BACWA BAY AREA CLEAN WATER AGENCIES

**Executive Board Meeting**
**AGENDA**
**Friday, November 15, 2019, 9:00 a.m. – 12:30 p.m.**
**SFPUC, Hetch Hetchy Room, 13th Floor**
**525 Golden Gate Ave., San Francisco, CA**

| | 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** | |
| **CONSENT CALENDAR** | | | **9:05 AM** | |
| 1 | October 18, 2019 BACWA Executive Board Meeting Minutes | | | 3-9 |
| 2 | August 2019 Treasurer's Reports | | | 10-16 |
| **APPROVALS & AUTHORIZATIONS** | | | **9:06 AM** | |
| 3 | Approval: BAR BACWA Annual Report | | | 17-27 |
| 4 | Approval: BAR Audit Approval | | | 28 |
| 5 | Approval: BAR Bureau of Reclamation WaterSMART Grant | | | |
| **OTHER BUSINESS - POLICY/STRATEGIC** | | | | |
| 6 | Discussion: Nutrients | | **9:10 AM** | |
| | a. Regulatory | | | |
| | i. Update on Nutrient Based Solution Study | | LINK | 29-57 |
| | ii. Briefing on EPA Nutrients Survey | LINK | LINK | **LINK** |
| | iii. Discussion of Key Questions Regarding the 3rd Watershed Permit | | | |
| | iv. Draft Scope and Evaluation Plan for the Recycled Water Evaluation | | | 75-86 |
| | v. Ocean Protection Council's 5-Year Plan | | LINK | 87-94 |
| | b. Technical Work | | | |
| | i. Debrief of Assessment Framework Workshop | | | 95-112 |
| | ii. Quality Assurance/Control on SFEI Work Products | | | |
| | iii. Forum to Provide Update on Nutrient Technologies | | LINK | 113-120 |
| | c. Governance Structure | | | |
| | i. Planning Committee Meeting #41 Debrief | | | 121-126 |
| 7 | Discussion: Risk reduction project updates | | | 127-131 |
| 8 | Discussion: EPA Reuse Action Plan | | LINK | 132-137 |
| 9 | Discussion: Update on SWRCB's Plans for PFAS and Impact on Wastewater Facilities | | | 138-145 |
| 10 | Discussion: Draft Agenda for January 8, 2020 Joint Meeting with Regional Water Board Staff | | | 146 |
| 11 | Discussion: Disposition of IRWMP Remaining Funds | | | 147-158 |
| 12 | Discussion: Update on Chlorine Residual Basin Plan Amendment | | | |
| 13 | Discussion: Update on CEC White Paper | | | 159-178 |
| 14 | Discussion: Regional Monitoring Program Questions Responses | | | 178-182 |
| 15 | Discussion: Comment Letter on the Proposed ELAP Regulations | | LINK | 183-199 |
| 16 | Discussion: Debrief on 2019 State of the Estuary Conference | | | 200-203 |
| 17 | Discussion: Request for Support of Grant Application for Horizontal Levee | | | 204-206 |
| **OTHER BUSINESS - OPERATIONAL** | | | **11:40 AM** | |
| 18 | Discussion: Pardee 2020 Confirmation of Dates | | | 207 |
| 19 | Discussion: Annual Meeting Planning | | | 208-212 |
| 20 | Discussion: CASA Executive Director Recognition | | | |
| 21 | Discussion: Summit Partners meeting Debrief | | | 213-220 |
| 22 | Discussion: Update on Executive Director Recruitment | | | 221-223 |
| 23 | Discussion: Update on Applications for Arleen Navarret Award | | | |
| 24 | Discussion: Update on the Asset Management Infoshare Group | | | |
| **REPORTS** | | | **12:10 PM** | |
| 25 | Committee Reports | | | 224-226 |
| 26 | Member Highlights | | | |
| 27 | Executive Director Report | | | 227-235 |
| 28 | Regulatory Program Manager Report | | | 236 |

| | | | | |
|---|---|---|---|---|
| 29 | Other BACWA Representative Reports | LINK | LINK | LINK |
| | a. RMP Technical Committee | Mary Lou Esparza | | |
| | b. RMP Steering Committee | Karin North; Leah Walker; Eric Dunlavey | | |
| | c. Summit Partners | Dave Williams; Lori Schectel | | |
| | d. ASC/SFEI | Dave Williams; Eileen White | | |
| | 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 | Artem Dyachenko | | |
| | n. Bay Area Regional Reliability Project | Eileen White | | |
| | o. WateReuse Working Group | Cheryl Munoz | | |
| | p. San Francisco Estuary Partnership | Eileen White; Dave Williams | | |
| | q. CPSC Policy Education Advisory Committee | Coleen Henry | | |
| | r. California Ocean Protection Council | Lorien Fono | | |
| | s. Countywide Water Reuse Master Plan | Karin North | | |
| 30 | **SUGGESTIONS FOR FUTURE AGENDA ITEMS** | | **12:27 PM** | |
| | **NEXT MEETING** | | **12:28 PM** | |
| | **The next regular meeting of the Board is scheduled for December 20, 2019 from 9:00 am to 12:30 pm at EBMUD, 2nd Floor Large Training Room, 375 11th Street, Oakland, CA. The BACWA Holiday and Committee Appreciation Lunch will follow at 12:30 pm.** | | | |
| | **ADJOURNMENT** | | **12:30 PM** | |

# Executive Board Meeting Minutes

October 18, 2019

**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 |
|---|---|
| Karen Hackett | SVCW |
| Amanda Roa | Delta Diablo |
| Karin North | City of Palo Alto |
| David Williams | BACWA |
| Lorien Fono | BACWA |
| Tom Hall | EOA |
| Melissa Foley | SFEI |
| Azalea Mitch | San Mateo |
| Holly Kennedy | HDR |
| Eric Dunlavey | San Jose |
| Justin Waples | Central Contra Costa Sanitary District |
| Lorrie O'Neill | BACWA |
| Sebastien Tilman | ReNUWIt |
| Julia King | RABAC |
| Paul Gi-Ryong Jung, Ph.D. | RABAC |

**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. Item 6, the RMP update, was taken out of order to accommodate the schedule of the presenter.

**CONSENT CALENDAR**

**1**. August 16, 2019, BACWA Executive Board Meeting Minutes – The approved minutes will be posted on the BACWA website.

***Consent Calendar item 1:*** *A motion to approve was made by Amy Chastain and seconded by Eileen White. The motion was approved with one abstention.*

**2.** October 1, 2019, BACWA Special Executive Board Meeting Minutes – The approved minutes will be posted on the BACWA website.

***Consent Calendar item 2:*** *A motion to approve was made by Amy Chastain and seconded by Eileen White. The motion was approved unanimously.*

**3.** July 2019 Treasurer's Reports and Financial Summary – No report.

**APPROVALS & AUTHORIZATIONS**

None requested.

**OTHER BUSINESS-POLICY/STRATEGIC**

Agenda **Item 4 –** Discussion: Nutrients

a. Regulatory
   i. Nature Based Solutions Study update – The Scoping and Evaluation Plan will be submitted by December 1 deadline. It should be completed by November 27 (the Wednesday before Thanksgiving). At the October 11 CMG meeting there was consensus that the study should include bolstering the wetlands projects that are already underway, since there are likely to be few new opportunities or locations to implement projects. The study will also shine a bright light on the challenges associated with implementing such projects. A Board member will contact Regional Water Board staff to make sure they are in agreement with this approach.
   ii. Recycled Water Report update - HDR was present to give an overview of the Scoping and Evaluation Plan. Any final comments should be submitted to HDR before October 31. The deadline for delivery date to the Water Board is December 1, 2019, which is the Sunday of the Thanksgiving weekend, so it will be submitted on November 27th. There was a discussion about how this report can be used to show regulators the projects that could be implemented in the Bay Area if funding were available, as well as the limits for achieving pollutant discharge reduction to the Bay where reverse osmosis projects are implemented. The issue of the limits and impacts of reuse projects will be added to the next Summit Partners agenda.
   iii. Technical Assistance for NMS Deliverables – There was a discussion about SFEI's QA protocols, since a high level of data certainty will be needed for management decisions. The ED will ask the NMS Project Manager to provide SFEI's QA procedures at a future BACWA Executive Board meeting. The ED outlined three options for review: 1. peer review – must have a certain number of reviewers; 2. set up technical advisory group (expert panel) to review the work as it progresses; and 3. contract with a scientific expert to review.
   iv. Priorities for 3rd Watershed Permit – The ED presented priorities for consideration by the next Executive Director and the need to nail down whether there will be a one-

to-two-year extension of the 2nd Permit to obtain greater scientific certainty to inform management needs.

v. Options for outreach on Nutrients – The ED outlined alternatives for communicating nutrient issues with the public, following up on a discussion at Pardee Technical Seminar. The Executive Board felt that it is too early in the process to begin public engagement.

vi. EPA Trading memo – EPA has posted its trading memo to the Federal Register. Unlike discussions in the SF Bay Region, the trading memo encourages "look-back" credits as well as the possibility of banking load credits for future use.

b. Technical Work

i. RABAC (Rotating Activated Bacillus Contactor) presentation – Dr. Paul Jung gave a presentation regarding the South Korean technology and is looking for participants in a pilot study. This technology uses bacillus to remove microorganisms and requires much less staff and a much smaller footprint for the facility than conventional activated sludge treatment and has been used in Japan and South Korea for 20 years. The technology does not require either odor control or disinfection. CCCSD is considering participating in a pilot project. There was a discussion regarding BACWA hosting an Innovative Technology Workshop. Stanford is participating in a WRF study in 2020 on innovative Nutrient Removal Technologies.

c. Governance Structure

i. Invitation to share BACWA's experience in the NMS with Puget Sound coalition of POTWs – The Board agreed that the ED can represent BACWA in a presentation t on the collaborative nutrient management effort underway in the Bay Area.

ii. Presentation to East Bay Leadership Council Water Task Force – Dave Williams and Eileen White have been invited to participate in a presentation at the January 2020 meeting.

Agenda **Item 5 –** Discussion: ReNUWIt Update - Sebastien Tilman discussed non-potable reuse – centralized vs. onsite water reuse anaerobic fluidized secondary treatment with 88% COD removal. Planning retrofit for WWTP for post-ERC Funding. NAWI – DOE expects within 10 years 90% will be cost-competitive with existing water sources.

Agenda **Item 6 –** Discussion: RMP Update – Melissa Foley from SFEI gave an overview of the microplastics symposium, an updated tiered risk framework for CECS, and the plans for CEC studies for the next two years. She discussed retrieving continuous monitoring data from sensor stations in the South Bay. The Pulse of the Bay 2019 was published and is available in print, as well as online. SFEI has opened a data visualization contest for highs school and university students which closes at the end of January. She gave an overview of the RMP's budget for its various programs. The Moore Foundation funding for microplastics studies is running out so they are looking for a new funding source. The multiyear planning meeting is to be held on October 23. RMP funding needs to increase by +3% per year through 2021. Further increased funding may be required in 2022 and after since 3% is barely adequate for continuing at the same level due to inflation.

Agenda **Item 7–** Discussion: The RMP Annual Meeting Debrief was given by the RPM. The program contained discharger and regulator perspectives for municipal wastewater, stormwater, and dredgers. There was also an update on the adaptation atlas.

Agenda **Item 8 -** Discussion: RMP CEC Data Synthesis and Evaluation: To kick off the next scientific panel on CECs in Aquatic Ecosystems, the RMP has been tasked with a preliminary data synthesis. As part of this effort, they have put a list of questions to stakeholders, which was included in the packet. Draft responses will be circulated to the Board as well as the Permits Committee.

Agenda **Item 9 –** Discussion: Debrief from Microplastics Symposium – The Microplastics Symposium was held on October 2. The morning focused on the results of the scientific studies, and the afternoon covered policy issues. Presenters noted that there needs to be more of an emphasis on reduce and reuse vs. recycle for plastic items to reduce plastic pollution. There was a discussion of filtration on washing machine drainage to reduce microfiber loads to POTWs.

Agenda **Item 10 –** Discussion: CASA Fact Sheet and NACWA Member Alert on PFAS – The NACWA member alert asked agencies with biosolids to send a letter to their congressman and the SWRCB regarding possible legislation that would identify biosolids containing PFAS as hazardous waste. CASA produced a Fact sheet on PFAS, as well as a comment letter to State Water Board staff on Phase III of PFAS monitoring in the state, which is to include POTWs. The ED and RPM participated in a meeting with State Water Board staff where staff stated that they do not plan to require monitoring for all POTWs statewide. They will focus on larger facilities with potential PFAS sources in their sewershed whose effluent may impact drinking water.

Agenda **Item 11 -** Discussion: Toxicity Update – Lawsuit Update and State Toxicity Provisions - The ED gave an update on the appeal on the TST lawsuit. The RPM and Region 2 staff met with State Water Board staff on the sensitive species screening requirements, and the RPM gave testimony at their October 3 Board hearing. State Water Board staff is working on updates to the Toxicity Provisions based on the outcome of the hearing. Provisions won't be adopted in December but rather scheduled for early 2020 or later.

Agenda **Item 12 -** Discussion: Preparation and Impacts Associated with Recent Power Shutdowns – Agencies reported they were generally not affected by the shutdown. Treatment facilities retained power, and there were backup generators for pump stations in affected areas. Fuel transport and procurement remains a concern for future shutoffs. There was dissatisfaction with PG&E's communication about the shutoff event.

Agenda **Item 13 –** Discussion: Chlorine BPA Update – Tom Hall, EOA, said the amendment is moving forward. More details are still being filled into the Staff Report, such as documenting the chemical savings, etc. There is a new survey form to get additional information regarding

SBS overdosing. EOA will develop a proposal to support incorporating the new enterococcus limits as part of the same Basin Plan Amendment as the chlorine residual. Plans are to finalize by end of October.

Agenda **Item 14 –** Discussion: Comments on BAAQMD Rule 13-2 – A draft comment letter regarding Rule 13-2 with BACWA member feedback in response to BAAQMD information requests during the August 22nd wastewater-specific meeting was included in the packet and will be finalized and submitted.

**OTHER BUSINESS-OPERATIONAL**

Agenda **Item 15 –** Discussion: Ethics Training and the Brown Act – Lori Schectel reminded members to be cautious regarding emails and verbal discussions outside of the Board meetings regarding Board activities. Ethics training update given.

Agenda **Item 16 –** Discussion: Holiday Lunch and Committee Appreciation Planning – Committee chairs should come prepared to introduce themselves and to give a short synopsis of their committee's activities.

Agenda **Item 17** - Discussion: Annual Meeting Planning – Adopt ideas for checking in, lanyards, roving microphone, committee chairs standing for recognition, written questions, Board members to moderate, BACWA stainless water bottle with BACWA logo to take to meetings – each registrant to receive one. Luncheon tables will be attended by committee chairs for members wanting more information about their committee.

Agenda **Item 18** - Discussion: Update on ED Recruitment – Dave Williams reported advertisements to post on Friday, October 25. Send comments on brochure next week.

Agenda **Item 19** – Discussion: BACWA Administrative Legal Assistance – Current legal advisor retiring. Current company can be sole-sourced or solicit for a new company. Current cost $380/hour, about $2500 per year. Board agreed to retain the current company.

Agenda **Item 20** – Discussion: Arleen Navarret Award – Applications due by November 12th.

Agenda **Item 21** – Discussion: Pardee Survey Results – Results in the packet.

Agenda **Item 22** – Discussion: BACWA Membership Update – San Rafael, a collection system, has joined as an Affiliate member.

**REPORTS**

Agenda **Item 23** – Committee Reports – Sunnyvale may request a letter on the Permit. Since the Permits Committee meeting, the Water Board has recalculated the RPA for toxicity and

removed the limitations in the Tentative Order.

Agenda **Item 24** – Member Highlights
**San Jose** – Expecting toxicity reports any day. Should receive Tentative Order today. It will contain a requirement to clean up legacy storage ponds.
**CCCSD** – Their facility is close to the epicenter of the earthquake earlier in the month. One piece of glass broke in the Lab. Chad White from the Air District spoke to CCCSD looking to give out loans for projects to reduce Greenhouse Gas emissions. He also noted that the Air District is hosting a workshop on microgrids.
**Delta Diablo –** Their tentative order is expected today.

Agenda **Item 25** – Executive Director Report – Included in the packet

Agenda **Item 26** – Regulatory Program Manager Report – Included in the packet.

Agenda **Item 27 - Other BACWA Representative Reports** – BACWA Representatives 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 – No report.
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 – No report
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 – No report.
l. ReNUWIt – Jackie Zipkin, Karin North - Requested BACWA support for a grant application for a 2-year Bureau of Reclamation WaterSMART grant with a 5% administration fee for BACWA. The funds would be used to facilitate workshops between Regional stakeholders. Board agreed.
m. RMP Microplastics Liaison: Artem Dyachenko – 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. CHARG: Coastal Hazards Adaptation Resiliency Group – Jacqueline Zipkin – Forum on flood control and sea level rise. UC Berkeley professor stated groundwater table rise may not be shoreline, but 1-2 miles inland due to groundwater table rise in addition to sea level rise.
v. BayCAN: Bay Area Climate Adaptation Network - David R. Williams; Lorien Fono– No report.

Agenda **Item 28 - SUGGESTIONS FOR FUTURE AGENDA ITEMS**. None.

**ANNOUNCEMENTS:** The next regular meeting of the Board is scheduled for November 15, 2019 at SFPUC, Hetch Hetchy Room, 13th Floor, 525 Golden Gate Avenue, San Francisco, California.

To receive a copy of any materials provided to the Board at a BACWA Executive Board meeting contact Lorrie O'Neill at loneill@bacwa.org.

The meeting adjourned at 12:49 pm.

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

November 7, 2019

MEMO TO: Bay Area Clean Water Agencies Executive Board
MEMO FROM: Damien Charléty, Treasurer, East Bay Municipal Utility District
SUBJECT: Second Month FY 2020 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, 2019 through August 31, 2019** (two months of Fiscal Year 2020). 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),
- Bay Area Biosolids Coalition (BABC),
- Prop84 Bay Area Integrated Regional Water Mgmt (PRP84)

# BACWA Fund Report as Of August 31, 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 | 1,185,382 | 4,239 | 37,255 | 1,152,366 | 572,487 | 579,879 |
| 804 | LEGAL RSRV | 300,000 | - | - | 300,000 | - | 300,000 |
| 805 | CBC | 1,926,714 | 11,810 | - | 1,938,524 | 752,116 | 1,186,408 |
| | ***SUBTOTAL 1*** | *3,412,096* | *16,048* | *37,255* | *3,390,890* | *1,324,603* | *2,066,287* |
| 802 | BABC | - | *113,305* | *1,039* | 112,266 | - | 112,266 |
| 810 | WOT | 322,375 | - | - | 322,375 | - | 322,375 |
| | ***SUBTOTAL 2*** | *322,375* | *113,305* | *1,039* | *434,641* | - | *434,641* |
| 811 | PRP84 | 161,590 | - | (2,859) | 164,449 | - | 164,449 |
| | ***SUBTOTAL 3*** | 161,590 | - | (2,859) | 164,449 | - | 164,449 |
| | **GRAND TOTAL** | **3,896,062** | **129,353** | **35,434** | **3,989,980** | **1,324,603** | **2,665,377** |

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 | 1,185,382 | 4,239 | 37,255 | 1,152,366 | 21,200 | 1,173,566 | 1,149,490 | 24,076 | 1% | - | | priority # 3 for allocation |
| 804 | LEGAL RSRV | 300,000 | - | - | 300,000 | - | 300,000 | - | 300,000 | 13% | - | | priority # 1 for allocation |
| 805 | CBC | 1,926,714 | 11,810 | - | 1,938,524 | - | 1,938,524 | - | 1,938,524 | 86% | - | | priority # 2 for allocation |
| | ***SUBTOTAL 1*** | 3,412,096 | 16,048 | 37,255 | 3,390,890 | 21,200 | 3,412,090 | 1,149,490 | 2,262,600 | 100% | - | | |
| | | | | | | | | | | | | | |
| 802 | BABC | - | 113,305 | 1,039 | 112,266 | - | 112,266 | 112,266 | - | 0% | - | | pass-through funds, no allocation |
| 810 | WOT | 322,375 | - | - | 322,375 | - | 322,375 | 322,375 | - | 0% | - | | pass-through funds, no allocation |
| | ***SUBTOTAL 2*** | 322,375 | 113,305 | 1,039 | 434,641 | - | 434,641 | 434,641 | - | 0% | - | | |
| 811 | PRP84 | 161,590 | - | (2,859) | 164,449 | - | 164,449 | 164,449 | - | 0% | - | | pass-through funds, no allocation |
| | ***SUBTOTAL 3*** | 161,590 | - | (2,859) | 164,449 | - | 164,449 | 164,449 | - | 0% | - | | |
| | **GRAND TOTAL** | **3,896,062** | **129,353** | **35,434** | **3,989,980** | **21,200** | **4,011,180** | **1,748,580** | **2,262,600** | **-** | | | |
| | | | | | | *verification* | - | - | - | | - | | |

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

**Reconciliation to Trial Balance - accrual basis**

Per Report above:

| | | |
|---|---|---|
| General | | 16,048 |
| WOT | | 113,305 |
| PROP | | - |
| **subtotal** | | **129,353** |

Billings-Pending Receipts

| | | |
|---|---|---|
| 4686 | Mem Contrib | - |
| 4687 | Transfer | - |
| 4690 | Assoc Contrib | - |
| 4696 | Other | - |
| 4731 | State Grant | - |
| 4732 | Grant Retention | - |
| **subtotal** | | **-** |

Trial Balance Revenue Accounts

| | | |
|---|---|---|
| 4411 | Interest | (16,048) |
| 4686 | Mem Contrib | - |
| 4687 | Transfer | (113,305) |
| 4690 | Assoc Contrib | - |
| 4696 | Other | - |
| 4731 | State Grant | - |
| 4732 | Grant Retention | - |
| **subtotal** | | **(129,353)** |
| **Difference** | | **-** |

# BACWA Revenue Report as of August 31, 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 | 506,774 | - | - | - | - | - | - | - | 506,774 |
| 800 | BACWA | 1011108 | BDO Other Receipts | - | - | - | - | - | - | - | - | - |
| 800 | BACWA | 1011109 | BDO Fund Transfers | 5,100 | - | - | - | - | - | - | - | 5,100 |
| 800 | BACWA | 1011117 | BDO- Interest Income from LAIF | 20,000 | - | - | - | - | - | 2,651 | 2,651 | 17,349 |
| 800 | BACWA | 1011133 | BDO Assoc.&Affiliate Contr | 184,111 | - | - | - | - | - | - | - | 184,111 |
| 800 | BACWA | 1014251 | BDO Non-Member Contr BAPPG | 3,876 | - | - | - | - | - | - | - | 3,876 |
| 800 | BACWA | 1014252 | BDO Non-Member Contr AIR | 6,936 | - | - | - | - | - | - | - | 6,936 |
| 800 | BACWA | 1014511 | BDO-Alternative Investment Inc | 18,000 | 1,588 | - | - | 1,588 | - | - | 1,588 | 16,413 |
| | **BACWA TOTAL** | | | **744,797** | **1,588** | **-** | **-** | **1,588** | **-** | **2,651** | **4,239** | **740,559** |
| 805 | WQA-CBC | 1011099 | BDO Member Contributions | 675,000 | - | - | - | - | - | - | - | 675,000 |
| 805 | WQA-CBC | 1011108 | BDO Other Receipts | 1,700,000 | - | - | - | - | - | - | - | 1,700,000 |
| 805 | WQA-CBC | 1011117 | BDO- Interest Income from LAIF | - | - | - | - | - | - | 11,810 | 11,810 | (11,810) |
| 805 | WQA-CBC | 1014528 | BDO-Voluntary Nutrient Contrib | - | - | - | - | - | - | - | - | - |
| | **WQA CBC TOTAL** | | | **2,375,000** | **-** | **-** | **-** | **-** | **-** | **11,810** | **11,810** | **2,363,190** |
| | **TOTAL** | | | **3,119,797** | **1,588** | **-** | **-** | **1,588** | **-** | **14,461** | **16,049** | **3,103,749** |

| | 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 | |
| 802 | BABC | 1011109 | BDO Fund Transfers | - | - | - | - | 113,305 | - | - | 113,305 | (113,305) |
| 802 | BABC | 1011099 | BDO Member Contributions | - | - | - | - | - | - | - | - | - |
| | **BABC TOTAL** | | | **-** | **-** | **-** | **-** | **113,305** | **-** | **-** | **113,305** | **(113,305)** |
| 810 | WOT | 1011117 | BDO- Interest Income from LAIF | - | - | - | - | - | - | - | - | - |
| | **WOT TOTAL** | | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |

| | 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 | | | - | - | - | - | - | - | - | - | - |
| | **PROP TOTAL** | | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| | **Grand Total** | | | **3,119,797** | **1,588** | **-** | **-** | **114,893** | **-** | **14,461** | **129,354** | **2,990,444** |

# BACWA Revenue Report as of August 31, 2019

| DEPTID | DEPARTMENT | JOB | REVENUE TYPE | AMENDED BUDGET | CURRENT PERIOD | | | YEAR TO DATE | | | ACTUAL | UNOBLIGATED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Admin & General | Contributons | Interest, Transfers,Others | Admin & General | Contributons | Interest, Transfers,Others | | |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011117 | BDO- Interest Income from LAIF | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011142 | Administrative Support | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011691 | Water Efficient Landscape Reba | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011702 | Sears Point Wtlnd & Wtrshd Res | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011705 | Regional Green Infrastructure | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011706 | Hacienda Ave Green St Improvem | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011707 | WQ Improve Flood Mgmt & EP | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011911 | Stream Restoration w/Schools i | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1011912 | Flood Infrastructure Mapping | - | - | - | - | - | - | - | - | - |
| 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 | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1012220 | Stormwater Improvements & PBP | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1012221 | Richmond Shoreline & San PFP | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1012222 | Pescadero Integrated FRAH | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1012223 | Restoration Guidance, San FC | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1012224 | SF Estuary Steelhead MP | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | 1012225 | Watershed Program Admnstrtn | - | - | - | - | - | - | - | - | - |
| | **PROP 84 TOTAL** | | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |

