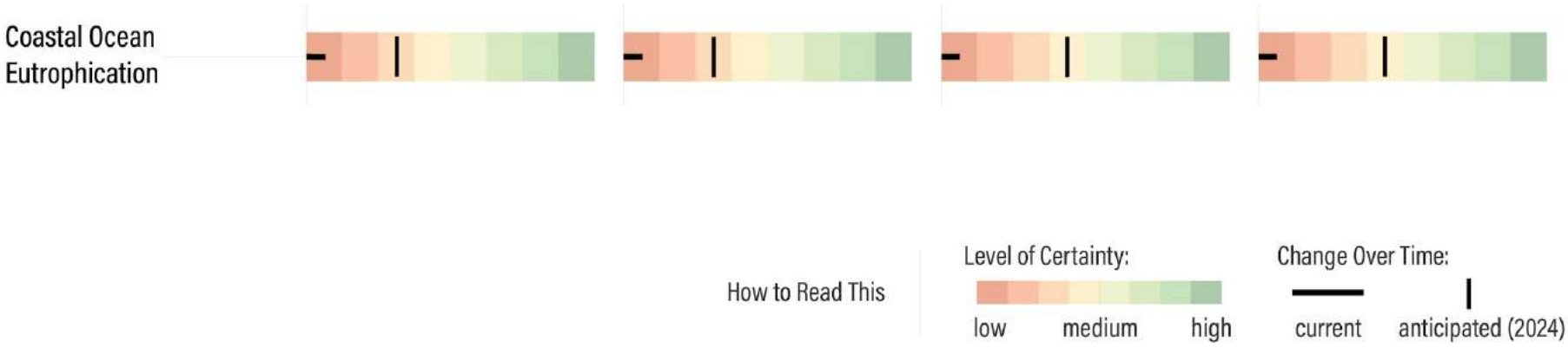
Anticipated progress: What level of confidence or certainty are we aiming to achieve?

-- Varies by topic area (rows) and management question (columns)

ENDPOINT CATEGORIES & SCENARIO ASSESSMENT	ASSESSMENT FRAMEWORK DEVELOPMENT	CONDITION ASSESSMENT	LINKAGE TO NUTRIENTS (DOSE:RESPONSE)	DETERMINATION OF NECESSARY ACTION

In collaboration with UCLA, UCSC, and SCCWRP, the NMS plans on increasing our understanding of nutrient processes and quantifying the <u>potential</u> for impacts.

(little or no focus on actually monitoring condition; that will come later, if necessary)

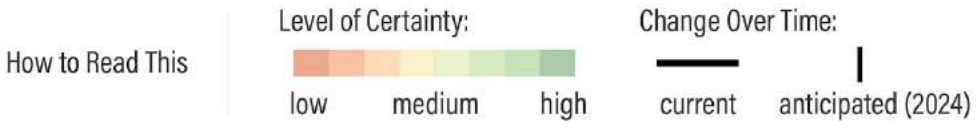


Anticipated progress: What level of confidence or certainty are we aiming to achieve?

-- Varies by topic area (rows) and management question (columns)

ENDPOINT CATEGORIES & SCENARIO ASSESSMENT	ASSESSMENT FRAMEWORK DEVELOPMENT	CONDITION ASSESSMENT	LINKAGE TO NUTRIENTS (DOSE:RESPONSE)	DETERMINATION OF NECESSARY ACTION
Conditions under * Future Scenarios	**same as each above			

Apply modeling to evaluate risks under future scenarios, resulting from potential changes to ecosystem response (changes to physical or biological drivers)



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**We're assuming that the way we determine whether condition is good or bad (Assessment Framework) will remain unchanged.

Anticipated progress: What level of confidence or certainty are we aiming to achieve?

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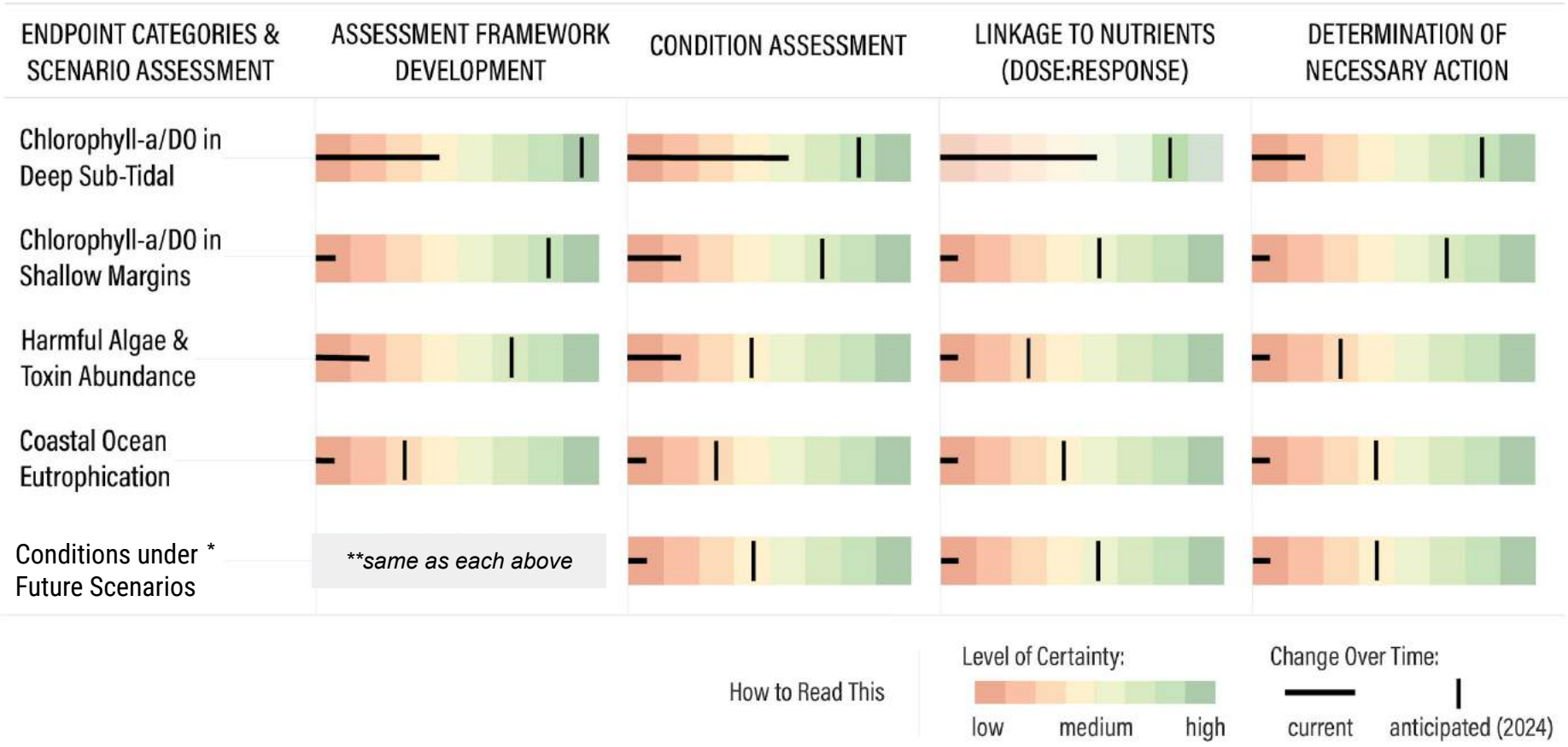

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**We're assuming that the way we determine whether condition is good or bad (Assessment Framework) will remain unchanged.

FY2020 Anticipated Funding

Nutrient Permit FY2020	$2,200k	
RMP CY2020	???	(past funding - 200-500k)
Total	**$2,400-2,700k**	

NMS FY2020 Core Program and Projects, aligned with Science Plan 2.0

Priority Level		
	Essential	$2,769,000
	High	$1,343,000
	Medium	
	OK, already covered by other funds	

After initial prioritization...

- Highest priority (essential): $2.77mill
- Next tier projects (med-high): $1.34mill

Project Number	Brief Description	Science Activity Category	Priority Level	Cost Estimate
Core Program				
C1	**Ship-based sampling:** Assumes continuation of program with USGS, using the R/V Peterson on ~12 full-bay cruises and an additional ~12 South Bay cruises. This activity includes all field components of the study as well as sample analysis, including measurement of nutrients, phytoplankton taxonomy, phycotoxins, and continuation of pilot molecular measurements (sequencing) of phytoplankton assemblage and HAB detection, plus limited data management.	Monitoring	4	$161,000
C2	**Moored sensor** field work and data management: Servicing of the eight moored sensor stations in the South and Lower South Bay, plus the new station on South Bay shoal. Maintenance at 3 week intervals, data management. Data analysis/interpretation covered elsewhere.	Monitoring	4	$355,000
C3	**Core Modeling:** Work includes ***Hydrodynamics:*** Running hydrodynamics for additional 1-3 years (2017, 2018, 2014), ***Biogeochemical model development:*** model validation for DO and Phosphorous (WY2013); continued work on sediment diagenesis model parameterization, model input/parameters sensitivity analysis; simulating biogeochemistry for 1-3 new year(s) (2017, 2018, 2014); reporting (reports, presentations); ***Tools/Maintenance:*** refinements to model grid aggregation scheme to allow for faster runs; Troubleshooting/refining code; Computing resources - internal or supercomputer time.	Modeling	4	$349,000
C4	**Program Management/Coordination:** Financial management, project management, stakeholder engagement, science program coordination	Program Management	4	$360,000
Projects				
P01	**Biogeochemical Field Studies:** Launching multi-year set of field studies to quantify important biogeochemical transformation rates to inform mechanistic understanding and calibrate models (funding for Year 1+). Work will include: Literature review for SFB and comparable systems to identify data gaps and existing data that could be applied to biogeochemical models; Convene an expert working group to provide input on the design of the field program. Field work will begin in Fall 2019, and will include: ***Water column rate measurements:*** e.g., gross primary production, nitrification, and respiration or oxygen demand. When possible, sample collection and measurements will be carried out during biweekly or monthly cruises already being conducted collaboratively between USGS and the NMS, both the sake of cost-effectiveness and to take leverage ancillary data collected during those cruises. Additional cruises will likely be needed to study conditions outside the channel. ***Sediment diagenesis/fluxes***- Sediment studies will be conducted to quantify transformation rates or fluxes between the water column and sediments, related to multiple processes, including: nitrification; denitrification; N and P fluxes to/from the sediments; and sediment oxygen demand. Sediment characteristics will also be measured to establish relationships between benthic conditions and process rates which are important for model calibration. Selection of sampling locations will be informed both by biogeochemical modeling that is underway and through interpretation of existing data for SFB, and will cover a range of habitats. ~80% of funding would support external collaborators on fieldwork, analysis, interpretation; 20% SFEI staff to participate in and coordinate project(s)	Field/Lab Study	4	$427,000
P02a	**Zooplankton sampling**: Zooplankton are important grazers of phytoplankton, and have the potential strongly regulate phytoplankton biomass accumulation. Despite their importance, little or no zooplankton data are available for the past 30 years for regions south of San Pablo Bay substantially influence, and these data are needed for model development and calibration. In Spring 2018, we began zooplankton sampling in priority regions of SFB, in particular those that currently have no zooplankton sampling (Central, South, Lower South). Funding to date has been used to support sampling. Funding in FY20 will support the taxonomy and counting, and continued field sampling in FY2020.	Field/Lab Study	4	$87,000
P02b	**Benthos monitoring:** Grazing by benthic filter feeders can act as a major control phytoplankton biomass accumulation in regions of SFB. To quantify benthic grazer influence on phytoplankton (e.g., for model calibration), benthic surveys are needed to estimate benthos abundance and biomass (and community composition), and how they vary over space. Currently, benthos monitoring occurs monthly in Suisun and San Pablo Bays (DWR-EMP); Although South and Lower South Bays have historic benthos data, no consistent benthos monitoring occurs there currently. This project would undertake fieldwork associated with benthic surveys, sample analysis, and reportin	Field/Lab Study	3	$100,000
P03	**HAB-toxin monitoring in bivalves:** This project will continue work that began in FY2016, measuring phycotoxins in naturally-occurring bivalves harvested from floating docks at ~10 locations throughout the Bay. Major project goals include: quantify phycotoxin concentrations entering biota in Central and South Bay through measurements in naturally occurring mussels; collect samples with sufficient frequency that concentrations in mussels can serve as semi-quantitative bioindicators of ambient toxin concentrations in the water column as a function of space and time. To date, this work has proven to be an informative, efficient, and cost-effective approach for characterizing how phycotoxin levels vary spatially, seasonally, and interannually.	Field/Lab Study	4	$104,000
P04	**HAB experimental study:** Factors influencing Pseudo-nitszchia growth and toxicity: This project will study growth requirements of the toxic phytoplankton Pseudo-nitszchia spp (P-N). NMS funding will be combined with other recently awarded funding (OPC) to investigators at the SFSU-RTC (now called EOS) researchers. The OPC-funded work wwill examine P-N growth and toxin production as a function of temperature and salinity, with a primary focus on conditions encountered outside the Golden Gate. The NMS funding will allow the work to pursue two or more of the following: expand the ranges of (i) temperature and/or (ii) salinity to also capture relevant conditions within SFB; or iii) investigate the effects of light (light limitation), along with temperature and salinity, on growth and toxin production. SFEI staff will join the project as co-PIs and will contribute to study design and interpretation. [Project already approved by NMS-SC, Mar 2019]	Field/Lab Study	4	$55,000
P05a	**Nutrient Dynamics** - ***Source Attribution:*** Quantify the proportional contributions of N and P from each POTW (and other sources) as a function of space and time. These will be provisional estimates based on best available simulations, and will be refined in subsequent years. ***Nutrient cycling in SFB:*** Spatial and temporal variations in N and P sources/fate/transport, at the subembayment-level, and causal factors, for informing assimilative capacity	Modeling	4	$102,000
P05b	Developing Particle Tracking Capabilities NMS models: Numerical tracers and particle tracking are important modeling tools used to help refine models and interpret model output. The transport and spreading over time of tracers or clusters of particles can be used to understand or quantify mixing rates, flushing rates, or residence times, and can also track or record conditions that a water parcel experiences during transit. The Deltares models do not currently have 3D particle tracking capabilities. However, the NMS has access to a well-tested particle-tracking code that has been used extensively in other Bay-Delta 3D-unstructured grid models. This project will focus on adapting that particle tracking model for use with Deltares hydrodynamic models. We anticipate that the first application of particles will be in P11a.	Modeling	4	$20,000
P05c	**Phytoplankton Bloom Dynamics:** Spatial/temporal variation in phytoplankton production and factors regulating productivity and fate (stratification, light, grazing, nutrients, transport). Analogous to P05a, but focused on phytoplankton dynamics	Modeling	3	$55,000

Project Number	Brief Description	Science Activity Category	Priority Level	Cost Estimate
P05d	**Potential for low DO conditions in SFB (South Bay focus):** Over the 25+ year record when DO data were consistently measured Bay-wide, near-surface and near-bottom DO levels almost always exceeded the 5 mg/L Basin Plan standard. Under what conditions could unacceptable DO conditions develop? To explore this question, we will use hydrodynamic+biogeochemical models to identify conditions under which low DO could develop in deep subtidal habitats. For a first phase of this work, we will 'force' the biogeochemical model by adding varying magnitude blooms to simulations (concentration*area*depth), and assess the effects on DO levels. Through this approach we can identify the organic matter loading rate required (as a function of space and time) to draw down DO levels low enough to have a pronounced impact.	Modeling	3	$31,000
P06a	**Biota and DO monitoring** in Lower South Bay margins: An extensive fish surveying effort has been underway in Lower South Bay, funded currently by San Jose and previously by the salt pond restoration program, and conducted by UC-Davis researchers (Hobbs). This funding will combined with funding from San Jose, to allow for additional field work relevant to NMS goals - e.g., extending the overall study duration; targeted surveys specific to DO management questions (e.g., locations, tidal phases/stages); or supporting ancillary data collection (e.g., continuous DO in currently unmeasured locations). Specific activities / study design will be identified through discussions with UC-Davis and San Jose.	Field/Lab Study	4	$25,000
P06b	**Fish/DO/habitat Data Analysis:** This funding will support continued analysis of data collected by the UC-Davis Lower South Bay fish surveys. This work will build upon the analyses included in the 2018 DO habitat quality report, including pursue some of the recommendations/next-steps identified in that report. In addition, since that report only included data through 2016, new work will include 2+ additional years of data	Synthesis	4	$25,000
P06c	**Fish/DO/habitat** Explore additional approaches for DO-related habitat condition in LSB: This project will explore DO-related habitat from a complementary angle to prior work (2018 DO habitat report), using an emerging approach that considers both DO, T, and metabolic DO requirements (animals' DO requirements vary as a function of T and species, with DO needs increasing with increasing T).	Synthesis	2	$25,000
P07	**Coastal Exchange:** A sizable proportion (e.g. 50% or more, depending on season) of the nutrients that enter SFB exit via the Golden Gate to the coast ocean. The fate of those nutrients, and their effects on the GoF and coastal habitats are poorly known. Through this project, we will begin a 3-year study, teaming up with an on-going study (collaborators SCCWRP/UCLA/UCSC) to explore fate of nutrients leaving SFB and obtaining refined boundary condition estimates for nutrients entering SFB. [Project already approved by NMS-SC, Mar 2019]	Modeling	4	$200,000
P08	**Modeling Program Planning, Model Advisory Group:** Convene a group of local and national experts to serve as a Modeling Advisory Group, to review and inform modeling strategy, and provide technical review of modeling products	Modeling	4	$53,000
P09a	**Assessment Framework Status and Work Plan:** This project will revisit the initial Assessment Framework efforts (AF1.0; Sutula et al., 2016, 2017), with the goal of producing three main outputs: a) Revisit and clarify the goals and intended uses of a SFB Assessment Framework, including the current status (how will AF1.0 be used?) and priorities for continued AF development; b) 'Test-drive' the numeric thresholds identified in AF1.0 by assessing condition relative to those thresholds in SFB, using long-term monitoring data; c) Develop an AF WorkPlan that reflects the major goals and timelines identified in **(a)**	Assessment Framework	4	$35,000
P09b	**DO-levels, condition in LSB:** Further data analysis to identify options for determining protective DO conditions in Lower South Bay sloughs/margins; utilize available fisheries data, coupled with high frequency DO data, to inform relationships and assessment criteria (e.g. Virginia Province approach and others). This would be one step, requiring on-going work in subsequent years.	Assessment Framework	3	$50,000
P09c	**Trends Analysis:** GAM Evaluation for trend detection: In FY2019 the NMS began introducing a status and trends element to the Assessment Framework, using Generalized Additive Models (GAMs) for trend detection (SFEI, 2018). To date, GAMs have proven effective at trend detection for chl-a, using customized GAM structures evaluated by subembayment. This activity involves expert evaluation of additional parameters/indicators for a set of GAMs, to identify the most appropriate tools for long-term trend detection and writing up a technical report/manuscript	Assessment Framework	4	$100,000
P09d	**Expert working group on HAB impacts:** Convene an expert panel to inform an approach to incorporating available HAB data into an Assessment Framework and review available data collected to date	Assessment Framework	2	$25,000
P09e	**Expert working group on DO influence on habitat:** Convene an expert panel of wildlife biologists and others to inform the degree to which DO may impair resident wildlife, within the context of local and national assessment criteria (e.g. Virginia Province)	Assessment Framework	2	$25,000
P10a	**Additional high-frequency sensors:** Augment current HF monitoring capacity by e.g., installing e.g., nitrate sensors at existing stations (Dumbarton, San Mateo, or Coyote); or by adding chl-a sensors at sites maintained by other groups (e.g., alcatraz, Exploritorium)	Monitoring	4	$92,000
P10b	**Expand mooring program:** During FY20, add new (temporary) mooring stations in diverse locations to quantify variability, to inform future monitoring program design. Note: Some of this could be accomplished by relocating equipment and maintenance effort from subset of existing sites in Lower South Bay.	Monitoring	3	$250,000
P11a	**Analysis of high-frequency DO data in sloughs/creeks of Lower South Bay:** Complete on-going work related to interpreting DO concentrations in sloughs/creeks in LSB, to identify causal factors and estimate rates	Synthesis	4	$60,000
P11b	**HAB synthesis:** complete current HAB long-term data report, expand toxin data analysis, including by providing some support for expert reviewer	Synthesis	4	$22,000
P11c	**Analysis/interpretation of ship-based monitoring data:** Continue and write-up analysis/interpretations from long-term monitoring data, e. g., related to phytoplankton community, gross primary production, nutrients, etc.	Synthesis	4	$48,000
P11d	**Deeper dive into HAB data analysis/interpretation**: Continuation of the report in P11b.	Synthesis	2	$49,000
P11e	**On-going analysis of moored sensor data:** e.g., GPP spatial variations; factors contributing to variations in biomass	Synthesis	4	$49,000
P11f	**Annual Report, status and trends report**	Synthesis	4	$40,000

Project Number	Brief Description	Science Activity Category	Priority Level	Cost Estimate
P12	**IFCB data analysis** An Imaging Flow Cytobot (IFCB) is now being used on USGS cruises, and between cruises is deployed at the Exploratorium pier, collecting data every 30 minutes on phytoplankton community. Funding would support a scientist to analyze and interpret IFCB data, including refining its machine-learning image classifier and characterizing spatial (cruises) and temporal (pier and cruises) variations in phytoplankton community and abundance. (Funding will support a postdoc or researcher salary).	Monitoring	3	$150,000
P13	**Lower South Bay Biogeochemical Modeling (Salt Ponds, Sloughs):** Although observations suggest that connections with restored salt ponds and sloughs have major influences on nutrient, phytoplankton, and dissolved oxygen concentrations in Lower South Bay, the NMS open-Bay biogeochemical model does not yet include those connections. This project will extend biogeochemical modeling into small-scale sloughs and ponds in the margins of Lower South Bay to quantify the effects of exchanges between open Bay ↔ sloughs/marshes ↔ salt ponds on LSB biogeochemistry, using the recently-developed LSB hydrodynamic model which does now simulate those slough/salt-pond connections. Work will move forward in two phases: i) Initial simulations with a simplified (highly-aggregated) version of the model, both to tune parameters and to obtain provisional quantitative estimates of the importance of the salt pond interactions (~30%); and ii) Simulations with higher-resolution model for refined estimates (70%).	Modeling	3	$99,000
P14	**Future Risks/Future Scenarios:** Develop a Work Plan for exploring Future Risks/Scenarios: workshop/goal setting; stakeholder input; expert input; planning	Synthesis	3	$50,000
P15	**Salt pond / slough biogeochemical field studies:** Evidence from NMS studies suggests that salt pond <--> slough/Bay exchange has a major local, and potentially whole-subembayment, level effect on N, C and DO cycles in LSB. Observational data are needed to inform model calibration so the magnitude of these processes can be quantified.	Field/Lab Study	3	$200,000
P16	**Mechanistic HABs field study:** Undertake targeted field study to improve understanding of HAB/toxin sources, relevant mechanisms, etc.	Field/Lab Study	2	$150,000
P17	**Improving turbidity and light field estimates,** through analysis of observation data: e.g., shoal mooring turbidity data; remote sensed turbidity data; long-term DFW data	Modeling	3	$75,000
P18	**Suisun-Delta Modeling:** Continuation of on-going work, with activitiesincluding: Suisun bay light field compilation; Suisun-Delta Hydrodynamic run for WY2016; Provisional biogeochemical model calibration for WY2016; and reporting (technical reports, presentations)	Modeling	OK	$166,000

Priority Level		
	Essential	$2,769,000
	High	$1,343,000
	Medium	
	OK, already covered by other funds	

San Francisco Bay Nutrient Management Strategy (NMS) Steering Committee Meeting

Date/Time: June 14, 2019, 9:00 AM to 3:00 PM

Location: SFEI, Richmond, CA

4911 Central Ave

Chair: Thomas Mumley

Call-In Information Join the meeting: join.me/sfei-conf-cw2 To dial in by phone:

+1.415.594.5500 Conference ID: 238-626-034 #)

AGENDA

	Agenda Item	Lead	Time
1	**Welcome, Introductions and Agenda Review**	TM	9:00-9:05
2	**Decision: Approve Prior SC Meeting Summaries** *Materials*: • March 8, 2019 meeting summary	TM	9:05-9:10
3	**Information: Action items** • Update on action items from previous meetings *Materials*: • Action Items Table	TM	9:10-9:15
4	**Information: Planning Subcommittee Report Out** • Update on planning subcommittee action items *Materials*: •	TM	9:15-9:20
5	**Information: Program Update:** • Quarterly update of staffing and finances • Other TBD *Materials*: • Quarterly Financial Report	DS	9:20-9:30
6	**Discussion: FY20 Program Plan** *Materials*: • Proposed FY20 Program Plan scenarios	DS	9:30-10:45
	Break		10:45-11:00

	Discussion: FY20 Program Plan (continued) *Materials*: • Proposed FY20 Program Plan scenarios Desired Outcome: • Approval of FY20 Program Plan	DS	11:00-12:00
	Lunch (provided)		12:00-12:30
7	**Technical Update: TBD** • *Materials*: • TBD	DS	12:30-1:30
9	**Discussion: Potential ship-based monitoring alternatives** • Recommendation from Planning Subcommittee.	DS	1:30-2:15
11	**Other Business** • Updates from other activities/members	TM	2:15-2:45
12	**Action Items and Wrap-up** Confirm next meeting date: September 20, 2019 @ SFEI Following meeting: Dec 13, 2019 @ SFEI	TM	2:45-3:00
	Adjourn		3:00

NOTES:

- *Public comment periods will be accommodated at the end of each agenda item (excluding item 1). The duration of each comment period will be at the discretion of the meeting chair.*
- *Breaks will be taken at the discretion of the meeting chair and the Steering Committee.*

Joint BACWA/Regional Water Board staff Meeting Summary

May 20, 2019, 10am-12pm

Dave Williams, BACWA
Eileen White, EBMUD
Lori Schectel, CCCSD
James Parrish, Regional Water Board
Amit Mutsuddy, San Jose
Tom Hall, EOA
Jackie Zipkin, EBDA
Amy Chastain, SFPUC
Lorien Fono, BACWA
Tom Mumley, Regional Water Board

1. **Introductions**

2. **Nutrients**

   a. **Watershed Permit Adoption –** BACWA gave an overview of the adoption hearing, which focused on the collaborative relationship between stakeholders in the Region.
   b. **Regional Studies –** At its May 17 Executive board meeting, BACWA approved a contract with SFEI to perform the Nutrient Removal by Nature-based Systems study. The contract provides a lump sum of $500K with quarterly invoicing by Task and percent complete. The Water Board would like to make sure that existing wetlands projects around the Bay are accounted for in the Study. For the Nutrient Removal by Water Recycling Report, BACWA is issuing an RFP for consultant support. The Water Board wants to ensure that this project generates higher quality information than the simple survey that was developed as part of compliance with the first Nutrient Watershed Permit.
   c. **House of representative hearings on USGS funding –** BACWA and the Regional Water Board submitted letters to Representative Huffman, Chair of the US House Subcommittee on Water, Oceans, and Wildlife, urging Congress to maintain at least current levels of funding levels to the Bay Water Quality Research Program. The Science Plan manager listened to the recent committee hearings, and the issue of USGS funding was not addressed. The NMS may need to contribute funds to keep the USGS monitoring program running.