# BACWA Expense Detail Report for August 2019

| DEPTID | DEPARTMENT | EXPENSE TYPE | AMENDED BUDGET | CURRENT PERIOD | | | | YEAR TO DATE | | | | OBLIGATED | UNOBLIGATED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ENC | PV | DA | JV | ENC | PV | DA | JV | | |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | BDO Fund Transfers | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Administrative Support | - | - | - | - | (2,859) | - | - | - | (2,859) | (2,859) | 2,859 |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | BDO Contract Expenses | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Regional Green Infrastructure | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Hacienda Ave Green St Improvem | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Sears Point Wtlnd & Wtrshd Res | - | - | - | - | - | - | - | - | - | - | - |
| 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 | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Stormwater Improvements & PBP | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Richmond Shoreline & San PFP | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Pescadero Integrated FRAH | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Restoration Guidance, San FC | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | SF Estuary Steelhead MP | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Stream Restoration in North BD | - | - | - | - | - | - | - | - | - | - | - |
| 811 | Prop84BayAreaIntegRegnlWtrMgmt | Watershed Program Admnstrtn | - | - | - | - | - | - | - | - | - | - | - |
| | **PRP84 TOTAL** | | **-** | **-** | **-** | **-** | **(2,859)** | **-** | **-** | **-** | **(2,859)** | **(2,859)** | **2,859** |

# BACWA Expense Detail Report for August 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 | 207,531 | (17,294) | 17,294 | - | - | 190,237 | 17,294 | - | - | 207,531 | - |
| AS-Assistant Executive Directo | 1011124 | 100,907 | 82,500 | - | - | - | 82,500 | - | - | - | 82,500 | 18,407 |
| AS-Regulatory Program Manager | 1011149 | 137,727 | (12,320) | 11,418 | - | - | 125,407 | 23,304 | - | (11,885) | 136,826 | 901 |
| **TECH SUPPORT** | | | | | | | | | | | | |
| WQA-CE-Nature Based Solutions | 1015367 | - | (500,000) | - | - | - | - | - | - | - | - | - |
| **ADMINISTRATION** | | | | | | | | | | | | |
| AS-EBMUD Financial Services | 1011125 | 41,616 | - | - | - | - | 41,616 | - | - | - | 41,616 | - |
| AS-Audit Services | 1014512 | 5,240 | - | - | - | - | 5,240 | - | - | (5,240) | - | 5,240 |
| AS-BACWA Admin Expense | 1011118 | 7,803 | - | - | 90 | - | - | - | 256 | (167) | 90 | 7,713 |
| AS-Insurance | 1011126 | 4,682 | - | - | - | - | - | - | - | - | - | 4,682 |
| **MEETINGS** | | | | | | | | | | | | |
| GBS-Meeting Support-Annual | 1014514 | 12,000 | - | - | - | - | - | - | - | - | - | 12,000 |
| GBS-Meeting Support-Exec Bd | 1014513 | 2,601 | (223) | 223 | - | - | 2,378 | 223 | - | - | 2,601 | - |
| GBS-Meeting Support-Misc | 1014516 | 5,202 | - | - | - | - | - | - | - | - | - | 5,202 |
| GBS-Meeting Support-Pardee | 1014515 | 6,242 | - | - | - | - | - | - | - | - | - | 6,242 |
| **COMMUNICATION** | | | | | | | | | | | | |
| CAR-BACWA File Storage | 1014518 | 1,500 | - | - | - | - | - | - | - | - | - | 1,500 |
| CAR-BACWA IT Software | 1014520 | 1,750 | - | - | - | - | - | - | - | - | - | 1,750 |
| CAR-BACWA IT Support | 1014519 | 2,600 | - | - | - | - | 2,600 | - | - | - | 2,600 | - |
| CAR-BACWA Website Dev/Maint | 1011116 | 600 | - | - | - | - | - | - | - | - | - | 600 |
| CAR-BACWA Website Hosting | 1014517 | 750 | - | - | - | - | - | - | - | - | - | 750 |
| **LEGAL** | | | | | | | | | | | | |
| LS-Executive Board Support | 1011110 | 2,133 | - | - | - | - | 2,133 | - | - | - | 2,133 | - |
| LS-Regulatory Support | 1011107 | 2,653 | - | - | - | - | 2,614 | 39 | - | - | 2,653 | - |
| **COMMITTEES** | | | | | | | | | | | | |
| AIR-Air Issues&Regulation Grp | 1014253 | 76,000 | - | - | - | - | 75,000 | - | - | - | 75,000 | 1,000 |
| BC-BAPPG | 1011147 | 100,000 | (3,238) | 3,238 | 5,000 | - | 42,763 | 3,238 | 10,000 | - | 56,000 | 44,000 |
| BC-Biosolids Committee | 1011101 | 1,000 | - | - | - | - | - | - | - | - | - | 1,000 |
| BC-Collections System | 1011097 | 1,000 | - | - | - | - | - | - | - | - | - | 1,000 |
| BC-InfoShare Groups | 1011102 | 1,000 | - | - | 193 | - | - | - | 193 | - | 193 | 807 |
| BC-Laboratory Committee | 1011103 | 1,000 | - | - | - | - | - | - | - | - | - | 1,000 |
| BC-Permit Committee | 1011098 | 1,300 | - | - | - | - | - | - | - | - | - | 1,300 |
| BC-Pretreatment Committee | 1011146 | 2,000 | - | - | - | - | - | - | - | - | - | 2,000 |
| BC-Water Recycling Committee | 1011100 | 1,000 | - | - | - | - | - | - | - | - | - | 1,000 |
| BC-Manager's Roundtable | 1014777 | 1,000 | - | - | - | - | - | - | - | - | - | 1,000 |
| BC-Miscellaneous Committee Sup | 1011104 | 45,000 | - | - | - | - | - | - | - | - | - | 45,000 |
| **COLLABORATIVES** | | | | | | | | | | | | |
| CAS-Arleen Navaret Award | 1012201 | 2,500 | - | - | - | - | - | - | - | - | - | 2,500 |
| CAS-FWQC | 1012202 | 7,500 | - | - | - | - | - | - | - | - | - | 7,500 |
| CAS-Misc Collaborative Sup | 1014521 | 5,000 | - | - | - | - | - | - | - | - | - | 5,000 |
| CAS-PSSEP | 1011112 | - | - | - | - | - | - | - | - | - | - | - |
| CAS-Stanford ERC | 1011969 | 10,000 | - | - | - | - | - | - | - | - | - | 10,000 |
| **BACWA TOTAL** | | **798,837** | **(450,575)** | **32,173** | **5,283** | **-** | **572,488** | **44,098** | **10,449** | **(17,292)** | **609,743** | **189,094** |
| | | | | | | | | | | | | |
| **BABC** | | | | | | | | | | | | |
| AS-Regulatory Program Manager | 1011149 | - | - | 901 | - | - | - | 901 | - | - | 901 | (901) |
| BDO Contract Expenses | 1011143 | - | - | - | 137 | - | - | - | 137 | - | 137 | (137) |
| **BABC TOTAL** | | **-** | **-** | **901** | **137** | **-** | **-** | **901** | **137** | **-** | **1,038** | **(1,038)** |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TECH SUPPORT** | | | | | | | | | | | | |
| WQA-CE Addl Work Under Permit | 1014254 | 100,000 | - | - | - | - | 220,000 | - | - | - | 220,000 | (120,000) |
| WQA-CE-Technical Support | 1011127 | 52,020 | - | - | - | - | 32,116 | - | - | - | 32,116 | 19,904 |
| WQA-CE Risk Reduction | 1014023 | 20,000 | - | - | - | - | - | - | - | - | - | 20,000 |
| WQA-CE-Nutrient WS Permit Comm | 1014021 | 2,000,000 | - | - | - | - | - | - | - | - | - | 2,000,000 |
| WQA-CE-Nature Based Solutions | 1015367 | 500,000 | 500,000 | - | - | - | 500,000 | - | - | - | 500,000 | - |
| **TECH SUPPORT (CBC) TOTAL** | | **2,672,020** | **500,000** | **-** | **-** | **-** | **752,116** | **-** | **-** | **-** | **752,116** | **1,919,904** |
| **GRAND TOTAL** | | **3,470,857** | **49,425** | **33,074** | **5,420** | **-** | **1,324,604** | **44,999** | **10,586** | **(17,292)** | **1,362,897** | **2,107,960** |
| | | | | | | | | | | | | |
| **WOT** | | | | | | | | | | | | |
| Administrative Support | 1011142 | - | - | - | - | - | - | - | - | - | - | - |
| BDO Contract Expenses | 1011143 | - | - | - | - | - | - | - | - | - | - | - |
| | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| | | | | | | | | | | | | |
| **GRAND TOTAL (BDO, CBC, WOT)** | | **3,470,857** | **49,425** | **33,074** | **5,420** | **-** | **1,324,604** | **44,999** | **10,586** | **(17,292)** | **1,362,897** | **2,107,960** |

# BACWA EXECUTIVE BOARD AUTHORIZATION REQUEST

**AGENDA NO.:** 3

**FILE NO.:** 20-25

**MEETING DATE:** November 15, 2019

**TITLE: Approval of the BACWA Annual Report to its Members for FY2019.**

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

**RECOMMENDED ACTION**
Approve the BACWA Annual Report to its membership for FY2019.

**SUMMARY**
At the end of each fiscal year BACWA is required to prepare and Annual Report to its membership which describes the technical and financial activities of the Association for the preceding year.

**FISCAL IMPACT**
The Annual Report to its members is prepared by BACWA staff.

**ALTERNATIVES**
Do not approve the Annual Report to the membership. This is not recommended as the Annual Report is required by the BACWA JPA.

*Attachment:*
*BACWA FY2019 Annual Report to Members*

**Approved:**

_____ **Date:** _____
**Lori Schectel, BACWA Chair**

## BACWA Annual Report

## Fiscal Year 2018/19

As water quality regulation becomes increasingly complex and stringent, BACWA provides technical expertise and a venue for collaboration to its membership, and a public utility perspective to negotiations and partnerships with regulators. With over forty Publicly Owned Treatment Works (POTWs) and more than a hundred collection systems in the San Francisco Bay (SF Bay) region, BACWA provides a needed forum for effective coordination to ensure good science-based regulations and continued water quality improvements throughout the Bay Area.

The clean water community's focus has shifted rapidly from industrial pollutant reduction to renewable resource generation, climate change mitigation and adaptation, and understanding the potential impacts of emerging contaminants on the aquatic ecosystem. Concurrently, tightening, and sometimes conflicting, air quality and biosolids management regulations are increasing cross-media challenges. Nutrient science and policy continues to be a major focus for BACWA. Member dues and fees support BACWA's goal of ensuring that any future nutrient regulations are well-supported by science and that any necessary reductions in nutrient loading will be equitable and lead to quantifiable improvements in water quality. Even as the issues change, BACWA continues to offer the services to our members and the public that have garnered the organization much respect and success.

Below is a list of BACWA's accomplishments over the previous fiscal year.

### List of Accomplishments

***Nutrient Activities –*** see BACWA Nutrient Webpage

- Following the submission of The Final Nutrient Treatment by Optimization and Upgrade Study Report on June 26, 2018, BACWA developed a brochure and presentation template for our agencies' use that summarizes the conclusions in the Report for use in communicating to the public and governing bodies. BACWA provided printed copies of the brochure to members for their use. BACWA also worked with Regional Water Board staff to present the results of the Report to their Board.
- Continued to hold BACWA Nutrient Strategy Team meetings to discuss the Nutrient Watershed Permit reissuance both internally and with Regional Water Board staff. The second Nutrient Watershed Permit was adopted on May 8, 2019.
- Contracted with the San Francisco Estuary Institute (SFEI) to prepare the Nutrient Discharge Reduction by Nature-Based Systems Report required by the 2nd Nutrient Watershed Permit
- Contracted with a consultant team led by HDR to perform the Nutrient Discharge Reduction by Recycled Water Evaluation required by the 2nd Nutrient Watershed Permit.

- Submitted the fourth Nutrient Annual Report in compliance with the Nutrient Watershed Permit.
- Developed an updated data sheet to reflect the new monitoring and reporting requirements in the 2nd Nutrient Watershed Permit.
- Submitted the Science Plan Progress Update to the Regional Water Board in compliance with the Nutrient Watershed Permit.
- Funded $880K in scientific studies and program coordination overseen by the Steering Committee for the Nutrient Management Strategy (NMS). Also advanced $200K in funding to the NMS initially allocated for the 2nd Nutrient Watershed Permit term in order to help expedite studies that will inform management decisions in future watershed permits.
- Participated in the Nutrient Management Strategy Steering Committee and Planning Subcommittee governing the scientific studies.
- Participated in the Nutrient Technical Workgroup.
- Worked with other Regional stakeholders to submit letters to Congress urging them to continue funding U.S. Geological Survey Programs supporting Water Quality and Water Resources in the California Bay-Delta
- Worked with the Summit Partners to oppose legislation that would have required all treatment plants discharging to the SF Bay or the ocean to implement nutrient removal in advance of scientific findings to support such a costly expenditure of public resources.

***Permit Compliance Activities***

- Initiated funding risk reduction work via a grant program in compliance with the 2017 Mercury and PCB Watershed Permit.
- Prepared a letter to the Regional Water Board, on behalf of our members demonstrating compliance with special studies required by NPDES permits.
- Reported participation in the Alternate Monitoring Plan, and contributions to the Regional Monitoring Program to the Regional Water Board.
- Worked with members to submit the Land Application of Biosolids Annual Report to the Solano County Board of Supervisors.

***Regulatory Advocacy***

- Conducted regular bimonthly meetings with Regional Water Board staff to discuss regulatory issues of interest to the BACWA community.
- Worked with Bay Area Air Quality Management District (BAAQMD) staff to help them understand how their short-lived climate pollutants regulations (Regulation 13) would impact POTWs.
- Worked with the Regional Water Board to revise the instantaneous chlorine residual effluent limit in the Basin Plan.
- Worked with POTWs statewide to respond to common issues, such as the State Water Board's proposed Toxicity Provisions, proposed ELAP Regulations, and the Sanitary Sewer Systems Waste Discharge Requirements reissuance.

- Collected information from member agencies on planned wetlands projects to inform revision of the Wetlands Policy.
- Worked with Regional Water Board and State Water Board staff to clarify the requirements for transitioning the R2-1996-011 recycled water permittees to the State General Order.
- Contracted with SFEI to develop a sampling plan to measure background enterococcus levels in the SF Bay to be used in effluent limit calculations in members' permits.
- Provided the following comment letters, including letters submitted jointly with other Associations:

    - *Letters to State Water Board*
        - Support for exploring the option of a dual laboratory accreditation within ELAP (Summit Partners) – 09-06-18
        - Comments on the Clean Water State Revolving Fund Policy Amendment – 10-19-18
        - Comments on the Draft State Toxicity Provisions – 12-21-18
        - Request for delay of 3rd Draft ELAP Regulation adoption (Summit Partners) – 01-29-19
        - Comments on the preliminary Draft ELAP Regulations – 02-18-19
    - *Letters to California State Legislature (through Bay Area Pollution Prevention Group (BAPPG))*
        - Support for SB212 Pharmaceutical and Sharps Take-Back Programs – 08-27-18
        - Support for AB 1672 (Bloom) Preventing Labeling of Plastic Wipes as Flushable – 04-09-19
        - Opposition to SB 69 (Wiener). Ocean Resiliency Act of 2019 – 05-06-19
    - *Letters to San Francisco Bay Regional Water Board*
        - Comments on the Review of Resolution 94-086 (Wetlands Policy) – 09-14-18
        - Comments on 2nd Nutrient Watershed Permit – 04-02-19
        - Comments on Palo Alto Regional Water Quality Control Plant – 05-13-19
    - *Letters to BAAQMD*
        - Comments on Regulation 13, Rule 1 and the Draft Workshop Report – 11-13-18
    - *Pesticides Regulatory Letters to EPA*
        - Comments on Dichlobenil – Proposed Interim Registration Review Decision – 10-09-18

- Comments on Amitraz – Preliminary Ecological Risk Assessment and Endangered Species Assessment for Registration Review of the Conventional Use in Honey Bee Hives – 01-29-19
- Comments on Metam Sodium and Metam Potassium, Draft Risk Assessment – 01-29-19
- Comments on Zinc and Zinc Salts – Draft Risk Assessment – 01-29-19
- Comments on Chlorine Gas – Draft Risk Assessment – 06-07-19

***Member communication and educational opportunities***

- Conducted routine communication with our membership through the Annual Meeting and Monthly Board meetings.
- Hosted Unintended Consequences of Water Conservation Workshop on 9-24-18
- Hosted Pretreatment Master Class at East Bay Municipal Utility District on 03-11-19
- Published the monthly BACWA Bulletin.
- Worked to collect responses on the 2018 BACWA Biosolids survey.
- Updated the Sewer Rate Survey.
- Maintained BACWA website to improve usability and access to documents.
- Provided three updates to the BACWA Regulatory Issues summary matrix.
- Provided support to the informal group, Managers Roundtable, to help provide an ongoing forum for Bay Area general managers and directors to convene and discuss issues of mutual concern as well as share information and experiences.

***Support Educational, Research, Advocacy Efforts, and Programs of Special Benefit***

- Conducted regional outreach campaigns related to flushable wipes, copper, pharmaceutical disposal, household hazardous waste, building demolition, and Fats, Oils, and Grease (FOG). Began a campaign to educate pet owners and veterinarians about less toxic flea and tick control alternatives. Issued Requests for Proposals (RFPs) for continued consultant support of these efforts.
- Provided funding for the California Product Stewardship Council and the Product Stewardship Institute.
- Provided funding for the Reinventing the Nation's Urban Water Infrastructure (ReNUWIt), an interdisciplinary, multi-institution research center whose goal is to change the ways in which we manage urban water.
- Provided funding for the Federal Water Quality Coalition (FWQC) to represent BACWA on national issues.
- Provided funding for the biannual State of the Estuary Symposium
- Provided administrative assistance for member agency funding of Wastewater Operator Training courses offered through Solano Community College.
- Assumed administrative and contract support for the Bay Area Biosolids Coalition
- Orchestrated the quarterly meeting for the Bay Area Managers Roundtable
- Coordinated with SFEI to arrange CEC sampling by volunteer member agencies.

- Provided administrative support and funding for the biosolids research project for exploring the beneficial role of biosolids in soil health and climate change mitigation in California's agricultural soils.

***External Representation and Collaboration***

- Provided representation at external groups such as:
  - Risk Management Plan (RMP) Technical Review Committee
  - RMP Steering Committee
  - Aquatic Science Center (ASC)/SFEI Governing Board
  - San Francisco Bay Nutrient Governance Steering Committee
  - San Francisco Bay Nutrient Technical Workgroup
  - State Water Resources Control Board (SWRCB) Nutrient Stakeholder advisory group
  - SWRCB Bacterial Objectives stakeholder group
  - SWRCB Mercury Amendments to the State Plan stakeholder group
  - Summit Partners
  - Bay Area Integrated Regional Water Management Plan (BAIRWMP)
  - National Association of Clean Water Agencies (NACWA) Emerging Contaminants
  - California Association of Sanitation Agencies (CASA) State Legislative Committee
  - CASA Regulatory Workgroup
  - ReNUWIt
  - RMP Microplastics Workgroup
  - Bay Area Regional Reliability Task Force
  - Association of Water Technologies (AWT) Certification Committee
  - WateReuse Workgroup on Recycled Water Policy
  - San Francisco Estuary Partnership
  - California Product Stewardship Coalition
  - Ocean Protection Council
  - Bay Area Climate Adaptation Network
  - One Water Network
  - Coastal Hazards Adaptation Resiliency Group

***Grant Efforts***

- Managed Administration of Proposition 84, Round 1, grant funds.
- Supported member agencies and partner organizations in grant applications for nutrient and biosolids treatment projects, and wetlands projects.

## BACWA Committees

Support for BACWA's committees is a key means for BACWA to ensure communication between our members and to formulate positions on emerging issues that accurately reflect the needs of our membership. BACWA maintains the following active committees:

- Air Issues and Regulations (AIR)
- Bay Area Pollution Prevention Group – see BAPPG 2018 Annual Report
- Collection Systems
- Laboratory
- Operations/Maintenance Infoshare
- Permits
- Pretreatment
- Recycled Water

BACWA issued an RFP in FY19 for support of our AIR committee.

## Financial Report

| ***BACWA FY19 BUDGET*** | ***Line Item Description*** | **FY 2019 Budget** | **Actuals June 2019** | **Actual % of Budget June 2019** | **Variance** |
|---|---|---|---|---|---|
| ***REVENUES & FUNDING*** | - | - | - | - | - |
| **Dues** | Principals' Contributions | $496,837 | $496,835 | 100.00% | -$2 |
| | Associate & Affiliate Contributions | $182,144 | $183,035 | 100.49% | $891 |
| **Fees** | Clean Bay Collaborative | $675,000 | $674,250 | 99.89% | -$750 |
| | Nutrient Surcharge | $800,000 | $799,998 | 100.00% | -$2 |
| | Member Voluntary Nutrient Contributions | $0 | $0 | | $0 |
| **Other Receipts** | AIR Non-Member | $6,800 | $6,800 | 100.00% | $0 |
| | BAPPG Non-Members | $3,800 | $3,801 | 100.03% | $1 |
| | Other | $0 | $55,000 | | $55,000 |
| **Fund Transfer** | Special Program Admin Fees | $5,000 | $5,000 | 100.00% | $0 |
| **Interest Income** | LAIF | $20,000 | $50,991 | 254.96% | $30,991 |
| | Higher Yield Investments | $9,000 | $13,001 | 144.46% | $4,001 |
| | **Total Revenue** | **$2,198,581** | **$2,288,711** | **104.10%** | **$90,130** |

| BACWA FY19 BUDGET | Line Item Description | FY 2019 Budget | Actuals June 2019 | Actual % of Budget June 2019 | Variance |
|---|---|---|---|---|---|
| EXPENSES | - | - | - | - | - |
| Labor | - | - | - | - | - |
| | Executive Director | $201,682 | $201,682 | 100.00% | $0 |
| | Assistant Executive Director | $90,526 | $77,489 | 85.60% | -$13,037 |
| | Regulatory Program Manager | $119,815 | $108,311 | 90.40% | -$11,504 |
| | **Total** | **$412,023** | **$387,482** | **94.04%** | **-$24,541** |
| | | | | | |
| **Administration** | | | | | |
| | EBMUD Financial Services | $40,800 | $27,032 | 66.25% | -$13,768 |
| | Auditing Services (Maze) | $6,426 | -$67 | -1.04% | -$6,493 |
| | Administrative Expenses | $7,650 | $7,089 | 92.67% | -$561 |
| | Insurance | $4,590 | $4,393 | 95.71% | -$197 |
| | **Total** | **$59,466** | **$38,447** | **64.65%** | -$21,019 |
| | | | | | |
| **Meetings** | | | | | |
| | EB Meetings | $2,550 | $2,223 | 87.18% | -$327 |
| | Annual Meeting | $10,200 | $9,113 | 89.34% | -$1,087 |
| | Pardee | $6,120 | $5,608 | 91.63% | -$512 |
| | Misc. Meetings | $5,100 | $4,852 | 95.14% | -$248 |
| | **Total** | **$23,970** | **$21,796** | **90.93%** | **-$2,174** |
| | | | | | |
| **Communication** | | | | | |
| | Website Hosting (Computer Courage) | $750 | $1,200 | 160% | $450 |
| | File Storage (Box.net) | $1,500 | $792 | 53% | -$708 |
| | Website Development/Maintenance | $600 | $0 | 0% | -$600 |
| | IT Support (As Needed) | $2,600 | $540 | 21% | -$2,060 |
| | Other Commun (MS, SM, Backup, PollEv) | $1,500 | $1,553 | 104% | $53 |
| | **Total** | **$6,950** | **$4,085** | **58.78%** | **-$2,865** |

| | | | | | |
|---|---|---|---|---|---|
| **Legal** | | | | | |
| | Regulatory Support | $2,601 | $195 | 7% | -$2,406 |
| | Executive Board Support | $2,091 | $7,756 | 371% | $5,665 |
| | **Total** | **$4,692** | **$7,951** | **169.46%** | **$3,259** |
| | | | | | |
| **Committees** | | | | | |
| | AIR | $51,000 | $49,833 | 98% | -$1,167 |
| | BAPPG | $100,000 | $94,874 | 95% | -$5,126 |
| | Biosolids Committee | $3,100 | $206 | 7% | -$2,894 |
| | Collections System | $1,000 | $0 | 0% | -$1,000 |
| | InfoShare Groups | $1,200 | $719 | 60% | -$481 |
| | Laboratory Committee | $6,100 | $0 | 0% | -$6,100 |
| | Permits Committee | $1,000 | $1,133 | 113% | $133 |
| | Pretreatment | $7,500 | $1,503 | 20% | -$5,997 |
| | Recycled Water Committee | $1,000 | $78 | 8% | -$922 |
| | Misc Committee Support | $45,000 | $0 | 0% | -$45,000 |
| | Manager's Roundtable | $1,000 | $297 | 30% | -$703 |
| | **Total** | **$217,900** | **$148,643** | **68.22%** | **-$69,257** |
| | | | | | |
| **Collaboratives** | | | | | |
| | State of the Estuary (SFEP-biennial) | $20,000 | $20,000 | 100% | $0 |
| | Arleen Navarret Award | $0 | $1,000 | | $1,000 |
| | FWQC (Fred Andes) | $7,500 | $7,500 | 100% | $0 |
| | Stanford ERC (ReNUWIt) | $10,000 | $10,000 | 100% | $0 |
| | Misc | $5,000 | $23,971 | 479% | $18,971 |
| | **Total** | **$42,500** | **$62,471** | **146.99%** | **$19,971** |
| | | | | | |
| **Other** | | | | | |
| | **Unbudgeted Items** | | | | |
| | Other | $0 | $85,000 | | $85,000 |
| | **Total** | **$0** | **$85,000** | | $85,000 |

| | | | | | |
|---|---|---|---|---|---|
| **Tech Support** | | | | | |
| | **Technical Support** | | | | |
| | Nutrients | | | | |
| | Watershed | $880,000 | $1,080,000 | 123% | $200,000 |
| | NMS Voluntary Contributions | $200,000 | $200,000 | 100% | $0 |
| | Additional work under permit | $100,000 | $39,410 | 39% | -$60,590 |
| | Opt/Upgrade/Annual Reporting Studies | $25,000 | $25,652 | 103% | $652 |
| | Member Voluntary Nutrient Contributions | $0 | $0 | | $0 |
| | Nutrient Workshop(s) | $20,000 | $0 | 0% | -$20,000 |
| | General Tech Support | $51,000 | $47,131 | 92% | -$3,869 |
| | Risk Reduction | $10,000 | $12,500 | 125% | $2,500 |
| | **Total** | **$1,286,000** | **$1,404,693** | **109.23%** | **$118,693** |
| | | | | | |
| | **TOTAL EXPENSES** | **$2,053,501** | **$2,160,568** | **105.21%** | **$107,067** |
| | | | | | |
| | **NET INCOME BEFORE TRANSFERS** | **$145,080** | **$128,143** | | |
| | **TRANSFERS FROM RESERVES** | **$0** | | | |
| | **NET INCOME AFTER TRANSFERS** | **$145,080** | | | |

## List of BACWA Members as of June 30, 2019

### Principals

East Bay Municipal Utility District
East Bay Dischargers Authority
- Castro Valley Sanitary District
- City of Hayward
- City of San Leandro
- Oro Loma Sanitary District
- Union Sanitary District

San Francisco Public Utilities Commission
Central Contra Costa Sanitary District
City of San Jose

BACWA
BAY AREA
CLEAN WATER
AGENCIES

## Associates

Central Marin Sanitation Agency
City of Livermore
City of Palo Alto
City of Sunnyvale
Delta Diablo
Dublin-San Ramon Services District
Fairfield Suisun Sewer District
Napa Sanitation District
Silicon Valley Clean Water
San Mateo Wastewater Treatment Plant
South San Francisco
Vallejo Flood & Wastewater
West County Agency

## Affiliates

City of Alameda
City American Canyon
City of Albany
City of Antioch
City of Belmont
City of Benicia
City of Berkeley
City of Brisbane
City of Burlingame
City of Calistoga
City of Crockett
City of Fairfield
City of Millbrae
City of Milpitas
City of Mountain View
City of Petaluma
City of Piedmont
City of Pleasanton
City of Redwood City
City of Richmond
City of San Bruno
City of San Carlos
City of St. Helena
Cupertino Sanitary District
Las Gallinas Valley Sanitary District
Mt. View Sanitary District
North San Mateo Sanitation District
Novato Sanitary District
City of Pacifica
Pinole/ Hercules Wastewater Treatment Plant
Rodeo Sanitary District
San Francisco International Airport
San Mateo County, Department of Public Works
Sanitary District of Marin County No. 1
Sanitary District of Marin No. 2
Sanitary District of Marin No. 5
Sausalito/Marin City Sanitary District
Sewer Authority Mid-Coastside
Sewerage Agency of Southern Marin
Sonoma County Water Agency
Stege Sanitary District
Tamalpais Community Services District
Treasure Island
West Bay Sanitary District
West Valley Sanitation District
Yountville

# BACWA EXECUTIVE BOARD AUTHORIZATION REQUEST

**AGENDA NO.:** 4

**FILE NO.:** 20-26

**MEETING DATE:** November 15, 2019

**TITLE: Approval of Audited Financial Reports for the Year Ended June 30, 2019**

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

**RECOMMENDED ACTION**
Approve the Audited Financial Report for Fiscal Year 2019 (Basic Financial Statements and Memorandum of Internal Control) provided by EBMUD acting as Treasurer of BACWA.