3. **Wetlands update**
   The EPA recently reversed its opinion, which was that discharges to groundwater with direct hydraulic connections to Waters of the US should be regulated under the Clean Water Act. They have stated that the Clean Water Act does not regulate discharges to groundwater. This issue will appear before the US Supreme Court later this year. If discharges to Groundwater do not need NPDES permits, that could change how horizontal levees are permitted. The Water Board does not feel that this will make a substantive difference, since the discharges still need to be controlled by some regulatory vehicle.

The Water Board discussed next steps on the Wetlands Policy – they are currently waiting for a final version of the report from last year. The Nature Based Systems study funded by BACWA as part of the Nutrient Watershed Permit will inform next steps. The Water Board is developing a Work Plan for a well-defined project within the next month or so. Changing shallow water discharge prohibitions will likely be a part of the project.

4. **Chlorine Residual Basin Plan Amendment Update**
   Tom Hall gave an update on progress developing the chlorine residual Basin Plan Amendment. The proposed Basin Plan objectives will be based on EPA criteria, and the 0.0 mg/L instantaneous maximum limit will be removed from Table 4.2, and there would be recognition of a reporting limit. Shallow dischargers will get the same dilution credit that they would get for cyanide. There still needs to be some thought given to how the new requirements would impact wet weather facilities. There was a discussion about other possible amendments to clean up the Basin Plan that could piggyback on this effort. One possibility would be to remove oil and grease as POTW monitoring parameters. Another would be to adopt the State Water Board's new enterococcus objectives. Regional Water Board staff are generally in favor of grouping these efforts together, but have some concerns about resources, especially since the new beneficial uses (tribal and subsistence fishing) have not yet been designated in the Region. The Water Board will get back to BACWA on the Oil and Grease and Enterococcus issues, and what resources may be needed to adopt them into the Basin Plan.

5. **Bacterial Objectives**
   BACWA is working with SFEI to develop a proposal to sample mid-Bay for enterococcus. The data would be used by the Regional Water Board when calculating effluent limits based on the new REC-1 Bacterial Objectives adopted by the State Water Board. SFPUC has offered the use of their boat and staff to do the sampling. BACWA will contract with a private laboratory to perform the analysis via membrane filtration, which has a lower detection limit than Enterolert.

6. **Collection Systems information during permit reissuance**
   BACWA expressed concern that the Water Board has begun to ask for more Collection System information in their permit reissuance letters that should be available in agencies' SSMPs. Regional Water Board staff replied that they are gathering the information at the direction of their Board. They are looking for a concise summary of the collection systems info they are asking for, but would find it acceptable if agencies simply pointed them toward the relevant section of their SSMP.

7. **Climate Change survey/census**
   The State Water Board is developing a census to better understand existing efforts by POTWs to plan for the impacts of climate change. There has been no update on the effort recently.

8. **CECs**
   The RMP has asked for volunteers for a study on ethoxylated surfactants in the San Francisco Bay. BACWA is concerned that they are asking for volunteers from the largest

agencies, as they have for previous studies. This will not result in “representative” sampling and may lead to sampling fatigue if just a few of the same agencies are always asked to participate. The Water Board shares these concerns and asked to be involved in all decision-making on POTW CECs sampling.

BACWA asked about the State Water Board’s plans to issue 13267 letters for data on PFAS in wastewater effluent, or in the groundwater beneath land application sites. Regional Water Board staff replied that they are not sure about the State Water Board’s intentions or timeline, but PFAS is more of a human health/drinking water concern than an ecological concern. There was a discussion about the flame retardant study that the EPA is requiring as part of SFPUC’s Oceanside Plant Tentative Order.

9. Toxicity

The Water Board had an internal meeting on the upcoming draft of the Toxicity Provisions. The revised schedule is:

- Release of updated Draft Provisions and Staff Report - June 17, 2019
- Staff Public Workshops - June 24 and mid-July, 2019
- Board Workshop - August 6, 2019
- Release of Responses to Comments - September, 2019
- Adoption - October, 2019

Region 2 is talking with State Water Board staff about ways to ensure that the sensitive species screening requirements don’t result in defunding of the RMP via the Alternative Monitoring Program, since currently Region 2 agencies have the options of foregoing the Sensitive Species screen if they contribute equivalent funds to the RMP.

ADJOURNMENT

DRAFT

Executive Board Special Meeting Agenda

SF Bay Regional Water Board / BACWA Executive Board Joint Meeting

Thursday July 18, 2019, 10am to 12pm

SF Bay Water Board, 1515 Clay Street, St. 1400 Oakland, CA

ROLL CALL AND INTRODUCTIONS – 10:00

PUBLIC COMMENT – 10:05

DISCUSSION/OTHER BUSINESS- 10:10

Topic	Goal	Time
1. Nutrients	• Next steps for NBS and recycled water regional studies • Alternatives for continuing USGS monitoring program • Timing of funding for science program	10:15
2. Chlorine Residual Basin Plan Amendment	• BACWA Update on progress	10:35
3. Enterococcus monitoring	• BACWA's update on enterococcus sampling effort	10:55
4. PSL Ordinances in NPDES Permits	• Discussion of requirement to adopt PSL Ordinance in SSF/San Bruno NPDES permit	11:05
5. CECs	• BACWA participants in ethoxylated surfactants studies	11:20
6. Wetlands	• Update from Water Board on progress •	11:30
7. Toxicity	• Review of new draft Provisions • Update on meetings with Staff and Board members, including July 15 workshop • Update on adoption	11:40
8. Pardee Technical Seminar	• Discussion of topics for Pardee	11:55

ADJOURNMENT

BACWA Microplastics Talking Ppoints

Introduction

Microplastics are found in many water bodies world-wide and is viewed as a contaminant of emerging concern in San Francisco. The San Francisco Estuary Institute is the lead scientific body investigating microplastic contamination in the Bay. They are collaborating with several other scientific and academic institutions in furthering the science on microplastics. The San Francisco Regional Water Board is engaged in the scientific investigations and is not proposing any regulatory actions pending the availability of more scientific information as to whether or not microplastics pose a threat to aquatic life and water quality.

As governing boards and councils hear more about microplastics they will be seeking information from their staffs on the status of scientific investigations, key issues, and the possibility of future regulations being imposed. As a member of the wastewater public agency community it is important to have a common understanding of the issue and be able to convey a common message to governing bodies. These talking points are intended to present key information that BACWA members can use in briefing their respective governing bodies.

Methods of Detection: As a result of early scientific investigation, it became clear that accurately identifying a microparticles as a microplastic was going to be very challenging, expensive and time consuming. However, if accurate detection was ignored, regulations could be adopted that would be expensive and misguided by attempting to reduce naturally occurring microparticles thought to be microplastics.

- Efforts for method standardization are a high priority, and are still underway. SCCWRP is recruiting POTW labs for method development assistance
- Due to the labor intensiveness of spectroscopy, only a small sample of the total particle collected in recent studies have been analyzed. Even with spectroscopy, in many cases it is impossible to differentiate between natural and plastic fibers, especially if they are dyed

Importance of different sources: Building on the scientific efforts to accurately identify microplastics and their potential negative impacts on the environment, it will be essential to identify the sources of microplastics so the most cost-effective means for reducing microplastics can be pursued such as end of pipe teatment, source control or runoff control.

- Results of 24-hour composite sampling at 8 POTWs in 2018 showed that advanced secondary plants had lower micropartcle counts than plants without filtration. However, the total counts are still millions per day. In aggregate, 47 billion microparticles are discharged annually to the SF Bay by POTWs, of which 21 billion are estimated to be plastic.
- Stormwater contributes more than 200 times more microparticles to the San Francisco Bay than POTWs. Runoff from industrial areas is disproportionately contributing to loading.
- Atmospheric deposition may be a significant source, but is poorly understood

Types of microparticles in POTW effluent: If POTWs are found to be a significant pathway for microplastics finding their way to the environment, it is important to understand the types of microplastics found in POTW effluent so that the most effective mean for removal can be designed.

- The majority of microparticles discharged by POTWs are fibers, followed by fragments, then foam.
- Most fibers could not be identified as natural or synthetic because the dyes mask the signal of the material.
- Of the fragments, 55% were identified as plastic.

Policy Issues: As the science matures on identification of microplastics and their impact on the environment, policies will need to be developed that address the issue. Current policy thinking is as follows:

- Due to persistence, increasing use, and lack of known toxicity thresholds, RMP is following EU decision, and recommending promoting microplastics to “moderate concern” tier
- Recommendations for reducing microfibers in WW effluent do not focus on end-of-pipe treatment. Instead they include development of clothing sheddability standard as well as washing mashing filtration

Lorien Fono

From: Lorien Fono
Sent: Wednesday, June 19, 2019 12:30 PM
To: Lorien Fono
Subject: FW: Microplastics Moderate Concern

From: Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>
Sent: Wednesday, May 29, 2019 2:40 PM
To: Meg Sedlak <meg@sfei.org>; Sutton, Rebecca@sfei.org (rebeccas@sfei.org) <rebeccas@sfei.org>; North, Karin (Karin.North@cityofpaloalto.org) <Karin.North@cityofpaloalto.org>
Cc: Melissa Foley <melissaf@sfei.org>; Jay Davis (jay@sfei.org) <jay@sfei.org>; Chris Sommers <csommers@eoainc.com>; David Williams <dwilliams@bacwa.org>; Looker, Richard@Waterboards <Richard.Looker@waterboards.ca.gov>; Baginska, Barbara@Waterboards <Barbara.Baginska@waterboards.ca.gov>; Harper, Samantha@Waterboards <Samantha.Harper@Waterboards.ca.gov>; Fernandez, Xavier@Waterboards <Xavier.Fernandez@waterboards.ca.gov>; Kelly Moran <kmoran@tdcenvironmental.com>
Subject: Microplastics Moderate Concern

I have reservations with the recommendation to classify microplastics as a "Moderate Concern" for the Bay within our Tiered Risk and Management Action Framework for emerging contaminants. My main concern is to avoid compromising the integrity of our Framework when a recommendation is more policy than science based as in this case. The following are my reservation points:

- The primary basis of the recommendation is the European Union proposal to evaluate microplastics as non-threshold contaminants, meaning any discharges to the environment would be considered harmful. That's a policy-based rather than a science-based decision. We can make a similar argument for other classes of contaminants, e.g., pesticides and pharmaceuticals.
- The non-threshold assertion that any discharges of microplastics to the environment would be considered harmful would justify classifying microplastics as a "High Concern". The "Moderate Concern" tier is for contaminants with exposure (Bay) levels below (but approaching) harmful levels.
- "Microplastics" is a broad term encompassing lots of different types and different of synthetic materials, and their exposure, fate and effects vary or likely vary by type and shape. Lumping all microplastics into the moderate (or high) concern tier could result in diluting attention on certain microplastics that merit more attention than others.
- Microplastic Workgroup participants and advisors have limited knowledge of and experience with the Framework, particularly its scientific basis. Any recommendation that affects the Framework should be vetted by the Emerging Contaminants Workgroup.
- There may be an expectation that microplastics will get more attention if we classify them as "Moderate Concern", but they are already getting a lot of attention. It certainly doesn't mean the RMP will commit more funding to microplastics, given the reality that the RMP has insufficient resources to attend to the other moderate concern contaminants. We also have to consider that a moderate concern classification will likely invite scrutiny of the classification by naysayers and could undermine the current level of attention and management efforts.
- The Draft Policy Recommendations Document contains an incorrect statement = "if the RMP identifies microplastics to be a Moderate Concern, the Regional Water Quality Control Board would lead development of a regional Action Plan". The Framework lists "action plan/strategy" as a water quality management action, but as an author of the management action aspects of the Framework, I can state with certainty that it does not mean the Regional Board would lead development of a regional Action Plan. We are not prepared nor able to do so for microplastics even if we wanted to.

Another issue is whether the RMP can or will sustain a separate microplastics strategy rather than incorporating into its emerging contaminants strategy given the limited resources available for workgroups and special projects.

Microplastic: Moderate Concern?

Comments from Advisors:

Anna-Marie Cook

This designation is not easy in my mind, and I've written down some "stream-of-consciousness" thoughts that I've grappled with over the past few years of attempting to tackle the question of microplastic risk from the EPA Superfund perspective (keeping in mind I come at this not as a toxicologist or ecologist, but from years of dealing with risk management).

Using the RMP risk framework definitions of levels of concern,

High Concern – Bay occurrence data suggest a high probability of a moderate or high level effect on Bay wildlife (e.g., frequent detection at concentrations greater than the EC10[1]).

Moderate Concern – Bay occurrence data suggest a high probability of a low level effect on Bay wildlife (e.g., frequent detection at concentrations greater than the PNEC[2] or NOEC[3] but less than the EC10 or another low level effects threshold).

Low Concern – Bay occurrence data suggest a high probability of minimal effect on Bay wildlife (i.e., Bay concentrations are well below toxicity thresholds and potential toxicity to wildlife is sufficiently characterized).

Possible Concern – Uncertainty in toxicity thresholds suggests uncertainty in the level of effect on Bay wildlife. Bay occurrence data exist; in some cases, they may be constrained by analytical methods with insufficient sensitivity.

Microplastic as a contaminant appears to simultaneously meet both the designations of "moderate" and "possible": occurrence/exposure is almost guaranteed to continue to increase in the Bay, yet uncertainty in toxicity thresholds is likely to remain.

There have been no microplastics toxicity thresholds established and it's difficult to imagine that any can be: I believe that the approach the EU has taken is the only practical approach, i.e. the threshold is zero:

- Establishing a risk threshold would be a massive undertaking given the confounding factors of polymer type, age of plastic, entrained plasticizer toxicities, preferentially sorbed POPs toxicities, varying toxicities/physiological-inflammations (along the lines of asbestos fibers) related to size of particles, exposure pathways varying by media and by receptor, etc;
- Teasing out measurable and environmental representative adverse impacts that can definitively be attributed to plastic exposure versus other exposures is very challenging and with current methodologies perhaps not possible;
- Deciding how many particles, of what type and size, and contaminated with what chemicals could constitute the "acceptable" lower boundary, and determining how to evaluate those threshold levels for adverse impacts on coral reefs against the threshold

levels for adverse impacts on sport fish and on humans for example is daunting. Usually we set a threshold value for a single contaminant in each media to protect the most sensitive receptors, but in this case the adverse impacts can potentially be more wide-ranging and species-specific than anything we have dealt with (e.g. size of particle may be the most critical factor for some receptors (e.g. coral) while sorbed or entrained chemicals may be critical for others (e.g. Hawaiian Monk Seal)).

- The SFEI study shows an abundance of plastic particles in the Bay. Demonstrating a correlation between the types and sizes of plastic found in 1) the water column samples taken from stormwater inputs after rain events and the fish feeding from the water column (pelagic? although nearshore) in the Bay, and 2) in sediment data and demersal fish, would show exposure (although not necessarily adverse impact) on Bay wildlife even in the absence of having any toxicity threshold to measure.

As the EU report points out, the quantity of this contaminant is only going to increase in the environment. SFEI can support this assertion by continuing periodic sampling of the Bay showing temporal trends. Plastic essentially has no half-life and cannot be considered inert which would seem to make it an increasing threat, however that is defined. I remain supportive of considering this a contaminant of moderate concern.

Chelsea Rochman

I agree with Anna-Marie that I am supportive of the "moderate" classification.
I am not sure I agree with the EU about a non-threshold, but that is because it's impossible to keep all microplastics out of the environment and out of our drinking water. They have become part of the dust with all of our plastic-usage in everyday life. I'm sure there is actually a threshold, although I agree with Anna-Marie that it's complicated and will vary by type, shape, mixture of additives, etc...
I have no doubt about the large concentrations (obviously! - given I have 20 students counting this stuff because there is so much plastic), increasing concentrations and their persistence. I also agree with potential for impact. My student and I just completed a systematic review and meta-analysis about the impacts of plastic pollution, with a focus on microplastics, and there is certainly evidence of effect across all levels of biological organization. BUT, there is also plenty experiments that do not detect an effect and thus I don't agree with the non-threshold. I think it's too simplistic.
BUT for SFEI, I do agree with the jump to moderate based on these things aside from the EU decision of how to consider it.

Kara Lavendar Law

I very much appreciate Anna-Marie's thoughtful discussion of her thought process on this classification decision, as well as Chelsea's comments, which are important and well-taken.

At the stage, given the very high concentrations of microplastics in the Bay and the strong likelihood that this will increase, I see a high probability of encounter with (contamination by) microplastics by Bay wildlife. Yet, clearly there is uncertainty in the level of effect, as both Anna-Marie and Chelsea point out, with little hope for a broadly applicable set of toxicity thresholds given the heterogeneous nature of the contaminant (and the wildlife that encounter it).

Because I do not come from a background in toxicology or risk management, I have to defer to my colleagues and their expert opinion in support of the "moderate" classification. I think there is sufficient reason for concern to justify this classification.

Derek Muir
Thanks for including me in the discussion. It is an interesting case. On the one hand MPs don't fit the "moderate" definition very well ie high probability of a low level effect on Bay wildlife (e.g., frequent detection at concentrations greater than the PNEC[2] or NOEC since there are presumably no threshold values for the polymer particles themselves). On the other hand I gather from reading a Chemical Watch article on this (I don't have the actual ECHA dossier) the decision refers to extreme persistence in the environment and degradation through the formation of nanoplastics. Also the presence of additives at parts per thousand or % levels needs to be considered. In fact some possible additives (alkyl phenols) are already on the moderate list for other reasons while others (BPA, phthalates) are listed in Table 2B as possible concern. So all things considered I think it argues for "moderate".

Kelly Moran
While I'm no microplastics expert, I've been trying to organize my thinking about how to approach microplastics hazards. Here are some thoughts for your consideration (and for the group's reactions if they like).

As I see it, on a very simple level, microplastics raise two kinds of issues:
(1) They are small physical things littering the environment.
As small physical things, they pose two hazards:
(a) Their physical presence degrades the aesthetic and potentially other qualities of aquatic ecosystems. This is akin to the Water Board's thinking about trash. The fact they don't belong is more than aesthetic, but like trash, aesthetics can drive the public policy reaction to them. (There is the yuck factor of knowing they are in fish we eat or water we drink, and the shock of seeing beaches with itty bitty colored plastic particles among the sand grains). The SF Bay Water Board members voted to make trash a priority based primarily on policy (aesthetics). Many people in the regulated community continue to question whether one can prove that the simple presence of trash actually harms ecosystems, even though there are plentiful data that some of it harms individual organisms. Trash has the same problem of no PNEC or NOEC for either individual species or whole ecosystems.

(b) Unlike trash, the microplastics can be a food substitute. Ignoring the contaminants they contain for the moment, microplastics pose the hazard of reduced nutrition for organisms that consume things in the microplastic size class. [You can tell from this sentence that I'm a chemist and not a biologist ;-)]. Again, at this point, we don't have a threshold concentration for individual species or ecosystem harm from this food-substitute physical hazard.

(2) They are transport pathways for contaminants inside their source material.
As Derek mentioned, some plastics contain relatively high concentrations of CECs on the Moderate and Possible concern lists. I'd add the currently unknown tire ingredient causing pre-spawn mortality to Coho salmon to that list (when Ed & Jen figure it out <*referring in part to*

stormwater work at University of Washington that the RMP is helping to fund> [I'm assuming they will because they are both clever and persistent], that pollutant will probably be on the "moderate " list at least for creeks). Until we understand the sources of plastics in the ecosystem and the chemical formulations of the sources, we can't identify all the pollutants that are involved in the microplastics exposure pathway.

For this hazard, microplastics are part of an exposure pathway. They aren't the original source (that's the product they came from), nor are they the ultimate hazard (that's the toxic chemical they contain). They have several ways of facilitating organism exposure to the toxic chemicals they contain:

- They are small, so they move readily through watersheds and into the Bay
- They have a lot of surface area, which makes it easy for the chemicals they contain to become bioavailable in water, sediment, or inside organisms
- They can be taken up by organisms, providing a direct exposure to the pollutants they contain
- They can fall into sediments, where sediment-dwelling organisms can be exposed through consumption and/or leaching into sediment pore water

The fact that they are a pathway rather than an individual pollutant is one of the challenges I'm having with wrapping my mind around the RMP concern level.

Whatever the formal classification of them (although I support "moderate concern," they might merit a special classification due to their unique and combined hazards), understanding microplastics better seems essential if we are to identify the full threat that CECs pose in SF Bay. Plus, if someone asked policy makers "should we minimize microplastics?" I'm pretty sure they would say "yes" for the reasons in #1.

Although we don't know the priorities because of the shortage of information linking plastics to their original sources and not knowing which of these contain the most hazardous pollutants, the control options all fit within the existing Bay & watershed frameworks:
—Source control - safer formulations once we know the pollutants of concern (e.g., tires), reducing plastics
—Treatment control - already a long-term goal for urban runoff (green infrastructure), maybe some new pathway interventions (e.g., washer filters, better dryer lint control)

As I'm still very much a microplastics novice, I'm curious if this thinking aligns with the experts' knowledge of the topic - and I would love to be straightened out if my simplistic approach isn't right!

Miriam Diamond

My reasons align with what's been said:

- high persistence
- fate leads to fragmentation into nanoplastics rather than true degradation
- modelling presented at the meeting shows net accumulation in the Bay as opposed to loss through flushing through ocean currents (which is solving the problem of pollution through dilution). Rather, the "loss" process in the Bay is accumulation in sediment which enables exposure to both pelagic and benthic communities. In addition, emissions are projected to increase. In total, these two factors suggest increases in microplastic and nanoplastic concentrations of time, and hence likelihood of increased exposures.
- as Derek pointed out, some microplastics are conveyors of elevated concentrations of some compounds already assigned as moderate concern or that are on the "watch list". These are the plastic additives that are most likely to transfer to biota upon ingestion (as opposed to chemicals that sorb to the plastics from ambient waters and are unlikely to transfer to biota).

Here are my additional reasons:

History should teach us to be cautious about a ubiquitous, persistent pollutant for which adverse effects are difficult to determine. Risk assessment is a useful but uncertain instrument to guide decision making. We seldom probe the uncertainty of risk assessment (RA) decisions. However, we do know that some RA decisions can yield "protective" decisions based on traditional toxicity assessments, that stand in contrast to field and epidemiological studies that suggest otherwise (e.g., evidence of adverse effects to populations at ambient exposures). Risk assessment is unable to deal with the complexities of real exposures of mixtures to wild animal experiencing "real life" multiple stresses.

I suspect that finding "reliable" toicological benchmarks for, microplastics, which is a complex mixture of polymers and additives, will be elusive. We want to find that benchmark(s) so that we can fit a decision into our risk assessment paradigm for decision making.

So at this point, I believe in making a precautionary decision to treat microplastics as a moderate concern, to trigger abatement and remedial actions, rather than waiting for the risk assessment answer. I believe a precautionary decision is warranted based on the points summarized from this thread.

Review of the ECHA Annex XV Restriction Proposal Report -Validity of toxicological conclusions

ECHA’s initial literature screen identified approximately 900 articles (from the scientific and grey literature) relevant in some respect to the risk assessment of microplastics. They also held discussions with stakeholders and scientific experts during the report development to identify additional relevant studies that were not highlighted in the literature screening, particularly recently published studies. While they may have missed some literature by using only Scopus and not cross-checking with other scientific databases, this potential issue is offset by their consultation with experts.

From the approximately 900 article identified in the literature screening, a more detailed analysis of key review papers on the topic (both from the peer reviewed and grey literature) and

the 25 most influential primary research articles (chosen by number of citations, cross referencing with reviews, and reporting effects in organisms related to microplastic exposure). These articles were chosen objectively using established, peer-reviewed methods, and while identifying influential articles based on citations gives preference to older articles, this limitation is acknowledged and balanced with the use of recent reviews and discussion with scientific experts. Each of the reviews and influential articles are evaluated individually (details in the Annex to the Annex XV Restriction Report), and a weight of evidence approach was used when synthesizing information across the studies. This is the preferred approach for considering risk in ecological assessments, especially when considering data from nonstandard toxicity testing experiments, which is the case for nearly all current microplastics toxicity studies.

Studies that report results contrary to the majority (e.g., reports of no effects at high exposure concentrations) are presented along with the majority conclusions, indicating no cherry-picking of results. Similarly, discussion of published species sensitivity distributions (SSDs) includes not only why the calculated hazard thresholds (e.g., HC5s or hazardous concentration for 5% of species, PNECs) do not meet REACH criteria, but also which species and analyses were included and usefulness of the results. Many data gaps are identified to help support the conclusion that there is not enough evidence to prove a lack of risk at any exposure (few reported dose-response curves, little chronic data, little translation from lab studies to field effects, few species studied, little work in freshwater and terrestrial systems, little work on nanoplastics, etc.).

The recommendation to classify microplastics as non-threshold contaminants is based not only on the lack of ecotoxicity data for calculation of risk thresholds, but also includes clear evidence of microplastic persistence and uncertainty in regards to bioaccumulation potential. Under REACH, other contaminants have been assessed for risk based on the PBT/vPvB (persistent, bioaccumulative, and toxic / very persistent and very bioaccumulative) perspective, so this logic is not new or unprecedented. ECHA is also careful to define the scope of microplastics covered by the recommendations in terms of size, material composition, origin, and degradability.

Note: Section 1.4.1 Approach to risk assessment. states "*It should also be noted that SAPEA* [Science Advice for Policy by European Academies] *are due to publish an 'evidence review report' on microplastics in nature and society in January 2019 as part of the European Commission Group of Chief Scientific Advisors work on microplastics. This review has been conducted independently from the assessment presented in this report and should be considered as complementary to it.*" This report, A Scientific Perspective on Microplastics in Nature and Society, can be found on SAPEA's website here: https://www.sapea.info/topics/microplastics/

About the SAPEA report:

A review of the scientific literature on occurrence, fate, and effects of microplastics is included (Chapter 2). However, unlike in the ECHA report, it is unclear how the literature was mined or which studies were given highest weight. The science is discussed in terms of what is known and unknown, and there is more emphasis on recent literature and modeling efforts than in the ECHA report. SAPEA's overall conclusions match ECHA's: even though 'high quality' risk assessment is not yet feasible, action to

reduce/prevent/mitigate microplastic pollution is suggested to be needed, as well as development and use of risk assessment approaches to be able to prioritize mitigation actions. This report also includes a review of social and behavioral sciences and how this research can inform microplastic policies and pollution prevention (Chapter 3) and a review of existing, emerging and potential future regulatory and legal frameworks of relevance to microplastics (Chapter 4). In a follow-up report (Environmental and Health Risks of Microplastic Pollution, April 2019), SAPEA provides another summary of the literature and provides science-driven recommendations for policy. Both reports appear to impartially present the current state of knowledge and important data gaps necessary for risk assessment.

Individual responses to comments from Tom Mumley:

Tom's concerns (copied from email) are written in Caveat. SFEI's responses are presented in Times New Roman. The toxicological portions of this response were prepared by Dr. Liz Miller, our recent addition to the SFEI team. Her area of expertise is ecotoxicology. Any mistakes or omissions are mine.

- The primary basis of the recommendation is the European Union proposal to evaluate microplastics as non-threshold contaminants, meaning any discharges to the environment would be considered harmful.
  The proposed designation as a non-threshold contaminant means that increases in the environmental stock from discharges to the environment correspond to an increased risk. Risk is different from harm; harm is damage, whereas risk is the possibility to cause harm. The non-threshold contaminant designation is because a thorough scientific analysis concluded there is currently not enough data to be able to justify a conclusion that risks are adequately controlled, based on current exposures in the environment or exposures that are forecast to occur in the future. ECHA is therefore proposing that the EU take a precautionary approach because the risks arising from intentional uses of microplastics that result in releases to the environment are not currently adequately controlled. While the risks posed by microplastics in the environment are currently considered as uncertain, ECHA expects that the understanding of risks will increase significantly over the next 10 years as microplastics, nanoplastics, and their impacts continue to be further studied. As microplastics are extremely persistent and are practically impossible to remove from the environment once released, the report argues it is appropriate to take cost-effective action now, despite these uncertainties. They also assessed the risk reduction potential and socio-economic impacts of several restriction options. The proposed restrictions are considered to be proportionate to the risk, with cost effectiveness similar to previously implemented REACH restrictions.

- That's a policy-based rather than a science-based decision.
  ECHA is still in the process of evaluating microplastics risks and has proposed, but not implemented, policy changes to address these risks. The Annex XV Restriction Proposal Report, while designed to inform policy, is science-based. The report was written in

cooperation with the EU Group of Chief Science Advisors, which are part of the EU Scientific Advice Mechanism and provide the Commission with independent scientific advice on specific policy issues. The report includes a comprehensive literature screening and review, and the risk assessment was conducted using a weight of evidence approach, which is the accepted scientific standard for risk assessments when conventional toxicity studies are not available or not comprehensive.

- We can make a similar argument for other classes of contaminants, e.g., pesticides and pharmaceuticals.

  Risk assessment of chemicals under REACH can be performed in several ways, depending on the hazard properties of the substance. As the hazard properties of microplastics are complex and in many instances uncertain (e.g., issues surrounding particle size, persistence, degradation), the report considered a range of risk assessment paradigms, including 'conventional' (eco)toxicological risk assessment based on the derivation of an effects threshold (PNEC) and quantitative risk characterization (PEC/PNEC or RCR approach), PBT/vPvB (persistent, bioaccumulative, and toxic / very persistent and very bioaccumulative) perspective, and case-by-case assessment according to para 0.10 of Annex I of REACH. Other environmental contaminants (such as pesticides and pharmaceuticals) must undergo the same scientifically-driven risk assessment process before policy decisions are made. The difference is that in the case of microplastics, ECHA has determined that since there is not enough data to determine adverse effect thresholds for risk assessment, and due to their extreme persistence and lack of remediation possibilities, microplastics should be treated in a similar manner to PBT/vPvB substances, whereas most other emerging contaminants are not as persistent and/or have more readily available toxicology data (especially in regards to dose-response relationships for multiple species), and can therefore be assessed using 'conventional' methods.

- The non-threshold assertion that any discharges of microplastics to the environment would be considered harmful would justify classifying microplastics as a "High Concern".

  Definition of High Concern – Bay occurrence data suggest a high probability of a moderate or high level effect on Bay wildlife (e.g., frequent detection at concentrations greater than the EC10).

  The non-threshold assertion does not mean that any discharges would be considered harmful because risk is not the same thing as harm. The non-threshold designation is because we do not currently have enough data to calculate safe thresholds and we know microplastics are extremely persistent. Discharges of microplastics to the environment therefore alter the relevant risk characterisation in terms of **when** safe thresholds will be exceeded, rather than **if** safe thresholds will be exceeded. A designation of high concern would only be warranted if we knew that microplastic concentrations were already high enough to be likely to cause "moderate or high level" adverse effects.

- The "Moderate Concern" tier is for contaminants with exposure (Bay) levels below (but approaching) harmful levels.
  Definition of Moderate Concern – Bay occurrence data suggest a high probability of a low level effect on Bay wildlife (e.g., frequent detection at concentrations greater than the PNEC or NOEC but less than the EC10 or another low level effects threshold).

  Current scientific consensus is that the best available evidence suggests microplastics and nanoplastics do not currently pose a widespread risk to humans or the environment, but that evidence is limited and the risks are unknown. We do know that the trend for plastic waste is on a steep upward trend and that removal of these microscopic particles from the environment is for all intents logistically impossible and cost-prohibitive. In addition, as Kelly mentions in her response, we have evidence that stormwater from roadways is causing toxicity to a species of interest (salmon). We do not understand the mechanism but we believe there is sufficient evidence to warrant moderate concern as we support those who are sleuthing out the mechanism.

- "Microplastics" is a broad term encompassing lots of different types and different of synthetic materials, and their exposure, fate and effects vary or likely vary by type and shape.
  The ECHA Annex XV Restriction Proposal Report acknowledges the complexity of the term "microplastics." There is no standardized understanding of what substances, and in what physical form, the term microplastics actually refers to. ECHA defines microplastics as a material consisting of solid polymer-containing particles, to which additives or other substances may have been added, and where ≥ 1% w/w of particles have (i) all dimensions 1nm ≤ x ≤ 5mm, or (ii), for fibres, a length of 3nm ≤ x ≤ 15mm and length to diameter ratio of >3. Polymers that occur in nature that have not been chemically modified (other than by hydrolysis) are excluded, as are polymers that are (bio)degradable. The EU is specifically focused on intentionally added microparticles ("primary" microplastics), not microplastics formed in the environment ("secondary" microplastics), as these can be regulated and also have been the subject of more (eco)toxicological hazard assessments. However, the ECHA literature review documented in the Restriction Proposal Report considered studies on both primary and secondary microplastics in their recommendation to classify microplastics as a non-threshold contaminant.

- Lumping all microplastics into the moderate (or high) concern tier could result in diluting attention on certain microplastics that merit more attention than others.
  Until we have enough scientific understanding to distinguish risks from different types of microplastics, why not keep them as one category? We do not currently have enough scientific evidence to know which types of microplastics are most harmful. Also, it is likely that mixture effects will be important in any adverse effects to ecosystems.

- Microplastic Workgroup participants and advisors have limited knowledge of and experience with the Framework, particularly its scientific basis.
  Many MPWG and ECWG stakeholders and meeting attendees overlap, so this may be less of an issue. As you can see from the input from our three MP advisors and three ECWG advisors, microplastics are a somewhat unique contaminant given its diversity in size, morphology and composition. However, I think the advisors have made a compelling argument based on the science as to why we should list microplastics as of moderate concern.

- Any recommendation that affects the Framework should be vetted by the Emerging Contaminants Workgroup.
  We have asked for the three ECWG advisors who have experience with microplastics to weigh in on this issue (see responses above). In addition, we would be happy to share this email with the ECWG if you think it would be informative.

- There may be an expectation that microplastics will get more attention if we classify them as "Moderate Concern", but they are already getting a lot of attention.
  As you note, microplastics are getting a lot of attention (and regulatory actions both in California and the EU) which is part of the driver for us to consider how to prioritize this chemical in our framework. That is there may be times when there is interest in a contaminant such as PBDEs or pyrethroids for which we have evaluated the risk to the Bay and determined that for us it is not warranted that these chemicals be placed in a higher tier category. The RMP community is looking to us to provide some guidance based on the state of the science.

- It certainly doesn't mean the RMP will commit more funding to microplastics, given the reality that the RMP has insufficient resources to attend to the other moderate concern contaminants.
  It is widely acknowledged that the RMP has limited dollars and cannot begin to address all of the monitoring and research needs for all of the contaminants that are of concern. However, we very often seek external funding for our projects to augment RMP funds and as such the external funders are looking to us to see how we have prioritized this class of compounds. If our tiered framework does not reflect our concern for this contaminant, it makes it challenging or at least confusing to external funders as to why we perceive this to be an issue of concern.

- We also have to consider that a moderate concern classification will likely invite scrutiny of the classification by naysayers and could undermine the current level of attention and management efforts.
  The rationale for the classification is based on science and in keeping with the EC strategy document to use threshold values derived by other scientific institutions (e.g., ECHA). The value of the RMP is an honest and open dialogue about the science of these

contaminants. We are happy to engage the naysayers and to have a discussion about this. We are committed to the scientific process that promotes open and transparent dialogues.

- The Draft Policy Recommendations Document contains an incorrect statement = "if the RMP identifies microplastics to be a Moderate Concern, the Regional Water Quality Control Board would lead development of a regional Action Plan". The Framework lists "action plan/strategy" as a water quality management action, but as an author of the management action aspects of the Framework, I can state with certainty that it does not mean the Regional Board would lead development of a regional Action Plan. We are not prepared nor able to do so for microplastics even if we wanted to.
  We will revise this statement; Barbara Baginska also brought this inaccurate language to our attention.

- Another issue is whether the RMP can or will sustain a separate microplastics strategy rather than incorporating into its emerging contaminants strategy given the limited resources available for workgroups and special projects.
  This is a good point and is something that we should discuss further as it relates to workloads, funding, opportunities to reach a diverse and new set of stakeholders, external, expertise, etc.

San Francisco Bay Microplastics Project
Science-Supported Solutions and Policy Recommendations

DRAFT - May 2019

Prepared by:
The 5 Gyres Institute
(With Assistance From SFEI)

Executive Summary

Plastics in the ocean, and more specifically microplastics (particles less than 5 millimeters), have gained global attention as a pervasive and preventable threat to the health of marine ecosystems. The San Francisco Bay Microplastics Project was designed to provide critical data on microplastics in the Bay Area, and generate scientifically supported, regional recommendations for solutions to plastic pollution. The project was also designed to engage multiple stakeholders in both science and policy discussions.

Data generated by the monitoring effort, in combination with insights on the sources of plastic pollution, drive the following ten recommendations:

- Develop microfiber sheddability standards discussions;
- Prioritize intervention points for microfibers around filtration;
- Identify and quantify other microfiber sources and pathways in stormwater systems;
- Support comprehensive packaging bill in Bay Area and statewide;
- Explore green stormwater infrastructure management options to reduce microplastics from entering San Francisco Bay;
- Increase collaboration between trash and microplastics efforts;
- Support innovation to address microplastic pollution in San Francisco Bay;
- Address additional research needs;
- Educate consumers on ways individuals can reduce microplastics from entering wastewater; and
- Support San Francisco Bay Microplastics Strategy to reduce microplastics.

I. An Introduction to the Plastic Pollution Movement

Plastic pollution has recently become an issue of global concern, with multinational corporations making plastic sustainability commitments, and both cities and entire nations introducing increasingly comprehensive legislation addressing single-use plastics. This worldwide attention may be due to a combination of factors, including the formation of a global movement on plastic pollution, a series of legislative victories addressing disposable plastics, social media driven campaigns engaging the general public, and an exponential increase in scientific research and mainstream reporting on plastic pollution.

The 5 Gyres Institute (5 Gyres) published the first global estimate on micro- and macroplastics in the world's oceans after completing scientific research expeditions across the five subtropical gyres, calculating that 5.25 trillion pieces of microplastics weighing over 250,000 tons were floating on the surface of our world's oceans (Eriksen et al., 2014, here). Additional research has confirmed and further defined the issue of plastic pollution, demonstrating that a significant amount of microplastics enter our oceans from land.

Meanwhile, land-based community and advocacy organizations have focused their efforts further upstream, searching for more systemic solutions to stop plastic pollution from reaching our waters. In 2007, a group of activists and lawyers in San Francisco passed the first plastic bag ban in the country. Soon, other cities around the world passed similar bills, building momentum. To date, there are hundreds of plastic bag bans nationwide (Surfrider 2019, here), and California was the first state to pass a statewide ban. New York and Hawaii have recently passed legislation as well.

California has also been a leader in other efforts to reduce microplastic pollution. While not the first state to ban personal care products with microbeads, tiny pieces of plastic intentionally added as ingredients, California's 2015 ban was the most comprehensive. The ban had considerable support from the plastic pollution prevention advocacy community, and was informed by a study that identified microbeads in San Francisco Bay (Sutton et al., 2016).

The San Francisco Bay Microplastics Project is the first regional and comprehensive effort to investigate microplastics, and was designed to standardize field and laboratory methods, collect and interpret field data, provide educational resources, and drive policy change in a nearshore region. The project brings stakeholders together to collectively evaluate the research and solutions moving forward.

What are Microplastics? What are Microparticles?

Microplastics are plastic particles smaller than 5 mm. In contrast, the term microparticles is used for particles smaller than 5 mm that appear to be plastic. For this report, microplastics are a subset of microparticles for which spectroscopy or another technique has been used to verify that they are, in fact, plastic. Many of the microparticles extracted from samples collected as part of the San Francisco Bay Microplastics Project could not be confirmed as plastic, either because they were not examined via spectroscopy due to resource constraints, or because the presence of a chemical such as a dye prevented identification of polymer type.

Microparticles and microplastics can be classified into five different shape categories, which can provide insight on sources:

- Fragment – firm, jagged particle; may come from breakdown of larger plastic debris;
- Fiber – thin or fibrous, straight particle; may come from textiles as well as fishing gear and cigarette filters;
- Pellet – hard, rounded, or spherical particle; may come from pelletized pre-production material for plastic or microbeads intentionally added to consumer products;
- Film – thin plane of flimsy material; may come from breakdown of film-like plastic debris, such as plastic bags and wraps; and
- Foam – lightweight, sponge-like particle; may come from breakdown of foam plastic debris.

Microplastics are chemically diverse contaminants made up of a variety of polymers including:

- polyethylene (PE),
- polypropylene (PP),
- polystyrene (PS),
- polyamide (nylon),
- polyethylene terephthalate (PET or polyester),
- polyacrylonitrile (PAN or acrylic),
- polyvinyl chloride (PVC),
- styrene butadiene rubber (e.g., vehicle tires)

What are Microfibers?

Microfibers refers to anthropogenic fibers (thin or fibrous particles) that are smaller than 5 mm, composed of synthetic (e.g., polyester, acrylic) or natural (e.g., cotton, wool) material, and end up in the natural environment as pollution. Plastic microfibers are microfibers that are synthetic and made of plastic.

Synthetic fibers have been used to produce textiles and fabrics for over 50 years (Geyer et al., 2017) and synthetic fibers shed and enter the environment as plastic microfibers, a category of microplastics (Browne et al., 2011). Plastic microfibers may also be derived from fishing line and cigarette filters, among other products.

During this project, stakeholders have recognized that there needs to be better alignment in terminology and definitions related to plastic microfibers, particularly in light of existing technical definitions of microfibers used by the textiles industry.

Why are Microplastics a Potential Threat?

Microplastics have been gaining global attention as a pervasive and preventable threat to the health of marine ecosystems. Microplastics are ingested by aquatic organisms, which may impact their health. Microplastics can contain harmful chemicals such as flame retardants or plasticizers, and may provide a substrate for the adsorption of other harmful chemicals in the ocean, including PCBs and DDT (Brown et al. 2013, Teuten et al., 2007). Once ingested, these contaminants can become concentrated up the food chain (Rochman et al. 2014). While toxicological evaluation of the impacts of microplastic pollution on wildlife is ongoing, and considerable uncertainties remain, a recent European Union analysis of microplastics proposes considering any amount of this contaminant as potentially harmful.

II. Using Science to Guide Action

5 Gyres has 10 years of expertise in scientific research and engagement on the issue of plastic pollution. Since 2009, 5 Gyres has completed 18 expeditions, bringing over 300 citizen scientists into the field to see the issue first hand and conduct research on marine plastic pollution. One of 5 Gyres' strengths and priorities has been disseminating science to a range of communities to engage them in solutions through advocacy and action campaigns at local and national scales.

San Francisco Estuary Institute (SFEI) is one of California's premier aquatic and ecosystem science institutes. SFEI's mission is to provide scientific support and tools for decision-making and communication through collaborative efforts. SFEI provides independent science to assess and improve the health of San Francisco Bay, the California Delta and beyond, empowering government, civic and business leaders to create cost-effective solutions for complex environmental issues.

Together, 5 Gyres and SFEI are working in partnership on the San Francisco Bay Microplastics Project to identify science-based recommendations for solutions to plastic pollution in San Francisco Bay.

These two institutes are informed by the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), which is SFEI's largest program, and provides the information that regulators and decision-makers need to manage the Bay effectively. The RMP is an innovative collaborative effort among SFEI, the Regional Water Quality Control Board, and the regulated discharger community. The Program has established a Microplastic Science and Monitoring Strategy for San Francisco Bay (here), outlining the scientific priorities water quality managers need to protect the health of the Bay (Sutton and Sedlak, 2017, here). The RMP also supports a Microplastics Workgroup, which serves as a forum for scientific discussion among experts and regional and state stakeholders.

The San Francisco Bay Microplastics Project was developed to respond to the scientific needs identified by the RMP, and designed to both provide critical research on microplastics in the Bay Area and to generate scientifically supported, regional recommendations for solutions. The project was designed to engage multiple stakeholders in both data collection and policy discussions. For example, wastewater treatment facilities and stormwater agencies facilitated data collection; and participated in solution discussions with textile manufacturers, policy experts, and scientists.

Understanding the dynamics of this issue from a scientific perspective is critical to inform and motivate effective policy solutions and innovations at numerous intervention points, including waste treatment, industry design, and individual/consumer behavior.

Development of this Report

This report was based on existing science, science generated by the San Francisco Bay Microplastics Project, related policy documents, and input from the Project's Policy Advisory Committee, made up of key stakeholders and experts in the field (Table 1). The Policy Advisory Committee began as 12 individuals and expanded to over 18. There is incredible interest in this project and in using the data to drive solutions to plastic pollution in the Bay Area and beyond. The report was prepared by 5 Gyres with input from SFEI.

The Policy Advisory Committee was selected to provide science-based recommendations on plastic pollution reduction, including potential innovation, design, and household interventions. Because the recommended actions and policies to control microplastic release into the Bay and ocean will be directly informed by the comprehensive scientific investigation currently underway, they carry significant weight.

The Policy Advisory Committee participated in two in-person meetings on December 13, 2018 and March 5, 2019. Both meetings explored preliminary results and discussed policy recommendations and innovative solutions to the issue of plastic pollution.

Table 1. Policy Advisory Committee for San Francisco Bay Microplastics Project

	Name	Affiliation
1	Miriam Gordon	Upstream
2	Chelsea Rochman	University of Toronto
3	Christopher Lester	San Francisco Department of the Environment
4	Sean Bothwell / Natalie Caulk	California CoastKeeper
5	Krystle Wood	Textile Consultant / Materevolve
6	Nick Lapis / Robert Nunez	Californians Against Waste
7	Elissa Foster	Patagonia
8	Karin North	City of Palo Alto, Treatment Plant
9	Trent Hodges / Shannon Waters	Surfrider Foundation
10	Genevieve Abedon	Eco Consult / Clean Seas
11	Leslie Tamminen	Clean Seas / 7th Generation Advisors
12	Chris Sommers	EOA, Inc.
13	Holly Wyer	Ocean Protection Council
14	Sherry Lippiatt	NOAA (National Oceanic and Atmospheric Administration)
15	Jacqueline Zipkin	EBDA (East Bay Dischargers Authority)
16	Nirmela Arsem	EBMUD (East Bay Municipal Utility District)
17	Allison Chan	Save the Bay
18	Kevin Messner	Association of Home Appliance Manufacturers (AHAM)
19	Tony Hale	SFEI
20	Michael Shen	Schmidt Marine Tech
21	Alexander Black	Microfiber Solution
22	Carolynn Box	5 Gyres
23	Anna Cummins	5 Gyres
24	Haley Haggerstone	5 Gyres
25	Ella McDougall	5 Gyres

26	Meg Sedlak	SFEI
27	Becky Sutton	SFEI
28	Diana Lin	SFEI
29	Cambria Bartlett / Emily Bartlett	Heirs to Our Oceans

Use of This Report

Many of the recommendations focus on regional policy efforts that emphasize the importance of source reduction. In addition, innovations along with individual actions are also summarized. NGOs, policy makers, companies, and scientists can use this document as a case study for how regional stakeholders and scientists can both develop scientific studies to better understand the local sources of microplastics pollution, and make recommendations, through a collaborative process, to reduce microplastic pollution. The document can also serve as a resource to inspire individuals and coalitions around the globe to address the issue of microplastics.

III. San Francisco Bay Microplastics Study Findings

Despite the considerable focus on research in microplastic pollution in recent years, scientific gaps in understanding exist in the San Francisco Bay (and elsewhere). Basic questions remain unanswered, such as where, when, and how are microplastics entering the Bay, and what circulation patterns deliver them to the ocean? The use of plastic in modern society is ubiquitous; as a result, the pathways by which microplastics reach the Bay, their transport and distribution throughout the Bay, and the levels to which they are taken up into the food web are multi-faceted and complex.

The San Francisco Bay Microplastics Project was designed to provide information to answer some of these questions, while also aiming to provide recommendations for best practices in field collection and laboratory methods, and to influence regional policy discussions.

Surface Water Results: Coming Soon

Surface water samples were collected from 16 sites in the Bay and 11 sites in the National Marine Sanctuaries off the California coast during both wet and dry seasons. Samples were collected to provide a baseline of microplastics in surface water, assess spatial distribution in the Bay and Sanctuaries, and evaluate the influence of season.

Sediment Results: Coming Soon

Sediment samples were collected to assess baseline conditions, evaluate spatial distribution (including nearshore vs open Bay sites), assess the influence of potential pathways such as stormwater and wastewater, and evaluate uptake from sediment into biota (small prey fish). Samples were collected from the San Francisco Bay and Tomales Bay to evaluate differences due to proximity to microplastic sources.

Prey Fish Consume Fibers

Two species (anchovy, *Atherinops affinis* and topsmelt, *Engraulis mordax*) were collected to evaluate the presence of microplastics in prey fish. Prey fish are important to assess because they represent a critical link between contaminant concentrations in sediment and water compartments and the food web, and may be an indicator of exposure to larger predators and humans. Approximately ten fish of each species were collected from six locations in San Francisco Bay and two locations in a less urban reference area (Tomales Bay).

Results indicate prey fish ingest microparticles; 99% of the fish sampled had microparticles in their gut. Prey fish from the highly urbanized San Francisco Bay had higher particle counts than fish from the more rural reference area, Tomales Bay. In prey fish from San Francisco Bay, there was an average of 12.6 microparticles per fish, and a maximum of 57 microparticles per fish. Most microparticles were fibers (87%) followed by fragments (10%). A majority of microparticles that underwent spectroscopy could not be identified based on polymer type, and may be plastic or non-plastic.

Rubber Fragments and Other Microplastics and Microfibers Found in Stormwater

Twelve tributaries comprising 11% of the watershed drainage area to San Francisco Bay (i.e., 763 sq. km out of a total of 6,725 sq. km), and 6% of the total flow to the Bay via small tributaries, were sampled during storms to estimate the concentration of microparticles. Geographically distributed throughout the Bay Area, these tributaries were selected based on watershed size, watershed characteristics (e.g., impervious surfaces), land-use characteristics (e.g., commercial, industrial, rural), and whether the tributary had been previously identified as a trash hotspot (i.e., macrodebris greater than 5 mm).

Microparticles were identified in stormwater from all 12 tributaries, discharging between 1.3 and 30 microparticles per liter, with a mean of 9.2 microparticles per liter. Fragments (59%) and fibers (39%) made up nearly all microparticles examined. Based on findings from the chemical spectroscopy conducted on 7% of the microparticles, visual identification of rubber fragments on

a larger subset, plus color and morphology identification in the entire dataset, we estimate that 48% of all microparticles in our samples were black rubber fragments. Rubber is considered a plastic. One potential source of rubber fragments is vehicle tires.

A regional stormwater contaminants model, previously developed for legacy pollutants such as PCBs and mercury, was used to calculate an estimate of discharges from small tributaries to the Bay. According to this model, each year 10.9 trillion microparticles are discharged to the Bay from small tributaries, and 63% to 90% of these particles may be plastic.

Based on model correlations, it appears that industrial land use may be associated with higher microparticle concentrations. The reasons for this are unclear; the influence of land use and other landscape attributes on microparticle and microplastic pollution needs to be further explored.

Wastewater Samples Dominated by Microfibers

Microparticles were captured from the effluent of eight Bay Area wastewater treatment plants that represent over 70% of the overall effluent flow to the Bay. The eight facilities were geographically distributed, varied in flow rates from 150 to 630 million liters per day (39 to 167 million gallons per day), and employed a variety of secondary and tertiary treatments.

Microparticles were identified in effluent from all eight facilities, discharging an average of 0.063 microparticles per liter (range 0.008 to 0.2 microparticles per liter). Most of these particles were fibers (55%). Of the fibers that underwent spectroscopy, a majority were identified as anthropogenic (50%), meaning that the fiber was dyed with a man-made chemical and may be either plastic or non-plastic. An additional 18% of were clearly identified as plastic.