**SUMMARY**
At the end of each fiscal year EBMUD requests an audit of the BACWA financials and provides the reports to BACWA. The two audits are provided for Board approval. There were no significant issues found in the audit.

**FISCAL IMPACT**
Audits are prepared by Auditors engaged by EBMUD and paid for under the budgeted Audit Fees.

**ALTERNATIVES**
Do not approve the audited financial reports. This is not recommended as the audits are required by the BACWA JPA.

*Attachments:*
*BACWA Basic Financial Statement*
*Memorandum on Internal Control and Required Communication*

**Approved:**

_____ **Date:** _____
**Lori Schectel, BACWA Chair**

# NATURE-BASED SOLUTIONS FOR NUTRIENT LOAD REDUCTION

## DRAFT SCOPING AND EVALUATION PLAN

San Francisco Estuary Institute (SFEI), on behalf of Bay Area Clean Water Agencies (BACWA)

November 2019

SFEI | AQUATIC SCIENCE CENTER
SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER

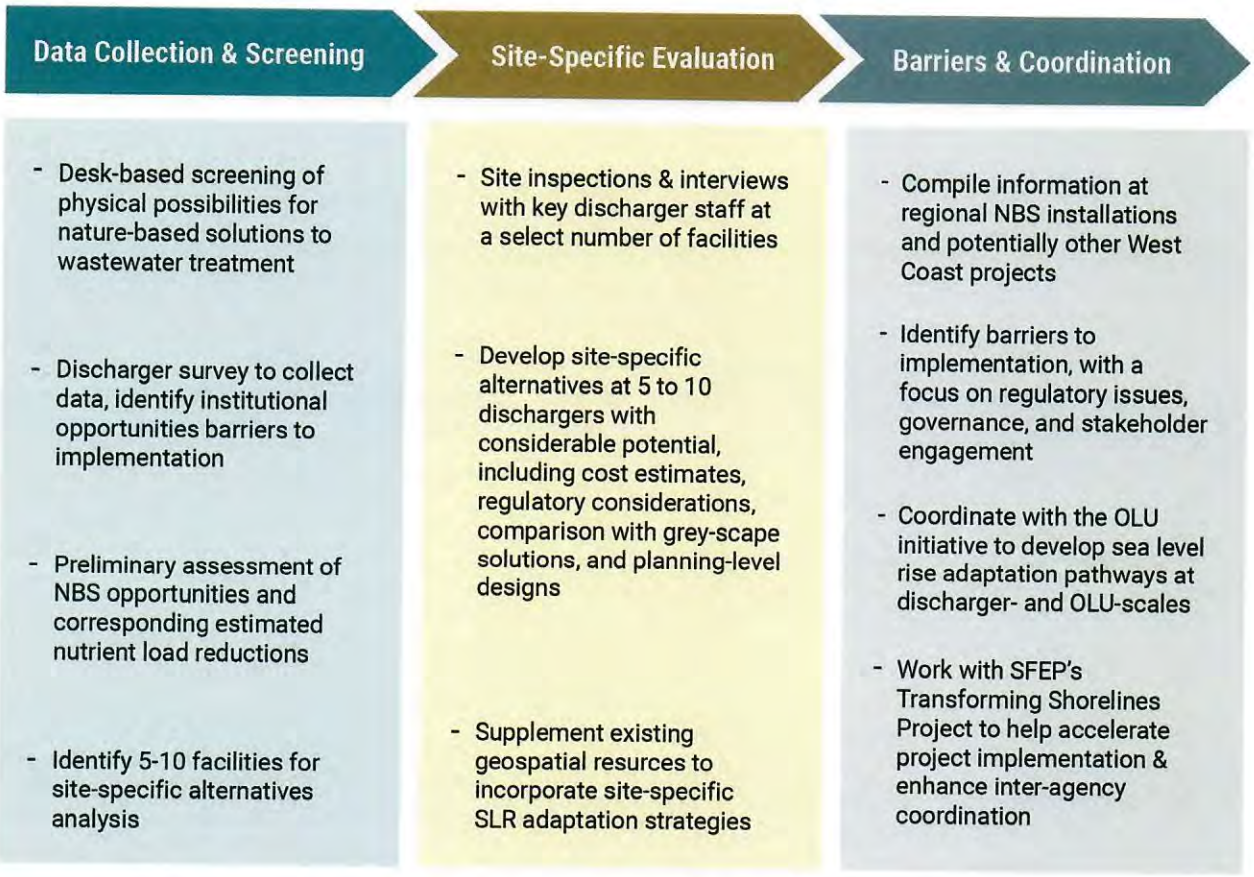
BACWA BAY AREA CLEAN WATER AGENCIES

## TABLE OF CONTENTS

## EXECUTIVE SUMMARY

This Scoping and Evaluation Plan serves to establish the rationale, objectives, and approach to performing a regional evaluation of potential nutrient discharge reduction by nature-based systems, pursuant to Order No. R2-2019-0017, *Waste Discharge Requirements for Nutrients from Municipal Wastewater Dischargers to San Francisco Bay* (Nutrient Watershed Permit). This project represents one of several regional initiatives aimed to evaluate the potential for or encourage the implementation of nature-based solutions (NBS) for wastewater treatment.

The overarching goal is to evaluate opportunities and constraints to deploying one or more types of NBS to reduce nutrient loading to San Francisco Bay at each of the thirty-seven (37) wastewater treatment facilities classified as Dischargers under the Nutrient Watershed Permit. Secondary objectives surround stakeholder interest in addressing barriers to implementation of NBS projects. Pending available resources, support will be provided to projects in the planning stage, including identification of strategies to reduce governance- and regulatory-based challenges to obtaining buy-in among diverse stakeholders or agencies, and effectively securing permit approvals. Key activities include:




This project follows a study required pursuant to the first iteration of the Nutrient Watershed Permit, involving treatment plant optimization and upgrade studies for nutrient removal using traditional wastewater treatment technologies at each of the region's wastewater treatment facilities. In the event nutrient load reductions are required from wastewater sources, these studies will inform future decisions regarding the appropriate mix of nutrient load reduction strategies.

# 1. INTRODUCTION

On May 8, 2019, the San Francisco Regional Water Quality Control Board (Regional Water Board) issued Order No. R2-2019-0017, Waste Discharge Requirements for Nutrients from Municipal Wastewater Dischargers to San Francisco Bay (Nutrient Watershed Permit). This permit represents the second iteration of the Nutrient Watershed Permit, the first of which required treatment plant optimization and upgrade studies for nutrient removal for each of the region's thirty-seven (37) wastewater treatment facilities. That effort resulted in a comprehensive Optimization and Upgrade Study, analyzing the options for achieving three (3) nutrient concentration scenarios via optimization of existing treatment processes and upgrades to each wastewater treatment facility using grey infrastructure-based technologies.[1]

According to Provision C.2 of the 2019 Nutrient Watershed Permit, Dischargers must perform a Regional Evaluation of Potential Nutrient Discharge Reduction by Natural Systems (Regional Evaluation), the language of which is provided in Appendix A. This document outlines the scope and approach to performing the Regional Evaluation, in fulfillment of provision requirements to prepare Scoping and Evaluation Plans. The Nutrient Watershed Permit conceives these plans as separate reports, though this document represents a combined Scoping and Evaluation Plan.

## 1.1. Project Goals and Objectives

The overarching goal of the Regional Evaluation is to improve our understanding of the opportunities and constraints associated with employing nature-based solutions (NBS) to reduce nutrient loading to San Francisco Bay from the region's wastewater facilities.

Objectives of the Regional Evaluation include:

1. Perform a screening-level analysis to identify opportunities and constraints of applying NBS for nutrient load reduction at each of the region's wastewater Dischargers;
2. Identify a subset of wastewater facilities (~5-10) where the opportunity to employ NBS for nutrient load reduction is both a) moderate to high, and b) plans for nutrient management via NBS are not already under serious consideration. For that subset of facilities, the following analyses apply:
    a. Determine the type of NBS most appropriate, if any, for an individual facility (e.g., open water treatment wetlands, sub-surface denitrifying bioreactors, ecotone levees, enhancements to existing basins);
    b. Generate estimated nutrient load reductions resulting from the implementation of one or more NBS-based system, at the facility-scale, as well as the Operational Landscape Unit (OLU) scale, which are geographic units expected to support a coherent suite of ecosystem functions appropriate for a given place, along with the physical processes needed to sustain those functions;
    c. Identify the likely ancillary benefits, or adverse effects, associated with implementing NBS strategies (i.e., removal of emerging contaminants; creation of, or disturbance to, habitats and species of concern; protection against sea-level rise);
    d. Assess the feasibility, efficacy, reliability, and cost-effectiveness of site-specific NBS strategies. Specifically, this involves performing cost estimates for construction and operation; evaluation of likely regulatory- and governance-based challenges; as well as

other challenges, including land ownership, proximity to a wastewater source, environmental conflicts, and negative public perception;

3. Compile case studies and identify regulatory, governance, and institution-based limitations to the implementation of multi-benefit shoreline resiliency projects; and
4. Recommend strategies for integrated design and regulatory efficiency, to minimize environmental conflicts and enhance certainty associated with regulatory consultation and permitting.

In parallel to this Regional Evaluation, permittees of the Nutrient Watershed Permit are also required to perform a regional evaluation of potential nutrient discharge reduction by water recycling. Preparation of three complementary nutrient load management evaluations (Optimization and Upgrade Study, Regional NBS Evaluation, and Regional Water Recycling Evaluation) serves to identify a robust range of multi-benefit alternatives, in the event regulators determine the need for nutrient load reductions to San Francisco Bay.

## 1.2. Management Questions and Objectives

The Nutrient Watershed Permit and documents developed in support of the San Francisco Bay Nutrient Management Strategy (NMS) identify relevant management questions and objectives related to this Regional Evaluation. For instance:

- Per the Nutrient Watershed Permit Fact Sheet (F-11), the Regional Water Board identifies that one of the primary purposes of the five-year permit term is to "evaluate, on an individual and sub embayment scale, nutrient removal approaches using natural systems and wastewater recycling."
- Also, within the Fact Sheet (F-22), the Regional Water Board states that "If nutrient reductions are required for San Francisco Bay, the Regional Water Board's overarching goal would be to achieve nutrient load reductions through the implementation of a regional plan encompassing cost-effective and multiple-benefit nutrient reduction options. This Order requires major Dischargers to evaluate nutrient reduction opportunities through natural systems, which would be a component of such a plan."
- Among the management questions targeted by the NMS Science Plan, question seven asks, "What specific management actions, including load reductions, are needed to mitigate or prevent current or future impairment?"[2]

This Regional Evaluation could inform the construction of a decision support framework if nutrient load reductions are required to fulfill the Regional Water Board's overarching goal of achieving nutrient load reductions via cost-effective multi-benefit strategies.

In all likelihood, NBS solutions will not be possible or practical at most of the region's wastewater facilities to meet, as a stand-alone solution, any of the three nutrient load reduction scenarios considered in the Optimization and Upgrade Study (i.e. total Nitrogen (TN) concentrations of 15 mg $L^{-1}$, 6 mg $L^{-1}$ and 3 mg $L^{-1}$). However, NBS and wastewater recycling likely represent significant opportunities for cost-effective load reductions, particularly in the context of the other ecological, societal, and water resource objectives attainable through thoughtful implementation. Construction of the most appropriate and compelling mix of solutions and technologies would likely follow regulatory decisions resulting in the need for nutrient load reductions.

## 1.3. Technical Team and Advisors

This project is led by SFEI under the direction of the Bay Area Clean Water Agencies (BACWA) Contract Management Group (CMG), which is a voluntary group of wastewater managers intended to receive updates on the status of this project, provide feedback or expert input, and serve as liaisons to the larger regional wastewater community. Additional direction and feedback shall be sought from key regulators and public stakeholders. HDR Inc. is a subcontractor to SFEI, to provide engineering and design support as this project enters the site-specific evaluation stage.

As the project progresses, SFEI shall seek out additional advisors with targeted expertise in the design and evaluation of nature-based strategies to inform final recommendations and provide peer review of nutrient load reduction calculations and designs.

## 1.4. Schedule

The Nutrient Watershed Permit describes the following milestones for this Regional Evaluation:

- December 1, 2019: Submit a Scoping Plan to the Regional Water Board;
- July 1, 2020: Submit an Evaluation Plan to the Regional Water Board;
- July 1, 2021, and 2022: Submit a Status Report to the Regional Water Board;
- July 1, 2023: Submit a Final Status Report describing the tasks completed and findings for each site identified in the Scoping Plan

An accelerated schedule is proposed here, to integrate the Scoping and Evaluation Plan for submission by December 1, 2019, as well as accelerate the initiation of site-specific evaluations. Table 1 presents an overview of the schedule, as well as approximate completion dates.

*Table 1. Overall Schedule for the Regional Evaluation*

| TASK | START DATE | END DATE |
|---|---|---|
| Scoping & Evaluation Plan Development | September 2019 | Dec. 1, 2019 |
| Discharger Survey | December 2020 | February 2020 |
| Desk-Based Evaluation | February 2020 | May 2020 |
| Site Visits/Interviews | June 2020 | August 2020 |
| Site-Specific Evaluations | October 2020 | July 2022 |

Annual status reports shall be submitted on July 1 of 2020 through 2023, consistent with the requirements of the Nutrient Watershed Permit. The anticipated completion date of the Final Evaluation Report is July 2022, one year prior to the specified Permit deadline.

## 2. BACKGROUND

Most of the Bay Area's wastewater treatment plants were not designed to remove nitrogen and phosphorus from wastewater, so over 50,000 kilograms or 110,000 pounds of total nitrogen is discharged with over 400 million gallons of treated wastewater into the Bay each day. The technology employed at most plants has not fundamentally changed in the decades following passage of the Clean Water Act and little precedent exists for managing nutrients outside the context of grey infrastructure-based technologies, from the local or international perspective.[3]

The San Francisco Bay Nutrient Management Strategy (NMS) serves to inform future regulatory decisions regarding the need for nutrient load reductions. Around the world, the general response to regulatory requirements for nutrient reductions has resulted in the application of tried and true, concrete and steel suspended growth processes or other innovative yet energy-intensive technologies.[4] These systems represent the most controlled and reliable approach to nutrient reduction. Though this comes at a cost, in terms of high capital and maintenance expenditures, intense energy and chemical demands, and the provision of few ancillary benefits. Recent estimates prepared by HDR, the engineering consulting firm, place the cost over $12 billion, depending on the potential level of nutrient reduction.[1]

Some water agencies in the region are considering the use of multi-benefit natural systems to assimilate nitrogen as an alternative to expensive and energy-intensive treatment systems that serve only to remove nutrients. Wastewater treatment wetlands have been successfully applied to thousands of sites throughout the world.[5] The key constraints for our region are that most wastewater plants are situated near the Bay's shoreline - often abutting sensitive ecological resources and susceptible to current and future flooding. Land in the region is scarce and notoriously expensive, increasing the need for collaboration among public agencies capable of sharing land and resources to achieve multiple needs.

Despite key constraints, opportunities exist for small (<5 acres) to large (>100 acres) scale treatment wetland installations at plants around the region. When designed correctly, benefits include water quality and recreational access improvements, flood risk reduction, habitat creation, and the reconstruction of marine to freshwater ecotones that were once ubiquitous along the shores of San Francisco Bay.

Existing regulations actively discourage the creation of such systems, however, over appropriate concerns with discharging wastewater close to the shore, protection of wildlife, and the longevity of these systems as sea-level rise increases. Through appropriate planning and design, these and other concerns can be addressed.

### 2.1. Nature-Based Wastewater Treatment in the Context of Shoreline Resiliency and Planning in the Bay Area

The Bay Area is making a concerted effort to protect communities and habitats from rising seas, reverse a legacy of habitat destruction and contamination, and improve access to San Francisco Bay – the region's iconic feature. Passage of Measure AA by an overwhelming majority indicated the region is taking the issue of habitat protection and sea-level rise more seriously. Resilient by Design's Bay Area Challenge attracted some of the world's top designers to escape the confines of what most in the region view as realistic to help us recognize a new reality.[6] And the success of habitat restoration efforts in the northern and southern extents of the Bay is steadily improving and teaching us more can be done in a shorter amount of time than previously imagined.[7]

The region is clearly willing and ready to leverage its wealth and innovative spirit to enhance habitat quality along the shorelines, enhance flood protection, and improve water quality. What is not clear is whether agencies, institutions, and regulatory frameworks can operate at a speed necessary to leverage this momentum and address the urgency of rising seas and the likelihood the Bay is losing its resiliency to fend off ongoing contamination. The fragmented nature of local and regional governance in the Bay Area, coupled with limited coordination among regulatory agencies, makes permitting costly and time intensive. At the same time, projects are generally not designed holistically to meet multiple benefits. Habitat projects generally do not represent nature-based solutions to flood control or water quality, for instance. As a result, projects do not maximize their potential natural capital.

Agencies have recently expressed more willingness to enhance coordination and provide greater clarity regarding expectations to reduce the burden and time required for project approvals. The San Francisco Bay Restoration Authority, which coordinates Measure AA efforts, is working with regulatory agencies to create the Bay Restoration Regulatory Integration Team (BRRIT) to enhance inter-agency coordination and lower the hurdles for Measure AA projects. From a project proponent perspective, there is still much ambiguity, however, regarding expectations surrounding design criteria, mitigation standards, and performance measures. To the extent this can be established in advance, multi-benefit projects will be viewed more favorably by cities and agencies, which currently have little incentive or mandate to pursue such projects.

Permit provisions require this Regional Evaluation to identify the physical and technical opportunities and constraints to deploying nature-based solutions for nutrient load reduction. Stakeholders and regulators also seek for this effort to address the regulatory, governance, and institution-based barriers to implementing multi-benefit shoreline projects in the region, more broadly. This aspect of the project represents is a less resource-intensive element, but no less significant than the identification of physical and land-use constraints and identification of engineered alternatives.

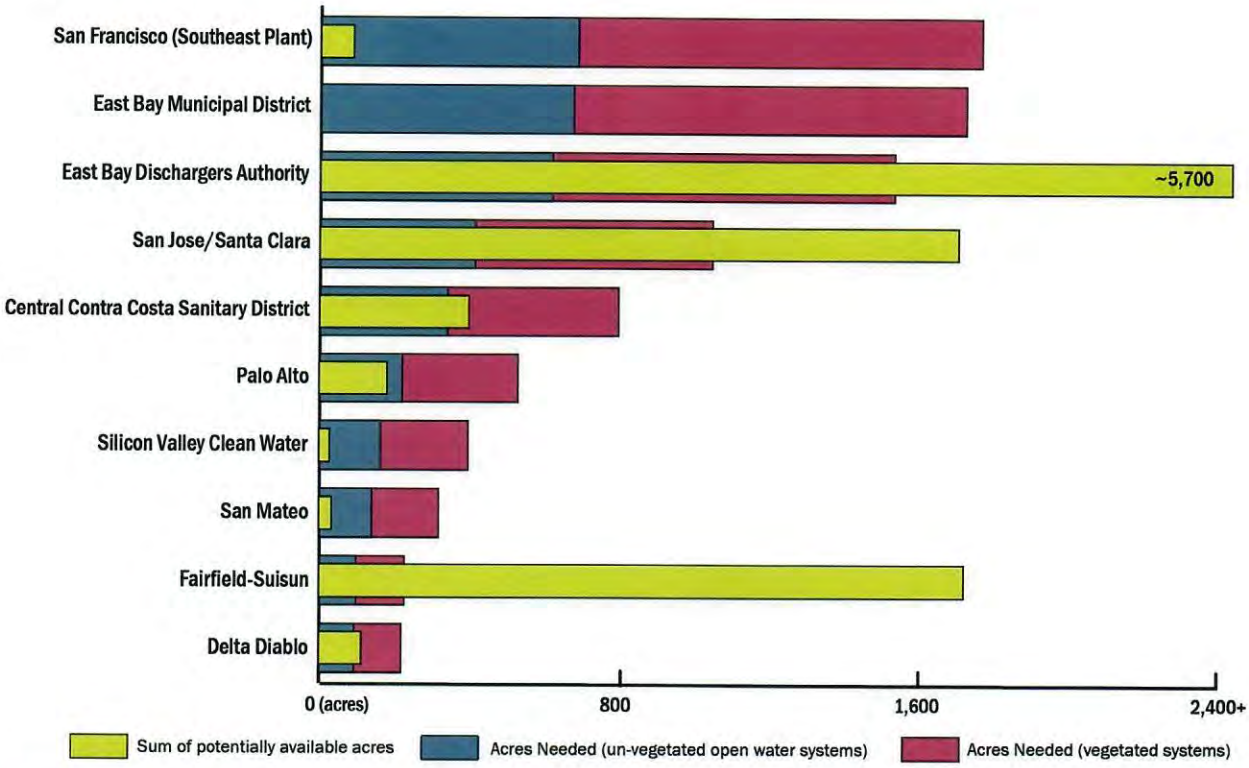
The sequence of this project is timely, considering the publication of several reports by the Regional Water Board regarding regulatory strategies and considerations of treatment wetlands and fill of the Bay for shoreline resiliency projects, in general.[8,9] Additionally, the Bay Conservation and Development Commission (BCDC) recently adopted amendments to the Bay Plan to recognize the critical role of fill, in select circumstances, to implement habitat and shoreline resiliency projects.[10]

## 2.2. Relationship to Prior Studies

### 2017 Treatment Wetland Screening Study

In 2017, the NMS supported a preliminary assessment to inform opportunities and constraints to deploying open water treatment wetlands at Bay Area wastewater facilities.[11] This discrete study served in part as the basis for this Regional Evaluation. Among the analyses performed, the estimated amount of land required, for conversion to two types of treatment wetland, was calculated and compared to the amount of land potentially available within a two-mile radius of each wastewater facility. First-order rate constants were taken from a recent demonstration project at the Town of Discovery Bay's wastewater treatment plant and compared against literature-based average nitrate removal rates from 84 FWS systems.[12,13] These were used to estimate the ability to meet total nitrogen (TN) based concentration reduction scenarios, assuming the deployment of these two types of NBS systems..

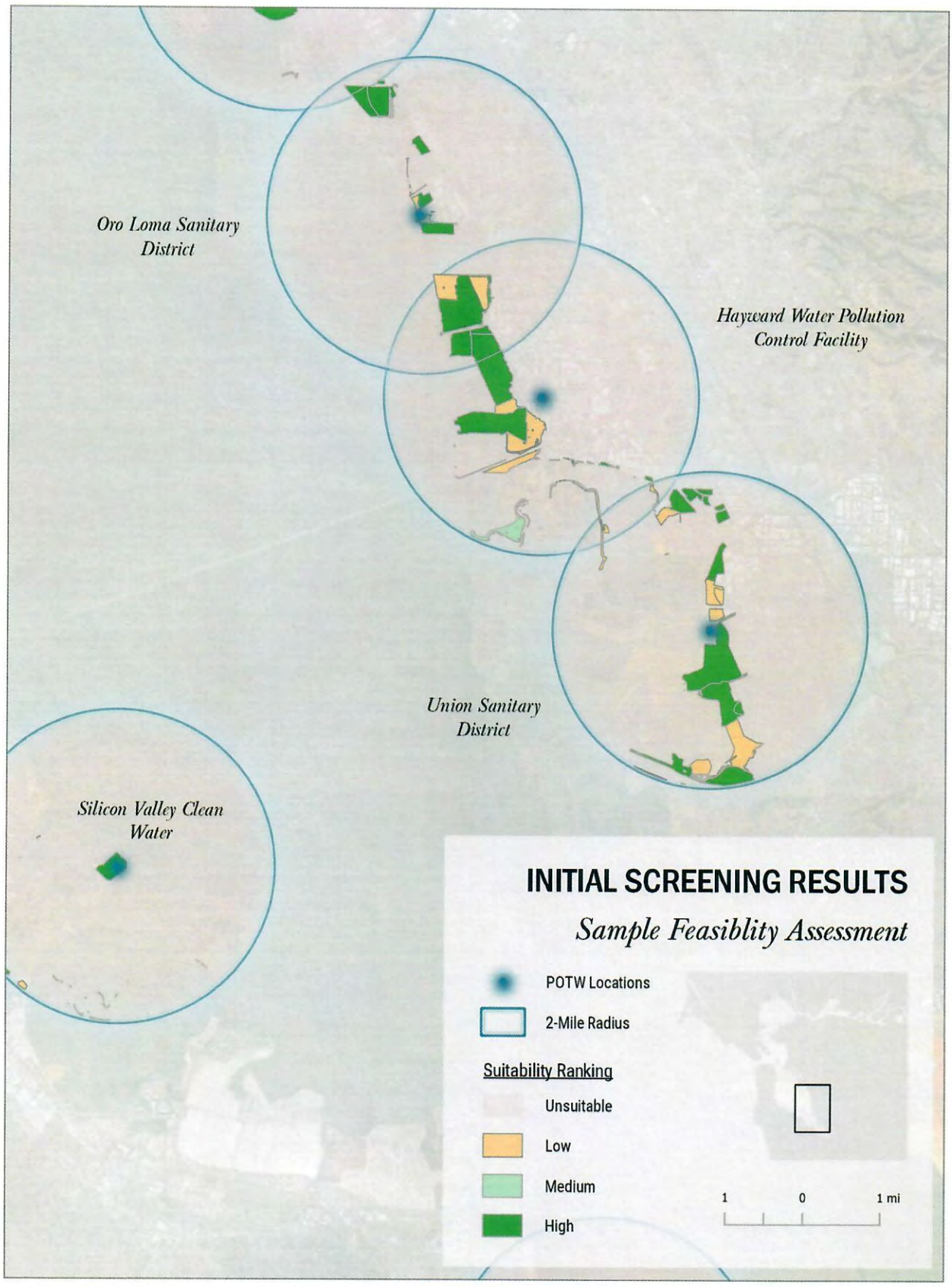
The following figure presents a sample output from the 2017 study, showing a subset of the screening results, in terms of estimated acreage required to meet the Level 3 (6 mg $L^{-1}$) TN reduction scenario, as defined in the *Optimization and Upgrade Study*, using two types of treatment wetlands, versus the sum of all potentially available land.