Facilities employing more advanced (tertiary) treatment had lower microparticle concentrations than other (secondary treatment) facilities, suggesting that enhanced treatment may have multiple benefits, including reduction in pollutants as well as microparticles. However, any microplastics captured through wastewater treatment are not expected to degrade within sewage sludge/biosolids or filtration media, and disposal of these materials may result in the transport of microplastics to other environmental compartments.

In aggregate, approximately 90 million microparticles per day were discharged to the Bay by the eight facilities. Assuming a similar distribution among the remaining facilities, approximately 129 million microparticles were estimated to be discharged per day, or approximately 47 billion microparticles annually. This estimate is substantially lower than the annual microparticle loads estimate from the small tributaries, discussed above. Based on available spectroscopy data and conservative assumptions that a portion of the anthropogenic particles are plastic, our data

suggest that somewhere from 37 to 57 million microplastics per day, or 14 to 21 billion microplastics per year, are discharged to the Bay.

Blank Samples Reveal Microfibers Everywhere

Fibers were widely detected in the field and laboratory blanks. In some instances, the fibers in the blanks could be traced back to a specific source (e.g., orange life jackets on board or a curly black fiber mat on one of the sampling vessels [removed after the third day of sampling]; however, in most instances, the source of the fibers could not be identified, attesting to the pervasive and ubiquitous presence of fibers in the environment. Based on the field sampling to date, there are indications that these fibers may be transported through air deposition.

IV. Related Bay Area Microplastics Research

Based on a pilot study conducted by the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) in 2015, microplastic pollution appeared to be greater in San Francisco Bay than in the Great Lakes and Chesapeake Bay. The study also found that microparticles, including microplastics, passed through Bay Area wastewater treatment plants, and that fibers made up most of the microparticles in wastewater effluent.

The RMP hosted a workshop on microplastics in San Francisco Bay in 2016, and, based on input from the workshop, developed a science and monitoring strategy for microplastics (Sutton and Sedlak 2017, here). The strategy defined management questions identified by local stakeholders as critical to informing water quality decision-making. The RMP supports a Microplastics Workgroup, a forum for experts and regional and state stakeholders to discuss the latest science. The 2017 Strategy has recently been updated and identifies high priority research needs based on the results of regional studies, including the San Francisco Bay Microplastics Project.

SFEI evaluated the efficacy of rain gardens during the wet season of 2016; influent into the garden and effluent after percolation through the garden were sampled over the course of one storm and analyzed for microplastics (Gilbreath et al. 2019). The small catchment (approximately one acre) that was analyzed was located along a major urban transit corridor. The study found fibers composed 58% of particle counts. Of the fibers, 13% were positively identified as plastics, 9% natural based cotton or wool, and the remaining were not able to be identified further than anthropogenic. Rubber and paint fragments made up 7% of particles, and 31% of the fragments were positively identified as plastic. All the microbeads identified in this study were made of glass, which are hypothesized to come from reflective paint on roads. Levels of microplastics and other particles in stormwater samples collected before and after flowing through the rain garden indicated that it removed over 90% of the material.

These results suggest that rain gardens may provide additional societal benefits beyond legacy contaminants. Further research on larger and alternative green stormwater infrastructure landscapes is necessary to understand efficacy and optimal employment with respect to microplastics.

V. Sources and Pathways of Microplastic Pollution

Many microplastic particles started out as larger plastic items, often single-use items. These items can escape waste management and end up in the environment, where they break into smaller pieces of plastic when exposed to sunshine and mechanical abrasion (e.g., caused by waves). Figure 1 identifies the general pathways for microplastics in the San Francisco Bay Area. Some common plastic polymers in single use items include polyethylene (PE; plastic bags, plastic utensils), polypropylene (PP; plastic tubs and food containers), polystyrene (PS; expanded to form a foam used in coffee cups, coolers, and packing materials), polyethylene terephthalate (PET; plastic water bottles), cellulose acetate (cigarette filters), and styrene butadiene rubber (vehicle tires).

<Figure 1. IMAGE OF MICROPLASTICS ENTERING SAN FRANCISCO BAY>

The majority of microparticles identified in the project were microfibers that can be derived from a number of sources (Table 2), and which can enter the Bay through a number of pathways, including wastewater, stormwater, and airborne. Common plastic polymers used in synthetic textiles include polyester (also known as polyethylene terephthalate or PET), polyamide (nylon), and cellulose acetate.

Table 2. Potential pathways and sources for plastic microfibers to the ocean.

Potential Pathways and Sources for Plastic Microfibers		
Environmental Compartments	Potential Pathways	Potential Sources
Wastewater / effluent	Washing machines (Institutional, commercial and residential), household and industrial drains (bathroom, kitchen), sewer	Clothing, bedding and towels; carpets; wipes used for personal care and cleaning; personal care products; diapers, tampons

Stormwater	Industrial discharge, storm drains, road runoff, agricultural runoff, precipitation, road abrasion, astroturf and other outdoor surfaces, plastic shredding from commercial lawn mowers	Plastic industry manufacturers (plastic packaging and textiles), street litter including cigarette filters, fertilizers, sewage sludge disposal, airborne microplastics transported via precipitation, many others
Airborne	Urban dust, wind	Fabrics, carpets, and upholstery; dryers; textile manufacturing
Ocean and bay surface waters / sediment / fish and other marine species	All of the above	All of the above; marine industry (fishing line, sails, tarps, nets, synthetic ropes, etc.)

Other microplastics are released directly into the environment in their original form, as microplastics. These include pre-production plastics, often powders and pellets (i.e., "nurdles"), which are used to produce other plastic items. Plastic powders are also used in a variety of activities, including plumbing and agriculture. These pre-production plastics enter the environment through spillage or shipping accidents.

Another form of primary microplastics are microbeads, small pellets and fragments added to personal care products such as facial and body scrubs and toothpaste. Common polymers used to make microbeads include polyethylene and polypropylene. Primary microplastics are also used in a variety of industrial activities, such as fluids used in oil and gas drilling, abrasives used during airblasting to remove paint from boat surfaces, and in cleaning engines and metal surfaces (CIEL Report, 2019, here).

Lastly, it is important to note that while much attention has focused on the clothing industry, the science isn't clear on the primary sources of microfibers. For example, carpets, and other household textiles (bedding, sheets, upholstery, towels, etc.) may also be significant contributors.

VI. Existing Policies and Innovation in the Bay Area and Beyond

Generally, solutions to plastic pollution include education and behavior change, policy action, design change, and innovation. A summary of policy action types is presented on Table 3.

Policy Action Types with Examples	
Preventative / Reduction Policies:	Examples
Single Use Bans	Food Service Waste Reduction Ordinance in San Francisco (bans expanded polystyrene disposable food ware); Statewide Plastic Bag Ban in California; National Microbead Ban
Multi / Comprehensive Bans	Berkeley Single Use Foodware and Litter Reduction Ordinance (bans several single use items)
Design / Extended Consumer Responsibility	Recycled content requirements, Leash the Lid
Source Reduction Goals	City zero waste goals
Post Manufacturing Policies:	
Filtration	LUV-R, Filtrol, Cora Ball, Guppy Bag, others
Structural Requirements	California Trash Policy, Trash Catchment Basins
Point of Purchase	Hang Tag, Certifications (Ex. Surfrider's Ocean Friendly Restaurant), Customer discounts for using reusable items
Economic Disincentives	Fees to manufacturer of problem products, Tax on cigarettes and single use plastics
Others Suggested Policies:	
Promotion of Innovation	Funding to encourage innovation, including filtration systems, trash catchment tools, new textiles (Fiber weave / types)
Mandates Monitoring and Research	CA Litter Strategy, CA Microplastics Strategy

Table 3. Policy Action Types and Examples

Local to Global: Short Summary of Policies

California is leading the nation in statewide plastic pollution reduction efforts. Statewide policy leadership began as early as the mid 1980s, with several Californian cities passing expanded polystyrene ordinances (e.g., Berkeley and Manhattan Beach in 1988) to the more recent statewide plastic bag ban in 2016, the first in the country. Advocates in California recently introduced a motion that would require significant reductions (75%) in single-use plastic packaging by 2030 (AB 1080, here), a bill that was introduced on February 21, 2019. Table 4 presents statewide policies that are related to the plastic pollution reduction in California.

Statewide Plastic Pollution Reduction Efforts in California

LEGISLATIVE ACTION	YEAR	DETAILS	ENFORCEMENT AGENCY
Phase Out Single Use Plastics	Proposed 2019	SB 54 would phase out the sale and distribution of single-use plastics by 2030 by setting up a state framework to address the issue.	N/A
Cigarette Ban at State Parks and Beaches	Proposed 2019	SB 8 will ban smoking cigarettes, cigars and other tobacco products at state parks and beaches.	Department of Parks and Recreation
California Ocean Litter Strategy	2018	SB 1263 requires development of a comprehensive statewide plan to reduce plastic pollution, including microplastics	OPC / NOAA
California Microplastics Strategy	2018	OPC is required to develop a Statewide microplastics strategy.	OPC
Plastic Straws On Request	2018	AB 1884 requires restaurants to offer straws only upon request.	State Department of Public Health
Food Service Packaging at State Agencies	2018	SB 1335 prohibits non-recyclable and non-compostable foodservice packaging at state facilities, including parks, beaches, colleges and fairgrounds.	Department of Resources Recycling and Recovery
Trash Amendments	2016	Requires cities and counties to have zero trash (5 mm and above) entering water bodies by 2030	California State Water Board
California Plastic Bag Ban	2016	Statewide plastic bag ban (SB 270) that prohibits most grocery stores, retail stores with a pharmacy, convenience stores, food marts, and liquor stores from providing single-use plastic carryout bags.	CalRecycle

California Plastic Microbead Ban	2015	Statewide plastic microbead ban (AB 888) which prohibits the sale of personal care products, such as soap, shampoo and toothpaste, that contain plastic microbeads. Two months later, the Microbead-Free Waters Act passed that made this ban span nationally.	N/A
Strategy to Reduce and Prevent Ocean Litter	2008	Strategy, developed in response to the 2007 OPC "Reducing and Preventing Marine Debris" Resolution, that called for a number of steps to reduce plastic pollution in the environment. This Strategy supported many of the statewide actions that are now in place.	OPC
California Bottle Bill	1986	Statewide incentive-based program that requires consumers pay a deposit on bottles of all materials, including plastic beverage bottles	CalRecycle
RELATED LEGISLATION	YEAR PROPOSED	DETAILS	ENFORCEMENT AGENCY
Microfiber Labeling	2018	AB 2379 would have required labeling on synthetic textiles that highlighted the potential environmental impacts of microfibers. This is the first statewide bill that focused on plastic microfibers.	N/A

Table 4. Plastic Pollution Reduction Statewide Efforts,

State-wide Policies

California's Trash Policy is another historic step for the state. The Trash Policy describes an enforceable state goal of zero trash, defined as 5 mm and above, present in any ocean waters, bays, or rivers by 2030. Cities and counties, including municipalities, can meet these requirements by installing capture systems on storm drains or by developing a trash reduction program that may include additional street sweeping, educational materials and programs, and local source control ordinances (e.g., single-use plastic item and comprehensive bans). Though the Trash Policy does not focus on microplastics, microplastics are often generated by single use plastic items (larger items) breaking down. The California Ocean Protection Council (OPC) and the California State Regional Water Quality Control are working with the Southern California Coastal Water Research Project (SCCWRP) and SFEI to test multiple trash monitoring methods (https://sites.google.com/sfei.org/trash/) with a goal of developing a library of methods with known levels of precision, accuracy, and cross-comparability of results, and linking these

methods to specific management questions. These tools will be valuable for reducing plastic pollution in the environment, no matter the size.

The definition of trash by the California State Water Resources Control Board does not include microplastics. The recent 2018 California Litter Strategy however, finalized by OPC and National Oceanic and Atmospheric Administration (NOAA) s Marine Debris Program, is a comprehensive statewide plan that addresses plastic pollution from source to sea, including goals that address microplastics. Microplastics and microfibers are identified as priority items to address.

California legislators recently passed SB 1263, which requires the OPC to work with scientific experts to develop a California Microplastics Strategy, another step that makes California a leader in plastic pollution reduction efforts. The provisions of the bill complement the 2018 California Litter Strategy. The statewide strategy will build upon the California State Water Resources Control Board's Pre-Production Plastic Debris Program that was designed in 2007 to address microplastic pollution that was being found along shorelines and in wetlands of San Francisco Bay. This program added special requirements to the industrial and municipal stormwater permits that requires best management practices when handling pre-production pellets and powders. As part of these requirements, each facility must submit a site-specific stormwater pollution reduction plan for approval. Based on a query of a State database of industrial dischargers, the Water Board identified 31 industrial sites in the Bay Area that are manufacturing plastic products. These sites are randomly inspected by Water Board officials, who have the authority to issue cleanup and abatement orders, if needed.

The California Microbead Ban passed in 2015 after microplastics were identified in San Francisco Bay (Sutton et al. 2016) and the Great Lakes (Eriksen et al. 2013). The statewide ban targeted personal care products containing microbeads, which are washed down the drain to wastewater treatment systems and then are discharged to the Bay and Pacific Ocean. The legislation required companies to phase out the use of microbeads in products sold in California. Ultimately, this law led to the national Microbead-Free Waters Act of 2015 that banned the use of microbeads in certain personal care applications.

Local: City and County

Cities and counties around California have been advocating for local ordinances to ban single-use plastics items since the late 1980s. California has over 65 ordinances that ban expanded polystyrene takeout containers, with multiple ordinances taking recent steps further to ban the sale of expanded polystyrene plates, cups and coolers all together, and the use of polystyrene in the non expanded form (Surfrider Website, here, Californians Against Waste Website, here).

Before the statewide plastic bag ban, over 100 bans were in place across California, with the first plastic bag ban in San Francisco in 2007.

More recently, comprehensive legislations have been introduced in multiple cities with the strongest plastic pollution reduction ordinance passing in Berkeley just months ago. Berkeley's Disposable Free Dining and Litter Reduction Ordinance (http://src.bna.com/FHH) immediately requires utensils, straws, lids and sleeves to be provided by request only; and by 2020, all takeout foodware must be compostable, vendors must charge $0.25 for hot and cold takeout cups, and eat-in dining facilities must use reusable foodware. Other cities, including San Francisco, are considering similar ordinances.

The City of Santa Cruz continues to lead by passing a local ordinance that prohibits the tourist industry from providing travel size shampoos to customers. Instead, hotel owners must provide shampoo and soaps in larger refillable containers. Santa Cruz is also discussing a comprehensive ban that would eliminate the sale of additional single-use plastic items, along with exploring options of installing filtration systems on washing machines at commercial laundry facilities.

As described above, many of the communities in the Bay Area are passing local ordinances to ban single-use plastic items. Close to half of expanded polystyrene bans are located in the Bay Area with many of them in communities with watersheds that drain directly to San Francisco Bay.

The cities of Alameda and Oakland have mandated a 'straws on request' policy, while San Francisco prohibits the distribution of a more inclusive list of plastic items such as beverage plugs, cocktail sticks, toothpicks, and beverage stirrers. Such items are to be self-service or on request, and take-out containers and food-ware must be certified recyclable. This ban in San Francisco is part of the inclusive ban on polystyrene take-out containers, and requires the materials to be recyclable or compostable.

Regional

The Ocean Conservancy and UC Santa Barbara's Bren School of Environmental Science and Management organized a Microfiber Leadership Summit in Fall 2017, where over 50 representatives from companies, universities, nonprofits and government agencies participated in a day long workshop to understand the state of the science and available solutions for microfiber pollution. The group agreed on five actions to work towards solutions on a national level, including:

- Developing a shared strategy to understand the challenges of plastic microfibers in the environment based on robust, peer-reviewed science. This resulted in a Microfiber

Roadmap (Ocean Conservancy 2018, here) that calls out a timeline for creating such a strategy;

- Establishing consistent testing methodologies for measuring plastic microfiber shed rates from textiles and other materials;

- Better understanding of loss of microfibers through the life cycle of various products and materials. This included quantifying the sources and leakages of microfibers from the production, distribution, use, and end-of-life of microfiber-generating materials;

- Assessing the risks of plastic microfiber pollution to humans and ecosystems using a Risk Assessment (RA) framework; and

- Identifying existing industry best practices that can be rapidly implemented to minimize plastic microfiber loss. The Microfiber Roadmap has an end goal of 2022 to carry out the life cycle assessment and generate science-based solutions.

Global Actions

The United Nations Environment Programme (UNEP) recently published a report called “Single-use Plastics: A Roadmap for Sustainability" that evaluates case studies from over 60 countries to provides an overview of plastic pollution, while also offering recommendations, mainly looking at actions governments can take towards solutions (UNEP 2018, here). UNEP also has an interactive map that highlights policy efforts around the world (UNEP 2019, here). The recommendations are very broad but they encourage communities to target the most problematic plastics, consider best actions according to socio-economic standing, evaluate impacts, engage stakeholders, raise public awareness, promote alternatives, provide financial incentives, and include monitoring with initiatives.

The United Nations also recently passed a comprehensive legislation that will require 28 countries to take actions to reduce plastic pollution. The initiative bans single-use plastic products, including plastic straws and stirrers, single-use cutlery, some polystyrene items, and cotton buds by 2021 and also requires a reduction in plastics with no alternatives, mostly food packaging, by 25 percent by 2025. There is also a requirement for beverage bottles to be recycled at a rate of 90 percent by 2025. Additionally, cigarette butt litter will have to be reduced by 50 percent by 2025, and 80 percent by 2030.

In 2013, the European Union funded MERMAIDS a program, part of the Plastic Soup Foundation, an environmental group located in Amsterdam, that focused on better understanding the loss of synthetic clothing fibers through laundering. Along with multiple partners, Plastic

Soup Foundation evaluated filtration systems on washing machines as a solution to microfiber pollution, as well as assessed detergent compositions that may reduce fiber release. The project found that a single load of laundry can release close to 20 million fibers, while also providing a set of methods to evaluate fiber release (Falco et al 2018, here). Additionally, the project suggests that using liquid detergent and fabric softeners can help reduce fiber release (possibly by up to 35%).

Building upon this work, these four entities developed a white paper in 2017 that called out immediate microfiber solutions, including:

1. Educate individuals on the best practices for reducing fiber release during washing cycles (e.g., use low temperatures, liquid detergent instead of powder, and fabric softener);
2. Use existing solutions, including technological filtration systems on the market;
3. Design textiles that shed less; and
4. Explore fabric design innovation (MERMAID Consortium et al 2017, here).

From a textile design perspective, the MERMAIDS Project determined strategies to develop stronger fibers that result in less fiber release during washing. Fiber length, yarn twist and fabric density play a role in the number of fibers released by textiles during wash.

The Plastic Soup Foundation started an environmental campaign called the Ocean Clean Wash to determine steps to address the microfiber pollution issue. Ocean Clean Wash gathered a broad range of stakeholders to work together to reduce synthetic microfiber release by 80% in the coming years by better understanding the entire product lifecycle and promoting solutions. The group formed a steering committee that includes multiple international NGOs and aims at increasing solutions through working with the fashion industry. Plastic Soup Foundation has hosted workshops, panel discussions, and meetings with the fashion industry. Most interesting was a meeting with 20 stakeholders in the fashion industry that explored all steps of the value chain, while discussion solutions and opportunities to solve microfiber pollution (Ocean Clean Wash Website, here).

Innovation

Several technology inventions and initiatives to address the issue of plastic pollution have been designed over the last few years. Table 5 describes systems that may be applicable in San Francisco Bay to reduce microplastics.

Innovation: Addressing Microplastics		
TYPE	DESCRIPTION	EXAMPLES

Filtration for Washing Machines	Several filtration systems are on the market that filter out microplastics before the water enters the wastewater system, including Filtrol, Lint LOV-R, and others	https://filtrol.net/, http://www.environmentalenhancements.com/Lint-LUV-R-about-luv-r.html
Microfiber Catchment Tools for Laundry	New tools are on the market to help reduce microfibers from entering the wastewater systems, including the Cora Ball and Guppy Friend	https://coraball.com/, http://guppyfriend.com/en/
Textile Design	Steps being explored to modify textile design to reduce shedding. Alternative materials are being explored and evaluated.	Take back programs, new fabrics
Microplastic Monitoring Devices	New equipment designed to monitor microplastics more efficiently, such as in situ automated microplastic sensors.	https://www.mantaraysampler.com/
Trash Interceptors	A trash interceptor is a device aimed to collect and remove floating debris, including microplastics, including Mr. Trash Wheel used in the Inner Harbor in Baltimore and Seabin, and more recently a new technology called Bubble Barrier.	https://www.baltimorewaterfront.com/healthy-harbor/water-wheel/https://www.seabinproject.com/ https://thegreatbubblebarrier.com/en/

Table 5. Innovation to Prevent and Remove Microplastics

There have been several studies to test the effectiveness of filtration systems attached to washing machines to filter microfibers and microplastics from water entering City's wastewater. Washing machine filtration systems, such as LUV-R and Filtrol, show to be effective at filtering small particples, such as microfibers from clothing. Concerns have been raised about consumers cleaning the filter appropriately to ensure filters work effectively and proper disposal of the filtered materials to make sure capture fibers are not released into the environment.

Innovation throughout the scientific community has been growing with new devices to capture and monitor microplastics (and macro plastics). Although devices designed to cleanup plastics pollution may be useful in some cases, generally, these devices do not address the root cause of the problem. However, technology that can monitor and model microplastics are extremely useful in identifying pollution hotspots and focussing monitoring efforts to collect valid and dependable data.

In addition to technological innovation, there have been some impressive community programs that have tried to address the plastic pollution issue by creating community reuse programs to eliminate single-use plastic items. The ReThink Disposal Program (https://www.cleanwater.org/campaign/rethink-disposable), designed and tested by Clean Water Action, and the Vessel Program (https://vesselworks.org/), are two examples of new systems that can be set up in communities to reduce single use plastics in the food and beverage industry. The ReThink Disposable Program, design by Clean Water Action, works with companies and

government agencies to switch out single use plastic items for durable reusable items that can be used over and over. Vessel Works is a free reusable stainless steel to-go cup service for cafes and their customers. You sign up and begin using Vessels instead of paper coffee cups. You take it with you throughout your day and eventually return it at a participating cafe or return kiosks.

VII. Recommendations for San Francisco Bay

Reducing the use of plastic is the most efficient and cost-effective option to prevent pollution, compared to end-of-pipe solutions, such as environmental cleanups and catchment systems. The following recommendations, based on scientific evidence from the San Francisco Bay Microplastics Project, primarily focus on plastic use or source reduction, with some options for capture of microplastics before they enter wastewater or stormwater systems. Recommendations also emphasize innovation, design, and household interventions that aim to reduce microplastic pollution in the Bay Area.

These recommendations are described in detail below and are not currently ranked in order of priority. Each recommendation includes a Suggested Actions table that describes policy, collaboration, innovation, and research suggestions that were identified by Policy Advisory Committee participants.

Recommendation #1: Develop microfiber sheddability standards

Project Results: Microfibers were widely detected in all samples, and represented a majority of microparticles identified in environmental samples. Specifically, 55% of microparticles in wastewater samples were identified as fibers; 18% were confirmed as plastic by spectroscopy and an additional estimated 50% could be plastic, but could not be confirmed because signals from dyes obscured the identification. Microfibers were also identified in fish samples (87% of microparticles in samples), stormwater samples (39% of microparticles in samples) and surface water samples (74% of microparticles in manta trawl samples). While only some of these microfibers could be confirmed as plastic with available resources and technology, it is likely that a substantial portion of the other fibers are also plastic.

A significant collaborative effort is underway to understand how to monitor and quantify microfibers, including plastic microfibers, that are shed by fabrics. The textile industry is highly involved and understands the need to be able to quantify fiber loss through the life-cycle of textiles (during production of textiles and garments or other articles, wear or use, washing and drying, recycling, disposal). Several entities related to textiles have initiated discussions on fiber loss. Mainly, this has been led by the clothing industry, though the washing machine and carpet industry are now part of the discussions. As noted previously, the textile industry employs

technical definitions of the term microfiber that differ from those used by scientists studying microplastics; greater clarity and alignment concerning terminology is likely to be an important step in coordinating efforts from different fields.

The Outdoor Industry Association (OIA) and the European Outdoor Group (EOG), the main trade organizations for the outdoor industry, recognize the industry's potential contribution to microfiber pollution. The OIA has a Sustainability Working Group subgroup focused on microfibers that has created a resource library to map the landscape of organizations, researchers, and institutions exploring both impacts and possible solutions. OIA and EOG were part of the development of the "Microfiber Action Roadmap" discussed earlier (Ocean Conservancy 2018 here).

The American Association of Textile Chemists and Colorists (AATCC) provides test method development, quality control materials, educational development, and networking for textile and apparel professionals throughout the world. AATCC includes employees of textile, apparel, and home goods manufacturers, dye and chemical manufacturers, testing laboratories, consumer and retail organizations, state and federal government agencies, and representatives from colleges and universities. AATCC has a series of committees, including AATCC Committee RA 100, Global Sustainability Technology, that is developing a new test method for fiber release during laundering. These types of standards are representative of the AATCC's current focus.

ASTM International is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services. The group represents producers, users, consumers, government, and academia from more than 140 countries. The entity primarily focuses on developing technical documents that are the basis of manufacturing, management, procurement, codes and regulations for dozens of industry sectors. Based on discussions with experts and the ASTM website, a proposed new standard or a revision to an existing standard is under development by a committee that focuses on fiber release of fabrics (here).

As these organizations work to standardize methods to measure fiber shed rates, the next discussion is to explore sheddability standards that will reduce the number of microfibers that shed when textiles are used and washed, ultimately sending fewer microfibers to the ocean.

Suggested Actions:

Policy Support: (1) Statewide legislation that supports standardization of these methods in California is encouraged to bring attention to microfibers.
Collaboration / Innovation:

(1) Better communication among existing efforts, regionally and globally; (2) Work with stakeholders to standardize definitions of microfibers; (3) Representatives from AATCC, OIA, EOG and ASTM should be invited to participate in the October 2019 Microplastics Symposium; and (4) Increase communication and information sharing among AATCC, OIA, EOG, ASTM, local entities, and others focusing on solutions to microplastics in San Francisco Bay.
Science: (1) Develop shedability standards and methods in partnership with input from stakeholders, including AATCC, OIA, EOG, ASTM, scientists, and the environmental community. The standards will push innovation on the textile industry; and (2) Identify possible microfiber sources and build a conceptual model (visual graphic) that can be used to explain possible microfiber pathways and sources.

Recommendation #2: Prioritize intervention points for microfibers around filtration

Project Results: The wastewater samples suggest that the wastewater facilities in the Bay Area discharge 50 billion microparticles annually (approximately 55% were classified as fibers). Of the fibers that underwent chemical analysis, approximately 18% of the microfibers were identified as plastic, with an additional 50% identified as anthropogenic, meaning the fibers were dyed with a man-made chemical and may be plastic. While Bay Area stormwater also contains high levels of microfibers, the sources are unclear.

Several independent studies indicate textile washing is a source of large releases of microfibers to wastewater systems, supporting discussion of potential interventions. Wash water can be filtered at various intervention points, and as we assess the most effective options, several key questions emerge around cost, impact, target audiences, and additional data required.

How can microfibers be removed most effectively from effluent, and which technologies can be implemented and scaled quickly? Several new filtration technologies and manufacturing innovations that target consumer household and commercial facilities have been developed for microfibers. Consumer facing devices include the Cora Ball, Guppy Friend, Filtrol, Lint LUV-R and others, which are all designed to capture microfibers in household laundry. Additionally, filtration socks, which attach to washing machine piping that drains into the sink, have historically been used to control particles from going down the drain. Recent studies have evaluated the efficacy of several of these devices in removing microfibers from effluent, finding a broad range of removal efficiency, from 26% (Cora Ball) to 87% (Lint LUV-R) (McIlwraith et al 2019, here).

In considering legislative or regulatory approaches to filtration, questions of cost, accountability, and target audience have been raised:

- Cost: If targeting the residential sector, should consumers be asked to purchase devices? Are rebates or incentive programs available to shift the cost burden from individuals to the community or manufacturers? Will there be educational programs offered to ensure proper installation and maintenance to ensure products are effective?

- Target audience: Should policy approaches target household washers, commercial laundromats, institutional laundry facilities, or all three? What additional information or data might be useful to prioritize?

- Accountability: Does introducing mandatory filtration remove responsibility from the manufacturing sector to address the problem from a design standpoint?

Wastewater treatment plants already serve as a point of intervention, and independent studies have demonstrated that common treatment technologies remove a large portion of microplastics and microfibers from treated effluent. Preliminary analysis of effluent data from the San Francisco Bay Microplastics Project suggests that facilities employing tertiary treatment that includes advanced filtration may discharge lower overall concentrations of microparticles than facilities using secondary treatment only. While this study was not designed to assess the removal efficiency of different wastewater treatment technologies, this topic may merit further exploration.

Nevertheless, it is important to note that additional end-of-pipe wastewater treatment is often not feasible for individual facilities. In addition, the particles that are captured via large-scale wastewater treatment do not disappear, which is also true for any filtration system attached to a washing machine; waste products like biosolids, which include captured microplastics, are applied to agricultural lands, resulting in a redistribution of microplastic particles in the environment. Fibers that are removed from filtration devices should be placed in the garbage and disposed of in a local landfill.

Suggested Actions:

Policy:
(1) Support a pilot ordinance to mandate filtration with monitoring built in to determine effectiveness; and
(2) Explore rebates for installation of filtration systems on commercial laundromats, institutional laundry facilities, and residential washing machines.

Collaboration / Innovation: (1) Work with the Washing Machine Trade Association and stakeholders to understand the feasibility and limitations of filtration systems that are built into the washing machine; (2) Work with new stakeholder groups (Carpet Trade Association, Washing Machine and Dryer Trade Associations, Filtration experts, Air Quality experts, etc) to identify other potential sources of microfibers; and (3) Involve "fast fashion" stakeholders in discussions.
Science: (1) Pilot filtration study comparing commercial laundromats, industrial laundry facilities and residential washing machines; (2) Establish and distribute best washing practices for residential users and operators of larger facilities (commercial and industrial laundromats); (3) Study ecological impacts of dyes carried plastic microfibers on aquatic organisms; (4) Identify and quantify sources of microfibers in the wastewater system; and (5) Study impact differences between virgin synthetic microfibers and Recycled Polyethylene Terephthalate (rPET).

Recommendation #3: Further identify and quantify microplastics sources and pathways within stormwater systems

Project Results: Data suggest that creeks and stormwater systems may be discharging more microplastics than wastewater systems, although additional monitoring is needed to support this hypothesis. Fragments (59%) and fibers (39%) constituted nearly all microparticles identified in stormwater samples. Approximately 48% of all the microparticles (most of the fragments) were black rubber fragments, with one likely source being vehicle tire wear. Rubber is considered a plastic. Based on a model developed to estimate pollutant discharges, it appears that industrial areas may be associated with higher concentrations of microparticles. The underlying factors that might drive this correlation are uncertain, and further work is necessary to better understand how land use and other landscape attributes may influence microparticle concentrations.

The potential sources of microparticles and microplastics in stormwater are complex, and their movement within the watershed is likely influenced by a myriad of factors including land use, level of impervious surfaces, and proximity to roadways. Our review of Bay Area stormwater data using a regional model developed for more traditional pollutants revealed a potential connection between industrial land use and higher levels of microparticle discharge. Industrial activities are often subject to discharge permit requirements; however, many industries are not regularly regulated regarding microplastics discharges.

Very few studies of microplastics have been conducted on stormwater, despite its potential to be a major pathway for environmental contamination. As a result, our conceptual understanding of outdoor urban sources of microplastics to stormwater is limited, as is our understanding of the landscape factors that lead to larger discharges. In particular, larger amounts of microparticle pollution related to industrial land use has not been noted previously, and it is possible that this correlation is in fact driven by other factors.

Greater insights regarding the sources of these microplastics, as well as how they enter the stormwater system, is needed in order to adequately identify strategic and cost-effective solutions. A conceptual model that allows us to identify relevant factors and predict which types of watersheds are likely to discharge higher levels of microplastics will inform a region-specific, targeted approach to reducing microplastic pollution.

Additionally, rubber particles, which may be associated with vehicle tires or other sources, were identified in surface water and stormwater samples. Rubber tire particles have been documented in aquatic environments around the world. As tires wear and rub on road surfaces, tire particles have the potential to enter the environment through a variety of pathways (e.g., stormwater, air deposition, etc.). Additional sources of rubber fragments to the environment may include artificial fields and playgrounds, among others. The sources, quantities, and impacts to wildlife health of rubber fragments should be further explored.

Suggested Actions:

Policy Actions: (1) Support the Regional Water Quality Control Board's effort to regulate and monitor microplastics through their discharge permits, including industrial discharge permits.
Collaboration / Innovation: (1) Install more green stormwater infrastructures to capture microplastics (See Recommendation #5).
Science: (1) Support research to develop a Conceptual Model of Microplastics in Stormwater, which would explore sources of microplastics and transport within the watershed, and identify the importance and influence of land use and other landscape attributes on the concentration of microplastics in stormwater runoff; and (2) Understand sources, quantities and impacts of rubber fragments in San Francisco Bay.

Recommendation #4: Support comprehensive packaging bill in Bay Area and statewide

Project Results: Foam, plastic fragments and plastic films, with potential sources including single-use plastic items, were detected in San Francisco Bay surface water samples, and to a lesser extent stormwater samples.

For several decades, since the 1980s, policymakers and advocates have worked to introduce packaging related local ordinances, limiting and/or banning specific polymers or products (i.e., Plastic bags, Polystyrene and its expanded form, and more recently, plastic drinking straws). While these efforts have resulted in new legislation, raised awareness, and galvanized communities and coalitions into action, it is difficult to determine, without significant pre- and post-implementation monitoring efforts, whether or not these victories have impacted the amount of plastic entering our watersheds.

The Bay Area has many ordinances that limit single-use plastic items, including plastic bags, plastic drinking straws, and expanded polystyrene take out containers. Single-use item bans have been in place for the last ten years. More recently, on January 22, 2019, the Berkeley City Council approved the Disposable Foodware and Litter Reduction Ordinance, the most ambitious and comprehensive piece of municipal legislation in the U.S. aimed at reducing single-use disposable foodware.

Berkeley's comprehensive ordinance can act as a model ordinance that other communities can refer to. Model ordinances have proven useful in guiding municipal and regional plastic bag and expanded polystyrene bans.

Suggested Actions:

Policy: (1) Additional cities in the Bay Area should explore comprehensive bans based on the ordinance passed in Berkeley; and (2) Regional policy, spanning more than one municipality or statewide, could be put in place to eliminate multiple single-use plastic disposables.
Collaboration / Innovation: (1) Work with other entities that monitor and track expanded polystyrene upstream (Surfrider Foundation, Break Free From Plastic, Clean Water Action, etc) to better understand the sources and pathways; (2) Support and explore alternatives to expanded polystyrene; (3) Encourage Bay Area stakeholders to build educational campaigns to make using reusables "cool" and work with influencers, young activists, and schools; and

(4) Encourage collaboration between food service industry and public health community to make it easier to use reusables.
Science: (1) Require monitoring alongside policy efforts to track efficiency and impacts (before and after implementation); and (2) Evaluate existing comprehensive and foodware ordinances to scale regionally.

Recommendation #5: Explore green stormwater infrastructure management options to reduce microplastics from entering San Francisco Bay

Project Results: Stormwater measurements calibrated to Bay Area land uses models suggest that rivers, streams and stormwater systems contribute more than 10.9 trillion microparticles annually. Though not directly part of the project, a related study performed by SFEI found that bioretention rain gardens may reduce microplastics from entering stormwater systems.

Green stormwater infrastructure, also referred to as Low Impact Design, is a stormwater management approach used in urban areas that utilizes the natural hydrologic processes of the landscape by increasing retention, detention, and filtration of stormwater runoff at its source (SF Better Streets 2019, here, EPA 2019, here). Examples include permeable pavement, rain gardens (bioretention systems), tree-well planters, or bioswales.

As described above, a 2018 SFEI study of a Bay Area rain garden supports the use of bioretention as a management option for reducing flows and regulated contaminant discharges, as required by water quality permits (SFEI, 2019, here). Anthropogenic microparticles, including microplastics, were also well-captured by the bioretention rain garden (over 90% removal).

In the Bay Area, green stormwater infrastructures can be required by the Regional Water Quality Control Board as defined in municipal regional permits (in Section C3), which covers the deployment of green stormwater infrastructures. Municipalities are required to set goals for their deployment of green stormwater infrastructures and then track progress toward meeting the planned goals. They are to attenuate the flow of stormwater to the Bay by slowing and sinking the water into these facilities. They are also often included to capture mercury and PCBs as targeted pollutants.

Stormwater programs are also responsible for reporting their progress via annual reports submitted to the Regional Water Quality Control Board. These reports record past and present

green stormwater infrastructures implementations. These reports are categorized and available at the GreenPlan-IT Tracker on the SFEI website (http://gptracker.sfei.org).

Suggested Actions:

Policy: (1) Support existing and encourage new green stormwater infrastructure in the Bay Area.
Science: (1) Assess locations for green stormwater infrastructure adjacent to the San Francisco Bay; and (2) Assess microparticle and microplastic filtration effectiveness for other green stormwater infrastructures.

Recommendation #6: Increase collaboration between plastic waste (trash) and microplastics efforts

Project Results: There has been an overwhelming amount of interest in the project and many new stakeholders have been brought together to discuss solutions for microplastics and plastic trash (items larger than 5 mm). During the Policy Committee meetings organized by the project to discuss results and solutions, it became clear that better communication between stakeholders, sharing of information, and collaboration on trash and microplastics related projects and efforts would be beneficial.

Many cities around the nation are working to reduce their plastic waste footprint and setting goals to have less trash end up in landfills. California's Trash Policy, an enforceable state goal of zero trash present in any ocean waters, bays, or rivers by 2030, has motivated Californian cities to begin documenting the presence of trash, identifying high concern sites, and implementing management actions. Communication efforts between these plastic pollution reduction efforts and municipal zero waste efforts should be increased. The current lack of communication in some cities may be due to the fact that microplastics are often not managed by the same regulations. But as a global movement, these worlds have begun to intersect through the Break Free From Plastic Movement, a coalition of more than 1,300 groups working collaboratively to demand massive reductions in single-use plastics and to push for lasting solutions to the plastic pollution crisis.

A regional coalition that brings together trash-focused work and ocean plastics efforts would be beneficial to share data that can support each other. There are many ongoing efforts to bring stakeholders and scientists together in both fields. For example, the Trash Data Dive, a stakeholder meeting that occured in Fall 2018, brought some of the stakeholders and scientists together focused on trash (debris greater than 5 mm). The recent Better Alternatives Now Report

(BAN List) brought together a number of statewide and international ocean conservation organizations, who aimed to understand trends in trash entering the ocean in order to focus policy efforts on the top contributors. More groups could be added to this conversation to better connect actions occurring in urban areas to the ocean.

This type of collaboration is particularly important for identifying sources of plastic pollution in San Francisco Bay. To fully understand the issue of plastic pollution in San Francisco Bay, trends in macroplastic (trash) on shorelines, upstream in rivers, and on streets is important. There is opportunity for data sharing that could be impactful.

Suggested Actions:

Policy: (1) Mandate standardized, open source data collection on trash, macroplastics, and microplastics, and establish a data portal where all plastic pollution and trash data is stored.
Collaboration / Innovation: (1) Set up a regional coalition that brings together trash-focused work and ocean plastics efforts to share data that can support each other; (2) Support additional solution oriented meetings that bring together a range of stakeholders; (3) Identify agency or entity to manage trash and microplastics protocol / monitoring sharing platform; and (4) Share project results and outcomes with participants at the Trash Data Dive that occured in Fall 2018 in the Bay Area.
Science: (1) Summarize the macroplastic / trash trends upstream in Bay Area with available data; (2) Combine microplastic data with macroplastic/shoreline cleanup data in Bay Area; and (3) Develop standardized monitoring methods and terminology / data reporting to allow for apples-to-apples comparisons?

Recommendation #7: Support innovation to address microplastic pollution in San Francisco Bay

It is clear that plastic pollution will not be solved without innovation because as a society we are going to continue to use plastics and generate waste. Plastics production is projected to increase even more. Innovation can range from creating new alternatives to plastic products and designing better products to developing new technologies to monitor microplastics in the environment. As

the plastic pollution movement has grown, foundations, nonprofits and companies have released innovation challenges geared towards funding new ideas to tackle the issue of plastic pollution.

One of the first challenges that focused only on plastic pollution was the Think Beyond Plastic Challenge, now called the Think Beyond Plastic Innovation Center. The international program brings together innovators, entrepreneurs, industry, scientists, engineers and consumer advocates and pushes individuals and companies to fundamentally rethink the way plastic products are being made, used and reused to prevent them from becoming waste. Think Beyond Plastic has recently partnered with the New Plastics Economy, an initiative to build momentum towards a plastics system that works, distributing the New Plastics Economy Innovation Prize ($2m) in 2018.

Similarly, National Geographic, has partnered with Sky Ocean Ventures to announce the international Ocean Plastic Innovation Challenge, a challenge that asks problem solvers from around the globe to develop novel solutions to tackle the world's plastic waste crisis. This challenges is broad and doesn't focus solely on product design. Projects that aim to advance science, for example better monitoring and identification of microplastics, are encouraged.

A similar trend is seen in the Bay Area, consistent with the Silicon Valley's reputation as the leading hub for high-tech innovation. Schmidt Marine Technology Partners and the Ocean Solutions Accelerator are two examples of Bay Area entities established to better connect technological innovation with ocean conservation efforts. Schmidt Marine Technology Partners, a program of the Schmidt Family Foundation, supports the development of ocean technologies with compelling conservation and research applications, as well as strong commercialization potential. The Ocean Solution Accelerator, a project of the Sustainable Ocean Alliance, partners with technology company founders to provide the guidance and resources needed to scale their businesses.

The Maritime Alliance in San Diego also has an incubator that funds projects to make the Port of San Diego more sustainable. This is an example of a more localized and specific effort with goals of addressing issues in the Port of San Diego.

A San Francisco Bay focused innovation challenge would be worth exploring. The Bay Area is already a center for innovations, and with the high number of philanthropists and an environmentally conscious public, there may be interest from local companies, foundations, and individuals to support such a fund.

Suggested Actions:

Collaboration / Innovation: (1) Explore feasibility and possible funders to establish a Bay Area focused innovation

challenge to find solutions to plastic pollution in the region.

Recommendation #8: Critical research needs

Project data suggest three critical general research needs: a) long-term monitoring to establish trends and to measure the effects of management actions; b) baseline microplastic monitoring in air; and c) gaining a better understanding of the ecological and ecotoxicological impacts of microplastic pollution.

The San Francisco Bay Microplastics Project collected baseline data on microplastics throughout the San Francisco Bay, with the goal of increasing our understanding of the sources and pathways of microplastic pollution in the region. Long-term monitoring is recommended to track trends and evaluate whether microplastics reduction policies are having a positive impact. For example, the Federal Microbead-Free Waters Act, passed in 2015, phased out the sale of products with microbeads by July 1, 2018. The field work conducted during this project, completed prior to this deadline, indicates microbeads are still being discharged to the sewer system. Levels of microbeads observed in samples collected in years after the ban should therefore be compared to current levels to assess the real world impacts of this policy.

Additionally, field blanks collected during the project suggest that airborne microplastics could be a potential pathway for microplastic contamination in San Francisco Bay. (A field blank is collected to see if samples have been contaminated during field sampling or transport.) Our field blanks had microfiber contamination, with the highest amount of contamination found in blanks collected alongside the surface water samples. The most likely avenue for microfibers to contaminate our samples during field work is airborne particles. There are few studies of microplastics in air, but growing interest within the scientific community to better understand this pathway.

Preliminary results of the fish samples suggest that microparticles are routinely ingested by prey fish, with 99% of the fish sampled having microparticles in their gut. A majority of microparticles were fibers (87%) followed by fragments (10%). Monitoring additional fish in the region, including sport fish consumed by humans, may be helpful to better understand if there are pathways for chemicals from the plastic pollution to transfer to and impact human health. Additionally, tissue sampling may be appropriate to understand if chemicals are transferred to the body of the fish from any plastic pollution inside the fish.

Suggested Actions:

Policy: (1) Funding for periodic microplastic monitoring in San Francisco Bay to evaluate effectiveness of Microbead ban and other current and future policies; and (2) Funding for additional research to evaluate concentrations of airborne microplastics, and ecological and human health impacts of microplastics.
Collaboration / Innovation: (1) Work with local universities to prioritize research on microplastics in San Francisco Bay; and (2) Work with textile industry to understand existing best practices to limit airborne contamination and ways to reduce shedding.
Science: (1) Long-term monitoring of microplastics in San Francisco Bay; (2) Study to identify pathways and sources of airborne microplastics; (3) Study to quantify microplastics in fish consumed by humans, along with tissue studies to understand any chemical transfer; and (4) Study to determine the potential impacts of microplastics and plastic-related chemicals in aquatic organisms relate to ecological and human health.

Recommendation #9: Educate consumers, including the youth, on ways individuals can reduce microfibers from entering San Francisco Bay

While the stakeholders and partners involved in this project agree that source reduction, policy change, and design innovation are higher priorities in addressing microfiber contamination, there is still a role for public education on best management practices to reduce the amount of microfibers that enter wastewater system. Simple, low cost and low technology techniques for proper washing of textiles can at least slow the rate of microplastic contamination while longer term solutions are developed. Additionally, project results and educational materials generated by the project should be shared with partners to distribute results to students, teachers, and the interested public.

Multiple outdoor industry brands are working with the Vancouver Aquarium's Ocean Wise Plastics Lab to understand microfibers in household laundry effluent, wastewater treatment plants and the ocean, with a goal to identify sources and fate of microfibers (Ocean Wide Plastics Lab, here). The study aims to look to smarter textile design, laundry best practices and wastewater engineering changes that would stem the release of microfibers. The project has identified best practices to reduce microfiber release during laundry, including:

- Less frequent washing
- Select delicate wash cycle
- Use a front loading washing machine
- Install a filtration device or lint trap on washing machines

The next generations will likely need to focus on innovative approaches to control plastic pollution into the future. Therefore, the current trends and results related to plastic microfiber research should be included in new environmental curricula and educational materials that reference this project, where possible. 5 Gyres plans to incorporate results from this project in the Catch the Waves educational curriculum that was designed to scientifically engage middle and high school students in their communities through the lens of plastic pollution (https://catchthewave.blue/).

Suggested Actions:

Collaboration / Innovation: (1) Distribute educational materials generated by this project to partners, local NGOs and teachers as an educational resource; (2) Incorporate project results into future environmental curriculum, including 5 Gyres' Catch the Wave Curriculum; and (3) Collaborate and share results with Vancouver Aquarium.

Recommendation #10: Support San Francisco Bay Microplastics Management Strategy to reduce microplastics

The Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) provides water quality regulators with the information they need to manage and protect Bay water quality. The Program has monitored the Bay for contaminants of emerging concern for over a decade, and performed the pilot study of microplastics in the Bay. Levels observed in this study were higher than other water bodies near urbanized regions of the US (e.g., Eriksen et al. 2013; Yonkos et al. 2014). The RMP developed a monitoring and science strategy for microplastics in San Francisco Bay; a regional strategy for management of this class of contaminants does not yet exist.

The RMP originally classified microplastics as a "Possible Concern" for the Bay within its Tiered Risk and Management Action Framework for emerging contaminants, as the lack of ecotoxicity thresholds meant there was uncertainty as to whether current Bay levels were harmful to wildlife. The European Union proposal to evaluate microplastics as non-threshold

contaminants, meaning any discharges to the environment would be considered harmful, suggests that microplastics might instead be a "Moderate Concern" for the Bay.

The increasing level of concern about microplastic in San Francisco Bay suggests the need to actively manage this contaminant. Currently, no single agency is mandated to monitor or regulate microplastics in wastewater, stormwater and surface waters of San Francisco Bay. However, the recent statewide bill (SB1422) requires the State Water Resources Control Board to develop and carry out standardized monitoring for microplastics in drinking water, while defining safe levels of microplastics for the public.

Other regional agencies that play a role in regulation of plastic pollution include:

- The San Francisco Bay Conservation and Development Commission (BCDC) is a coastal management agency that was established to protect and enhance San Francisco Bay and to encourage the Bay's responsible and productive use for this and future generations. State law requires sponsors of projects that propose to fill or extract materials from the Bay to apply for a BCDC permit. Though BCDC focuses largely on coastal development, the agency is well-positioned to play a role in microplastic pollution prevention. This would likely require state legislation, so this would not be an immediate solution.

- The San Francisco Bay Regional Water Quality Control Board regulates trash through municipal and industrial stormwater permits, mandated by the State Water Resources Control Board. If the RMP identifies microplastics to be a Moderate Concern, the Regional Water Quality Control Board would lead development of a regional Action Plan to manage the contaminant.

- The Ocean Protection Council was recently mandated through SB-1263 (here) to develop a Statewide Microplastics Strategy in collaboration with the State Water Resources Control Board, the Office of Environmental Health Hazard Assessment, and other entities. The legislation specifies a range of goals, including identifying research needs, standardizing field and laboratory methods, understanding ambient microplastics concentrations and sources, improving our understanding of risks and health impacts, and developing policy recommendations to advance solutions. This Strategy is expected to provide regulatory agencies with the background information and evidence to move forward with solutions.

A natural next step would be to incorporate the scientific results and recommendations determined by this project into the Statewide Microplastics Strategy that OPC is spearheading.

Suggested Actions:

Policy Recommendations: (1) Results and Recommendations from San Francisco Bay Microplastics Project should be incorporated into the Statewide Microplastics Strategy; and (2) A Microplastics Strategy that lays out priorities and actions towards a microplastics reduction in San Francisco Bay; or (3) Incorporate San Francisco Bay recommendations in the Statewide Microplastics Strategy.
Collaboration / Innovation: (1) Explore capacity of regional regulatory agencies best positioned to manage microplastics

Proposed Enterococcus sampling locations in San Francisco Bay

Overview

This sampling plan proposes 19 locations for *Enterococcus* sampling throughout San Francisco Bay. This work is being undertaken to evaluate background *Enterococcus* concentrations so the San Francisco Bay Regional Water Quality Control Board can determine if dilution credits would be allowed in upcoming National Pollution Discharge Elimination System (NPDES) permits. This option is being reviewed because the bacterial objective for water contact recreation was recently reduced from 35 CFU/100 mL to 30 CFU/100 mL.

Proposed locations for sampling

Proposed sampling locations were selected based on: (1) outfall locations of major publicly-owned treatment works (POTWs), (2) locations of previous studies, and (3) distance from San Francisco due to sample hold times. Deep water discharge locations were prioritized over outfalls that discharge to creeks (American Canyon, Fairfield-Suisun, Napa, Petaluma, Sonoma Valley, Yountville, St. Helena, Calistoga, Mountain View, and Las Gallinas excluded). In addition, three Lower South Bay POTW outfalls (Palo Alto, Sunnyvale, and San Jose) were excluded from this study because any dilution credit is unlikely to change their operational practices. Previous enterococcus data have been collected near the POTW outfalls of San Jose, East Bay Discharger Authority (EBDA), and Central Contra Costa Sanitation District (CCCSD). The EBDA and CCCSD outfalls are included in the study. Delta Diablo was excluded because it is too far from San Francisco to adhere to the six-hour sample hold time for enterococcus samples.

A total of 19 sites is suggested; ten sites south of Marin (Figure 1, Table 1) and nine sites north of Marin (Figure 1, Table 2). Sampling coordinates listed in Tables 1 and 2 are located approximately 200 feet away (toward the center of the channel) from the discharge location so samples are less likely to be collected in the outfall zone of influence.