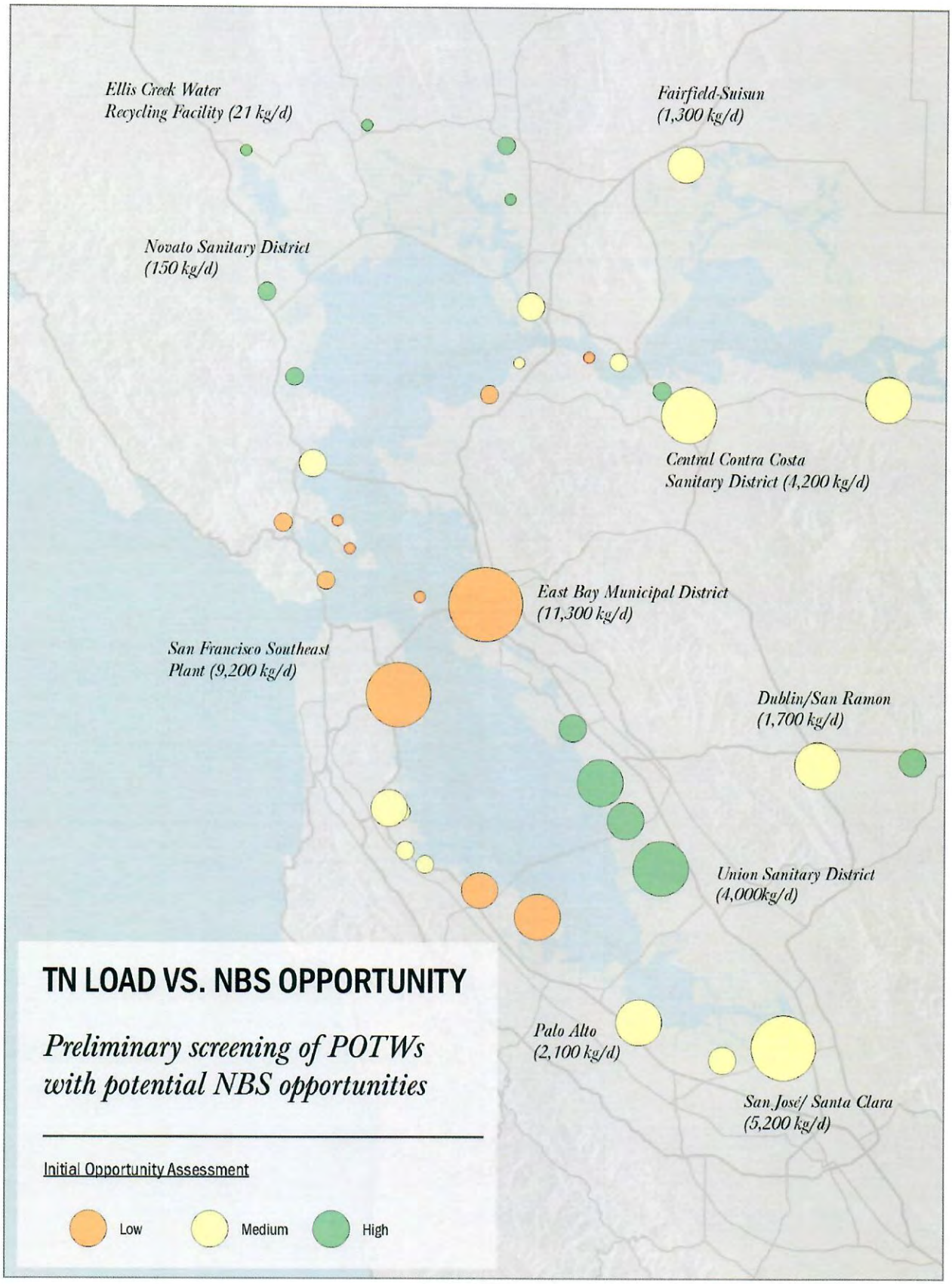



*Summary of potentially available acres versus estimated treatment wetland acreage to meet the Level 3 TN concentration scenario (6 mg L-1), from the 10 POTWs with the highest concentration reduction needs*

The 2017 study was subject to considerable uncertainty yet provided a valuable initial screening to inform the geographical distribution of wastewater facilities where NBS for nutrient load reductions may be feasible.

This Regional Evaluation will refine the screening criteria used in the 2017 study. However, the overall results of the proposed GIS exercise, in terms of which wastewater facilities generally have the most significant potential, is not expected to change dramatically. Regardless, the screening process is not intended to be the sole determinant of whether a more focused analysis is pursued at a given facility. Some agencies with moderate or low levels of opportunity may wish to explore NBS opportunities outside the immediate vicinity of their facilities, for instance. Another scenario that could alter the feasibility of deploying NBS at a given facility includes the opportunity to partner with adjacent agencies with available land or other shared resources.

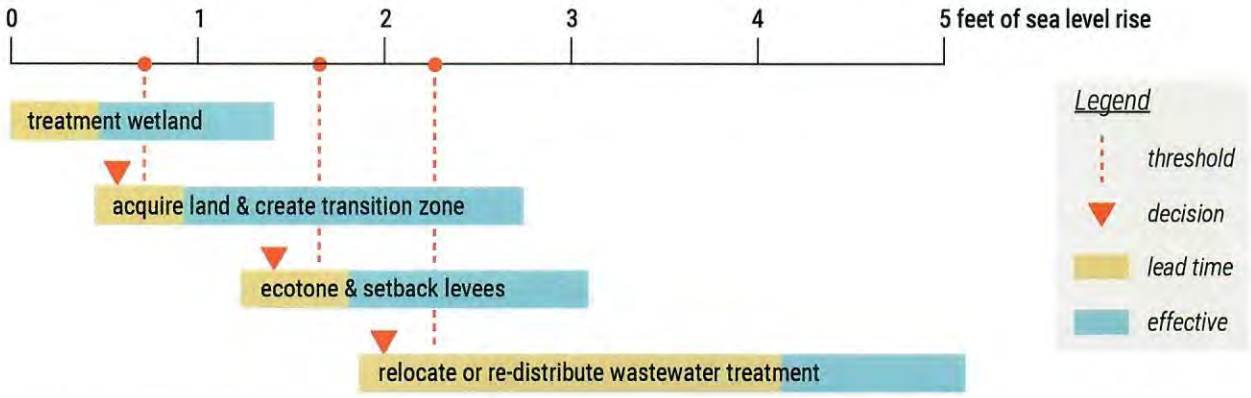

Oro Loma Sanitary District
Hayward Water Pollution Control Facility
Union Sanitary District
Silicon Valley Clean Water
INITIAL SCREENING RESULTS
Sample Feasiblity Assessment
POTW Locations
2-Mile Radius
Suitability Ranking
Unsuitable
Low
Medium
High
1
0
1 mi


Ellis Creek Water
Recycling Facility (21 kg/d)
Fairfield-Suisun
(1,300 kg/d)
Novato Sanitary District
(150 kg/d)
Central Contra Costa
Sanitary District (4,200 kg/d)
East Bay Municipal District
(11,300 kg/d)
San Francisco Southeast
Plant (9,200 kg/d)
Dublin/San Ramon
(1,700 kg/d)
Union Sanitary District
(4,000kg/d)
Palo Alto
(2,100 kg/d)
San José/ Santa Clara
(5,200 kg/d)
TN LOAD VS. NBS OPPORTUNITY
Preliminary screening of POTWs
with potential NBS opportunities
Initial Opportunity Assessment
Low
Medium
High

## Phase 1 Operational Landscape Units and Sea Level Rise Adaptation Framework

Over the last several years, SFEI and partners have developed and continue to refine a science-based framework for identifying effective strategies for adapting to rising sea levels, which are both appropriate for settings and take advantage of natural processes. This framework has been termed Operational Landscape Units for San Francisco Bay. Two recent reports best illustrate the application of the framework on a regional and OLU-specific scale.[14,15]

The Regional Water Board has recently funded the second phase of OLU-specific work, and the intention is to work in close parallel with this Regional Evaluation to develop case studies and sea-level rise adaptation pathways for OLUs with POTWs that contain a significant potential to employ NBS for nutrient load reductions. Nearly every SF Bay OLU contains at least one wastewater facility, and Phase 2 of the OLU initiative will involve analysis of 2-3 additional OLUs, including their associated wastewater facilities. Phase 2 efforts include the evaluation of several scenarios for each OLU, as well as sea-level rise adaptation pathways. These pathways are conceptual strategies for how various SLR adaptation strategies can be modified, enhanced, or abandoned in favor or another measure as water levels increase.



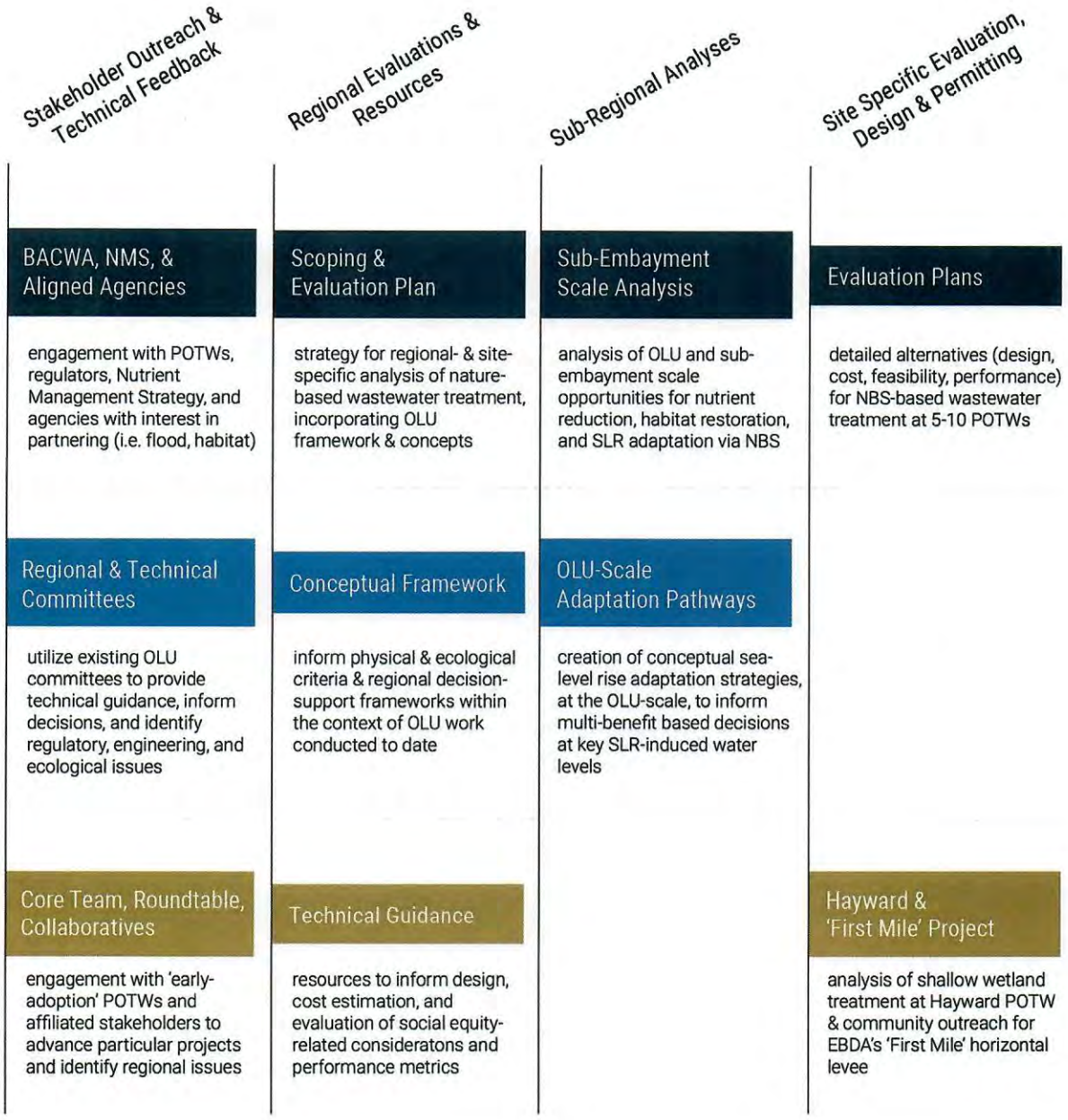

*Sample conceptual sea level rise adaptation strategy involving adaptive management of NBS until the relocation of wastewater facilities may be necessary. Adapted from the San Francisco Bay Shoreline Adaptation Atlas.*[14]

This Regional Evaluation intends to leverage the ongoing efforts to employ the OLU framework, as exemplified in the recent report, which presented an adaptation framework for Marin County.[15] That report contained a case study for the Novato OLU, which included consideration of an ecotone levee relying on treated effluent from the Novato Sanitation District. The report presented three separate scenarios, which were evaluated based on several metrics. This Regional Evaluation will reflect the outputs of the Phase 2 OLU project.

## 2.3. Relationship to Other On-Going Studies

In the process of developing this Regional Evaluation, two additional related projects were initiated, and managers of these efforts have sought to develop complementary work plans. These projects include the *Phase 2 OLU Project*, introduced above, as well as the San Francisco Estuary Partnership's (SFEP) *Transforming Shorelines Project*. Refer to the following diagram to illustrate the anticipated outputs and outcomes from the three (3) related projects.

# RELATED NBS PROJECTS: ANTICIPATED OUTPUTS & OUTCOMES



The OLU initiative is most closely aligned to this Regional Evaluation, in large part because project team members intersect. Although SFEI and SFEP have refined the work plans for these three projects to minimize overlap and ensure that resources are leveraged to maximize the impact of the collective effort.

Of the three projects, Transforming Shorelines features the largest budget – the largest single task for which is dedicated to outreach and design of the 'First Mile' Horizontal Levee project. That project proposes to create a linear mile of ecotone levees in the vicinity of the Oro Loma Sanitary District and is intended to serve East Bay Dischargers Authority (EBDA) agencies. The project also proposes undertaking regional forums to discuss and address issues arising at specific projects currently in the outreach, design/permitting, or implementation phases. This Regional Evaluation continues to align efforts with SFEP and intends to participate in public forums and roundtables as they arise.

## 2.4. Nature-Based Solutions: definitions & context

The origins of the term are unclear, though in the last five years European institutions have adopted 'nature-based solutions', or NBS, as a guiding principle for policies shaping urban climate adaptation and mitigation efforts.[16] As noted by managers and academics advancing NBS policy and practice, use of the term marks a shift in the narrative, from 'working with nature' towards 'innovating with nature' - recognizing the highly engineered nature of urban infrastructure, including those involving natural processes.[17] The term is also more encompassing than related terms, such as green infrastructure or low-impact development.

Given the recent adoption of the term, there is no agreed-upon definition of NBS, but the International Union for Conservation of Nature (IUCN) and European Union Directorate General on Research and Innovation have adopted official working definitions.[18] Since these institutions intend for the term to encompass the universe of solutions capable of drawing on nature to achieve broad sustainability objectives, these expansive definitions lack specificity relevant to this Regional Evaluation effort. A more recent discussion of the science, policy, and practice of nature-based solutions provides a more concrete synthesis:

> *Nature based solutions beneficially exploit natural processes providing stand-alone solutions or hybrid approaches integrated with technology-based or engineered solutions to foster urban resilience and sustainability.*[19]

This characterization encompasses the types of shoreline resiliency and nature-based wastewater treatment systems being considered in the region, including horizontal levees, open-cell treatment wetlands, vegetated open water treatment systems, and denitrifying bioreactors (i.e. subsurface treatment). Such systems rely primarily on natural processes to achieve the intended treatment objectives. Yet they all rely on engineered elements, including pumps, pre-treatment, nitrification, control structures, and levees.

## 2.5. NBS Types Considered for this Regional Evaluation

One could argue that all wastewater treatment systems rely on natural processes, given the reliance on microbiological processes. Yet traditional wastewater treatment plants are resource intensive and provide few urban resilience and sustainability objectives beyond their intended water quality objectives. This Regional Evaluation considers a narrow list of NBS types for wastewater treatment in the evaluation procedure. Table 2 does not characterize the full range of treatment wetlands or other types of NBS suitable for wastewater treatment, though these broad categories include the types of systems currently

under consideration in the region; they capture the range of physical requirements necessary for implementing other types of NBS; and data regarding treatment performance is available or emerging.

*Table 2. Classes of NBS for wastewater treatment considered in this Regional Evaluation*

| METRIC | DESCRIPTION |
|---|---|
| Free water surface constructed wetlands (FWS) | FWS wetlands have areas of open water and are similar in appearance to natural marshes. They contain areas of open water, floating vegetation, and emergent plants, either by design or as an unavoidable consequence of the design configuration. As wastewater flows through the wetland, it is treated by the processes of sedimentation, filtration, oxidation, reduction, adsorption, and precipitation.[5] |
| Unit-cell open water wetlands (UPOW) | Shallow (~.3m) open water treatment systems designed to promote photo- and biologically-mediated water treatment processes.[20] UPOW wetlands have been observed to have improved treatment efficiency compared to vegetated FWS wetlands due to a diversity of pathways available for contaminant removal, and a hydraulic regime that approaches plug flow, when designed and constructed correctly.[21,22,23] |
| Denitrifying bioreactor beds | Denitrifying bioreactors are a class of systems where solid carbon substrates are added into the flow path of contaminated water.[24] Denitrification beds are intended for concentrated discharges and are typically containers, ditches, or basins filled with wood chips, acting as a carbon source.[24] Nitrate ($NO_3$-) rich effluent is passed through the bed to promote heterotrophic denitrification to enhance $NO_3$- conversion to N gases.[25] |
| Ecotone levees | Also referred to as horizontal levees or wetland levees, these multi-benefit flood control systems are comprised of soil and planted with native wet meadow and/or riparian scrub vegetation and irrigated.[26] These systems have proven effective in $NO_3$- removal when coupled with "denitrification layers", which are another class of denitrifying bioreactors.[24] Horizontal layers of a woodchip-soil mix are installed under effluent-irrigated topsoil where rapid denitrification takes place.[27] |

Refer to other texts such as *Treatment Wetlands*[5], *Principles of Design and Operation of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers*[28], and *Natural Wastewater Treatment Systems*[29] for a more complete characterization of the range of NBS types suitable for wastewater treatment, including design, operations, and maintenance criteria. Nesshöver et al (2017) and Frantseskaki et al (2019) provide a useful discussion of NBS as a framework for addressing climate resiliency in urban settings, as well as the challenges of advancing NBS as a viable alternative to traditional engineered solutions to meet societal needs, such as wastewater treatment and flood protection.[18,19]

# 3. METHODS

This section establishes the approach to completing this Regional Evaluation of NBS opportunities and potentially associated nutrient reductions, as well as site-specific evaluations at facilities with opportunities for deploying NBS. Section 4 describes the priorities for assisting in the advancement of ongoing projects or those in development.

## 3.1. Discharger Survey

The first step of the data collection process involves a survey and questionnaire, requesting plant-specific information. The questionnaire will supplement existing data collected in response to the request for information associated with the *Optimization and Upgrade Study*, which covered the following issues:

- Plant process and service area description
- Site layout
- Major unit process dimensions and information on the number of units in service
- Annual energy and chemical usage
- Future upgrade plans/expansion plans
- Identification of site constraints (e.g., space constraints, poor soils requiring piles, off-limits spaces, odor constraints, etc.)
- Prior reports and technical memoranda on existing facilities/nutrient removal plans
- Prior reports documenting nutrient reductions by other means. For example, plans for recycled water, wetlands treatment, etc.
- Background on regulatory drivers

Agencies will be asked to update this information, where any current or planned changes are applicable. The questionnaire will also request additional information applicable to the assessment and preliminary design of NBS:

- Current in-plant capacity for full- or partial-nitrification.
- Land under ownership by the applicable wastewater agency, affiliated municipalities, and partner agencies, for potential conversion to NBS use.
- Requests for effluent data not presented in CIWQS, or other public databases, including the concentration of nutrient species in effluent, on a seasonal basis, not subject to reporting requirements.
- Details regarding any existing or proposed treatment wetlands or other NBS for wastewater treatment (type, size, flow-through, treatment performance data, maintenance and monitoring, general performance issues).
- Information regarding internal interest in and institutional support for deploying NBS for wastewater treatment and other sustainability objectives. This may require follow-up interviews or site visits, on a case-by-case basis.
- Sea level rise planning initiatives and any intended actions.
- Real or perceived challenges to implementing NBS for wastewater treatment, including questions related to regulatory, institutional, and governance challenges.

Development of the survey and questionnaire shall take place in coordination with BACWA's CMG for this project, to ensure questions are designed to optimize clarity and elicit accurate responses.

## 3.2. Desk-Based Screening Study

To inform discharger-specific suitability assessments, SFEI's GreenPlanIT will be used to screen and score areas throughout the region based on a set of defined criteria. The original use case for the GreenPlanIT was to identify potentially suitable nature-based stormwater infrastructure sites.[30] Simple modifications will enable SFEI to perform similar analyses for wastewater applications. Specifically, the Site Locator Tool can be leveraged to combine the physical properties of different NBS types with local and regional GIS information to identify and rank potentially suitable sites.

The approach presented here outlines the application of outputs from GreenPlanIT to a screening criterion, though is subject to refinement, with the intent to reduce setup time by leveraging existing data sources. The approach is adapted from the site selection criteria in *Natural Wastewater Treatment Systems* and builds upon the method utilized to perform a simplified screening effort in 2017, consisting of assigning rating factors for several metrics for each site and then summing the scores.[11] For the purposes of this screening effort, three (3) general categories of NBS for wastewater treatment are considered (Table 3). Other approaches may be suitable on a site-specific basis though these broad categories likely capture the types of sites considered suitable for an array of NBS types, subject to site-specific evaluation.

*Table 3. Special site requirements for wastewater treatment based NBS considered here*

| NBS STRATEGY CONSIDERED | SPECIAL SITE REQUIREMENTS |
|---|---|
| Unit-cell open water wetlands and Free water surface constructed wetlands | Proximity to surface water for discharge, impermeable soils or liner to minimize percolation, no steep slopes, out of flood plain, no bedrock or groundwater within excavation depth |
| Denitrifying bioreactor beds | Proximity to surface water for discharge, impermeable soils or liner to minimize percolation, slopes 0-6%, out of flood plain, no bedrock or groundwater within excavation depth |
| Ecotone levees | Proximity to surface water for discharge, ideally sloped 1-3% to a maximum of 10% |

Those sites with moderate to high scores are candidates for serious consideration and site investigation, as defined according to the ranges in Table 4. The ranking for a specific site is obtained by summing the values from Table 5. Suitability rankings for the NBS strategies identified in Table 3 will be developed pending further data exploration.

*Table 4. Special site requirements for wastewater treatment based NBS considered here*

| DEGREE OF SUITABILITY | SCORE |
|---|---|
| Low | <18 |
| Moderate | 16-34 |
| High | 34-45 |

Among the factors considered in the general procedure include depth to groundwater, land use, proximity to a wastewater source, and habitat type (Table 5). Factors for consideration regarding individual wastewater treatment concepts include site grade and elevation. As cited in *Natural Wastewater Treatment Systems*, the relative importance of the various factors in Table 5 is reflected in the magnitude of the values assigned, so the largest value indicates the most important characteristic. Custom suitability rankings for each type of NBS system will be developed pending further data exploration.

*Table 5. Physical- and Land Use-based Rating Factors for Land Application of Wastewater*

| METRIC | VALUE | SUITABILITY RATING |
|---|---|---|
| Site Grade (%) | 0-3 | 8 |
| | 3-8 | 6 |
| | 8-16 | 3 |
| | >16 | 1 |
| Land Use (Existing or Planned) | Industrial | 0 |
| | High density, residential or urban | 0 |
| | Low density, residential or Urban | 1 |
| | Agricultural, or open space | 4 |
| Land Cost and Management | No land cost, owned by wastewater agency | 5 |
| | No land cost, owned by a partner agency | 3 |
| | Land purchased | 1 |
| Depth to Groundwater (m) | <1 | 0 |
| | 1-3 | 4 |
| | >3 | 6 |
| Distance from Wastewater Source (km) | 0-3 | 8 |
| | 3-8 | 6 |
| | 8-16 | 3 |
| | >16 | 1 |

| METRIC | VALUE | SUITABILITY RATING |
|---|---|---|
| Elevation Difference from Wastewater Source (m) | <0 | 6 |
| | 0-15 | 5 |
| | 15-60 | 3 |
| | >200 | 1 |
| Habitat Classification | Lagoons, Lakes on fill, Managed marsh and Diked Marsh | 1 |
| | former salt ponds not currently intended for restoration (i.e. Crystallizer, Medium & Low Salinity Salt Ponds), former military lands, urban open space | 2 |
| | Undeveloped Bayland, Storage or Treatment Basin (e.g. existing oxidation ponds or treatment ponds), Farmed Bayland, Undeveloped Fill, Developed Island or Fill, Undefined Bayland, Ruderal Bayland, Agriculture, Rangeland | 4 |

Final scoring strategies will be informed by the availability of data, additional opportunities or constraints afforded by the GreenPlanIT tool, and initial testing. Additional factors may be introduced to refine suitability based on factors such as:

- Topography
- Utilities
- Environmental (i.e., critical habitat, wetlands, known legacy contamination)
- Land use (i.e., existing and adjacent, ownership, land value)
- Floodplain (i.e., current and SLR projections)
- Access limitations
- OLU-related opportunities and constraints

Information compiled through this desk-based screening process will be used in conjunction with data collected via the questionnaire to inform preliminary assessments.