Table 1. Ten sites south of Marin

Nearest WWTP discharge	Latitude (degrees north)	Longitude (degrees east)	# on map
Marin County	37.869761	-122.450341	13
Sewerage Agency of Southern Marin	37.869452	-122.45179	13a
Sausalito-Marin City Sanitation District	37.842847	-122.467843	26
Treasure Island	37.830439	-122.356807	32
East Bay Municipal Utility District	37.816038	-122.349902	10
San Francisco Southeast	37.750563	-122.371331	22
EBDA	37.693035	-122.295451	9
North Bayside System Unit*	37.667182	-122.359552	3
San Mateo	37.580918	-122.244919	25
Silicon Valley Clean Water	37.561667	-122.217076	29

*Includes discharge from Millbrae, SFO, South SF/San Bruno, and Burlingame

Table 2. Nine sites north of Marin

Nearest WWTP discharge	Latitude (degrees north)	Longitude (degrees east)	# on map
Central Contra Costa Sanitation District	38.044184	-122.098838	5
Benicia	38.03948	-122.151226	2
Crockett Community Services District	38.057396	-122.213904	7
Vallejo Flood & Wastewater District*	38.0897	-122.2533	33
Pinole	38.052931	-122.270877	21
Rodeo Sanitary District			21a
Novato Sanitary District	38.056486	-122.484608	17
Central Marin Sanitation Agency	37.948504	-122.455541	6
West County Agency	37.91286493	-122.4179766	34

* The map shows the Carquinez Strait discharge location but the coordinates are for the Mare Island site

Sampling methods

At each location, one grab sample should be collected from 1 meter below the water surface. If using a sampling device (e.g., Niskin, Van Dorn), the sampler should be rinsed thoroughly with site water before water is collected and dispensed into clean bottles. The sampler should follow QA/QC procedures provided by the laboratory. At a minimum, the sampler should wear gloves to avoid contaminating the sample bottles, and samples should be kept in the dark and on ice, and delivered to the lab within six hours of the first sample time. Field notes should include location, time, sampler name, and qualitative comments regarding wind, rain, and water clarity. Sampling should commence at the farthest away location from the lab drop-off location to ensure samples are delivered within the six-hour hold time.

Samples should be collected on two occasions—once during dry weather and once during wet weather. Dry weather sampling should be completed by the end of June 2019. Wet weather sampling should occur by the end of January 2020 but does not have to occur during a storm event.

Sample analysis

A total of 38 samples will be delivered to Cel Analytical in San Francisco (19 samples in each sampling period) where they will be analyzed for *Enterococcus*. Data will be sent electronically to Melissa Foley (melissaf@sfei.org) upon completion of analysis and data QA/QC.

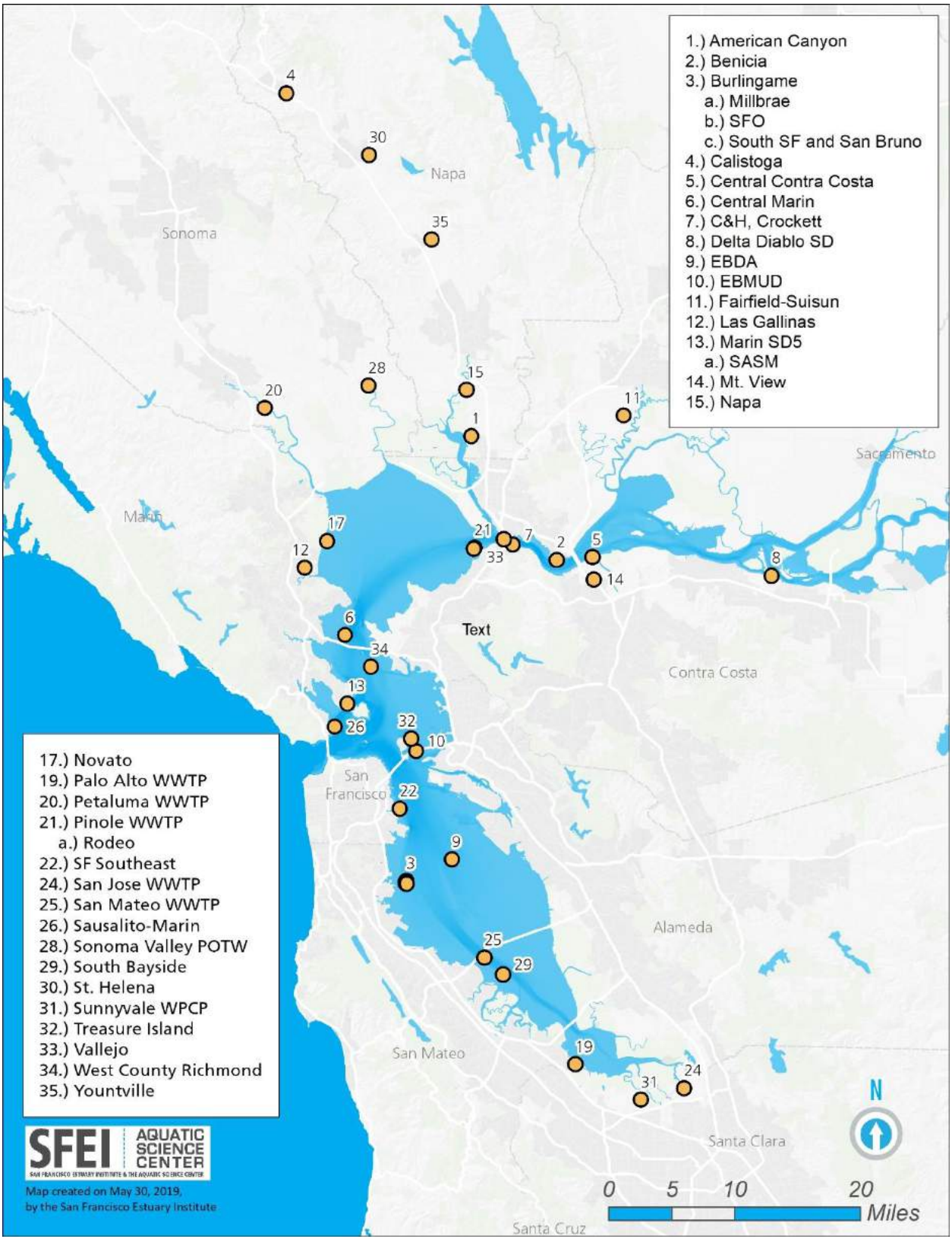

Figure 1. Map of POTW outfalls that discharge to San Francisco Bay.

Lorien Fono

From: Lorien Fono
Sent: Tuesday, June 18, 2019 10:45 PM
To: Lorien Fono
Subject: FW: agenda item#20 - ethoxylated surfactants study

From: Diana Lin <diana@sfei.org>
Sent: Tuesday, June 11, 2019 2:13 PM
To: David Williams <dwilliams@bacwa.org>; Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>
Cc: Lorien Fono <lfono@bacwa.org>; Rebecca Sutton <rebeccas@sfei.org>
Subject: Re: Bay RMP ethoxylated surfactants in effluent study

Hi Tom and Dave,

Thanks for the super helpful discussion last week regarding WWTP sampling for the ethoxylated surfactant study. We clarified the study objective as a screening study for potential ethoxylated surfactants that may warrant further follow-up study, and facility sampling selection should be based on a including a diverse set of treatments and geographic locations. Here's my revised proposed list of ideal study participants (Table below). Facilities were chosen to capture tertiary (including nitrification and denitrification) v. secondary treatment; variety of treatment processes; UV v. chlorine disinfection; all subembayments included, range of medium to large facilities included. Please let me know if you have comments on this sampling design by Monday next week (6/17).

Revised POTW sampling design for ethoxylated surfactants.

	Facility	Annual Average Daily Effluen Flows (mgd)	Subembayment	Secondary	Tertiary Treatment	Nitrification	Denitrification	Disinfection
1	**San Jose-Santa Clara**	87	LSB	Activated Sludge/Biological Nutrient Removal	Y	Y	Y	Liquid Chorine
2	**Palo Alto**	18.4	LSB	Trickling Filter/Nitrifying Activated Sludge	Y	Y		UV
3	**Hayward**		SB	Trickling Filter/Solids Contact				Sodium Hypochlorite
4	**EBMUD**	52.5	CB	High Purity Oxygen Activated Sludge				Sodium Hypochlorite
5	**CCCSD**	35.4	Suisun Bay	Activated Sludge with Anaerobic Selector				UV
6	**Fairfield Suisun**	13.4	Suisun Bay	Oxidation Tower/Activated Sludge	Y	Y	Y	UV

7	**Vallejo**	9.2	San Pablo Bay	Trickling Filter/Activated Sludge		Y (partial)		Liquid Chlorine
8	**San Mateo**	10.4	SB	Activated Sludge				Sodium Hypochlorite

Thanks!
Diana

Diana Lin, Ph.D.

San Francisco Estuary Institute
4911 Central Avenue
Richmond, CA 94804
510.746.7385

On Fri, May 31, 2019 at 8:34 AM David Williams <dwilliams@bacwa.org> wrote:

> Diana, please send me the meeting link
>
> Sent from my iPhone
>
> On May 30, 2019, at 10:11 PM, Lorien Fono <lfono@bacwa.org> wrote:
>
> > I can't make that time, but perhaps Dave can.
> >
> > **From:** Diana Lin <diana@sfei.org>
> > **Sent:** Thursday, May 30, 2019 9:10 PM
> > **To:** Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>
> > **Cc:** Lorien Fono <lfono@bacwa.org>; Rebecca Sutton <rebeccas@sfei.org>
> > **Subject:** Re: Bay RMP ethoxylated surfactants in effluent study
> >
> > Thanks! Let's do Thursday 6/6 10-11. I just sent a meeting invitation with the following conference call number:
> >
> > 1.415.594.5500
> > Conference ID: 943-326-397#
> >
> > -Diana
> >
> > Diana Lin, Ph.D.

San Francisco Estuary Institute

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Richmond, CA 94804

510.746.7385

On Thu, May 30, 2019 at 8:20 PM Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov> wrote:

> We should discuss the candidates. Here are my thoughts.
>
> Assuming the prime objective is to obtain representative samples of ethoxylated surfactants in POTWs to determine presence in treated effluent and loading to the Bay, we should avoid unique facilities, particularly since we are limited to eight sites.
>
> I'm hesitant to bias the selection based on AFFF usage. I assume the magnitude of AFFF use would be << overall industrial, commercial, and residential uses of ethoxylated surfactants. SFO is too unique and it's small. I'm more willing to include FSSD since it's a medium size POTW with advanced treatment comparable to Palo Alto.
>
> Sunnyvale's unique treatment chain is cause to exclude not include it.
>
> I would add a medium POTW with secondary treatment.
>
> FYI - EBDA is not a POTW; it's a combined discharge from seven POTWs.
>
> I could do a call on 6/6 between 10 and 11 am or 1230 to 2 pm.
>
> ---
>
> **From:** Diana Lin <diana@sfei.org>
> **Sent:** Thursday, May 30, 2019 5:51 PM

To: Lorien Fono; Mumley, Thomas@Waterboards
Cc: Rebecca Sutton
Subject: Re: Bay RMP ethoxylated surfactants in effluent study

Hi Tom and Lorien,

Just wanted to check-in again regarding the study design for ethoxylated surfactants. Do you have major comments that you want to discuss? If you are OK with the plan as outlined below, I'd like to move forward and contact facilities to participate in the study.

Lorien, should I work with you to solicit participation? Let me know if you have a suggested process for engaging facilities.

Thanks,

Diana

Diana Lin, Ph.D.

San Francisco Estuary Institute

4911 Central Avenue

Richmond, CA 94804

510.746.7385

On Fri, May 24, 2019 at 8:37 AM Diana Lin <diana@sfei.org> wrote:

> Hi Tom and Lorien,
>
> Becky and I discussed briefly with Lee Ferguson about the sampling objective and design for studying ethoxylated surfactants in wastewater effluent. Our objectives are to 1. understand loads to the Bay and 2. capture variations in effluent concentrations due to treatment or upstream sources.

Therefore we would prioritize sampling at the 6 largest POTWs (San Jose, EBDA, EBMUD, SFPUC, CCCSD, Palo Alto). We would add to the list FSSD and SFO because previous study by Houtz et al. indicated AFFF related usage which contains ethoxylated surfactants. We would also add Sunnyvale because of its interesting treatment chain. The project budget is for sampling at 8 plants, so we will need to narrow down the list to 8 (proposed 9). Included in the budget is for a blank at all facilities, and a duplicate at 2 facilities.

We would collect 24-hour composites from each facility. We would want to ask each participating facility what their cleaning procedures are for their sampling equipment and note this, since cleaning products can be an important source of contamination.

Are you interested in discussing over the phone? Becky and I are pretty clear Tues and Wed next week (Tuesday before 3 pm, Wed outside 11:30-1pm). The following week (week of 6/3), we are available Wed (6/5) and Thurs (6/6) before 2 pm.

Thanks!

Diana

Diana Lin, Ph.D.

San Francisco Estuary Institute

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510.746.7385

Lorien Fono

From: Lorien Fono
Sent: Wednesday, June 19, 2019 2:37 PM
To: Lorien Fono
Subject: FW: agenda item # 23 - wastewater presentations the SOE conference

From: David Williams
Sent: Tuesday, June 18, 2019 6:25 PM
To: Dunlavey, Eric <Eric.Dunlavey@sanjoseca.gov>; Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>; Jay Davis <jay@sfei.org>
Cc: David Senn <davids@sfei.org>; Melissa Foley <melissaf@sfei.org>; Ian Wren <ianwren@gmail.com>
Subject: RE: SOE Session Organizing Team: Water Quality and Freshwater Supply

I understand the deadline for the SOE agenda is tomorrow. If we go with options #1 and want a tag team effort of treatment upgrades and green nature based solutions, I think Mike Falk would be the best presenter for the treatment upgrade portion of the talk and we will need to confirm with him his availability.

David R. Williams
Executive Director
Bay Area Clean Water Agencies (BACWA)
Cell: 925-765-9616
Email: dwilliams@bacwa.org

From: Dunlavey, Eric <Eric.Dunlavey@sanjoseca.gov>
Sent: Tuesday, June 18, 2019 2:29 PM
To: Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>; Jay Davis <jay@sfei.org>
Cc: David Senn <davids@sfei.org>; Melissa Foley <melissaf@sfei.org>; David Williams <dwilliams@bacwa.org>; Ian Wren <ianwren@gmail.com>
Subject: RE: SOE Session Organizing Team: Water Quality and Freshwater Supply

Hi all,

Chiming in here with hopefully helpful input (I'm not on the SOE Planning Committee – so take it with a grain of salt).

If you go with option 1 for SOE, I agree that a BACWA perspective (i.e. HDR or other presenter) would be good for the second talk for the treatment upgrades piece of that talk. Option 1 does seem to fit a little better into what I'm seeing as the general theme: General overview of Nutrient Science followed two examples of additional focused work on management actions (Bay and then Delta).

I will note that this type of talk – upgrade to reduce nutrients or an example of current nature based solution project is one of the talks that garnered interest among the 3 BACWA reps (me, Karin, and Leah) at the RMP SC meeting as a talk for the POTW session of the RMP Annual Meeting. However, we were thinking of either the engineering talk OR the NBS example talk and we were not thinking that both would be covered in one talk or even covered in the RMP session. Also, the NBS talk could be a science based talk given by an SFEI scientist like Jeremy Lowe, or it could be a talk covering an example of an actual project like the Oro Lomo horizontal levee. That said, the RMP annual meeting POTW session is a discussion point at our Friday BACWA Board Meeting. Other ideas might materialize through that discussion, including a more Bay science focused talk for the RMP annual mtg. Just off the top of my head, something on Bay

segmentation for nutrient fate/transport (may not be ready?) or something on current state of knowledge and future direction of studies to understand nutrient biogeochemistry in the Bay might be decent candidates as alternatives to the HDR or NBS focused talks.

Eric Dunlavey
Wastewater Compliance Program Manager
Sustainability and Compliance Division
San José-Santa Clara Regional Wastewater Facility
700 Los Esteros Road | San José, CA 95134
Tel: 408.635.4017 | Fax: 408.586.8264
sanjoseca.gov/esd | sanjoseca.gov/wastewater

From: Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>
Sent: Tuesday, June 18, 2019 1:43 PM
To: Jay Davis <jay@sfei.org>
Cc: David Senn <davids@sfei.org>; Melissa Foley <melissaf@sfei.org>; David Williams <dwilliams@bacwa.org>; Ian Wren <ianwren@gmail.com>; Dunlavey, Eric <Eric.Dunlavey@sanjoseca.gov>
Subject: Re: SOE Session Organizing Team: Water Quality and Freshwater Supply

I prefer option 1.

Sent from my iPhone

On Jun 18, 2019, at 1:39 PM, Jay Davis <jay@sfei.org> wrote:

> Dave Senn and I just discussed this and have the following proposals for the SOE session.
>
> Option 1
> Dave Senn - Nutrient Science Overview
> BACWA or HDR person and Ian Wren (a two person tag-team) - Treatment upgrades and green solutions for Bay nutrient load reductions
> Tamara Kraus - Conceptual models and studies of the response of the Delta to the Regional San upgrade
>
> Option 2
> Dave Senn - Nutrient Science Overview
> Ariella Chelsky - HABs in the Bay
> Tamara Kraus - Conceptual models and studies of the response of the Delta to the Regional San upgrade
>
> Please let me know your preference or other comments. Under option 1, Dave would briefly cover the latest HAB findings as part of the overview.
>
> The draft lineup for the RMP Annual Meeting POTW block was very draft and open to BACWA input. The main thing is to have a science talk that the POTW folks will be excited about.
>
> I'll be participating in the SOE meeting on Friday (phoning in).

Jay

On Tue, Jun 18, 2019 at 1:11 PM Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov> wrote:

> There may be overlap, but they could/should be different presentations and audiences or at least I thought until I saw the potential RMP lineup. I wasn't expecting a separate RMP presentation on engineering and/or nature based solutions in addition to a BACWA presentation. I was expecting the RMP science presentation in the POTW session would be an SFEI scientist presenting past to current RMP findings relevant to POTWs.
>
> Our main challenge is the SOE Conf. deadline. Karen M said COB tomorrow is the extended due date. Are you attending the SOE Committee meeting on Friday? I'm not.
>
> Sent from my iPhone
>
> On Jun 18, 2019, at 10:05 AM, Jay Davis <jay@sfei.org> wrote:
>
> > Hi all;
> > Regarding the WW upgrades and management options, we need to think about possible overlap with the RMP Annual Meeting. We had tentatively slated a talk along those lines for the Annual Meeting as well. At the RMP SC meeting we decided to get input from BACWA on the Annual Meeting municipal wastewater session, and it is on the agenda for the BACWA Board meeting this Friday.
> >
> > Here's the latest draft of the RMP session on municipal wastewater:
> > o Regulator – Bill Johnson
> > o Discharger Group – BACWA – awaiting input from BACWA
> > o Science – HDR on engineering solutions or someone on nature-based solutions (Jackie Zipkin?) – awaiting input from BACWA
> > o Moderator: TBD
> >
> > Jay
> >
> > On Tue, Jun 18, 2019 at 9:53 AM Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov> wrote:
> >
> > > I agree, if we include WW upgrades and other management options etc, it would be best to have someone from BACWA (or (HDR) present. What do you want honk Dave W and Eric?
> > >
> > > I also agree that a talk just on algal toxins may be too specific. My preference would be an overview of Bay nutrients science (which would include algal toxins) to complement the talk on Bay nutrient management options.

Dave S - are you going to give the delta nutrients talk?

We need a decision ASAP. We need to submit a complete session = moderator, speakers and talk titles by COB tomorrow.

Sent from my iPhone

On Jun 17, 2019, at 7:20 PM, David Senn <davids@sfei.org> wrote:

> Hi
>
> Couple thoughts...
>
> 1. If you go the route of the wastewater upgrade presentation, seems likely that would be WWTP rep giving the presentation, do you agree?
>
> 2. If you want to include #1, and nutrients has 2 talks total, I'm not sure if I would suggest focusing that other talk entirely on HAB-toxins. For sure the results are interesting and are worth presenting; but describing only HABs results focuses on ~15% of the overall effort.
>
> - Dave
>
> ooo
> David Senn, PhD
> Senior Scientist
> San Francisco Estuary Institute
> 4911 Central Avenue
> Richmond, CA 94804
> mobile: (510) 999-1105
> davids@sfei.org
>
> On Mon, Jun 17, 2019 at 5:49 PM Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov> wrote:
>
> > I like the Algal Toxins option, but keep in mind the broad audience at the conference.
> >
> > I also like the wastewater plant one too as long as the speaker can point out that we are also looking for green alternatives.
> >
> > Sent from my iPhone
> >
> > On Jun 17, 2019, at 5:17 PM, Jay Davis <jay@sfei.org> wrote:
> >
> > > Hi Tom;
> > > Dave and I started discussing this and need to pick it up again in the morning. Here's where I think we are, but it's not a done deal yet. Your input is welcome.
> > > Jay

Session B: Nutrients

Session will focus on nutrients in South Bay, their relationship to sediment and algal toxins, and the outlook for upgrading wastewater treatment plants to reduce nutrient delivery to the Bay.

1. Nutrients and sediment management – conceptual model and implications - lowest priority - seems like the one to drop (since we only have room for three talks)
2. Algal toxins and accumulation in mussels - possible speaker Ariella Chelsky, SFEI - overview of HAB work - including preliminary data on high toxin concentrations in anchovies
3. Upgraded treatment works outlook - someone from HDR
4. Nutrient issues in the Delta and science related to the Sac Regional upgrade – Dave Senn - he has a report and presented on this at the IEP meeting - ties in well with #3

Lorien Fono

From: Lorien Fono
Sent: Tuesday, June 18, 2019 10:44 PM
To: Lorien Fono
Subject: FW: agenda item # 24 - ReNUWIt request for BACWA rep for stormwater conference

---

From: Richard G. Luthy <luthy@stanford.edu>
Sent: Thursday, May 30, 2019 9:56 AM
To: David Williams <dwilliams@bacwa.org>
Cc: Richard G. Luthy <luthy@stanford.edu>; Sasha Harris-lovett <sharrislovett@berkeley.edu>
Subject: Re: BACWA Representative for Stormwater Workshop re Bay Area One Water Network

Dave, please put this on the June agenda. Ideally this would be someone with perspectives on stormwater management and who has thought about capture and use.

Best, Dick

Richard G. Luthy
Silas H. Palmer Professor, Department Civil and Environmental Engineering, and
Director, Engineering Research Center for Re-inventing the Nation's Urban Water Infrastructure [renuwit.org]
Street address: Room 191, Yang & Yamazaki Environment & Energy Building, 473 Via Ortega
Stanford University, Stanford, California 94305-4020
email: luthy@stanford.edu telephone: 650-721-2615 fax: 650-725-9720
Research Group

On May 29, 2019, at 4:43 PM, David Williams <dwilliams@bacwa.org> wrote:

Dick, I would like to but unfortunately I will be out of the country that last week of July. How soon do you need an answer on the BACWA rep. I can put on our June Board meeting agenda (June 21st) and ask the Board who they would like to have represent BACWA at the Workshop. Let me know.

David R. Williams
Executive Director
Bay Area Clean Water Agencies (BACWA)
Cell: 925-765-9616
Email: dwilliams@bacwa.org

From: Richard G. Luthy <luthy@stanford.edu>
Sent: Wednesday, May 29, 2019 10:02 AM
To: David Williams <dwilliams@bacwa.org>
Cc: Richard G. Luthy <luthy@stanford.edu>; Kara Elizabeth Baker <Kara.Baker@stanford.edu>; Sasha Harris-lovett <sharrislovett@berkeley.edu>; Molly Mayo <MMayo@merid.org>
Subject: BACWA Representative for Stormwater Workshop re Bay Area One Water Network

Dave:

Thank you for your support.

We are planning our stormwater workshop for Thursday July 25 and half day Friday July 26. The location will most likely be in San Francisco at the SFPUC conference room.

The Planning Committee's first choice is that you represent BACWA given your broad perspective. If you are unavailable can you suggest an alternate.

Best wishes, Dick

Richard G. Luthy
Silas H. Palmer Professor, Department Civil and Environmental Engineering, and
Director, Engineering Research Center for Re-inventing the Nation's Urban Water Infrastructure [renuwit.org]
Street address: Room 191, Yang & Yamazaki Environment & Energy Building, 473 Via Ortega
Stanford University, Stanford, California 94305-4020
email: luthy@stanford.edu telephone: 650-721-2615 fax: 650-725-9720
Research Group

<190418_stormwater_description_RGL.pdf>

Bay Area Chemical Consortium (BACC) Program Administration
Meeting between DSRSD and BACWA
June 17, 2019

Participants:
Jeff Carson, Gemma Lathi, Megan Bucci (DSRSD)
Jackie Zipkin (EBDA)
Dave Stoops (BACWA) – via conference call

AGENDA

1. Timeline/Schedule
2. Member Agencies – 72 total, average 60 agencies participate per year
3. Chemicals – 14 typical, as many as 16 depending on agency participation
4. Work Effort Commitment – 300 to 400 hours
5. Growth of Program – participation interest continues

Attachments:

1. Bid 2019: Timeline/Schedule
2. Bid 2019: List of Agencies and Chemicals
3. List of Chemicals
4. List of Member Agencies
5. Sample Bid Document
6. Cost Summary

BAY AREA CHEMICAL CONSORTIUM (BACC)

SCHEDULE & PROCESS FOR BIDDING FOR FY 2019-2020 ORDER/DELIVERY

Activity	When	Completion Date
Survey: Send out survey to members to determine what chemicals each agency is interested in bidding this year	October 29, 2018	November 9, 2018
Review: Review of proposed changes to front-end documents	November-December 2018	
Review: Coordinator send summary of proposed changes to front-end documents based on comments/lessons learned and suggestions and requests received from vendors and agencies from last year's bid	November 30, 2018	November 27, 2018
Request for Information: Coordinator sends request for estimated annual quantities and delivery details (attach the templates)	Before Christmas Holiday	December 17, 2018
First Draft of Bid Documents: First draft of front end documents (without estimated annual quantities and delivery details) prepared and submitted to members for review	December 28, 2019	December 28, 2018
Deadline for Estimated Annual Quantities and Delivery Details: Participating members to submit information needed to complete the FY 2019-2020 bid documents *After deadline, coordinator send a summary of estimated annual quantities per chemical, per agency, for accuracy and completeness review	January 11, 2019	January 28, 2019
Ongoing Review and Update of Bid Documents: Incorporate ongoing updates received from agencies, corrections and edits.	January - February 2019	
Final Draft of Bid Documents: Final draft sent to agencies; all final changes must be received by February 22, 2019	February 21, 2019	February 21, 2019
Bid Documents: Bid documents finished and advertised for bidding in the Bay Area News Group newspaper and on eBid Board	March 5, 2019	March 5, 2019
Bid Openings and Preliminary Bid Tabulations: Bid openings for chemical bids. Prepare and send out preliminary bid tabulations same day	April 2, 2019	April 2, 2019
Bid Recommendations: Bid recommendations completed and circulated to BACC agencies with final bid tabulations; request agencies to review, especially any deviations, and provide a deadline to respond if agency has concerns	April 8, 2019	April 8, 2019 except for Ferrous Chloride sent April 17 (lowest bid rejected)
Bid Protest Deadline	April 9, 2019	April 9, 2019
Notice of Intent to Award with Final Bid Tabulation: Notice of intent sent to BACC agencies and to all bidders	April 16, 2019 (10 business days after bid opening,unless there is protest)	April 17, 2019
Award Letters: Award letter mailed to lowest responsive bidder for each chemical bid; email copies to BACC agencies	April 23, 2019	April 19, 2019
Invoices: Participation fee invoices sent to members	June 1, 2019	May 23, 2019
Annual Wrap-up Meeting: Annual wrap-up membership meeting	August 2019	TBD

BACC Chemicals for Fiscal Year 19/20, Survey Monkey Results

List of Chemicals to Bid

Aluminum Sulfate

Aluminum Sulfate 44%-49% Liquid Solution

Aluminum Sulfate 5% Acidized Liquid Solution (OPTIONAL BID ITEM)

Aluminum Sulfate 7% Acidized Liquid Solution (OPTIONAL BID ITEM)

Ammonium Sulfate

Ammonium Sulfate 40% Liquid Solution

Aqueous Ammonia

Aqueous Ammonia 19% Solution

Aqueous Ammonia 29% Solution

Aqueous Ammonia 30% Solution

Calcium Nitrate

Calcium Nitrate Solution

Calcium Nitrate (dry material)

Calcium Nitrate (dry material) Nitrate Oxygen

Citric Acid

Citric Acid 48% - 52% Liquid

Citric Acid (Crystalline Powder)

Citric Acid (Crystalline Powder) dry material

Ferric Chloride

Ferric Chloride

Ferrous Chloride

Ferrous Chloride

Hydrofluosilicic Acid (Fluoride)

Hydrofluosilicic Acid (Fluoride) 23% - 24%

Liquid Chlorine

Liquid Chlorine One-Ton Cylinders (2,000 lbs)

Liquid Chlorine 150-Lb Cylinders (OPTIONAL BID ITEM)

Sodium Bisulfite

Sodium Bisulfite 25% Solution

Sodium Bisulfite 40% Solution

Sodium Hydroxide

Sodium Hydroxide 20% (Caustic)

Sodium Hydroxide 25% (Caustic)

Sodium Hydroxide 30% (Caustic)

List of Chemicals to Bid

Sodium Hydroxide 50% (Caustic)

Sodium Hypochlorite 12.5%

Sodium Hypochlorite 12.5%

Sodium Hypochlorite 12.5% In Carboys (OPTIONAL BID ITEM)

Sodium Hypochlorite 5.25%

Sodium Hypochlorite 5.25% OPTIONAL BID ITEM

Sulfuric Acid

Sulfuric Acid 50%

Sulfuric Acid 93%

*Includes 2019 bid participants and those that have participated in the past

Bay Area Chemical Consortium (BACC)
Member Agencies by Region

Central Valley (8 Members)

City of Fresno	Fresno
City of Lathrop (Veiola NA)	Lathrop
City of Merced	Merced
City of Stockton	Stockton
City of Tracy	Tracy
Modesto Irrigation District	Modesto
Oakwood Lake Water District	Stockton
Turlock Irrigation District	Turlock

East Bay (6 Members)

Alameda County Water District	Fremont
City of Hayward	Hayward
City of San Leandro	San Leandro
East Bay Dischargers Authority	San Leandro
Oro Loma Sanitary District	San Lorenzo
Union Sanitary District	Union City

Marin Sonoma Napa (10 Members)

Central Marin Sanitation Agency	San Rafael
City of Mill Valley - Sewerage Agency of Southern Marin	Mill Valley
Fairfield-Suisun Sewer District	Fairfield
Las Gallinas Valley Sanitary District	San Rafael
Marin Municipal Water District	Corte Madera
Napa Sanitation District	Napa
North Marin Water District	Novato
Sanitary District No. 5 of Marin County	Tiburon
Sausalito Marin City Sanitary District	Sausalito
Sonoma County	Santa Rosa

Bay Area Chemical Consortium (BACC)
Member Agencies by Region

North Bay (16 Members)

Central Contra Costa Sanitary District	Martinez
City of Antioch	Antioch
City of Brentwood	Brentwood
City of Martinez	Martinez
City of Pinole (Pinole/Hercules WPCP)	Pinole
City of Pittsburg	Pittsburg
City of Watsonville	Watsonvilel
Contra Costa Water District	Concord
Delta Diablo Sanitation District	Antioch
Diablo Water District	Oakley
Ironhouse Sanitary District	Oakley
Mt. View Sanitary District	Martinez
Pleasant Hill Recreation & Park District	Pleasant Hill
Rodeo Sanitary District	Rodeo
Town of Discovery Bay CSD	Discovery Bay
West County Wastewater District	Richmond

Peninsula (7 Members)

City of Burlingame	Burlingame
City of Daly City/North San Mateo County Sanitation District	Daly City
City of Millbrae	Millbrae
City of San Mateo	San Mateo
City of South San Francisco	South San Francisco
Sewer Authority Mid-Coastside	Half Moon Bay
Silicon Valley Clean Water (SVCW)	Redwood City

Bay Area Chemical Consortium (BACC)
Member Agencies by Region

Sacramento (14 Members)

Carmichael Water District	Carmichael
City of Folsom	Folsom
City of Roseville	Roseville
City of Sacramento	Sacramento
City of Yuba City	Yuba City
County of Sacramento	Sacramento
El Dorado Irrigation District	Placerville
Nevada Irrigation District	Grass Valley
Placer County Water District	Auburn
Rancho Murieta Community Services District	Rancho Murieta
Sacramento County Water Agency	Sacramento
Sacramento Regional County Sanitation District	Elk Grove
Sacramento Suburban Water District	Sacramento
Woodland-Davis Clean Water Agency	Woodland

South Bay (5 Members)

City of Gilroy	Gilroy
City of Morgan Hill	Morgan Hill
City of Sunnyvale	Sunnyvale
San Jose - Santa Clara Regional Wastewater Facility	San Jose
Santa Clara Valley Water District	San Jose

Tri Valley (5 Members)

City of Dublin	Dublin
City of Livermore	Livermore
City of Pleasanton	Pleasanton
Dublin San Ramon Services District	Pleasanton
Zone 7 Water Agency	Livermore

As of 6/17/2019

71 Total BACC Members

BAY AREA CHEMICAL CONSORTIUM (BACC) FY 2019-2020 BIDDING
COST SUMMARY FOR DUBLIN SAN RAMON SERVICES DISTRICT AS BACC COORDINATING AGENCY
Chemical Bid Documents Prepared: 13

BACC – ESTIMATED HOURLY COSTS

TASK	COMMENTS	HOURS	Billing Rate	COST
Dan Lopez, Operations Support Services Supervisor	2018 work efforts	0.00	$139.30	$0.00
Supervisory support and advisor	2019 work efforts	30.00	$145.58	$4,367.40
Gemma Lathi, Administrative Analyst II	2018 work efforts	35.00	$104.23	$3,648.05
Coordinator	2019 work efforts	226.50	$108.93	$24,672.65
Megan Bucci, Administrative Assistant II	2018 work efforts	0.00	$63.61	$0.00
Misc admin support, eBidboard coordinator	2019 work efforts	6.00	$66.16	$396.96
Levi Fuller, Plant Operations Supervisor	2018 work efforts	0.00	$247.81	$0.00
Bid opening: read/announce bid prices	2019 work efforts	2.00	$267.24	$534.48
Jeff Carson, Operations Manager	2018 work efforts	0.00	$169.43	$0.00
Management support and advisor	2019 work efforts	5.00	$186.02	$930.10
	TOTAL COMBINED HOURS AND COST	**299.50**		**$33,619.54**

BACC - ESTIMATED MISCELLANEOUS EXPENSES

Legal Ad Cost	Legal Ad Publishing for 15 chemical bids - Bay Area News Group			$1,190.70
Postage Cost	Mailing notice of award letters, protest responses and miscellaneous correspondence			$45.73
Office Supplies	Envelopes, paper, labels			$194.93
Conference Call Meeting Cost	AT&T TeleConference for BACC Meetings			$0.00
Photo Copy Cost	Estimate			$211.17
BACC Membership Meeting	No expenses during 8/30/2018 meeting			$0.00
Legal Counsel Cost	DSRSD Legal Counsel legal advices on various BACC issues (i.e., bid document language, Force Majeure Deviation for Ferrous Chloride Bid 06-2019, etc.)			$442.00
	TOTAL MISCELLANEOUS EXPENSES			**$2,084.52**
	TOTAL HOURLY COSTS AND EXPENSES			**$35,704.06**

Total combinations for 13 chemical bids:	**195**
Participation Fee per Bid:	**$183.00**
Billed ($183 x 195):	**$35,685.00**

Lorien Fono

From: Lorien Fono
Sent: Tuesday, June 18, 2019 10:49 PM
To: Lorien Fono
Subject: FW: agenda item #27 - Fire Reclamation Study Advisor work

From: Greg Kester <gkester@casaweb.org>
Sent: Wednesday, May 29, 2019 2:11 PM
To: Tom Meregillano <TMEREGILLANO@OCSD.COM>; Matt Bao <mbao@lacsd.org>; Mike Sullivan <msullivan@lacsd.org>; Ray Arthur <Ray.Arthur@fresno.gov>; Rick Staggs <Rick.Staggs@fresno.gov>; Christina Jones <christina.jones@lacity.org>; Timeyin Dafeta <Timeyin.Dafeta@lacity.org>; Jeff Ziegenbein <jziegenbein@ieua.org>; Cathleen Pieroni <cpieroni@ieua.org>; Debbie Webster <eofficer@cvcwa.org>; Carolyn Ginno <CGinno@sandiego.gov>; Amber Baylor <abaylor@socwa.com>; David Williams <dwilliams@bacwa.org>; Sherry Hull <shull@bacwa.org>; Zach Kay <ZKay@ci.santa-rosa.ca.us>
Cc: Jessica Gauger <jgauger@casaweb.org>; Bobbi Larson <blarson@casaweb.org>; David Crohn <david.crohn@ucr.edu>; Harry Allen <Allen.HarryL@epa.gov>; Brett Dingman <BDingman@lvmwd.com>; vhurtado@lvmwd.com; Adam Link <alink@casaweb.org>; Mike Steinlicht <mikes@encinajpa.com>; onavarrete@encinajpa.com; Layne Baroldi <lbaroldi@synagro.com>
Subject: Fire Reclamation work

Hello everyone – I wanted to provide you an update that the fire reclamation project intended to quantify the benefits of biosolids for such purposes is proceeding at Las Virgenes Municipal Water Districts compost facility in Calabasas. Many thanks to you all for your financial contribution to support this and to Las Virgenes MWD for all of their in-kind support and assistance. Synagro is likewise providing in-kind support by transporting heat dried pellets from Encina to the project site. We hope to begin in the next month or so. The Water Research Foundation (WRF) will be administering the project. They have $71,000 already, which you provided some time ago ($10,000 each from OCSD, Fresno, LA San, IEUA, LACSD, CVCWA, San Diego, and $1,000 from SOCWA). WRF will be sending you each Letters of Agreement (LOA), which essentially is to confirm that you still want the funds to be used for this purpose. BACWA ($10,000) and Santa Rosa ($2,500) will be receiving invoices along with the LOA. We are working with WRF to figure out how best to administer the project. We are hopeful of being granted an additional $200,000 from the California legislative budget process based on Jessica's good work. If successful, we will break the project into three phases. Las Virgenes will be phase 1, a Northern California site (as yet undetermined) would be phase 2 (led by UC Davis), and a return to Colorado to re-evaluate the site reclaimed 25 years ago to quantify long term benefits (led by Colorado State) would be phase 3. I wanted to provide this update and heads up on what to expect from WRF. We would also like to invite each contributing agency to be represented on our advisory committee. Please let me know if you are interested and who the representative will be. Also please let me know if you have questions or comments in the meantime. It is very exciting to actually be about to begin this process which has been attempted for many years!! Thanks again - Greg

Greg Kester
Director of Renewable Resource Programs
CA Association of Sanitation Agencies
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Lorien Fono

From: Lorien Fono
Sent: Tuesday, June 18, 2019 10:57 PM
To: Lorien Fono
Subject: FW: agenda item #28 - BACWA speaker for the RMP Annual Meeting

From: Dunlavey, Eric <Eric.Dunlavey@sanjoseca.gov>
Sent: Tuesday, June 18, 2019 10:26 AM
To: David Williams <dwilliams@bacwa.org>; Lorien Fono <lfono@bacwa.org>
Cc: North, Karin <Karin.North@cityofpaloalto.org>; Walker, Leah <LWALKER@ci.petaluma.ca.us>; Mary Lou Esparza <MEsparza@centralsan.org>
Subject: FW: RMP Annual Meeting Session on Municipal Wastewater

Dave and Lorien,

It appears the item on the BACWA Board agenda about RMP annual meeting speaker is a little broader than just a single speaker. RMP would like input/recommendations from BACWA on

(1) a speaker about general wastewater treatment information – more like a history+vision of where we were, where we are (and how we're all different), and where we're going regionally.
(2) Recommendation on a speaker and topic for a more science based presentation. Could be an HDR presentation on upgrades/optimization, or a look at what's been done so far regarding Nature Based Solutions, or some other science topic of interest that is relevant to BACWA (topic is an obvious discussion point on Friday).
(3) Ideas about a moderator for the session – presumably also from the wastewater agencies.

Jay also mentioned that the overall goals of this year's annual meeting are to attract an audience that represents all participant categories, highlight RMP work (but not exclusively), and have new faces presenting.

Eric Dunlavey
Wastewater Compliance Program Manager
Sustainability and Compliance Division
San José-Santa Clara Regional Wastewater Facility
700 Los Esteros Road | San José, CA 95134
Tel: 408.635.4017 | Fax: 408.586.8264
sanjoseca.gov/esd | sanjoseca.gov/wastewater

From: Jay Davis <jay@sfei.org>
Sent: Tuesday, June 18, 2019 9:47 AM
To: North, Karin <Karin.North@cityofpaloalto.org>
Cc: Dunlavey, Eric <Eric.Dunlavey@sanjoseca.gov>; Walker, Leah <LWALKER@ci.petaluma.ca.us>; Mary Lou Esparza <MEsparza@centralsan.org>
Subject: Re: RMP Annual Meeting Session on Municipal Wastewater

Hi Karin and all;

I just noticed that the item on this for the BACWA Board meeting is "BACWA speaker for Regional Monitoring Program Annual meeting". We are actually looking for more than a speaker - rather input on the whole session.
Here is what I currently have in the draft agenda:

Municipal Wastewater
o Regulator – Bill Johnson
o Discharger Group – BACWA – awaiting input from BACWA
o Science – HDR on engineering solutions or someone on nature-based solutions (Jackie Zipkin?) – awaiting input from BACWA
o Moderator: TBD

So we're looking for input on two talks (and the moderator if you have ideas on that).
Thanks,
Jay

On Thu, Jun 13, 2019 at 2:49 PM North, Karin <Karin.North@cityofpaloalto.org> wrote:

> We are putting on the agenda for the June BACWA Board meeting. Leah just reminded us this week.
>
> Thanks,
>
> Karin
>
> ---
>
> **From:** Jay Davis [mailto:jay@sfei.org]
> **Sent:** Thursday, June 13, 2019 2:38 PM
> **To:** North, Karin; Dunlavey, Eric; Walker, Leah
> **Cc:** Mary Lou Esparza
> **Subject:** RMP Annual Meeting Session on Municipal Wastewater
>
> **CAUTION: This email originated from outside of the organization. Be cautious of opening attachments and clicking on links.**
>
> ---
>
> Hi all;
>
> At our last Steering Committee meeting on April 30 we came up with an action item for BACWA to provide input on the session on Municipal Wastewater. BACWA was going to discuss it at the next BACWA Board meeting. I'm writing to see if you had that discussion, and, if so, what came out of it.
>
> The latest version of the outline for the meeting is attached.

Many thanks,

Jay

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Interested in quarterly updates on products and highlights from the Regional Monitoring Program for Water Quality in San Francisco Bay? Subscribe here.

For alerts to information on Bay water quality, follow me on Twitter: @JayDavis_ASC

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Dr. Jay Davis

Senior Scientist

San Francisco Estuary Institute/Aquatic Science Center

4911 Central Avenue, Richmond, CA 94804

(510) 746-7368

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Interested in quarterly updates on products and highlights from the Regional Monitoring Program for Water Quality in San Francisco Bay? Subscribe here.

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Dr. Jay Davis
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Lorien Fono

From: Lorien Fono
Sent: Tuesday, June 18, 2019 10:53 PM
To: Lorien Fono
Subject: FW: agenda item #30 - support for PPIC
Attachments: BACWA_Sponsorship Letter.pdf; WPC Case for Support.pdf; PPIC_WPC_InspiringChange_may2019.pdf

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From: Caitrin Phillips Chappelle <chappelle@ppic.org>
Sent: Thursday, June 6, 2019 11:15 AM
To: David Williams <dwilliams@bacwa.org>
Cc: Beth Elder <elder@ppic.org>
Subject: Support the Water Policy Center

Dear David,

I hope this message finds you. We have been having really interesting and productive conversations about the Managing Wastewater in a Changing Climate report, and expect them to continue! Want to make sure you saw our commentary in Cal Matters and latest blog on the ripple effects of increasing recycled water production- both of which led to folks from the legislature reaching out to learn more. Would love to hear if you have gotten any feedback from the sector or thoughts on future areas of research.

I want to sincerely thank you for your support of PPIC in the past- and am writing today to ask for your support again. In the next few days you will receive a mailed invitation to join us as an annual supporter of the Water Policy Center, and in the meantime I am attaching copies of the materials.

Your sponsorship provides critical resources that significantly increase our ability to respond strategically and thoughtfully to the state's rapidly changing water policy environment. The materials contain more details about this year's programs including the 2019 policy brief, *Priorities for California's Water*, and our annual fall conference. We hope that you will come on board.

We'll be in touch in the coming days. In the meantime, please feel free to contact me directly if you have any questions!

Thank you!

Caitrin

Caitrin Chappelle
Associate Center Director
PPIC Water Policy Center

PUBLIC POLICY
INSTITUTE OF CALIFORNIA
500 Washington Street, Suite 600
San Francisco, CA 94111
tel 415 291 4435
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PPIC 25 YEARS

June 7, 2019

David Williams
Executive Director
Bay Area Clean Water Agencies
P.O. Box 24055, MS 59
Oakland, CA 94623

Dear David, Dave

As the leadership transition takes shape in Sacramento, the center's role as an honest broker of strategic and rigorous research will become even more critical. During this important transition, we'll be doubling down on our efforts to illuminate priority water challenges and make the case for practical policy solutions.

In the past year the center tackled a variety of topics, including managing for drought in a changing climate, envisioning water futures for the San Joaquin Valley, and managing wastewater. Our California's Water briefing kit outlined issues that are front and center for managing California's water supply and natural environment. In conjunction with its release, our third annual water conference was attended by more than 300 people and viewed by 800 more via live webcast. We produced more than 70 reports, blogs, and fact sheets on a range of topics. We traveled the state to discuss our findings with policymakers, business leaders, water users, and other stakeholders. Our products and outreach are enriched by our dynamic research network from California's leading scientific institutions.

We would like to invite you to join us with an annual sponsorship of the PPIC Water Policy Center at the $10,000 level. Your support provides critical resources that significantly increase our ability to respond strategically and thoughtfully to the state's rapidly changing water policy environment. Your annual contribution is essential to these key initiatives:

- The 2019 Priorities for California's Water, policy brief. Updated every two years, this informative and popular piece features sponsors who contribute in the year it is released.
- The annual fall conference—California's premier water policy event.
- Targeted activities that will position the center as a key resource for California leaders.

Annual sponsors are noted prominently on the policy brief, PPIC's website, and event invitations and signage. In addition, sponsors have many excellent opportunities to connect with a broad community of policymakers and others committed to improving water policy in California.

Members of the PPIC Water Policy Center team will follow up with you shortly about this important opportunity. In the meantime, please feel free to contact me directly (hanak@ppic.org or 415-291-4433). Thank you for your consideration.

With kind regards,

Ellen Hanak
Center Director

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San Francisco, California 94111
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C. BACWA Committees

Committee	Chair	Vice/Co-Chair	Comments
AIR	Nohemy Revilla, SFPUC, Co-Chair	Randy Schmidt, CCCSD, Co-Chair	CASA Climate Change Group Representative
BAPPG	Autumn Cleave, SFPUC, and Robert Wilson, Petaluma (Co-chairs)	Simret Yigzaw, (San Jose) V-Chair of Budget; Joe Neugebauer (WCWD) V-Chair of Reporting	Robert Wilson is new Co-Chair effective November 2017
BAPPG Pesticide Subcommitee	Karin North, Palo Alto	Robert Wilson, Petaluma; Autumn Cleave, SFPUC	
Biosolids	Co-Chair	Co-Chair	Committee Dormant due to biosolids activities being carried out by BABC.
Collection Systems	Andrew Damron, Napa San, Chair	Erin Smith, City of Alameda, V-Chair	
Info Share Ops/Maint	Joaquin Gonzales, Delta Diablo, Co-Chair	Kevin Dickison, EBMUD, Co-Chair	
InfoShare/Asset Mgmt	Co-Chair	Co-Chair	Both Dana Lawson, CCCSD, and Aaron Johnson, DSRSD, stepped down form Co-Chair positions. Committee on hiatus for now
Laboratory	position open	Dan Jackson, Union San, Vice-cahir	
Permit	Samantha Engelage, City of Palo Alto, Chair	Mary Lou Esparza, CCCSD V-Chair	
Pretreatment	Tim Potter, CCCSD, Co-Chair	Michael Dunning, Union San, Co-Chair	
Recycled Water	Stefanie Olsen, DSRSD, Co-Chair	Justin Waples, CCCSD, Co-Chair	0

FY20 BACWA EXECUTIVE BOARD
PROPOSED REGULAR MONTHLY MEETING SCHEDULE

DATE	TIME	LOCATION
July 19, 2019	9:00 – 12:30	EBMUD HQ, 2nd Floor Large Training Room
August 16, 2019 *(Short Regular Board Meeting-* *Pre-Pardee Tech Seminar*	8:30 – 9:00 9:00 – 4:00	SFPUC, Hetch Hetchy Room EBMUD Pardee Reservoir Facility
September 26-27, 2019 *(Pardee Tech Seminar – no regular Board meeting in September*	TBD	
October 18, 2019	9:00 – 12:30	EBMUD HQ, 2nd Floor Large Training Room
November 15, 2019	9:00 – 12:30	SFPUC, Hetch Hetchy Room
December 20, 2019 *(Holiday & Committee Leadership Appreciation Lunch)*	9:00 – 12:30 12:30 – 2:00	EBMUD HQ, 2nd Floor Large Training Room
January 10, 2020 *Annual Members Meeting*	9:00 – 3:00	Scottish Rite Center
February 21, 2020	9:00 – 12:30	SFPUC, Hetch Hetchy Room
March 20, 2020	9:00 – 12:30	EBMUD HQ, 2nd Floor Large Training Room
April 17, 2020	9:00 – 12:30	SFPUC, Hetch Hetchy Room
May 15, 2020	9:00 – 12:30	EBMUD HQ, 2nd Floor Large Training Room
June 19, 2020	9:00 – 12:30	SFPUC, Hetch Hetchy Room

Special Board Meetings to be scheduled in FY20:

Joint BACWA/San Francisco Bay Regional Water Board meetings are planned for September (Pardee), November, February, May, and July, and other dates as needed.

Meeting Date: April 3, 2019
Executive Board Meeting Date: April 19, 2019
BAPPG Chair: Autumn Cleave, Robert Wilson

Committee Notes are available online.
17 attendees representing 8 member agencies

Steering Committee Update

The Steering Committee conference calls will be switched to the Tuesday of odd months from 10-11 am. For the RFQ for outreach support, four firms sent in their qualifications. The selection committee was unable to choose between the top two firms, so has issued an RFP to just the two of them, with a deadline of June 14. (Edited after the meeting to add that only one firm – SGA – submitted a proposal, so we will negotiate a contract with them). Doug Datawalker is looking for agencies to send him GIS shape files of their sewersheds so that the committee can put together a map of different agencies' jurisdictions in the Region.

Water Board Report-out

The 2019 P2 Award nomination is now open.

Microplastics update

Carolynn Box of 5Gyres gave a presentation on the results of microplastics surveys in the Bay, where samples were collected from the surface via Manta trawl. Some key points:

- More than 21,000 microparticles were collected
- 10% of particles were analyzed w/ spectroscopy
- More than 68% of microfibers positively identified as plastic through spectroscopy
- Approximately 50% of stormwmater particles were rubber
- Atmopheric desposition poorly understood as a source
- Ecological impacts need more study

Alicia Gilbreath, SFEI, presented the results of studies focusing on sources of microplastics to the Bay. At the May 22 RMP Microplastics Worksgroup meeting, microplastics were promoted to "moderate concern" tier from the "possible concern" tier, following European Union directive that microplastic is a non-threshold substance for which no safe level exists. "There is currently insufficient information to derive a robust predicted no effect concentrations (PNECs) for microplastics, that could be used to justify a conclusion that risks are adequately controlled."

Results of 24-hour composite sampling at 8 POTWs in 2018 showed that advanced secondary plants had lower microparticle counts than plants without filtration. However, the total counts are still millions per day. The majority of microparticles discharged by POTWs are fibers, followed by fragments, then foam. Most fibers could not be identified as natural or synthetic because the dyes mask the signal of the material. Of the fragments, 55% were identified as plastic. In aggregate, 47 billion microparticles are discharged annually to the SF Bay by POTWs, of which 21 billion are estimated to be plastic.

For stormwater sampling, 10.9 trillion microparticles to SF Bay annually; 63-90% of that is plastic. (Half of microparticles are rubber fragments). This means that stormwater contributes more than 200 times the load of POTWs. Industrial areas appear to be disproportionally contributing to microparticle loading.

Budget

The FY19 committee budget was approximately 86%, spent.