## 3.3. Preliminary Assessment

Quantitative and qualitative data collected via the questionnaire and screening processes shall be compiled for each participating discharger. Any data gaps will be documented per plant and disseminated to each plant via email with a request for additional data and, if necessary, to perform additional sampling. Sampling request may include:

- Constituents of interest (example BOD, TKN, TP, alkalinity)
- Sampling location (example: raw influent, primary effluent, secondary effluent)

- Sampling frequency (example: daily, weekly)
- Sample method (example: daily composite, hand composite, grab)
- Analytical methodology and laboratory reporting limits

Similar requests for information were made pursuant to the *Optimization and Upgrade Study*, the responses to which will be reviewed to assess the availability of information and minimize duplicate requests. Where considered necessary, the collection of additional data will inform feasibility assessments as well as potential load reductions capable from various NBS approaches, based on site-specific effluent quality.

Questionnaire results and outputs from the desk-based analysis will be used to perform a preliminary assessment of NBS suitability and screening-level load reduction potential for each discharger, pursuant to Section VI.C.2 of the Nutrient Watershed Permit. Potentially suitable sites shall be identified, along with a reporting of the metrics and associated weighting factors used to judge suitability. Nutrient load reduction potential estimates for one or more NBS strategies will be illustrated in map-based and tabular formats.

Qualitative information obtained through the questionnaire process will also be compiled to express additional factors to consider when prioritizing NBS for a given discharger. For instance, parcels may be identified through the GIS exercise that may or may not be considered suitable for other factors. Or perhaps a discharger is intending on rapidly escalating wastewater recycling to the point where NBS for nutrient removal is not a priority and resources should be applied elsewhere.

The preliminary assessment will contain short (1-2 page) summaries of preliminary NBS suitability assessments for each discharger. Conclusions shall include recommendations for facilities where the application of additional resources could be applied to develop conceptual designs and planning-level cost estimates (Tasks 3.4 and 3.5). Decisions regarding which facilities shall be subject to additional evaluation, including site visits and interviews with discharger staff (Task 3.4) as well as the final decisions regarding which facilities will undergo in-depth analyses (Task 3.5), shall be made in coordination with BACWA and the Regional Water Board.

## Approach to estimating nutrient load reductions

Preliminary assessments will include estimates of Total Inorganic Nitrogen (TIN) and total phosphorus (TP) reduction potential associated with the conceptual implementation of one or more types of NBS strategies suitable for a given discharger. Potential load reductions will be presented on a discharger basis as well as the OLU-scale. This will satisfy the requirements of the Nutrient Watershed Permit to identify potentially suitable sites and estimate resulting nutrient reductions, in terms of TIN and TP.

Quantitative estimates of TIN reductions will assume full conversion of TIN to $NO_3^-$ for the purposes of conceptual estimates, which is required to maximize efficient denitrification rates as well as minimize ammonia toxicity in aquatic receiving waters. During site-specific evaluations (Task 3.5), analyses will include refinements to nitrification needs, including partial nitrification based on NBS capacity limitations. Facility information obtained during the *Optimization and Upgrade Project* will be utilized to inform site-specific nitrification requirements.

Several models and methods are available from the literature to estimate nutrient removal from wetlands and perform other wetland sizing parameters.[29,5] To estimate the conversion of $NO_3^-$ to N gases from unit-cell open water wetlands (UPOW) and free water surface (FWS) constructed wetlands, the tanks-in-

series model has been used extensively and will be used for this Regional Evaluation.[7,13,20] This model can be transformed to estimate wetland area needs for corresponding nitrate concentration reduction scenarios:

$$\frac{C_{out}}{C_{in}} = \left(1 + \frac{kA}{NQ}\right)^{-N}$$

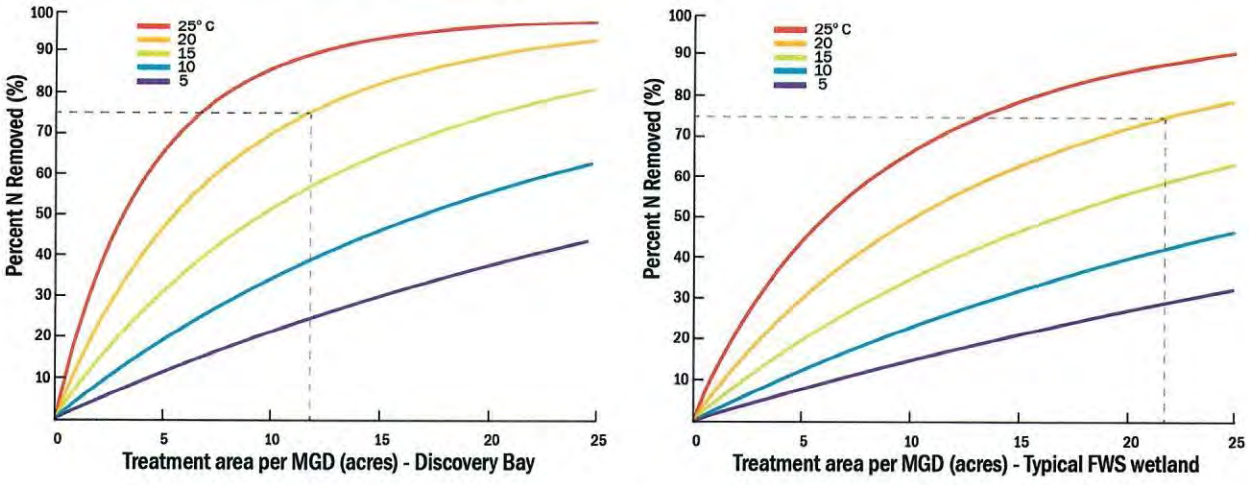
Where:

Cout is the outlet NO3 – concentration,
Cin is the inlet NO3 – concentration,
k is the areal removal rate (m $yr^{-1}$ ),
A is the wetland area ($m^2$ ),
Q is the influent flow rate ($m^3$ $yr^{-1}$ ), and
N is the number of tanks-in-series used to describe cell hydraulics.

First-order rate constants are available from the literature for FWS and UPOW wetlands. The k value reflects a strong seasonal dependence of $NO_3^-$ removal, consistent with the effect of water temperature on denitrification rates, as predicted by the modified Arrhenius equation:

$k = k_{20}\theta^{(T-20)}$

Where θ is the temperature coefficient, $k_{20}$ is the first-order removal rate at 20 °C (m $yr^{-1}$), and T is the water temperature (°C). From a recent demonstration project at the Town of Discovery Bay's wastewater treatment plant, $k_{20}$ was 59.4, whereas an average value for vegetated FWS treatment wetlands is 25, reflecting higher treatment performance from the unvegetated shallow basin system at Discovery Bay. In addition to $k_{20}$, N is a value particular to the system in question. Jasper et al (2014) assumed an N of 6.4 for the optimized shallow basin whereas Kadlek (2012) used a value of 4.4 to represent average FWS wetland systems.[12,13] The higher N value suggests a serpentine system with longer hydraulic residence time. The figures below illustrate the temperature-driven seasonal shifts in treatment performance for the two types of systems, which can be used to estimate wetland required to treat a given volume and to achieve an approximate level of treatment performance.




*Nitrate removal performance in optimized shallow basins at Discovery Bay versus average performance of vegetated FWS treatment wetlands*

Approaches to estimating TP removal is not as well established as those for $NO_3^-$ and requires additional investigation and consultation with experts, regarding appropriate coefficient ranges for the NBS types under consideration. Additional investigation is also required to estimate $NO_3^-$ removal from denitrifying bioreactor systems, including ecotone wetlands since the literature on these systems is limited. Preliminary data from the Oro Loma system is available and will be evaluated to confirm the most appropriate models and removal rates.

## 3.4. Site-Visits and Synthesis

Following the preliminary assessment phase, stakeholders may wish to perform additional outreach to a select group of dischargers to inform opportunities and constraints as well as narrow the list of dischargers undergoing in-depth site-specific evaluations. In consultation with the BACWA CMG for this project and the Regional Water Board, a list of up to twelve (12) facilities will be developed, representing dischargers where either additional site-specific information is required, or site-specific evaluation is likely (Task 3.5).

Site visits to each of these facilities will be undertaken by two-person teams, comprised of SFEI staff or contractors with experience in the design and siting of nature-based flood or wastewater-related solutions and/or landscape ecology. Key staff with intimate knowledge of plant operation, land ownership on and adjacent to the wastewater facility, and understanding of current or proposed master planning efforts, are expected to participate in the visit and escort SFEI staff or contractors to areas of interest. This likely includes the General/Plant Manager of the facility or other senior staff with a comparable understanding of plant operations and planning initiatives.

Objectives of the site visits include confirmations of how the plant operates, evaluate areas considered potentially suitable for conversion to nature-based wastewater treatment facilities, and identify opportunities and constraints to implementation. An example list of information that will be generated during the site visit is as follows:

- Confirm land ownership of potentially suitable lands for conversion to NBS
- Validate opportunities and constraints to nitrification of effluent
- Identify ecological and physical constraints, including likely environmental constraints or regulatory issues pertaining to sensitive species, wetlands, contamination.
- Identify available special studies or surveys available that could support site-specific evaluations, such as habitat surveys, topographic surveys, wetland delineations, groundwater, and geological surveys.
- Confirm the status of any on-going or proposed planning efforts pertaining to flood risk, wastewater recycling, sea level rise adaptation, or NBS for habitat and/or water quality improvement.
- Confirm the status of any on-going optimization/upgrade projects and summarize their potential impacts on nutrient discharge loads.
- Generate a list of suitable NBS types for wastewater treatment, as well as supporting information needed to validate this information in consultation with expert advisors, and their implications, such as:
    - Flow routing and pumping strategy
    - Nitrification requirements
    - Impacts to sensitive habitats
    - Vector control considerations

- Elevation constraints
- Need for carbon supplementation
- Conflicting land uses and potential stakeholder concerns
- Maintenance and operations issues

For each facility visited, a memorandum (<5 pages) will be prepared to summarize the site visit, information obtained and recommendations regarding further evaluations. Each facility will have the opportunity to review the memo and provide comments. The memo will include the following:

- Description of the plant and the current discharge requirements
- Description of the potential impact on nutrient discharge loads from on-going optimization/ upgrade projects and the status of any other projects with a nexus to NBS, nutrient reduction, wastewater recycling, or flood risk mitigation.
- Checklist confirming the preliminary assessment findings, including but not limited to land use, environmental constraints, and interest in pursuing NBS projects.
- List of potential NBS strategies, as well as an estimation of the range of nutrient removal benefits associated with each, and the likely ancillary benefits/negative consequences.
- Summary and conclusions

Each facility will have the opportunity to review the memo, provide comments, and inform decisions regarding whether the site should be subject to additional evaluations.

## 3.5. Site-Specific Evaluation

The selection of sites for in-depth evaluation will follow Tasks 3.3 (Preliminary Evaluation) and 3.4 (Site Visits and Synthesis). The focus of this effort will be to identify site-specific NBS strategies and costs at approximately 5-10 facilities. Final site selection decisions shall be based on the following criteria, in consultation with the Regional Water Board and BACWA's CMG for this project:

1. Information collected and recommendations made pursuant to Tasks 3.3 and 3.4;
2. The magnitude of potential NBS-based nutrient load reductions;
3. Internal support for pursuing NBS-based nutrient load reduction strategies, including management and board interest, technical capacity to oversee design and implementation, availability of funds to conduct further evaluations or provide matching grant funds; and
4. Whether a facility is pursuing an NBS-based project that could benefit from additional resources and analysis not otherwise possible or available.

With respect to selection criteria #4, in addition to developing planning-level alternatives for NBS strategies at facilities not already pursuing such projects, projects in progress will be evaluated for the purposes of developing real-time case studies and the need for additional support, for the purposes of advancing the science and policy of NBS implementation in the region. Should the Regional Water Board and BACWA agree one or more on-going projects require additional technical, outreach, or governance-based support, resources will be applied in consideration of available resources. The focus of site-specific evaluations, however, is to identify and advance new projects with agencies not already pursuing NBS for nutrient management.

One or more planning-level alternatives will be generated for each discharger selected for site-specific evaluation. Anticipated outputs for each discharger will include the following, presented in a compiled report suitable for submission to the Regional Water Board, to fulfill permit obligations, as well as for use in communication and outreach purposes:

1) Planning-level designs for one or more NBS alternatives will be generated to a level sufficient to enable cost estimation and serve as an outreach tool for decision-makers, the public, and regulators. The format of the designs has not been decided upon but will likely be generated with AutoCAD or compatible formats;
2) Cost estimates will be prepared to inform capital and operating costs for the most attractive option. Capital and operating costs will be presented for the NBS system as well as associated nitrification requirements. Effort shall be made to calculate and present costs in a manner allowing for comparability with outputs of the Optimization and Upgrade Study;
3) Estimation of nitrogen (TIN) and phosphorous (TP) discharge reductions associated with each project alternative;
4) Comparison of NBS nutrient reduction strategies with greyscape-based technologies, in terms of ability to meet Level 2 (15 mg $L^{-1}$), 3 (6 mg $L^{-1}$), and Advanced (3 mg $L^{-1}$) TIN reduction scenarios;
5) Ancillary benefits of each project, including estimates of emerging contaminant removal, restored habitat, degree of sea-level rise protection;
6) Negative consequences of implementation, such as lower degree of certainty regarding treatment performance versus traditional wastewater treatment approaches, GHG releases (methane/nitrous oxide), vector attraction/need for monitoring & control;
7) Likely and potential challenges to implementing each project, such as regulatory issues, cost, and potential stakeholder concerns; and
8) Incorporate outputs of the OLU Phase 2 project, including sea-level rise adaptation pathways on the OLU- and site-specific POTW scale (i.e., conceptual strategies for 2030, 2050, 2100 horizons). In-depth adaptation pathways are expected to be generated for three (3) dischargers, through the OLU Phase 2 Project, while more generalized adaptation pathways will be developed for the other dischargers where site-specific evaluations are performed.

## 4. CASE STUDIES & BARRIERS TO IMPLEMENTATION

Stakeholders and regulators have requested that this project also include a compilation of case studies of existing and on-going NBS projects in the region and elsewhere in California and other semi-arid regions, to identify lessons learned and strategies to reduce barriers to implementation. Stakeholders also wish to more thoroughly evaluate barriers to implementation, to minimize regulatory burden and implementation costs. This will include details of the regulatory processes involved in, as well as costs and institutional factors leading to success/failure.

Targeted outreach will be necessary to identify information on projects not already characterized or where additional information is needed. For those local agencies with NBS already in operation, the Discharger Survey (Task 3.1) will be targeted to request information including operations and maintenance, costs, treatment performance, as well as institutional and regulatory factors leading to success/failure.

The level of effort applied to this project element depends on the availability of resources and must be evaluated more fully. This section introduces projects in the region that could be analyzed and an introduction to the barriers to implementation that will be explored more fully on a project-specific or region-wide basis.

## 4.1. Introduction to the History of Treatment Wetlands in the Bay Area

Bay Area sanitation districts were some of the first along the West Coast to adopt treatment wetlands into their treatment trains. Based on a review of the available information, Mt. View Sanitation District was the first on the West Coast to adopt natural treatment, starting as a pilot project in 1974 and adopted as a permanent feature in 1977. This took place several years prior to initiation of the well-studied Arcata Marsh and Wildlife Sanctuary, in Humboldt County. Since then, Las Gallinas, Fairfield-Suisun Sewer District (FSSD), Sonoma Valley County Sanitation District (SVCSD), Union Sanitary and Petaluma have formally integrated wetlands into their treatment processes. Others have incorporated wetlands into their treatment process as demonstration projects, including Oro Loma Sanitation District and the Palo Alto Regional Water Quality Control Plant. For some of these examples, detailed case studies are compiled in EPA reports or through a recently prepared report by the Regional Water Board.[8,31]

*Table 5. Summary of the permanent, pilot, or demonstration-scale treatment wetlands currently operating in the Bay Area*

| LOCATION | DISCHARGE TYPE | SUMMARY |
|---|---|---|
| Las Gallinas Valley SD | permanent discharges to wetlands and agriculture | Las Gallinas Valley Sanitary District employs a reclamation project consisting of 200 ac irrigated pasture, 40 acres (ac) of storage ponds, a 20-ac freshwater wetland, 10 ac salt marsh and landscape irrigation to eliminate dry weather discharges. This project has been active since 1984. |
| Ellis Creek Water Recycling Facility, Petaluma | permanent discharges to wetlands adjacent to a tidally influenced portion of the Petaluma River | ~4.5 million gallons per day (MGD) of dry weather flows routed to treatment wetlands, beginning in 2009. Flow is routed from 146 ac oxidation ponds to 16 ac constructed wetlands. Water is then chlorinated then routed to 31 ac of polishing wetlands or a chlorine contact chamber. Dechlorinated water discharged to the Petaluma River or recycled for irrigation. Nutrient removal data from the wetlands is not available. |
| Moorhen Marsh; Mt. View SD | permanent discharges to treatment wetlands | 1.3 MGD dry weather flow routed to treatment wetland, prior to release to Suisun Bay, representing 100% of the total flow from the facility. Nitrified effluent (~30 mg L–1 NO3) is discharged to the wetland and removal effectiveness ranges from 13% in winter months to 50% in the summer months (~30% annual average). Ponds A & B came online as a pilot project in 1974. Ponds C, D & E came online in 1977. |

| LOCATION | DISCHARGE TYPE | SUMMARY |
|---|---|---|
| Oro Loma SD | pilot/demonstration discharges to an open water pond and horizontal levee | The Oro Loma Sanitary District's Wet Weather Equalization and Ecotone Demonstration Project involves studying the application of treated wastewater to create upland ecotone habitats for tertiary treatment and sea-level rise adaptation. The project remains in the testing phase of treatment performance. |
| Union Sanitary | on-going discharges to Hayward Marsh | ~2.6 MGD routed to three 145 ac freshwater marsh basins and two 60 ac brackish basins. NPDES permit was obtained in 1983 and effluent was supplied to Hayward Marsh starting in 1988. Ponds need maintenance and future use as a treatment wetland is uncertain. |
| Palo Alto | long-term demonstration project involving discharges to Matadero Creek via Renzel Marsh | Nitrified effluent discharged to Renzel Marsh prior to discharge to Matadero Creek, beginning in 1994. Wetland complex comprised of 15 ac freshwater marsh and Data from 2013-14 indicates Renzel Marsh can reduce marsh influent TN concentrations by 40% via denitrification and cellular uptake (based on 0.74 MGD flow). Phosphorus is reduced by only 4%. Phase II study involved 1.26 MGD, where TN removal reduced to 30%.12 |
| Fairfield | on-going discharges of advanced secondary effluent to Boynton Slough (Suisun Marsh) | FSSD discharges ~14 MGD of advanced secondary effluent to Boynton Slough, part of the larger Suisun Marsh complex. Approximately 10-15% of FSSD effluent recycled for agricultural and landscape irrigation. |
| Napa-Sonoma Marsh | on-going discharges to Schell Slough, two managed wetlands and Napa-Sonoma Marsh | SVCSD discharges tertiary-treated effluent during the wet season to Schell Slough during the time of reduced demand for recycled water. Water is discharged to two managed wetlands during the dry season to maintain freshwater marshlands and ponds. Future discharges may occur to aid in the restoration of 9,460 ac of saline ponds in Sonoma Marsh. |
| Silicon Valley Advanced Water Purification Center | experimental-scale Unit-Cell Open Water Wetlands | Valley Water is partnering with the ReNUWIt consortium (Stanford & UC Berkeley), as well as SFEI to test the performance of UPOW systems for the treatment of reverse osmosis concentrate sourced from their advanced recycling system. Several other pilot projects are being considered for treatment evaluation, including the use of 'floating wetlands' and the horizontal levee at Oro Loma SD, as well as a non-NBS technology for metals removal. |

## 4.2. Barriers to Implementation: Processes & Recommendations

The benefits of multi-benefit shoreline resiliency projects, including treatment wetlands, horizontal levees, beneficial reuse sites, and integrated habitat enhancement/flood risk reduction projects are well documented, widely encouraged, and not worth repeating here. Bay Area sanitation districts were some of the first along the West Coast to adopt treatment wetlands into their treatment trains and most agencies recognize their value in reducing contaminants and adapting to sea level rise.[32]

Virtually every management plan dedicated to Bay restoration and water quality enhancement have for years actively supported green infrastructure. Yet institutional and permitting-related challenges pose a persistent impediment to implementation. It is no agency's responsibility to champion these projects, let alone finance them. And permit processes across the resource management landscape make no distinction between grey infrastructure-based shoreline development (e.g. hotels and office complexes) and green infrastructure presenting multiple benefits to habitats and communities.

A summary of the governance and permit-based challenges are introduced here and will be explored further in the course of this Regional Evaluation. Remedies to these issues require coordination and coalition building on scales perhaps never initiated in the Bay Area. A framework for addressing these will be explored with key stakeholders and agencies with an interest in easing the regulatory and institutional hurdles of implementing multi-benefit projects. Opportunities for exploring these issues could be pursued through a selection of the complementary regional and sub-regional initiatives currently underway that could affect wetland planning and potentially help facilitate utilization of existing or created wetlands for multiple benefits, including wastewater treatment:

- BCDC's Adapting to Rising Tides (ART) project
- Baylands Ecosystem Habitat Goals Update (BEHGU)
- South Bay Salt Ponds Restoration Project (SBSP)
- Coastal Hazards Adaptation Resiliency Group (CHARG)
- San Francisco Bay Restoration Authority
- BCDC's Bay Fill Working Group

Targeted outreach to the appropriate representatives of these groups, some of which overlap, may result in funding opportunities or avoidance of duplicated regulatory engagement or community outreach.

### Geography

The fundamental constraint to deploying natural treatment of wastewater effluent in an urban setting such as the Bay Area lies in securing enough land area to construct wetland treatment wetlands in quantities necessary to meet substantial load reductions. In those instances where land is available, however, nutrient reductions could be achieved with natural systems at a significantly lower cost, compared to traditional grey infrastructure approaches.

In addition to physical constraints of finding available land to construct or restore multi-benefit projects on the shoreline, other geographic constraints include those involving land use, infrastructure, and environmental conflicts, for instance:

- Prohibitively high land acquisition costs and/or the need for complex use agreements
- Restrictive land-use designations that may prohibit wastewater treatment facilities of any type

- Physical and institutional challenges of meeting multiple infrastructure needs (e.g. flood risk, habitat, water/power conveyance)
- Local objections to the utilization of baylands for wastewater treatment or discharging treated effluent to nearshore Waters of the U.S.
- Sea level rise considerations, requiring criteria for assessing appropriate elevation bands, specification of project lifetime, and other flood-related design criteria.

Land acquisition and use agreements will be of concern throughout high-cost and built-out portions of the Bay Area. In the Central Bay, for instance, little to no land acquisition opportunity exists and in most other portions of the region, treatment wetlands may only be feasible where lead or partner agencies have already acquired land. Environmental and stakeholder conflicts are sure to arise wherever real or perceived threats to existing or planned wetlands could occur. Careful outreach to resource agencies, grassroots NGOs, and community groups, as well as the incorporation of ecological risk management strategies throughout the design stage, must be prioritized to address such concerns.

## Institutions and Governance

The planning, design, and implementation of constructed wetlands and multi-benefit projects, in general, requires inter-agency coordination and cooperation, potentially involving multiple municipalities and landowners. The successful coordination of these stakeholders relies on strong governance and modifications to institutional norms. Institutions refer to the structures, processes, rules, and norms that formalize the constraints and incentives facing participants pursuing a given action.[33] Governance refers to the systems and processes put into place to coordinate action and decision-making about the policies, financing, and management of multi-benefit projects likely to lead to nutrient load reductions.[32]

Efforts are underway to convene working groups around multi-benefit projects, modify regulatory structures or policies, and exchange best practices. It is not certain, however, that these changes are occurring with the level of scale or speed required in response to climate change or even our traditional regulatory frameworks. For instance, if large-scale nutrient reductions were deemed necessary and urgent, we cannot say that multi-benefit projects would be pursued over traditional nutrient removal technologies, despite interest and available funding. This Regional Evaluation intends to include an exploration of the governance and institutional barriers to implementation, which will be captured in part through the questionnaire process, and through on-going coordination with key stakeholders and regulators.

The release of recent research focused on barriers to implementation of multi-benefit projects and decision-making processes influencing nutrient management in the region provides a useful starting point.[34,32] Results generally suggest a preference for managing nutrients in the region through approaches that provide multiple benefits and indicate the strong need to address concerns surrounding the longevity of nature-based or traditionally engineered solutions when factoring in sea level rise and issues of aging infrastructure. This requires on-going dialogue and analysis extending beyond evaluations of technical opportunities and constraints to implementing one solution over the other.

## Permitting

Projects involving the creation or enhancement of wetlands adjacent to or upland of SF Bay are subject to a number of regulatory requirements, generally pertaining to protection of water quality and sensitive species. Appendix B provides a summary of the range of applicable regulations and permits. Appendix C

contains an introduction to permitting processes for treatment wetlands in other parts of the country. This Regional Evaluation will include efforts to refine this information and identify a suite of regulatory and institutional constraints, as well as possible approaches to reduce these hurdles while maintaining appropriate protections and considerations.

The Regional Water Board and BCDC are actively investigating policies to address the challenges associated with granting approval to multi-benefit projects, particularly pertaining to treatment wetlands. Some recent policy updates and recommendations are included in Appendix B. This Regional Evaluation process could serve to inform policy and institutional modifications needed to advance NBS for wastewater treatment. Several NBS projects are currently in the planning, design, or permitting stages, serving as useful case studies to document changes made in response to evolving governance and institutional changes.

# NACWA Webinar – EPA's Survey on Nutrient Removal and Secondary Technologies

October 30, 2019

# Today's Speakers and Logistics

- Chris Hornback, Deputy CEO, NACWA
- Jim Pletl, Director, Water Quality, Hampton Roads Sanitation District; NACWA Water Quality Committee Chair
- Logistics:
  - All participants are muted; use the Q&A box to ask questions

# NACWA: A Clear Commitment to Our Nation's Waters

- National trade association for public wastewater & stormwater utilities
- Represents over 320 public utilities of all sizes from around the nation
- Leader in legislative, regulatory, legal & communications advocacy on the full spectrum of clean water issues

# NACWA Engagement

- U.S. EPA Survey – NACWA has been engaged for several years
  - Was mandatory, now **voluntary**
  - Some problematic content removed
  - Shorter, less time to complete
- EPA remains focused on point source contributions of nutrients
- Survey raises broader policy questions

# The Survey

- Screener Survey is first part of a planned, multi-year study
- Screener Survey went live online – October 22
- Responses are due by November 26
- EPA's Study Objectives
- NACWA Board decided not to object to the survey if key changes were made

# NACWA's Concerns with the Survey

- NACWA did not support a mandatory survey – EPA made the decision to use a voluntary approach instead
- How will the data be used by EPA? Will it be safe?
- What is the burden for utilities who choose to complete the survey?
- Some problematic content removed from the survey, but some remains

# NACWA's Concerns - Background

- Natural Resources Defense Council (NRDC) – Petitioned EPA in 2007 to modify secondary treatment to include nutrients
  - EPA denied the petition in 2012, but the screener survey and broader study EPA has planned would provide a roadmap for moving in this direction
- Optimization – A stated goal of the Survey is to help utilities identify opportunities for 'low cost' optimization to remove nutrients
  - Pros and cons
  - Another EPA pressure point on utilities

# Next Steps

- Screener Survey went live online – October 22
- Responses are due by November 26
- NACWA is recommending that each utility discuss internally the pros and cons of responding to the survey before deciding how to proceed.

# WHY JOIN NACWA?

NACWA is the nation's recognized leader in clean water advocacy, made possible through the collective voice of our members.

Join NACWA and elevate clean water as a national priority.

Visit **nacwa.org/membership** to learn more!

**Advocacy**
Legislative, regulatory, legal, and communications information and analysis

**Unity**
Peer-to-peer resource exchange and support

**Value**
Resources, conferences, and recognition

# Questions?

- Use the Q&A feature of the webinar platform to submit your questions.

# Registration Now Open!

NACWA's 2019

## National Clean Water Law and Enforcement Seminar

November 20 - 22, 2019 | Austin, TX


NACWA's 2020

## Winter Conference

***Chasing Zero: How Today's Policies are Shaping the Future of Clean Water***

February 4 – 7, 2020 | Atlanta, GA

Visit nacwa.org/events for more info


# 2020 Utility Leadership Conference and 50th Anniversary Annual Meeting & 50th Anniversary Gala

*July 13-16, 2020 | Seattle, WA*

# Thank you!

# EPA's ONLINE NUTRIENT SURVEY

## Background

- EPA has been planning survey for over 3 years
- Original idea was to used EPA authority under CWA section 308 to make survey mandatory
- NACWA lobbied hard, the survey is now voluntary
- Survey posted online Oct 22nd, due Nov 26th
- Survey to use calendar year 2018 data

## Purpose

- EPA has limited knowledge of POTW's ability to deal with nutrients
- Online screener survey will provide valuable information, envisioned to be the first part of a multi-year study on nutrients
- Ultimate goal is protection of beneficial uses of nation's waters

## EPA's Goals

- Establish a nation-wide database on ability to reduce nutrients through optimization
- Help set more realistic targets for nutrient reductions
- Focus on plants not specifically designed for nutrient reductions (i.e. non-BNR plants)
- Collect data on technology challenges

- Encourage performance with less expense
- Provide forum for stakeholders to share best practices
- Provide performance from POTWs who have been successful in optimizing existing processes
- Assist plants who have limited resources and expertise

**Concerns Raised by NACWA**

- How will data be used?
- Will data be safe?
- What is the burden on utilities to complete survey?
- Must all survey questions be answered?
- Is DMR 40 CFR 136 quality data required?
- Will completing the screener survey oblige a plant to participate in subsequent efforts by EPA?
- Any implications for not completing a survey?

**NACWA's Dialogue with EPA**

- Data will not be used for enforcement
- Survey requests ranges of data not exact numbers so QA data is not absolutely necessary, 40 CFR 136 data quality may be required on future efforts focused on drilling down on specific processes
- Results will be publicly available but not attributed to individual agencies
- Not all questions must be answered in order to submit survey. Can opt out of providing effluent data, some

questions are voluntary, can skip many of the questions if no answer available

- EPA estimates 3.3 hours to complete survey
- Plants with population <750 or < 1 mgd do not need to complete survey
- No special monitoring is being requested to complete survey
- In order to have robust data set, EPA is requesting survey be completed by all types of plants including those that have very unique processes, helps to demonstrate that one size does not fit all
- Due to the voluntary nature, participation in the screener survey will probably not oblige a plant to participate in future efforts
- EPA has not indicated any implications for not submitting a survey

**Lingering Concerns**

- Data will be easy to access (perhaps by NGOs) vs. the digging that might be required to mine the data using huge existing electron reporting databases. FOIA requests would result in disclosure of data from a specific plant.
- In 2007 NRDC petitioned EPA to include nutrient limits as part of secondary treatment standards. EPA denied petition because they didn't have the data to back-up what was technically feasible for nutrient reductions from existing secondary plants. New data could fuel another

NRDC petition or EPA reexamining the basis for secondary treatment.

- Nutrients are complicated, not like conservative pollutants such as copper. Its not clear the impact of nutrients on designated uses of various individual water bodies. Management of nutrients demands site specific assessments
- Optimization often requires use of excess capacity. Fear of use of backsliding regulations such that once the capacity is devoted to nutrient reduction, it cannot be regained.
- Survey continues the focus on point sources rather than the larger impact from non-point sources
- EPA water sector needs to collaborate with wastewater sector on conflicting regulations (e.g. Lead and Copper Rule suggest adding othro-P to water supply to reduce lead and coper concentrations)

**Next Steps**

- Survey due Nov 26th, can only complete online
- Each plant needs to evaluate pros and cons of completing the survey, recognizing EPA has authority to make it mandatory
- If completing the survey, providing good data is <u>essential</u> as conclusion will be drawn by EPA that will influence further activities by EPA to address the nation's nutrient issues

**Bay Area Clean Water Agencies**

# DRAFT Scoping and Evaluation Plan

Regional Evaluation of Potential Nutrient Discharge Reduction by Water Recycling

*DRAFT for Review by BACWA Board*

**October 16, 2019**

## Table of Contents



## List of Tables

# Introduction

On May 8, 2019, the San Francisco Regional Water Quality Control Board (Water Board) issued Order No. R2-2019-0017, *Waste Discharge Requirements for Nutrients from Municipal Wastewater Discharges to San Francisco Bay* (Watershed Permit). The Watershed Permit sets forth a regional framework to facilitate collaboration on studies that will inform future management decisions and regulatory strategies. The 2019 Watershed Permit has four special provisions to implement as follows:

1. Reopener provisions.
2. Regional evaluation of potential nutrient discharge reduction by natural systems.
3. Regional evaluation of potential nutrient discharge reduction by water recycling.
4. Monitoring, modeling, and subembayment studies.

This Scoping and Evaluation Plan for the Regional Evaluation of Potential Nutrient Discharge Reduction is a component of item 3, listed above. The other provisions of the 2019 Watershed Permit that require submittals to the Water Board (natural systems and modeling systems) are being addressed separately. The Regional Evaluation of Potential Nutrient Discharge Reduction by Water Recycling will result in a Recycled Water Study that will increase the understanding of potential effluent nutrient load reductions and the associated costs for water recycling projects by the publically owned treatment works (and other agencies) that discharge to the San Francisco Bay.

Forty four agencies, as listed in Appendix A, were identified in the 2019 Watershed Permit to conduct the water recycling evaluation. These agencies (the participating agencies) have agreed to conduct the evaluation collectively, as members of the Bay Area Clean Water Agencies (BACWA).

# Scoping and Evaluation Plan

The 2019 Watershed Permit requires a Scoping and Evaluation Plan that describes the approach and schedule for completing the nutrient reduction studies by water recycling. The effluent nutrients of interest are nitrogen ion species and total phosphorus. The evaluation will consider both current and projected flows for water recycling. The evaluation includes the following steps:

- Issue a request for information (RFI) to each participating agency
- Compile data and planning documents and perform a preliminary assessment
- Review preliminary assessment with each participating agency
- Prepare draft report for each participating agency
- Review period for each agency to review their report
- Finalize each agency report based on report comments
- Prepare the Draft Recycled Water Study that summarizes the overall study findings
- Review period for BACWA to review the Draft Recycled Water Report
- Finalize the Recycled Water Report and submit to the Water Board

The following sections describe the study schedule and the tasks that will be implemented to complete the aforementioned steps.

## Schedule

The 2019 Watershed Permit requires the submission of a status report by July 1, 2021 and again by July 1, 2022. The final report is due to the Water Board on July 1, 2023.

An overview of the schedule for completion of the water recycling study is presented in **Error! Reference source not found.**. The project schedule has been designed to efficiently execute the study ahead of the deadlines specified in the 2019 Watershed Permit.

**Table 1. Schedule by Tasks**

| Task | Description | Permit Deadline | Proposed Completion Date | Comment |
|---|---|---|---|---|
| 1. Scoping and Evaluation Plan | Prepare a combined document for review by BACWA and submission to the Water Board | Scoping Plan – 12/1/2019 Evaluation Plan - 7/1/2020 | 12/1/2019 | These plans will be combined into one document that describes the project approach and schedule |
| 2. Data Collection and Analysis | Issue RFIs to participating agencies; collect, review and compile data; perform analysis | N/A | 2/2020 | Collect agency information, including data and reports, provide guidance via webinar(s), compile data and consult with agencies for clarifications, and perform analysis |
| 3. Status Report No. 1 | Submittal to Water Board describing tasks completed | 7/1/2021 | 7/1/2021 | |
| 4. Agency Reports and Validation | Prepare agency report template, individual agency reporting (draft and final), and collect agency validation letters | N/A | 7/2022 | Each agency will have an opportunity to review its respective draft agency report and provide comments. Upon receiving comments, a conference call will be held to review the comments prior to finalizing each agency report |
| 5. Status Report No. 2 | Submittal to Water Board describing tasks completed | 7/1/2022 | 7/1/2022 | |
| 6. Recycled Water Study | Prepare Draft and Final Recycled Water Study | 7/1/2023 | 7/1/2023 | The study will summarize overall findings. The Final Study will be presented to the Water Board |
| 7. Project Management | Participate in meetings to convey study progress and findings, manage the project, and perform QA/QC | N/A | 6/2022 | |

## Data Collection and Analysis

As part of the Nutrient Reduction Study that was conducted under the first Watershed Permit (R2-2014-0014), a series of RFIs were submitted to the participating agencies that focused initially on general plant information, plant facilities, and performance, followed by an RFI on future and projected recycled water projects. The recycled water survey from the first Watershed Permit (R2-2014-0014) focused on recycled water demands for various categories of recycled water use types, from existing through 2040 in five year increments. The RFI(s) associated with this Recycled Water Study will expand and refine the recycled water questionnaire from the first Watershed Permit (R2-2014-0014).

Following receipt of the requested information and documents, a preliminary assessment will be conducted, followed by a conference call with each agency to confirm the preliminary assessment and clarify any outstanding data needs.

The following sections provide additional detail regarding the data collection and analysis tasks.

**Data Collection**

The RFI will be submitted to each participating agency during the spring of 2020. This detailed request will expand and refine the recycled water questionnaire from the first Watershed Permit (R2-2014-0014). The expanded and refined RFI will seek the following information:

- Description of existing recycled water program and service area, including maps, figures, and details of existing demands and use types.
- Current recycled water flows and associated nutrient loads removed (if applicable and available).
- Updated status of previously identified recycled water projects, including the relative confidence that the project will be implemented (e.g., is the project conceptual, included in a CIP, currently in construction, etc.) and the anticipating timing of the project, and projected growth in recycled water use over time.
- Projected future recycled water use, in five-year increments. Where available, anticipated type of recycled water use will be collected to support the evaluation of nutrient loads removed. Recycled water seasonality demand will also be considered, particularly for those agencies with a dry season discharge prohibition
- Estimated capital and operations and maintenance (O&M) costs, for each respective anticipated project.

Once the RFIs have been issued to the participating agencies, consultant will confer with each agency to review and confirm the data provided and resolve any outstanding questions.

**Analysis**

Upon receiving the requested information, the data will be organized and compiled. The analysis for each participating agency will include the following:

- Recycled water flows by use type, in five year increments. Projected flows will be captured in acre-feet per year. An average daily use will be estimated in order to

estimate the reduction in the nutrient load discharged to San Francisco Bay. Projections will be presented in five year increments, beginning in 2020 (as current).

- Nutrient load reduction projections for Ammonia and Total Inorganic Nitrogen constituents. Not all recycled water use types result in a reduction in nutrient loads discharged to the bay. Some uses, such as potable reuse, could increase nutrient concentrations discharged to the bay due to the concentrated return streams created during the advanced treatment processes. Generally, irrigation uses (i.e., landscape, golf course, and agricultural) result in a decrease of nutrient loads since the water is consumed at the application site. However, uses such as potable reuse and some industrial uses, will have a concentrated stream that is either returned to the wastewater treatment plant for discharge or otherwise discharged to the bay. Thus, with respect to identifying the nutrient reductions associated with future recycled water uses, the use type will be captured (if available) and the load reduction will be estimated accordingly.
- Capital and operations and maintenance (O&M) costs will be included, if available. Costs will be escalated to the ENR CCI for the SF Bay Area for the most current period prior to completing the draft recycled water study. It is assumed that cost estimates will be available from existing master plans (or more detailed cost estimates) as provided by the participating agency. Development of new cost estimates is not anticipated.
- Develop unit metrics for comparison with the 2018 Nutrient Reduction Study and to allow comparisons between the participating agencies. Unit metrics will include the following:
    - Cost per acre-foot for recycled water project yield ($/acre-foot). A 30 year planning period will be used to allow comparison with 2018 Nutrient Reduction Study (HDR, 2018).
    - Cost per pound of nutrient removed ($/lb nutrient removed). A 30 year planning period will be used to allow comparison with 2018 Nutrient Reduction Study (HDR, 2018). To maintain consistency with the 2018 Study, the projected discharge concentrations will be based on the 2015 BACWA Nutrient Reduction Study Group Annual Report (which includes nutrient effluent data from 7/2012 through 6/2015) and projected to the midpoint of the planning period.
    - Capital and/or present value cost per gallon of recycled water used per day ($/gpd). Present value costs can only be prepared if estimated O&M costs are available. In the absence of O&M costs, only capital cost per gallon of recycled water used per day will be provided. This unit metric will be prepared to allow for comparison with the 2018 Nutrient Reduction Study.
- Qualitative identification of adverse effects and benefits from each project (e.g., reduction of natural water resource diversion, reduction of potable water demand, increase of nutrient concentration discharged to the bay, reduction of chemical fertilizer reliance, etc.).

- Assessment of feasibility, efficacy, and reliability for each project (e.g., low reliability for recycled water fill stations).
- Identification of potential challenges to implementation (e.g., regulatory barriers, disposal of concentrate from reverse osmosis (RO) treatment).

## Agency Reporting

The results of the recycled water data collection and analyses will be documented in individual agency reports and provided to each participating agency for review and confirmation prior to finalization. Each individual report will the following sections:

- Executive summary that includes a table (flow projections, load reduction, and cost of implementation in five-year increments) and a brief description of the future recycled water projects and uses.
- Introduction of each agency, plant and processes (limited to agencies with plant facilities), summary of relevant discharge requirements (e.g., dry season prohibition), and existing recycled water service area, flows, and use types.
- Description of study approach, including methods for projecting recycled water and nutrient load reductions from discharge, and unit cost calculations.
- Results that present the analysis in tables and figures and discusses the likelihood of implementation of future recycled water projects.
- Summary of adverse impacts and benefits, feasibility, and potential challenges to implementation.
- Appendices will include any relevant information from the RFI excluded from the main body and the agency acceptance letter.

Each agency will have an opportunity to review its draft agency report and provide comments prior to the report being finalized for inclusion in the Draft Recycled Water Study.

## Recycled Water Study

Following completion of the agency specific reports, an executive summary style report will be prepared to summarize the information and results. The components of the Recycled Water Study will include:

- Executive summary that presents the overall findings and provides context on the role of recycled water as a means to reduce nutrient loads discharge to San Francisco Bay.
- Basis of evaluation that describes the approach and methodologies employed for the study.
- Results summarized by subembayment and bay-wide, presented with tables and graphics.

- Summary of study limitations.
- Key observations, as appropriate.
- Appendices, including each agency report, agency acceptance letters, scoping and evaluation plan, and other information if appropriate.

# Appendix A – Participating Facilities

| No. | Discharger | Facility Name | Facility Address | Minor/ Major |
|---|---|---|---|---|
| 1 | American Canyon, City of | Wastewater Treatment and Reclamation Facility | 151 Mezzetta Court American Canyon, CA 94503 Napa County | Major |
| 2 | Benicia, City of | Benicia Wastewater Treatment Plant | 614 East Fifth Street Benicia, CA 94510 Solano County | Major |
| 3 | Burlingame, City of | Burlingame Wastewater Treatment Plant | 1103 Airport Boulevard Burlingame, CA 94010 San Mateo County | Major |
| 4 | Central Contra Costa Sanitary District | Central Contra Costa Sanitary District Wastewater Treatment Plant | 5019 Imhoff Place Martinez, CA 94553 Contra Costa County | Major |
| 5 | Central Marin Sanitation Agency | Central Marin Sanitation Agency Wastewater Treatment Plant | 1301 Andersen Drive San Rafael, CA 94901 Marin County | Major |
| 6 | Crockett Community Services District | Port Costa Wastewater Treatment Plant | End of Canyon Lake Drive Port Costa, CA 94569 | Minor |
| 7 | Delta Diablo | Delta Diablo Wastewater Treatment Plant | 2500 Pittsburg-Antioch Hwy Antioch, CA 94509 Contra Costa County | Major |
| 8 | East Bay Dischargers Authority (EBDA); Cities of Hayward and San Leandro; Oro Loma Sanitary District; Castro Valley Sanitary District; Union Sanitary District; East Bay Regional Parks District; Livermore-Amador Valley Water Management Agency, Dublin San Ramon Services District, and City of Livermore | *EBDA Common Outfall*[A] | EBDA Common Outfall 14150 Monarch Bay Drive San Leandro, CA 94577 Alameda County | Major |
| 9 | | Hayward Water Pollution Control Facility | | |
| 10 | | San Leandro Water Pollution Control Plant | | |
| 11 | | Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant | | |
| 12 | | Union Sanitary District, Raymond A. Boege Alvarado Wastewater Treatment Plant | | |
| 13 | | East Bay Regional Parks District[B] | | |
| 14 | | *Livermore-Amador Valley Water Management Agency Export and Storage Facilities*[A] | | |
| 15 | | Dublin San Ramon Services District Wastewater Treatment Plant (LAVMA) | | |
| 16 | | City of Livermore Water Reclamation Plant | | |
| 17 | East Bay Municipal Utility District | East Bay Municipal Utility District, Special District No. 1 Wastewater Treatment Plant | 2020 Wake Avenue Oakland, CA 94607 Alameda County | Major |
| 18 | Fairfield-Suisun Sewer District | Fairfield-Suisun Wastewater Treatment Plant | 1010 Chadbourne Road Fairfield, CA 94534 Solano County | Major |
| 19 | Las Gallinas Valley Sanitary District | Las Gallinas Valley Sanitary District Sewage Treatment Plant | 300 Smith Ranch Road San Rafael, CA 94903 Marin County | Major |
| 20 | Marin County (Paradise Cove), Sanitary District No. 5 of | Paradise Cove Treatment Plant | 3700 Paradise Drive Tiburon, CA 94920 | Minor |
| 21 | Marin County (Tiburon), Sanitary District No. 5 of | Wastewater Treatment Plant | 2001 Paradise Drive Tiburon, CA 94920 | Minor |
| 22 | Millbrae, City of | Water Pollution Control Plant | 400 East Millbrae Avenue Millbrae, CA 94030 San Mateo County | Major |

| No. | Discharger | Facility Name | Facility Address | Minor/ Major |
|---|---|---|---|---|
| 23 | Mt. View Sanitary District | Mt. View Sanitary District Wastewater Treatment Plant | 3800 Arthur Road<br>Martinez, CA 94553<br>Contra Costa County | Major |
| 24 | Napa Sanitation District | Soscol Water Recycling Facility | 1515 Soscol Ferry Road<br>Napa, CA 94558<br>Napa County | Major |
| 25 | Novato Sanitary District | Novato Sanitary District Wastewater Treatment Plant | 500 Davidson Street<br>Novato, CA 94945<br>Marin County | Major |
| 26 | Palo Alto, City of | Palo Alto Regional Water Quality Control Plant | 2501 Embarcadero Way<br>Palo Alto, CA 94303<br>Santa Clara County | Major |
| 27 | Petaluma, City of | Ellis Creek Water Recycling Facility | 3890 Cypress Drive<br>Petaluma, CA 94954<br>Sonoma County | Major |
| 28 | Pinole, City of | Pinole-Hercules Water Pollution Control Plant | 11 Tennent Avenue<br>Pinole, CA, 94564<br>Contra Costa County | Major |
| 29 | Rodeo Sanitary District | Rodeo Sanitary District Water Pollution Control Facility | 800 San Pablo Avenue<br>Rodeo, CA 94572<br>Contra Costa County | Major |
| 30 | San Francisco (San Francisco International Airport), City and County of | Mel Leong Treatment Plant, Sanitary Plant | Bldg. 924 Clearwater Drive<br>San Francisco, CA 94128<br>San Mateo County | Major |
| 31 | San Francisco (Southeast Plant), City and County of | Southeast Water Pollution Control Plant | 750 Phelps Street<br>San Francisco, CA 94124<br>San Francisco County | Major |
| 32 | San Jose and Santa Clara, Cities of | San Jose/Santa Clara Water Pollution Control Plant | 700 Los Esteros Road<br>San Jose, CA 95134<br>Santa Clara County | Major |
| 33 | San Mateo, City of | City of San Mateo Wastewater Treatment Plant | 2050 Detroit Drive<br>San Mateo, CA 94404<br>San Mateo County | Major |
| 34 | Sausalito-Marin City Sanitary District | Sausalito-Marin City Sanitary District Wastewater Treatment Plant | 1 East Road<br>Sausalito, CA 94965<br>Marin County | Major |
| 35 | Sewerage Agency of Southern Marin | Wastewater Treatment Plant | 450 Sycamore Avenue<br>Mill Valley, CA 94941<br>Marin County | Major |
| 36 | Silicon Valley Clean Water | Silicon Valley Clean Water Wastewater Treatment Plant | 1400 Radio Road<br>Redwood City, CA 94065<br>San Mateo County | Major |
| 37 | Sonoma Valley County Sanitary District | Municipal Wastewater Treatment Plant | 22675 8th Street East<br>Sonoma, CA 95476<br>Sonoma County | Major |
| 38 | South San Francisco and San Bruno, Cities of | South San Francisco and San Bruno Water Quality Control Plant | 195 Belle Air Road<br>South San Francisco, CA 94080<br>San Mateo County | Major |
| 39 | Sunnyvale, City of | Sunnyvale Water Pollution Control Plant | 1444 Borregas Avenue<br>Sunnyvale, CA 94089<br>Santa Clara County | Major |
| 40 | U.S. Department of Navy (Treasure Island) | Treasure Island Wastewater Treatment Plant | 1220 Avenue M,<br>San Francisco, CA 94130-1807<br>San Francisco County | Major |

| No. | Discharger | Facility Name | Facility Address | Minor/ Major |
|---|---|---|---|---|
| 41 | Vallejo Flood and Wastewater District | Vallejo Flood and Wastewater District Wastewater Treatment Plant | 450 Ryder Street<br>Vallejo, CA 94590<br>Solano County | Major |
| 42 | West County Agency; West County Wastewater District; City of Richmond; and Richmond Municipal Sewer District | West County Agency Combined Outfall[B] | 2910 Hilltop Drive<br>Richmond, CA 94806<br>Contra Costa County | Major |
| 43 | | West County Wastewater District (WCWD) Treatment Plant | | |
| 44 | | Richmond Municipal Sewer District Water Pollution Control Plant | | |

Note:

A. Conveyance; no treatment facilities.

B. No treatment facilities

## GOAL ONE: SAFEGUARD COASTAL AND MARINE ECOSYSTEMS AND COMMUNITIES IN THE FACE OF CLIMATE CHANGE

The world's oceans absorb roughly one-third of the total carbon dioxide emitted by human activities each year.[6] Simultaneously, they have absorbed over 90 percent of the warming caused by humans since the 1970s.[7] As a result, scientists have observed biological, chemical, and physical changes that include sea-level rise, coastal erosion, ocean acidification, warming seas, changing ocean currents, and shifting species distributions. Such impacts currently, and will continue to, threaten California's communities for decades to come.

Over the next five years, California will prioritize improved scientific understanding, increased resilience, raising of awareness, and integration of changing coastal and ocean conditions into California's state government policies, planning, and operations. Collaborating closely with other state agencies and supporting active coordination, OPC will catalyze, facilitate, and align agency action toward objectives and specific targets that demonstrate activity milestones. A key component of this work will be investment in multi-benefit projects that provide nature-based climate resilience. For example, properly designed MPAs can simultaneously sequester and store carbon, protect wildlife, and enhance adjacent fisheries, achieving co-benefits across multiple sectors while contributing to climate goals.[8]

### Objective 1.1: Build Resiliency to Sea-Level Rise, Coastal Storms, Erosion and Flooding

***Targets:***

- **1.1.1 (cross-cutting – covers more than one goal area):** Ensure California's coast is resilient to at least 3.5 feet of sea-level rise by 2050, consistent with the statewide average projection for sea-level rise under a high emissions scenario and low risk aversion.[9]

**Partners:** OPR, CCC, BCDC, SCC, SLC, State Parks, Caltrans, SWRCB, CalOES, DWR

[6] https://www.noaa.gov/education/resource-collections/ocean-coasts-education-resources/ocean-acidification.
[7] https://www.climate.gov/news-features/understanding-climate/climate-change-ocean-heat-content.
[8] C.M. Roberts et al., Proc. Natl. Acad. Sci. U.S.A. 114, 167 (2017).
[9] http://www.opc.cav/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf

***Actions:***

- Develop and adopt a California Resolution on Sea-Level Rise, outlining broad state commitments over the next ten years to completing coastal climate adaptation research, funding, policymaking, and pilot project implementation.
- Continue to lead a multiagency effort on sea-level rise that recognizes and acts on the urgency of this issue (including developing recommended policies, resolutions, actions and projects), the breadth of its impact, and the severity of anticipated harm.
- Fund and promote nature-based infrastructure adaptation measures and projects, including living shorelines, eelgrass beds, wetland and beach restoration, and other adaptation strategies such as managed retreat, where feasible.