Next BAPPG Meeting

BAPPG General Meeting
August 7, 2019: 10:00am-12:00pm
SFPUC - 525 Golden Gate Ave; 2nd floor, O'Shaughnessy Conference Room A and B

Laboratory committee meeting on: June 11, 2019
Executive Board Meeting Date: June 21, 2019
Committee Chair : Jason Mitchell, standing in for Nirmela Arsem

Committee Request for Board Action: none

18 attendees representing 14 member agencies

Toxicity
Lorien gave an update on the latest Toxicity Provisions timeline. Important issues for Region 2 going forward continue to be how reasonable potential is determined, and how to qualify for the reduced monitoring frequencies. Statewide, how *Ceriodaphnia dubia* testing is conducted, and how the results are used, is an issue of high importance, but less relevant in the SF Bay Region since few of our agencies use it as a test species

Nutrient Watershed Permit
The Watershed Permit was adopted on May 8. There are some changes to the monitoring and reporting program:
-New influent monitoring requirements for agencies rated >10 mgd
-No more TKN or soluble reactive phosphorus monitoring in effluent
-Reporting year now lines up with water year (October 1 to September 30), whereas previously it was permit year (July 1 to June 30)
Participants were invited to stay for the Permits Committee, where HDR would be in attendance to discuss the new data worksheet for reporting.

Instrumentation Database
Chris Francis emailed out an Excel document as a first step toward creating an instrumentation and method database for the Lab Committee. He got several responses which he inputted into the spreadsheet. The next steps are to determine whether the data will be stored as a database or spreadsheet, and how it will be updated.

Lab Committee Survey
The Committee reviewed the survey results. There was overwhelming support for going to every other month. Most respondents wanted to meet the morning of the permits committee. There was some support for changing locations. The group agreed to one meeting per year at another site/day of the month.

Committee leadership
The committee is seeking new leadership for the coming year, and will go to a systems where the vice chair replaces the chair once per year. There were two volunteers for vice-chair but no volunteers for the chair position.

Microplastics
There was a summary of the presentations at the BAPPG meeting on microplastics (5Gyres Presentation and SFEI presentation). Preliminary estimates indicate that stormwater is the source of more than 200x the count of microplastics to the Bay compared to POTWs. SCCWRP is looking for POTW lab volunteers to participate in a method standardization study. Lorien will find out more about their needs and get back to the committee.

Instrumentation
There was a discussion about self-certification for pipettes, and how calibration and verification are different processes. Under TNI, agencies will need to meet the measurement traceablility standard.

LIMS Update
Two agencies are currently doing LIMS updates. Their new systems will be browser-independent. There was a discussion about automatic reporting to CIWQS via LIMS.

Certification
There was a discussion about timing of interim versus final certificates. ELAP often waits until the day the interim certificate expires before issuing a final certificate – agencies should email ELAP before expiration.

Recruitment
SFPUC has 10 technican positions open
EBMUD has a Chemist I position open
CMSA has an environmental services analyst position open
San Jose is recruiting 6 laboratory technicians

Next meeting: August 13, 2019

Permits Committee –
Report to BACWA Board

Permits Committee Meetings on: 6/11/19
Executive Board Meeting Date: 6/21/19
Committee Chair: Samantha Engelage

Committee Request for Board Action: None

30 attendees (including 4 on phone), representing 19 member agencies.

Nutrients

a. Nutrient Watershed Permit Adoption – The permit was adopted on May 8 and goes into effect July 1.
b. Group Annual Reporting (GAR) – The HDR team that puts together the GAR was in attendance to walk participants through the data worksheet. It goes from July 1 through September 30 since the new reporting year will match the water year (Oct through Sept), rather than the permit year (July through June) as was the case in the first Permit. They will deliver a new worksheet for the next Water year by the beginning of October. The spreadsheet has been updated to match RWB load calculations, and for the new monitoring parameters. Members should note the influent monitoring is not optional for agencies rated >10mgd. Agencies should submit their data to HDR by the end of October, and they will develop a draft GAR for the committee to review in December.
c. NBS Study – BACWA has signed a contract with SFEI to conduct the Nature Based Systems study required by the Nutrient Watershed Permit. The effort will be overseen by a group of BACWA representatives from the different subembayments.
d. Recycled Water Report – BACWA has issued an RFP for consultant support of the Report. This effort will be overseen by the Recycled Water Committee.

Upcoming Permits

June – *Sonoma* – No issues

July – *SSF/San Bruno* – The permit requires the Board to adopt a private sewer lateral ordinance in exchange for continued bypass approval. BACWA will address this issue with Regional Water Board staff at our next joint meeting.

August – *SFPUC Oceanside Plant* – Jennie Pang gave an overview of the Tentative Order, which was written by EPA since the outfall is outside California jurisdictional waters. It is complicated by the fact the SFPUC is a combined sewer system. The new Order covers discharge of RO concentrate from the Westside recycled water facility which will come online during the next permit term. It also includes a requirement to do a flame retardant study, which is not well defined. They get larger dilution credit for times when they have reduced flow.

Collection Systems info in Permit Reissuance letters

FSSD was recently inspected by Regional Water Board staff and asked whether they would want the Collection System included in their new NPDES permits. There was a discussion about the Reginal Water Board asking for more information on Collection Systems to add to NPDES permits, and possibilities for curtailing this trend.

Enterococcus Study

To be granted dilution credit in the calculation of the new objectives the Water Board will need background enterococcus levels in the receiving water. BACWA has contracted with SFEI to develop a sampling proposal with 19 sites, which was circulated to the committee in draft form. The current draft shows sample points 200 ft from outfalls, and members of the committee were concerned that the location of the outfalls is not known with sufficient precision to be assured that we would not be sampling from the effluent plume. Lorien will ask the Water Board if they would be satisfied with a distance in the 500-1000 foot distance from the outfall. BACWA is preparing to enter a contract with Cel Analytical to do the analysis via membrane filtration. SFPUC will do the sampling via their boat.

Chlorine Residual Basin Plan Amendment

Tom Hall has sent the Regional Water Board the simple edits needed to the BP Tables 3-3, 3-4, and 4-2 for the TRC BPA. The proposed Basin Plan objectives will be based on EPA criteria, and the 0.0 mg/L instantaneous maximum limit will be removed from Table 4.2, and there would be recognition of a reporting limit. Shallow dischargers will get the same dilution credit that they would get for cyanide. There was a discussion about other possible amendments to clean up the Basin Plan that could piggyback on this effort. One possibility would be to remove oil and grease as POTW monitoring parameters. Another would be to adopt the State Water Board's new enterococcus objectives. The Water Board will get back to BACWA on the Oil and Grease and Enterococcus issues, and what resources may be needed to adopt them into the Basin Plan.

Toxicity

The Regional Water Board has posted an updated schedule for the adoption of the Toxicity Provisions (edited to add they have updated the schedule again since the Permits committee meeting). Important issues for Region 2 going forward continue to be how reasonable potential is determined, and how to qualify for the reduced monitoring

frequencies. Statewide, how *Ceriodaphnia dubia* testing is conducted, and how the results are used, is an issue of high importance, but less relevant in the SF Bay Region since few of our agencies use it as a test species.
Announcements a. CASA looking for representatives for Water Quality Monitoring Coalition b. Regulatory issues matrix updated c. RMP Annual Meeting 10/10
Next BACWA Permits Committee Meeting: Tuesday, August 13, 2019 12:00 to 2:00 PM, EBMUD lab library.

Recycled Water Committee Meeting on: 5/21/19
Executive Board Meeting Date: 6/21/19
Committee Chair: Stefanie Olson, Leah Walker

Committee Request for Board Action: None

Detailed notes from meetings are posted online.
27 attendees (including 16 on phone) representing 12 member agencies

Federal Funding update

Water Infrastructure Improvements for the Nation (WIIN) Act

The U.S. Bureau of Reclamation posted their WIIN Act Recycled Water Funding Opportunity Announcement (BOR-DO-F018) on April 29, 2019 with applications due June 28, 2019. This provides the last $20 M of the $50 M program authorization. Agencies/project sponsors who have USBR-approved feasibility studies (which have been transmitted to Congress) are eligible to apply. USBR expects to make about 6 awards.

Congresswoman Grace Napolitano's "Water Recycling Investment and Improvement Act" (H.R. 1162) currently has 26 cosponsors and was last referred to the Subcommittee on Water, Oceans, and Wildlife (of which Congressman Huffman is Chair and Napolitano is a member). This bill would increase the authorization of appropriations for the recycled water grant program under the WIIN Act from the original $50 M to $500 M. It would also increase the current per project federal share from $20 M to $30 M (for all Title XVI projects). Even with the current program authorization capped, Congresswoman Napolitano has reportedly been pushing appropriators to add significant recycled water funding in the FY20 budget.

Recycled Water Permit Transition

The effective date for the Recycled Water Policy is the end of April 2019. This means that projects with post-2001 Engineering Reports must be transitioned to the State General Order by the end of April 2020. There are only a few agencies with Engineering Reports that are older than 2001 - Livermore and SASM. Regional Water Board staff will get back to the Committee with any gaps in information that the Committee will help to gather. They are awaiting legal opinion about covering the production gap created by the State General Order, which states that it does not cover production. Upon consultation with the SWB attorney, Regional Water Board staff concluded that production does not need to be permitted, unless there is a discharge to land or water, in which case it needs to be covered by WDR or NPDES. They are planning another consultation with Regional Water Board management, as well as SWB staff, since there still isn't sufficient clarity.

Nutrient Discharge Reduction by Water Recycling

The Recycled Water Committee will provide oversight for the Recycled Water Report required by the Nutrient Watershed Permit. This will be a standing item on committee agendas moving forward.

Legislation update

AB 292 (Quirk) Potable Reuse Terminology (WRCA sponsored bill)
Bill passed out of the Assembly with no 'no' votes. WRCA met with SWRCB staff recently to discuss staff's concern that definition of raw and treated water augmentation is too narrow. WRCA is considering revising the definition of the 4 different types of potable reuse so that all types of potable reuse projects can be captured in one of the categories, which will minimize the need for special permitting by the SWRCB.

AB 405 (Rubio) Tax Exemption RW Chemicals
Bill is on Appropriations suspense. Key concern is that bill excludes public agencies from tax exemption of recycled water treatment chemicals (bill currently applies to privately owned "public utilities"). Author understands the concern.

AB 1180 (Friedman) Title 22 Update NPR (WRCA sponsored bill)
SWRCB prefers the handbook method to update T22. However, WRCA members are not comfortable with the more informal handbook process to update T22 – Jennifer West informed SWRCB staff of WRCA's position. WRCA encourages letters of support from agencies to support this bill. Bill passed out of the Assembly Appropriations Committee today. This bill will now go to the Assembly Floor in next two weeks for a vote and then to the Senate Environmental Quality Committee.

AB 1588 (Gloria/Grey) Water-Wastewater Training
Bill is on Appropriations suspense.

SB 332 (Hertzberg-Wiener) Ocean WW Discharge
The Senate Appropriations Committee "held" — did not pass to the floor — Senator Hertzberg's bill SB 332 that would severely limit ocean wastewater discharges. This means it is likely a two-year bill as it missed the legislative deadline to pass to floor for a vote. While there are rule waivers that could come into play, WRCA thinks there is only a slim chance it will reemerge in 2019. The Senator can take up the bill next year in the Senate Appropriations Committee.

SB 45 (Allen-Stern) Wildfire, drought, flood bond
Includes $600 M for water supply.

Budget Prop 68 RW Funds
The proposed Prop 68 includes $80 million in grants and loans for recycled water projects. Senate moved measure forward. Waiting to see what happens in Assembly. Assume that bill will move through with support. Funds are tied to same guidelines as Prop 1 program.

CWSRF Intended Use Plan Comment Letter
There are upcoming workshops on changes and updates to the plan. A major proposed change is 0.25% interest rate reduction if applicant is willing to take a 20-year loan. Construction costs are eligible. State targeting to issue a little over $1 billion in loans this year from the program. Large projects have concerns with size of 20-year loan.

Next Meeting – Tuesday, July 16, 2019, 10:30 am to 12:30 pm, EBMUD Small Training Room

Executive Director's May 2019 Report

NUTRIENTS:

Completed a variety of tasks and activities associated with BACWA's interests on nutrients and collaborating with the Water Board including:
-Coordinated with the NMS Science Manager on presentations, meetings, and key issues on nutrients.
-Conducted follow-up discussions with the WB staff and SFEI on the scope of work and cost for the Nature Based Solutions Study which is required by the 2nd Nutrient Watershed Permit
-Attended the meeting of the Nutrient Technical Workgroup and presented BACWA's issues and concerns.
-Attend the May meeting of the SF Regional Water Board where the 2nd Nutrient Watershed Permit was adopted.
-Coordinated with the Water Board and consultants on the scope of work for the Regional Recycling Report required under the 2nd Watershed Permit.

BACWA BOARD MEETING AND CONFERENCES:

-Worked with staff in preparing for the May Board Meeting.
-Conducted the monthly agenda review with the Chair of BACWA
-Held the monthly Board meeting for May
-Continued to track all action items to completion
-Attended the bi-monthly Joint Meeting with the Water Board staff

ASC/SFEI:

-As the Chair of the Governance Committee, coordinated with the SFEI Executive Director on committee activities.
-Provided input on the agenda for the June quarterly Board meeting of ASC/SFEI

COLLECTION SYSTEM COMMITTEE:

-Coordinated with the RPM on planning for the next Collection System Committee meeting
-Coordinated with BACWA staff on the collaborative effort amongst CASA, SCAP and BACWA on continuing to inform the SWRCB on issues with the proposed SSS WRD.

BIOSOLIDS COMMITTEE:

-Participated in a joint discussion with the Biosolids Committee and the Bay Area Biosolids Coalition on the future activities and coordination between the two groups.

FINANCE:

-Reviewed the monthly BACWA financial reports with the RPM.
-Worked with the RPM to prepare for closing of FY 19 and invoicing for FY 20.

RECYCLED WATER COMMITTEE:

-Attended the Recycled Water Committee and provided updates on BACWA activities and the Recycled Water Report required by the 2nd Nutrient Watershed Permit.

LAB COMMITTEE:

-Participated in discussion between the Lab Committee and SFEI on the Microplastics Workshop
-Attended the SFEI sponsored Microplastics Workshop and presented BACWA's issues and concerns.

PERMIT COMMITTEE:

-Coordinated with the RPM for items to agendize for the next Permit Committee meeting.
-Coordinated with partners in the SCAP lawsuit on challenging the validity of use on the TST in permits
-Worked with the RPM and SFEI to plan for conducting a sampling and analysis effort for enterococcus in order to demonstrate the dilution available in the Bay which will impact permit limits.

BAPPG COMMITTEE:

-Coordinated with the RPM on the next steps for preparation of the CEC White Paper.
-Worked with the RPM and SFEI on BACWA's participation in the ethoxylated surfactants study and the opportunity to use this emerging contaminant as a case study for future sampling efforts by BACWA.

COLLABORATIONS:

-Coordinated with CASA Regulatory Program Manager and Executive Director on regulatory issues of mutual concern.

-Worked with the Bay Area Biosolids Coalition Steering Committee in securing a contract for BACWA to assist with the administration of the Coalition's activities.
-Continued serving as contract administrator for a research effort with UC Merced.
-Coordinated with CASA and CVCWA on the next steps in effecting changes to the Coast Keeper's bill on ocean acidification.
-Participated in the BAIRWMP Coordinating Committee discussion on the next round of IRWM Prop 1 funding

WOT:

-Worked with the Executive committee to plan for the future direction of the BACWWE program.

MANAGER'S ROUNDTABLE

-Planned for the next the quarterly Bay Area Manager's Roundtable Meeting.

ADMINISTRATION:

-Worked with legal advisor and the Board to address a BACWA personnel issue
-Planned for and conducted the monthly BACWA staff meetings to prepare for the Board Meeting and to coordinate and prioritize activities.
-Assumed duties in the absence of the Assistant Executive Director
-Met with EBMUD accounting staff to coordinate financial activities in the absence of the AED.
-Signed off on invoices, reviewed correspondence, prepared for upcoming Board meetings, responded to inquiries on

BACWA efforts, oversaw updating of web page and provided general direction to BACWA staff.
-Worked with the RPM in the preparation of the monthly BACWA Bulletin.
-Coordinated with the AED to plan activities and review duties, schedules, and priorities.
-Developed and responded to numerous emails and phone calls as part of the conduct of BACWA business on a day-to-day basis.
-Coordinated with ABAG on the finalization of the Prop 84 invoices

MISCELLANEOUS MEETINGS/CALLS:

-BACWA Chair and Committee Chairs on items that arose during the month
-Water Board staff on coordinating the nutrient activities
-Other misc calls and inquiries regarding BACWA activities
-Participated in coordination calls with the HDR project manager on future work under the 2nd Watershed Permit.
-Responded to Board members requests for information

BACWA ACTION ITEMS

Number	Subject	Task	Responsibiity	Deadline	Status
	Action Items from April 19, 2019 BACWA Executive Board Meeting				
2019.5-105	October Micropolastics Workshop	Reqeust to be co-presenter on SFEI work	RPM/ED	7/1/2019	pending
2019.5-104	Nutrient Watershed Permit	Finalize and post RFP for Nutrient Removal by Recycled Water Study	RPM/ED	5/31/2019	completed
2019.5-103	Nutrient Surcharge	Agendize basis for nutrient surchage at June EB meeting	RPM/ED	6/20/2019	completed
2019.5-102	CECs	See if it's possible to coordinate pesticides and CEC sampling	RPM	6/20/2019	pending
2019.5-101	Microplastics	Develop Fact Sheet on Microplastics	ED	9/30/2019	pending
2019.5-100	Joint meeting agenda	Add PFAS to the jt RWB meeting agenda	RPM	5/17/2019	completed
	Action Items Remaining from Previous BACWA Executive Board Meetings				
2018.4-93	Website Policy	Add reference to regulatory requirements for Agency websites	ED	4/30/2019	pending
2018.4-92	BACWA Website	Swap out photo, add photos in future	AED/RPM	4/30/2019	completed

FY19: *101of 105 Action Items completed*
FY18: *66 of 66 Action Items completed*
FY17: *90 of 90 Action Items completed*

BACWA BOARD CALENDAR
June 2019 to May 2020

DATE	AGENDA
6/21/2019	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 6/14	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	Approval: FY20 Agreements
	Approval: Officers: Chair & Vice-Chair FY20
	Other Business - POLICY/STRATEGIC
	Discussion: Nutrient Removal through BAC in RO Concentrate
	Discussion: Water Board Jt Mtg Draft Agenda
	Other Business - OPERATIONAL
	Discussion: AED recruitment
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports
7/18/2019	
Joint Meeting - Water Board	
Schectel, Mitsuddy, White, Zipkin, Henderson Williams; Fono	
Items due: 7/12	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	Approval: Annual Nutrient WS Payment
	Approval: FY20 Agreements
	Approval: BACWA Biennial Conflict of Interest Code Review
	Other Business - POLICY/STRATEGIC
	Discussion: Nutrient Removal through BAC in RO Concentrate
	Discussion: Biosolids Update
	Discussion:PFAS update Update
	Discussion: Microplastics policy discussion (5Gyres and SFEI)
	Other Business - OPERATIONAL
	Discussion:
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports

8/16/2019	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 8/9	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	Approval:
	Other Business - POLICY/STRATEGIC
	Discussion: Water Board Jt Mtg Debrief
	Discussion:
	Other Business - OPERATIONAL
	Discussion:
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports

8/16/2019	**No Board Actions Permitted**
Pre-Pardee Seminar	
Schectel, Mitsuddy, White, Zipkin, Henderson	
Williams; Fono; Hull	

8/?/2019	
Joint Meeting - Water Board	**Other Business: Discussions**
Schectel, Mitsuddy, White, Zipkin, Henderson	
Williams; Fono	

9/26-27/2019	**No Board Actions Permitted**
Pardee Technical Seminar	
Schectel, Mitsuddy, White, Zipkin, Henderson	
Williams; Fono; Hull	

10/18/2019	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 10/11	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	Approval:
	Other Business - POLICY/STRATEGIC
	Discussion: Pardee Debrief & Survey
	Discussion: Water Board Jt Mtg Draft Agenda
	Other Business - OPERATIONAL
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports

11/15/2019	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 11/8	Monthly Financial Report

Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	Approval: Adoption of FY19 Annual Reports
	Other Business - POLICY/STRATEGIC
	Discussion: Water Board Jt Mtg Debrief
	Discussion: Pesticides Update
	Discussion: ReNEWIt Industrial Advisory Board Meeting Debrief
	Other Business - OPERATIONAL
	Discussion: Annual Meeting Planning
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports

12/?/2019	
Joint Meeting - Water Board	**Other Business: Discussions**
Schectel, Mitsuddy, White, Zipkin, Henderson	
Williams; Fono	

12/20/2019	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 12/13	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	**Other Business - POLICY/STRATEGIC**
HOLIDAY & COMMITTEE	Discussion:
LEADER APPRECIATION	Discussion: Update on CASA Climate Change Program
LUNCH	**Other Business - OPERATIONAL**
	Discussion: Annual Meeting Agenda
	Discussion: Budget Schedule & Key Issues
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports

1/?/2020	
Annual Members Mtg	Service & Leadership Recognition
Schectel, Mitsuddy, White, Zipkin, Henderson	RMP & NMS Update
Williams; Fono; Hull	EPA, CWRCB, RWCB, Air Dist,

2/21/2020	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 2/8	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	Approval:
	Other Business - POLICY/STRATEGIC
	Discussion: Joint Meeting Debrief
	Other Business - OPERATIONAL
	Discussion: FY2019 Budget Planning - 1st Draft of FY21 Budget

	Discussion: Annual Meeting Debrief
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports
3/15/2020	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 3/8	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	**Other Business - POLICY/STRATEGIC**
	Discussion: Water Board Jt Mtg Debrief
	Discussion: Update on CASA Climate Change Program
	Other Business - OPERATIONAL
	Discussion: Second Draft of FY20 Budget
	Discussion: Draft BACWA Policy on Website
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports
3 or 4/?/2020	
Joint Meeting - Water Board	**Other Business: Discussions**
Schectel, Mitsuddy, White, Zipkin, Henderson	
Williams; Fono	
4/19/2020	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 4/12	Monthly Financial Report
Schectel, Mitsuddy, White, Zipkin, Henderson	**Authorizations & Approvals**
Williams; Fono; Hull	Approval: FY20 Budget
	Other Business - POLICY/STRATEGIC
	Discussion: Draft Agenda Water Board Jt Mtg
	Other Business - OPERATIONAL
	Discussion: Update on BAAQMD Regulations
	Discussion: Update on regional and statewide biosolids issues
	Discussion: NBWA Conference Debrief
	Reports
	Committee Reports (Committee Chairs)
	Board Reports (Executive Board)
	ED Report (ED)
	RPM Report (RPM)
	Other BACWA Representative Reports
5/17/2019	**Consent**
Monthly Board Mtg	Previous Board Meeting Minutes
Items due: 5/10	Monthly Financial Report

Schectel, Mitsuddy, White, Zipkin, Henderson Williams; Fono; Hull	**Authorizations & Approvals** Approval: SFEI NBS SOW, TDC amendment, Committee Policy Authorization (ED): Legal & IT Support Amendments FY19 **Other Business - POLICY/STRATEGIC** Discussion: Water Board Jt Mtg Planning Discussion: BAAQMD meeting planning Discussion: NMS update **Other Business - OPERATIONAL** **Reports** Committee Reports (Committee Chairs) Board Reports (Executive Board) ED Report (ED) RPM Report (RPM) Other BACWA Representative Reports
CURRENTLY UNSCHEDULED & SIGNIFICANT	Sugestions for Monthly Meeting Guest Speakers/Presenters

Regulatory Program Manager's Report to the Board

May 2019

NUTRIENTS: Watched Watershed Permit adoption hearing. Updated bacwa.org nutrients page. Developed RFP for Recycled Water Report required by Nutrient Watershed Permit. Developed scenarios for nutrient surcharge. Discussed updated GAR worksheet with consultant.

BACWA BULLETIN: Drafted and distributed May Bulletin.

COLLABORATIONS: Participated in CASA RWG Water Committee calls. Participated in NACWA Quarterly State and Regional Call. Viewed PPIC webcast on Managing Wastewater in a Changing Climate.

CECs: Reviewed materials and attended RMP microplastics workgroup meeting. Discussed POTW sampling with RMP leads and Regional Water Board staff.

TOXICITY: Communicated with other Statewide POTW representatives to plan next meeting with State Water Board staff. Met with State Water Board Staff on proposed provisions.

BACTERIAL OBJECTIVES: Worked with SFEI to get them information in support of Enterococcus sampling plan.

REGULATORY ISSUES MATRIX: Updated Regulatory Issues Matrix for May, 2019.

HG/PCBs: Reviewed risk reduction progress report from APA.

COMMITTEE SUPPORT:
AIR – Received and reviewed Consultant Support RFP submittals. Worked with selection committee to choose consultant.
BAPPG – Called into Steering committee meeting. Received and reviewed Consultant Support RFP submittals. Worked with selection committee to choose two firms from which to solicit full proposals. Contacted firms and developed RFPs.
Biosolids – Worked to complete 2018 BACWA Biosolids survey data.
Collection Systems – Drafted Board Report. Participated in CASA call with environmental groups on SSS WDR.
Laboratory –Drafted Board report for April meeting. Reviewed committee survey results.
O&M Infoshare – Drafted Board Report.
Permits – Recruited new vice-chair.
Executive Board – Prepared for meeting, assembled handout and attended meeting. Drafted and posted meeting minutes, and drafted action items. Finalized agenda for and attended May joint meeting with Water Board.

ADMINISTRATION/STAFF MEETING – Met with BACWA staff to plan Executive Board meeting, and discuss BACWA operations. Managed committee Google Groups. Developed list of non-member committee participants. Updated documents on website. Began routine posting duties, as well as contract management. Worked with ED on invoicing and other accounting management. Met with EBMUD Accounting staff.

MEETINGS ATTENDED:
BAPPG Steering Committee Call (5/6), Toxicity meeting with State Water Board staff (5/7), Nutrient WSP Adoption Webcast (5/8), Staff meeting (5/9), CASA RWG meeting (5/16), Executive Board meeting (5/17), Joint meeting with Regional Water Board (5/20), Meeting with EBMUD Accounting staff (5/21), Recycled Water Committee (5/21), Microplastics Workgroup meeting (5/22), CASA meeting with environmental groups on SSS WDR call (5/20).