- **1.1.2:** In conjunction with ongoing efforts, develop a site-specific infrastructure resiliency plan focused on state roads, wastewater treatment plants, water supply facilities, ports, and power plants by 2023.

  **Partners:** OPR, CCC, BCDC, SCC, SLC, State Parks, Caltrans, SWRCB, CalOES, DWR

  ***Actions:***

  - Adopt an OPC Infrastructure Resiliency Resolution aligned with existing efforts that sets out a proactive approach to sea-level rise planning for state properties, facilities, and investments and other key infrastructure elements, and that prioritizes natural infrastructure solutions and regional coordination.
  - Prioritize development of a dependable, adequate source of state funding for planning grants, technical assistance, and project implementation support for state and local governments and non-profits leading on sea-level rise response.
- **1.1.3 (cross-cutting):** Inventory, characterize and prioritize remediation for toxic sites vulnerable to sea-level rise by 2022.

  **Partners:** OPR, CCC, BCDC, SCC, SLC, DTSC, Caltrans, SWRCB
- **1.1.4:** Identify pilot projects across the state that demonstrate the efficacy of various sea-level rise and extreme event adaptation strategies by 2021 and begin project implementation immediately thereafter, consistent with existing laws and policies.

  **Partners:** OPR, CCC, BCDC, SCC, SLC, State Parks, Caltrans, SWRCB
- **1.1.5:** Build on existing planning efforts to ensure adoption of a requirement that, at a minimum, all coastal counties will develop a coastal resilience action plan or element by 2023. Develop template and minimum standards for the coastal resiliency plan or element by 2021.

  **Partners:** CCC, OPR, BCDC, CalOES, SCC

***Actions:***

- Aid local governments in completing or updating Local Coastal Programs to integrate sea-level rise and other climate impacts into local planning, consistent with the California Coastal Act.

- **1.1.6:** Update the State of California's Sea-Level Rise Guidance every five years to incorporate best available science and projections.

**Partners:** CCC, BCDC, SCC, DSC, SLC, State Parks

- **1.1.7 (cross-cutting):** Work with partners to ensure an additional 10,000 acres of coastal wetlands[10] will be protected, restored or created by 2025, and that acreage of coastal wetlands in California is increased by 20% by 2030 and 50% by 2040.

**Partners:** CCC, BCDC, SCC, DSC, DFW

***Actions:***

- With partners, develop a wetland action plan that outlines how to meet protection, restoration and creation targets by 2022.
- Develop a standardized approach for optimizing wetland climate resilience, carbon sequestration, flood control, and biodiversity benefits by 2022.

## Objective 1.2: Minimize Causes and Impacts of Ocean Acidification and Hypoxia

***Targets:***

- **1.2.1 (cross-cutting):** Advance state efforts to secure adoption of regulations establishing water quality objectives for ocean acidification and hypoxia that includes, but is not limited to, publicly owner treatment works, stormwater, and non-point source pollution, by 2025, with scientific analysis of the relationship between nutrient inputs and acidification hot spots complete by 2022.

**Partners:** SWRCB, RWQCBs, ARB

***Actions:***

- Provide scientific guidance to the State Water Resources Control Board to inform new nutrient loading standards that minimize biological and chemical impacts including ocean acidification, hypoxia, and harmful algal blooms.

[10] The wetland targets were developed based on extensive consultation with partnering agencies and review of numerous state and NGO wetland planning documents.

- Fund research and monitoring to assess changes in chemical and biological ocean conditions caused by the absorption of airborne emissions, including carbon dioxide.

- **1.2.3 (cross-cutting):** Establish a target date for phasing out coastal sewage discharge into the ocean by 2022. Work with partners to achieve 80-100% coastal wastewater recycling by 2040.

**Partners:** SWRCB, RWQBCs

- **1.2.4 (cross-cutting):** Ensure implementation of California's Ocean Acidification Action Plan by 2023.

**Partners:** CDFW, FGC, SWRCB, RWQCBs, CCC, SCC, BCDC

### Objective 1.3: Improve Understanding of Climate Impacts on California's Coast and Ocean

***Targets:***

- **1.3.1(cross-cutting):** Identify and continue to fund needed climate-related research, with summary reports issued in 2022 and 2025.

**Partners:** SWRCB, CDFW, SCC, SLC, FGC, BCDC, CCC

***Actions:***

- Research and assess current and future impacts to California's ecosystems, species, communities, cultural resources, and economies due to climate change and changing ocean conditions.
- Invest in long-term climate monitoring, modeling, and mapping of data at both the statewide and regional scales, to better reduce or mitigate climate change impacts.
- Better quantify the evolving role of aquatic vegetation in mitigating ocean acidification and storing carbon;
- Map current inventory of and projected future habitat space for seagrass meadows and kelp forests along the California coast; identify data gaps and set targets for restoration as needed.

### Objective 1.4: Understand the Role of California's Marine Protected Areas in Conferring Climate Resilience

- **1.4.1 (cross-cutting):** Release scientific report summarizing the ability of California's marine protected areas to provide ecosystem resilience to climate change impacts by 2020 and begin funding identified data gaps in 2021.

**Partners:** CDFW, FGC


November 8, 2019

Sent via electronic-mail to: COPCpublic@resources.ca.gov

Wade Crowfoot, Secretary for Natural Resources
Chair, California Ocean Protection Council
California Natural Resources Agency1416 Ninth Street, Suite 1311
Sacramento, CA 95814

SUBJECT: **Comments on Strategic Plan to Protect California's Coast and Ocean 2020-2025**

Dear Chair Crowfoot and Members of the Council,

On behalf of the water and wastewater community in California, the undersigned trade associations write to provide comments on the proposed Strategic Plan to Protect California's Coast and Ocean 2020-2025. Our coalition represents over 500 public water and wastewater systems in California. Together we provide essential public services in nearly every community in the state including the delivery of clean safe drinking water, treatment and distribution of drought resilient recycled water, and we protect the environment and public health through effective wastewater treatment. Our associations promote sustainability with a focus on advocacy, education and leadership.

Our coalition shares the OPC's commitment to ocean protection and increasing recycled water use in California. We worked with OPC staff to develop legislation guiding the OPC's development, adoption and implementation of a Statewide Microplastics Strategy. (SB 1263-Portantino, Chapter 609, Statutes of 2018), which is reflected in Goal 3.4.4. Additionally, we advocated for and supported AB 888 by Assemblymember Richard Bloom (Chapter 594, Statutes of 2015) which prohibited the use of plastic microbeads in personal care products like face wash, soap, and toothpaste after January 1, 2020.

We value our partnerships with OPC and were therefore surprised and dismayed to see that the proposed plan includes for the first time a significant new provision with potentially major impacts on water and wastewater agencies. The plan proposes the following goal:

> 1.2.3: Establish a target date for phasing out coastal sewage discharge into the ocean by 2022. Work with partners to achieve 80-100% coastal wastewater recycling by 2040.

Our comments below discuss our concerns with the goal as proposed and offer suggested revisions for the Council's consideration. We do not believe, however, that the few days allowed for comments (one of which is a national holiday) is adequate to obtain public and stakeholder input on this proposed goal. **We urge the Council to extend the opportunity for comment on the plan by at least 30 days and defer adoption to a future meeting.**

**Proposed Goal 1.2.3 is at Best Premature**

The goal is included in the section of the plan dealing with ocean acidification and hypoxia. The potential impact from discharges of nitrates and remediation is a complicated and nuanced issue for which there is a significant amount of research currently underway and also for which many technological advances are being made relative to management options. In California's Bay Area and also in Southern California, large scale scientific studies and management plans for nutrients, including the need for nitrification/denitrification, are currently being employed in conjunction with California Regional Water Quality Control Boards. California's Regional Water Quality Control Boards currently have the authority to require wastewater agencies to comply with water quality requirements and can impose requirements for planning and implementation of processes to decrease nitrogen loadings in receiving waters. In fact, in the San Francisco Bay Area the Regional Water Board has already issued the 1st nutrient watershed permit in 2014 with the 2nd watershed permit planned for adoption in May 2019.

The other two goals in this section appropriately focus on science and strategy development. Goal 1.2.1 calls for scientific guidance to the State Water Resources Control Board to inform new standards that minimize biological and chemical impacts including ocean acidification, hypoxia, and harmful algal blooms and Goal 1.2.4 calls for implementation of California's Ocean Acidification Action Plan by 2023. In contrast, despite the acknowledgement that the science is still developing and that there are multiple factors affecting ocean acidification, Goal 1.2.3 leaps ahead to presume that elimination of permitted coastal wastewater discharges—all of which are already regulated under the Clean Water Act-- is the answer.

For this reason, we recommend that the Council delete Goal 1.2.3.

**Any OPC Goal to Address Coastal Discharges Should be Consistent with the Recycled Water Policy**

The State Water Board's recently adopted Recycled Water Policy includes a goal to:

> "Reuse *all dry weather direct discharges* of treated wastewater to enclosed bays, estuaries and coastal lagoons, and ocean waters *that can be viably put to a beneficial use*. For the purpose of this goal, treated wastewater does not include discharges necessary to maintain beneficial uses and brine discharges from recycled water facilities or desalination facilities. (Emphasis added.)

While the OPC's goal appears to be to reduce discharges for water quality reasons, the only way to reduce discharges (as discussed further below, elimination of wastewater discharges to the ocean is neither reasonable nor feasible) is to greatly increase water recycling. The water generated by millions of Californians will not simply disappear. In addition, it is not helpful to have two state agencies with key roles in ocean protection with different goals. If the Council decides to retain some form of a goal for coastal discharge reduction, we recommend it include the goal already adopted by the Water Board after extensive stakeholder comment and move the goal to Objective 1.1 dealing with climate resiliency.

**Major Regulatory, Funding and Practical Realities Stand in the Way of an 80 to 100 Percent Reduction in Discharges**

We appreciate that the plan acknowledges the need to engage with the Water Board to develop a plan to achieve the proposed discharge elimination goal. There are numerous other public agencies and stakeholders who must also be at the table in any plan development process. As of today, the regulatory framework necessary for agencies to plan and implement projects to manage the massive volumes of water contemplated in Goal 1.2.3 does not exist. Existing beneficial reuse options are limited and could not be utilized to manage such a vast quantity of water. Instead, many agencies would need to implement large scale potable reuse projects. The State Water Board is charged with developing regulations for Direct Potable Reuse by 2023. Until that regulatory scheme has been developed it will be nearly impossible for agencies to plan for, let alone implement, projects to meet the goal. To put this in perspective, some of the most ambitious recycling projects underway in the state currently have 20 to 30 year project schedules, and when fully operational will still not meet the proposed 80 to 100 percent discharge reduction.

There are numerous technical realities in the wastewater treatment and management processes that must be considered. Major operational issues exist, including brine management, wet weather influent management, existing regulatory constraints relative to minimum flows, and other real and substantive conflicts with how wastewater agencies function in their communities. These technical issues are vast, far reaching, and vary based on the regional watershed and individual permitting levels.

**The Proposed Discharge Elimination is in Conflict with Important Public Policies**

Some of California's most ambitious policy goals may be in conflict with Goal 1.2.3. For example, California is a leader on climate change mitigation and adaptation and has taken several steps in recent years to curb emissions and transition to a more sustainable future. Requiring all coastal areas to severely curtail discharges could adversely impact those efforts by increasing the emissions associated with advanced wastewater treatment and the associated energy demand required to move the high volumes of water over or across a variety of geographical settings.

California is simultaneously pursuing policies to make living more affordable for all residents of the state. Unfortunately, achievement of the goal to severely reduce discharges would require massive infrastructure development and rate increases for a significant portion of the state's population, including some of the most disadvantaged communities in California. The rate implications would likely have a trickle-down effect of impacting housing affordability as well, as connection fees and ongoing rates would necessarily increase living expenses and the cost of new development in impacted areas.

Finally, as California grapples with how to provide safe, affordable, clean drinking water for all, we need to be cautious of a singular focus on coastal discharges that would create additional strain on the limited resources available to fund clean water projects. To the extent that coastal agencies seeking to meet this goal would be expected to apply for and absorb the limited existing grant and loan opportunities available to them, this would inevitably draw funds away from numerous inland areas (such as the Central Valley) where there are so many urgent drinking water and clean water priorities in need of funding.

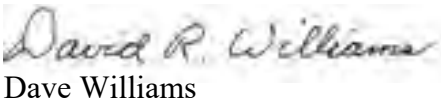
Thank you for your consideration of our comments. Our coalition values its constructive relationship with the OPC and respectfully requests that the Council allow additional time for public review and comment before proceeding with a goal to reduce or eliminate ocean discharges.

Sincerely,

Roberta Larson
California Association of Sanitation Agencies

Danielle Blacet
California Municipal Utilities Association

Dave Bolland
Association of California Water Agencies



Dave Williams
Bay Area Clean Water Agencies

Steve Jepsen
Southern California Alliance of Publicly Owned Treatment Works

CC: Members, California Ocean Protection Council
Mark Gold, Executive Director, California Ocean Protection Council

# NMS Assessment Framework (AF) planning meeting
# 29 October 2019, 1-4 pm, SFEI

| Item | Description | Time & Lead |
|---|---|---|
| 1 | **Introductions and goals of the meeting**<br><br>Goals for this meeting:<br>● Understand the Water Board, EPA, and BACWA goals for the Assessment Framework<br>● Gather input on<br>○ priority activities or project for continued AF development<br>○ priorities for AF development process<br>● Start to develop the work plan for at least one element of the work plan | 1:00<br><br>Melissa Foley |
| 2 | **Review Assessment Framework 1.0**<br><br>High-level overview of the work that has been done to date on the Assessment Framework | 1:05<br><br>Dave Senn |
| 3 | **Discussion of the goals of different entities (15 minutes each + 15 minutes general discussion)**<br><br>Water Board and EPA:<br>1. In what ways does the WB/EPA plan to use or apply the "final" AF? How will AF be used to inform specific regulatory or management decisions?<br>2. Given those anticipated uses, what are WB/EPA priorities for AF development to allow the AF to be most useful, or most-confidently-applied?<br>3. How does AF1.0 (Sutula et al. 2016) fit into WB/EPA's vision of the "final AF", or inform the priorities for AF development?<br><br>BACWA:<br>4. What are the priorities of the POTW community for the AF development process?<br>5. What aspects of the AF development process or specific components (e.g., data collection, expert input or review) are highest priority in terms of maximizing confidence in the outcome? | 1:35<br><br>Everyone |

| | | |
|---|---|---|
| 4 | **Begin to develop the Assessment Framework Workplan**<br><br>Discuss what studies need to be conducted to advance the Assessment Framework and how much effort should be devoted to each effort. We will focus on indicators for the Open Bay in this meeting. | 2:35<br><br>Melissa Foley, Dave Senn |
| 5 | **Schedule next meeting and review action items** | 3:50 |
| 6 | **Adjourn** | 4:00 |

# Scientific Basis to Assess the Effects of Nutrients on San Francisco Bay Beneficial Uses

Final January 2016

Prepared for:
San Francisco Bay Regional Water Quality Control Board
Contract 11-151-120
Contract Manager: Naomi Feger

Martha Sutula
Southern California Coastal Water Research Project, Costa Mesa CA

David Senn
San Francisco Estuary Institute, Richmond, CA

Links:
- Main Document
- Folder with all Appendices

**EXPERT WORKGROUP**

Gry Mine Berg
Applied Marine Sciences, Santa Cruz, CA

Suzanne Bricker
NOAA National Centers for Coastal Ocean Science, Silver Spring, MD

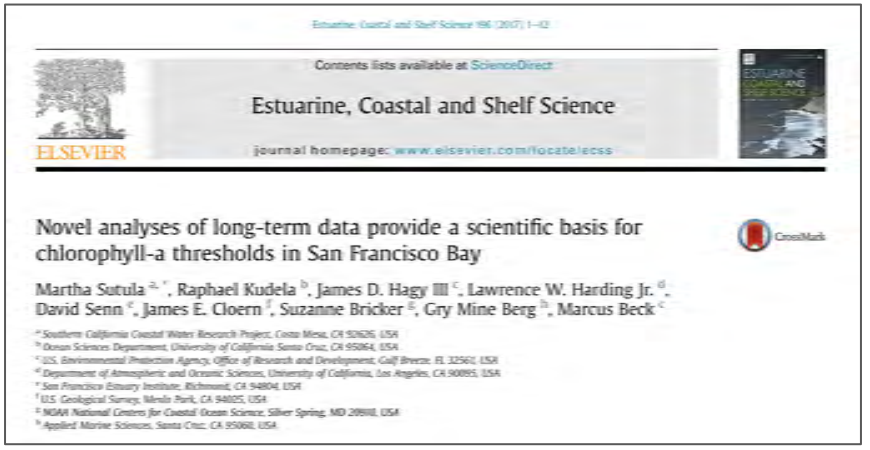
James Cloern
U.S. Geological Survey, Menlo Park, CA

Richard Dugdale
Romberg Tiberon Center, San Francisco State University, Tiberon, CA

James Hagy
U.S. Environmental Protection Agency
Office of Research & Development, Gulf Ecology Division, Gulf Breeze, FL

Lawrence Harding
Department of Earth and Atmospheric Sciences, University of California Los Angeles, CA

Raphael Kudela
Ocean Sciences Department, University of California, Santa Cruz, CA




**Focus:**
- Deep subtidal habitats
- DO, HABs, and their linkage to chl-a

**Goals:**
- Evaluate whether it's feasible to develop indicator-like relationships using existing long-term monitoring data in SFB
  - HAB vs. chl-a
  - Toxin vs. chl-a
  - DO vs. chl-a
- Develop a set of initial guidance HA 'thresholds'.
- Developing classification schemes for DO and HABs, including using chl-a as an indicator.

**from Executive Summary**

"Analyses of two decades of phytoplankton species composition, chlorophyll-a, and dissolved oxygen (DO), and 3 years of toxin data from solid phase adsorption toxin tracking (SPATT) samplers were used to support decisions on the AF and demonstrated:

1) significant increases in chlorophyll-a, declines in DO, and a high prevalence of HAB species and toxins across most SFB subembayments; and

2) strong linkage of increasing chlorophyll-a to declining DO and HAB abundance. Statistical approaches were used to define thresholds in chlorophyll-a relating to increased risks of HABs and declining DO. These thresholds were used, in combination with expert best professional judgment, to develop an AF classification scheme.

The AF is intended to provide a decision framework for quantifying the extent to which SFB is supporting beneficial uses with respect to nutrients. This AF is comprised of three important elements: 1) a set of conceptual models that defines what a problem would look like in SFB, if it occurred, 2) a set of core principles supporting the AF, and 3) classification tables.

The classification scheme is a critical element of the AF, because it represents a quantitative and transparent mechanism through which SFB data can be interpreted to assess, nutrient-related beneficial use support. Given its importance, the authors of this document fully acknowledge the uncertainty in the AF classification scheme and need for refinement, through multiple iterations of basic research, monitoring, and modeling. We suggest that the near-term use of the AF classification system be focused on a scientific "test drive" focused on understanding how to collectively use and improve efficiencies for assessment, monitoring and modeling. The "test drive" of the AF can be conducted in tandem with research, monitoring, and modeling to improve the scientific foundation for the AF…"

## From Section 2

Thus, the Water Board is working to develop an AF based on the following key tenets:

1. *Ecological response indicators (e.g., dissolved oxygen, primary producer abundance, productivity and assemblages) should provide a more direct risk-based linkage to beneficial uses than to nutrient concentrations or loads.* The AF should be based on assessing eutrophication (or other adverse effects), rather than nutrient over-enrichment per se.
2. *A weight-of-evidence approach with multiple indicators can produce a more robust assessment of eutrophication.* Wherever possible, the use of multiple indicators in a "weight-of-evidence" approach provides a more robust means to assess ecological condition and determine impairment. This approach is similar to the multimetric index approach, which defines an array of metrics or measures that provide limited information on biological status on an individual basis, but when integrated, serve to inform overall biological condition.
3. *Models can be used convert response indicators to site-specific nutrient loads or concentrations.* A key premise of the NNE framework is the use of models to convert numeric endpoints, based on ecological response indicators, to site-specific nutrient goals appropriate for permitting and TMDLs. A key feature of these models is that they account for site-specific co-factors, such as light availability, temperature, and hydrology that modify the ecological response of a system to nutrients. Thus, nutrient forms and ratios are not an explicit element of the AF, but become linked to assessment endpoints through modeling of ecological processes.

### Desirable Attributes of an AF

The goal of the nutrient AF is to provide a structured set of decision rules that specify how to use monitoring data to categorize specific subembayments of SFB, from very high to very low ecological condition, using indicators that have a direct linkage to nutrients and support of SFB beneficial uses.

To achieve this goal, a nutrient AF for SFB should offer the following features:

- The AF should employ indicator(s) that have a strong linkage to Bay beneficial uses. This linkage should be scientifically well-supported and easily communicable to the public.
- One or more primary indicators of the AF should have a predictive relationship with surface water nutrients and/or nutrient loads to the Bay.
- The AF should employ the indicator(s) that classify the Bay subembayments from very high ecological condition to very low ecological condition. It should be explicit as to how the magnitude, extent, and duration of the effects cause the subembayments to be classified differently.
- The AF should be spatially explicit for different subembayments of the Bay and different habitat types (deep vs. shallow subtidal), as warranted by the ecological nature of response to nutrients.
- The AF should specify what appropriate methods are used to measure the indicator and the temporal frequency and spatial density of data required to make that assessment.
- It should provide guidance on how the data should be analyzed to categorize the Bay subembayments.

- An Assessment Framework serves as a yardstick (or set of yardsticks) defining what conditions constitute high← → medium← → low quality.

- Emphasis on using *response* indicators...measures of ecosystem *response* (as opposed to nutrients directly)

- Indicators are compared against the AF to identify habitats that are experiencing healthy/protective conditions, and habitats that are sufficiently impacted that they would be considered impaired.

| Classification Based On Ecological Condition | Indicator |
|---|---|
| **Very High** | ≤ ? |
| **High** | ? – ? |
| **Moderate** | ? – ? |
| **Low** | ? – ? |
| **Very Low** | > ? |

Good Indicators…

- Well-documented links to beneficial uses
- Mechanistic, and predictable, link to nutrients
- Can be reliably and sustainably measured
- 'Sensitive' and acceptable signal:noise

Sutula et al. 2007, 2016

# Objectives for chl-DO and GPP

**Table 3.5. Chlorophyll-a Classification Table Based on Risk of Falling Below DO Water Quality Objectives, Based on Annual February-September Mean Chlorophyll-a, for South Bay and Lower South Bay only.**

Feb-Sep mean chl-a

| Classification of ecological condition based on mean February - September chlorophyll-a (mg $m^{-3}$) linked DO benchmarks - South Bay and Lower South Bay Only | | |
|---|---|---|
| **Category** | **Lower South Bay** | **South Bay** |
| Very high) | ≤23 | ≤14 |
| High | | >25 - 32 |
| Moderate | >23 - 35 | >32 - 44 |
| Low | >35 - 51 | >44 - 58 |
| Very Low | >51 | >58 |

**Table 3.6. Gross Primary Productivity Classification Table Based on Annual Rate (g $m^{-2}$ $yr^{-1}$). Classification should be applied to each subembayment.**

Calculated from monthly chl-a, photic depth, and seasonally-varying sunlight

| Category | Gross Primary Productivity (g $m^{-2}$ $yr^{-1}$) |
|---|---|
| Very high/High | ≤300 |
| Moderate | >300 - 500 |
| Low/ Very Low | ≥ 500 |

# Objectives for chl-HABs and HA abundance

**Table 3.4. Chlorophyll-a Classification Table Linked to HAB Abundance, Based on Annual Frequency of Occurrence in Monthly Samples. Classification should be applied to each subembayment.** Relationship between chl-a and increased probability of exceeding HAB alert levelmonthly mean chl. See figure to right

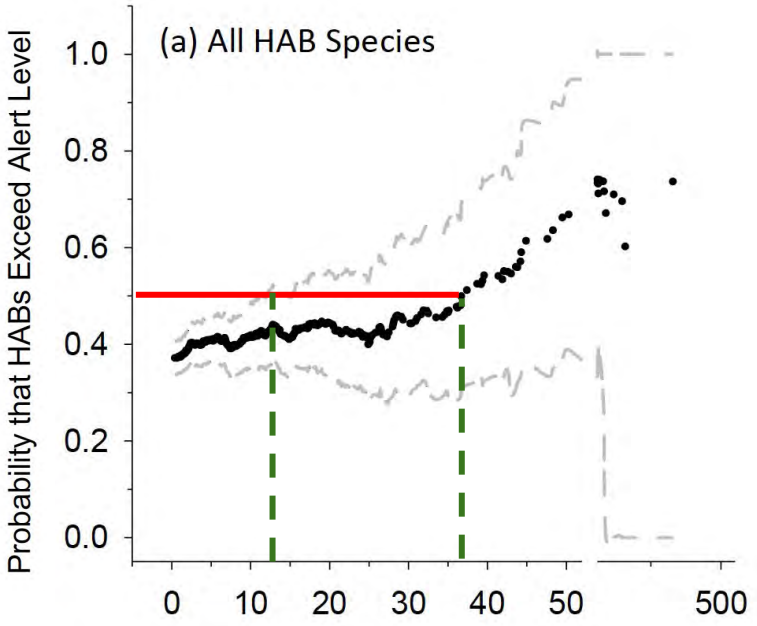
| Subembayment Monthly Mean Chlorophyll-a Linked to HAB Abundance (µg $L^{-1}$) | Ecological Condition Based on Annual Frequency of Occurrence in Monthly Samples | | | |
|---|---|---|---|---|
| | 1 of 12 | 2-3 | 4-6 | 6+ |
| ≤ 13 | Very high | Very high | Very high | Very high |
| >13 – 25 | Good | Moderate | Moderate | Low |
| >25 – 40 | Moderate | Moderate | Low | Very Low |
| >40 – 60 | Moderate | Low | Very Low | Very Low |
| >60 | Low | Very low | Very low | Very low |

**Table 3.11. HAB Abundance Classification Table. Classification should be applied to each subembayment. If multiple HABs are detected within a subembayment on an annual basis, lowest rating for the year should be applied.**

| Cell Count By Taxonomic Group | Ecological Condition Based on Annual Frequency of Occurrence in Monthly Samples | | | |
|---|---|---|---|---|
| | 1 of 12 | 2-3 | 4-6 | 6+ |
| **Cyanobacteria**[1]. Applies at salinities ≤ 2 ppt. | | | | |
| Absent to < 20,000 cells per ml | Very high | Very high | Very high | Very high |
| 20,000 – $10^5$ cells per ml | High | Moderate | Low | Very Low |
| $10^5$ – $10^7$ cells per ml | Moderate | Low | Very Low | Very Low |
| > $10^7$ cells per ml | Low | Very Low | Very Low | Very Low |
| **Pseudo-nitzchia spp.** | | | | |
| <100 cells per l | Very high | Very high | Very high | Very high |
| 100 to 10,000 cells per l | High | High | Moderate | Low |
| 10,000 -50,000 cells per l | Moderate | Low | Low | Very Low |
| > 50,000 cells per l | Low | Very Low | Very Low | Very Low |
| **Alexandrium spp.** | | | | |
| Non detect | Very high | Very high | Very high | Very high |
| Detectable to < 100 cells | High | Moderate | Low | Very low |
| >100 cells | Low | Very low | Very low | Very Low |

[1] Cyanobacteria include: Cylindrospermopsis, Anabaena, Microcystis, Planktothrix, Anabaenopsis, Aphanizomenon, Lyngbya, Raphidiopsis, Oscillatoria, and Umezakia

13 µg/L corresponds to the lower-95% confidence interval for HAB probability exceeding 50%.




y-axis above corresponds to exceeding any one of the levels below.

**Table 3.7. Potential HABs from San Francisco Bay, and alert levels used in other regions.**

| *Organism* | *Alert Level (cells/L)* | *Reference* |
|---|---|---|
| *Alexandrium spp.* | Presence | http://www.scotland.gov.uk/Publications/2011/03/16182005/37 |
| *Blue-Green Algae* | 100,000 | WHO, 2003; California Guidance (OEHHA, 2012) |
| *Dinophysis spp.* | 100-1,000 | http://www.scotland.gov.uk/Publications/2011/03/16182005/37; Vlamis et al. 2014 |
| *Heterosigma akashiwo* | 500,000 | Expert opinion |
| *Karenia mikimotoi* | 500,000 | Expert opinion |
| *Karlodinium veneficum* | 500,000 | Expert opinion |
| *Pseudo-nitzschia* | 10,000-50,000 | Cal-HABMAP ; Shumway et al. 1995; Anderson et al. 2009 |

# Objectives for Phycotoxins, produced by HABs: Particulate, Dissolved (SPATT), and Mussels

**Table 3.8. Toxin Classification Table for Microcystin. Classification should be applied to each subembayment. If multiple occurrences in different media (particulate, SPATT, tissue) are detected within a subembayment on an annual basis, the lowest rating for the year should be applied.**

D

| Toxin Concentration | Ecological Condition Based on Annual Frequency of Occurrence in Monthly Samples | | | |
|---|---|---|---|---|
| | 1 of 12 | 2-3 | 4-6 | 6+ |
| **Particulate concentration** | | | | |
| Non-detect | Very high | Very high | Very high | Very high |
| Detectable, but < 0.8 ppb | High | Moderate | Moderate | Low |
| 0.8 - 20 ppb | Moderate | moderate | Low | Very Low |
| >20 ppb | Low | Very Low | Very Low | Very Low |
| **SPATT** | | | | |
| Below the warning level <100 ng/g) | Very high | Very high | Very high | Very high |
| 100-250 ng/g | Moderate | Low | Very low | Very Low |
| >250 ng/g | Low | Very Low | Very Low | Very Low |
| **Mussel Tissue** | | | | |
| Non-detect | Very high | Very high | Very high | Very high |
| Detectable, but < 12 ng/g | High | Moderate | Moderate | Low |
| 12-24 ng/g | Moderate | moderate | Low | Very Low |
| > 24 ng/g | Low | Very Low | Very Low | Very Low |

**Table 3.9. Toxin Classification Table for Domoic Acid. Classification should be applied to each subembayment. If multiple hits in different media (particulate, SPATT, tissue) are detected within a subembayment on an annual basis, lowest rating for the year should be applied.**

| Toxin Concentration | Ecological Condition Based on Annual Frequency of Occurrence in Monthly Samples | | | |
|---|---|---|---|---|
| | 1 of 12 | 2-3 | 4-6 | 6+ |
| **Particulate concentration** | | | | |
| Non-detect | Very high | Very high | Very high | Very high |
| 0-100 ug/L | High | Moderate | Moderate | Low |
| 100 - 1000 ug/L | Moderate | moderate | Low | Very Low |
| > 1000 ug/L | Low | Very Low | Very Low | Very Low |
| **SPATT** | | | | |
| <30 ng/g | Very high | Very high | Very high | Very high |
| 30-75 ng/g | Moderate | Low | Very low | Very Low |
| >75 | Low | Very Low | Very Low | Very Low |
| **Mussel Tissue** | | | | |
| Non-detect | Very high | Very high | Very high | Very high |
| < 10 ppm | High | Moderate | Moderate | Low |
| 10-20 ppm | Moderate | moderate | Low | Very Low |
| > 20 ppm | Low | Very Low | Very Low | Very Low |

**Table 3.10. Toxin Classification Table for Paralytic Shellfish Toxins. Classification should be applied to each subembayment. If multiple hits in different media (particulate, SPATT, tissue) are detected within a subembayment on an annual basis, lowest rating for the year should be applied.**

| Toxin Concentration | Ecological Condition Based on Annual Frequency of Occurrence in Monthly Samples | | | |
|---|---|---|---|---|
| | 1 of 12 | 2-3 | 4-6 | 6+ |
| **Particulate Concentration** | | | | |
| Non-detect | Very high | Very high | Very high | Very high |
| Detectable | Low | Very low | Very low | Very Low |
| **Mussel Tissue** | | | | |
| Non-detect | Very high | Very high | Very high | Very high |
| < 40 µg/100 g | High | Moderate | Moderate | Low |
| 40-80 µg/100 g | Moderate | moderate | Low | Very Low |
| > 80 µg/100 g | Low | Very Low | Very Low | Very Low |

## 4.3 Recommendations for Refinement of the AF

From this initial work, a number of recommendations emerge for refining and potentially expanding the AF. Please note that these recommendations have not been prioritized, and that early discussions to incorporate these needs into the SFB Nutrient Management Science Plan have already begun.

1. **Improve scientific basis for nutrient-related segmentation of SFB.** Our recommendation that the preliminary segmentation be based on Jassby et al. (1997) is a departure from the existing subembayments used by the SFB Water Board for assessments and permit-related activities. We strongly recommend reanalysis of existing data to be repeated using the Jassby et al. (1997) methodology, using newly available and relevant ecological data, to finalize this segmentation scheme.

2. **Include diked baylands, restored salt ponds and tidal sloughs in future iterations of this AF.** Deepwater and shallow subtidal habitats are the focus of this AF; diked baylands, restored salt ponds, and tidal sloughs are excluded in this first phase of work. We believe that these shallow water margin habitats are critical components of the SFB ecosystem and should be include in future iterations of the AF.

3. **Include dissolved oxygen classification and recommendations for monitoring in future iterations of the AF.** Current recommendations for AF focus on indicators of phytoplankton. We recommend science and synthesis to accomplish the following:

    a. Improve understanding of what species, representative of different beneficial uses, are the most sensitive to low DO and what are the temporal and spatial scales of their use of SFB subembayments as habitat
    b. Identify DO criteria representing acute and chronic tolerances to low exposure, and individual and population scales
    c. Improve characterization of the diel variability of DO at key points within the deep water and shallow margin habitat of each subembayment in order to better characterize support of species and habitats
    d. Improve mechanistic understanding of the physical and biological factors influencing DO within and between the deep channel and shallow water margin habitat

4. **Optimize spatial and temporal sampling of AF indicators to best align quality of the information produced, while balancing costs, logistics, and power to detect trends.** Dissolved oxygen, phytoplankton biomass, productivity and phytoplankton composition are all extremely variable across both time and space. The temporal and spatial elements of the AF and the monitoring program must be aligned and optimized to capture this variability in a manner that is also cost-effective. This could be done by conducting an intensive field observation program coupled interpolated with hydrodynamic model simulations, then conducting power analyses to understand how to best capture variability, given real constraints in available resources. Another approach is to invite subject matter experts to provide perspective about how this was done in systems of similar size and complexity (e.g. Chesapeake Bay).

## NMS Work Related to AF recommendations

See also timeline on slide8

No specific work yet

- LSB synthesis
- LSB margins mooring network
- Margin DO-habitat expert workgroup
- Technical report: analysis/interpretation
….DO condition in LSB margins
….Fish-DO

c. Moorings at South Bay bridges, and in LSB margins. Limited NMS work in Suisun.

d. Data analysis underwayand modeling underway

a and b proposed for upcoming AF work

- Modeling analysis, mooring pilot studies, and biogeochem mapping work in South Bay
- Installation of South Bay shoal site, shoal chl-a and GPP, biogeochem mapping
- Continued modeling analysis, site locations. But more targeted work is needed.
- Early steps with power analysis (trends)

See also timeline on slide8

5. **Reduce sources of uncertainty in chlorophyll-a, HAB abundance and toxin classification.** Three major recommendations are given to reduce uncertainty in the chlorophyll-a classification. These include:

   e. Better characterization of the significance of the ecological and human risk of HABs in SFB through more intensive monitoring of subembayments
   f. Co-location of chlorophyll-a, particulate, shellfish and SPATT monitoring to improve linkage of chlorophyll-a to HAB toxin concentrations, rather than cell counts as the foundation for the risk paradigm
   g. Expansion of SPATT samplers to include other toxins, particularly PSTs
   h. A work element to better validate SPATT toxin data relative to particulate or mussel toxin tissues: While this has historically been difficult, precedence exists (Lane et al. 2010), and because SPATT were originally designed for lipophilic toxins (Mackenzie et al. 2004), an obvious next step would also be to analyze SPATT samplers for okadaic acid, dinophysistoxins, and yessotoxins.
   i. Assembly of a scientific workgroup to synthesize scientific understanding of chronic effects of HAB toxins on SFB food webs and human health
   j. Monitoring improvements through better spatial coverage and temporal coverage of data to link chlorophyll-a to DO, focused specifically on South SFB, coupled with improved understanding of DO expectations for shallow water margins, tidal sloughs and intertidal wetland habitat (see Recommendation C above).

6. **Link HABs more specifically to nutrients.** Although deliberately excluded from this analysis, sufficient data exist to develop more complex multidimensional statistical models for harmful algal species and toxins (e.g. Kudela 2012) or to apply existing estuarine and coastal models to SFB (e.g. Lane et al. 2010; Anderson et al. 2009, 2010). This would also more directly link condition to nutrients.

## NMS Work Related to AF recommendations

e1. Instituted consistent collection of phytoplankton- and HA-related data at sentinel sites through SFB, as noted below for **f**.

f.1 Measured particulate toxin (ptox), biweekly-monthly at 6-9 sentinel sites co-located with chl, microscopy and SPATT

f.2 Testing the utility of sequencing and/or qPCR for detection of priority HAB-organisms. (archived 2015-2019 samples)

f3. Continued collection/measurement of SPATT for DA and MCY.

f.4 Biweekly mussel toxin measurements in Central and South Bays (DA, STX, MCY)

f.5 Pilot study investigating toxins in anchovies in San Pablo Bay, Central Bay, and South Bay.

g. Not yet begun. Samples exist, could be done if prioritized

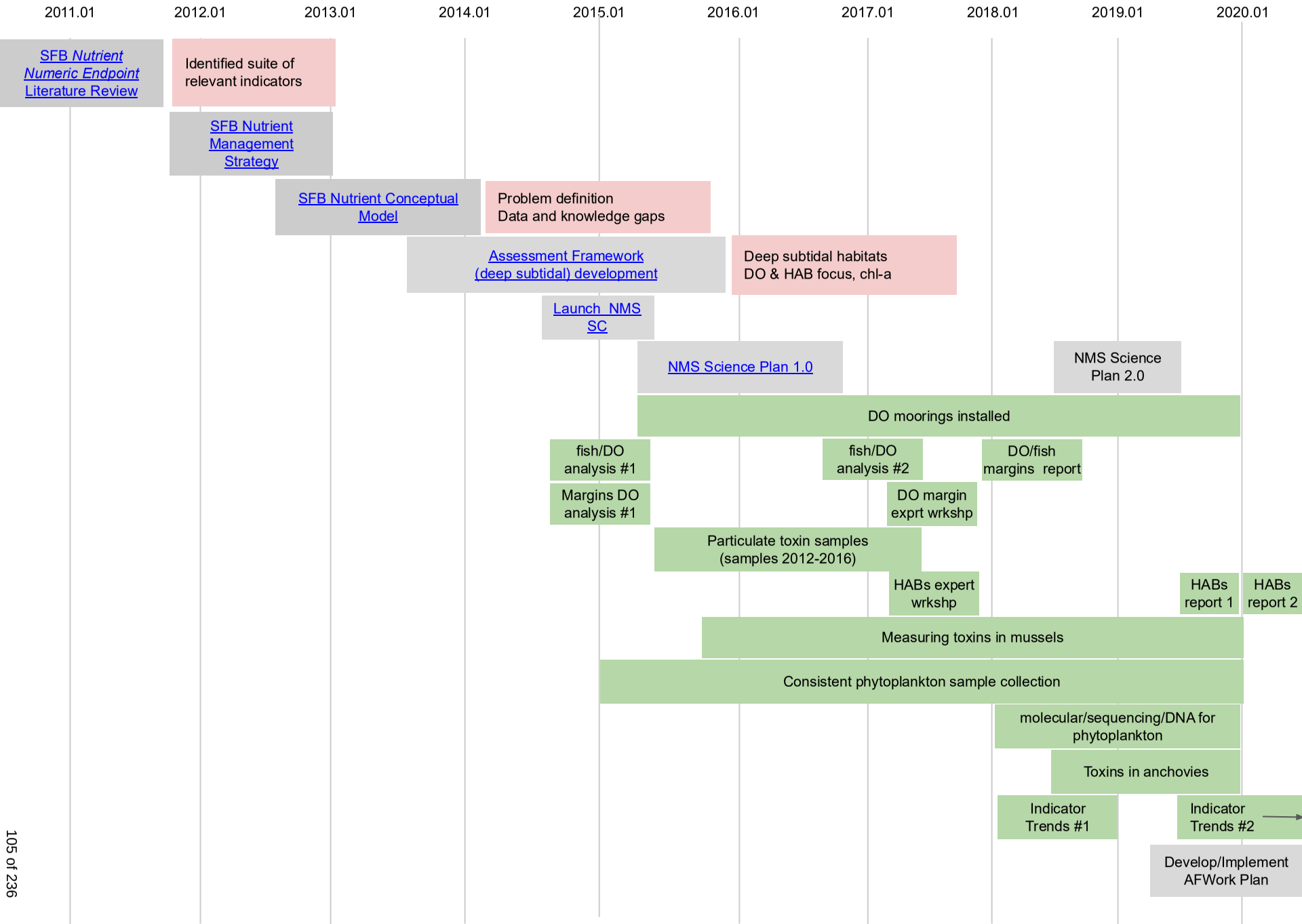
h. Work to date has gone toward building the necessary data resources (see f); data analysis toward this recommendation has not yet begun.

i. First workgroup held in 2017. Updated group proposed for continued AF work, early 2019

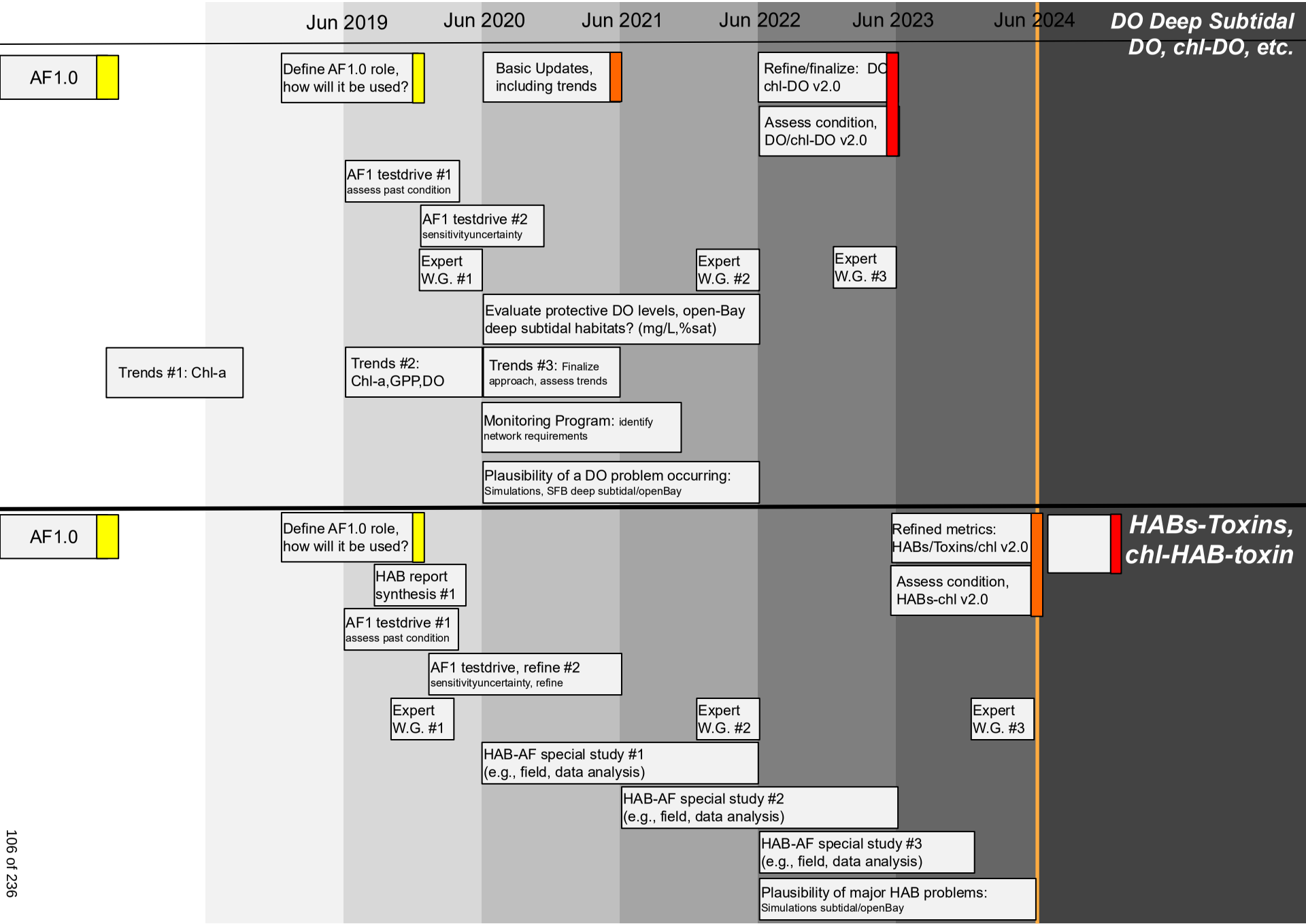
j. Installation of South Bay shoal site, shoal chl-a and GPP, biogeochem mapping. See also work related to 2 and 3.

k. Additional data resources developed, but no work begun specific to this task

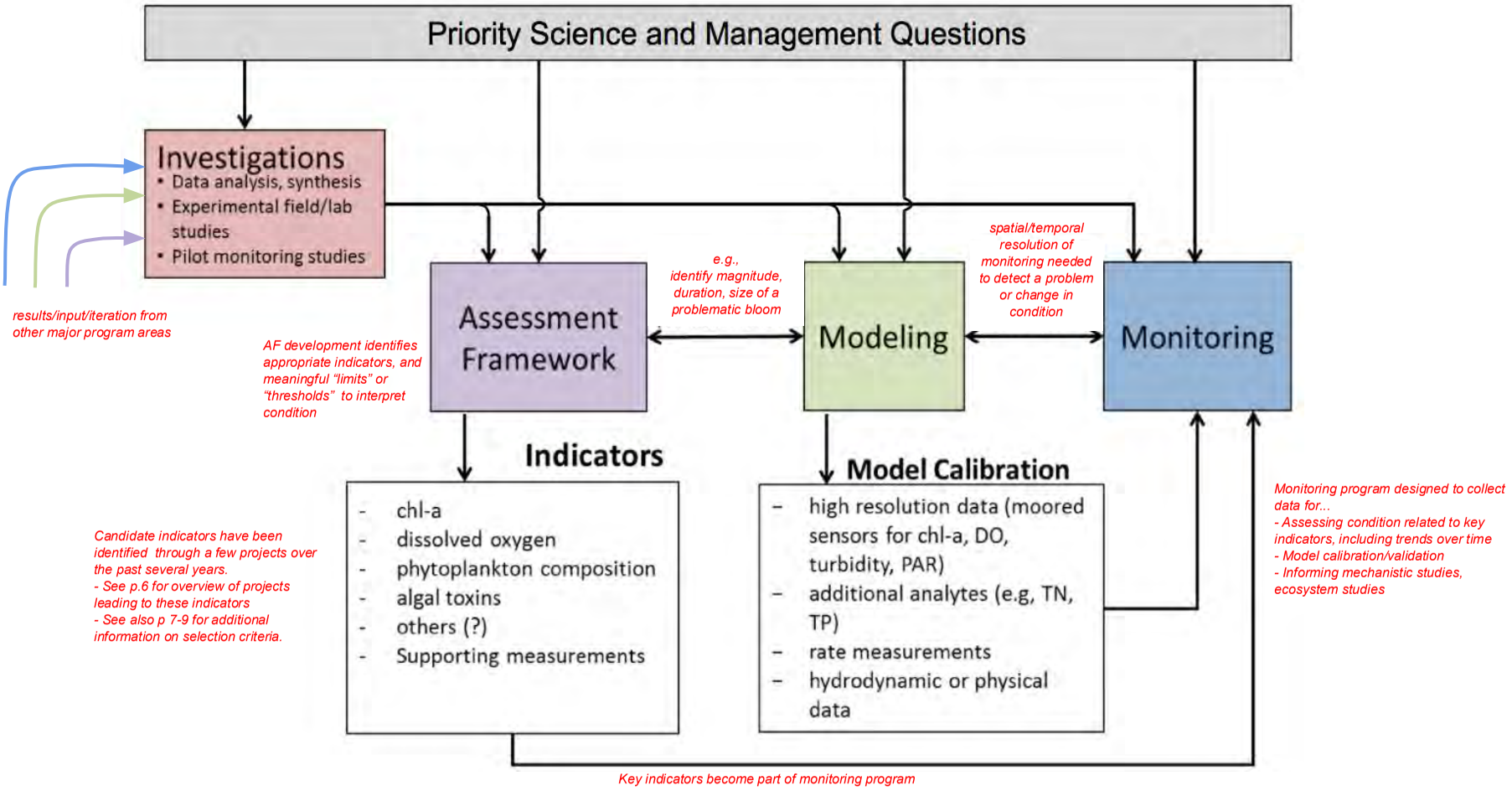
# Timeline of NMS AF-Related Activities

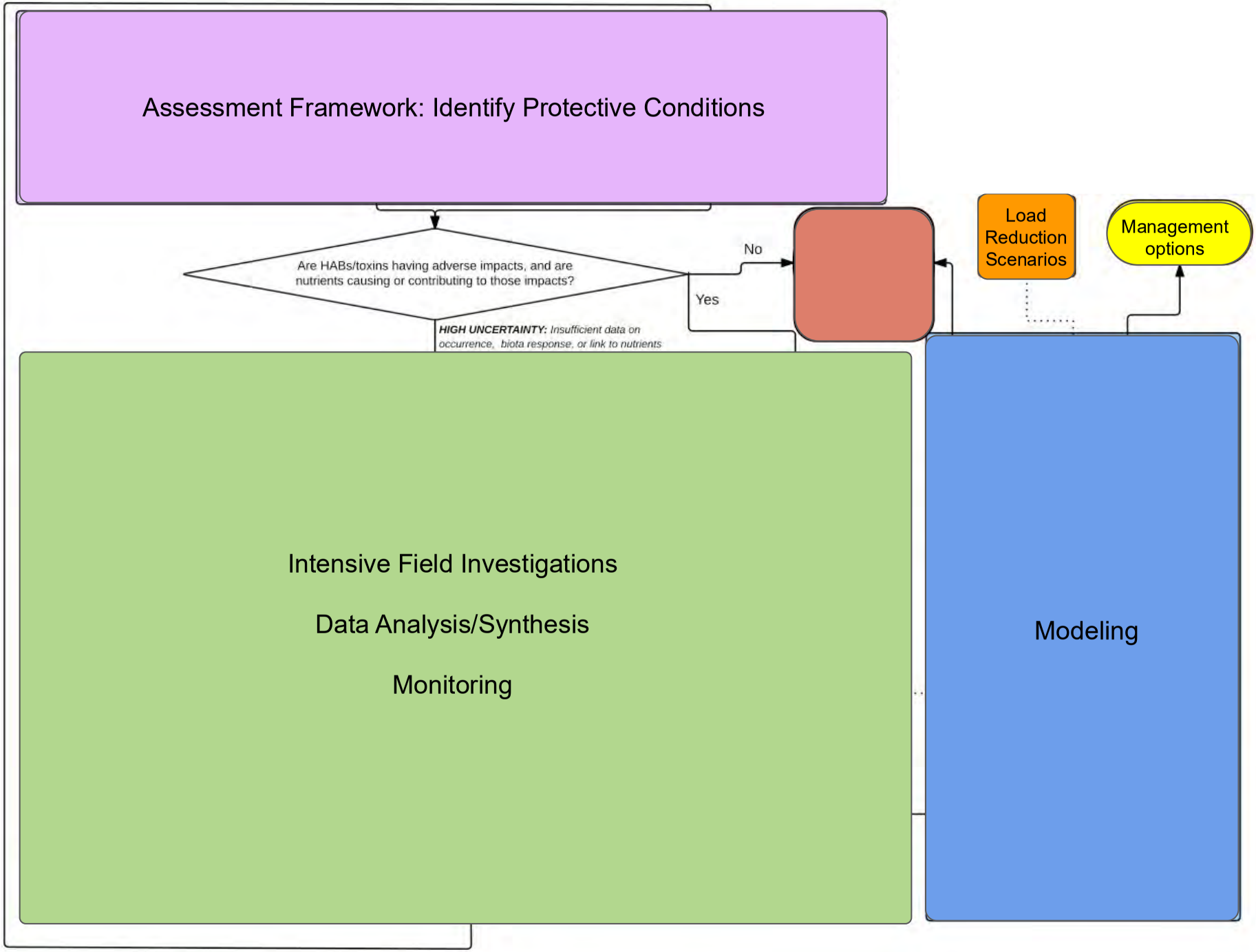


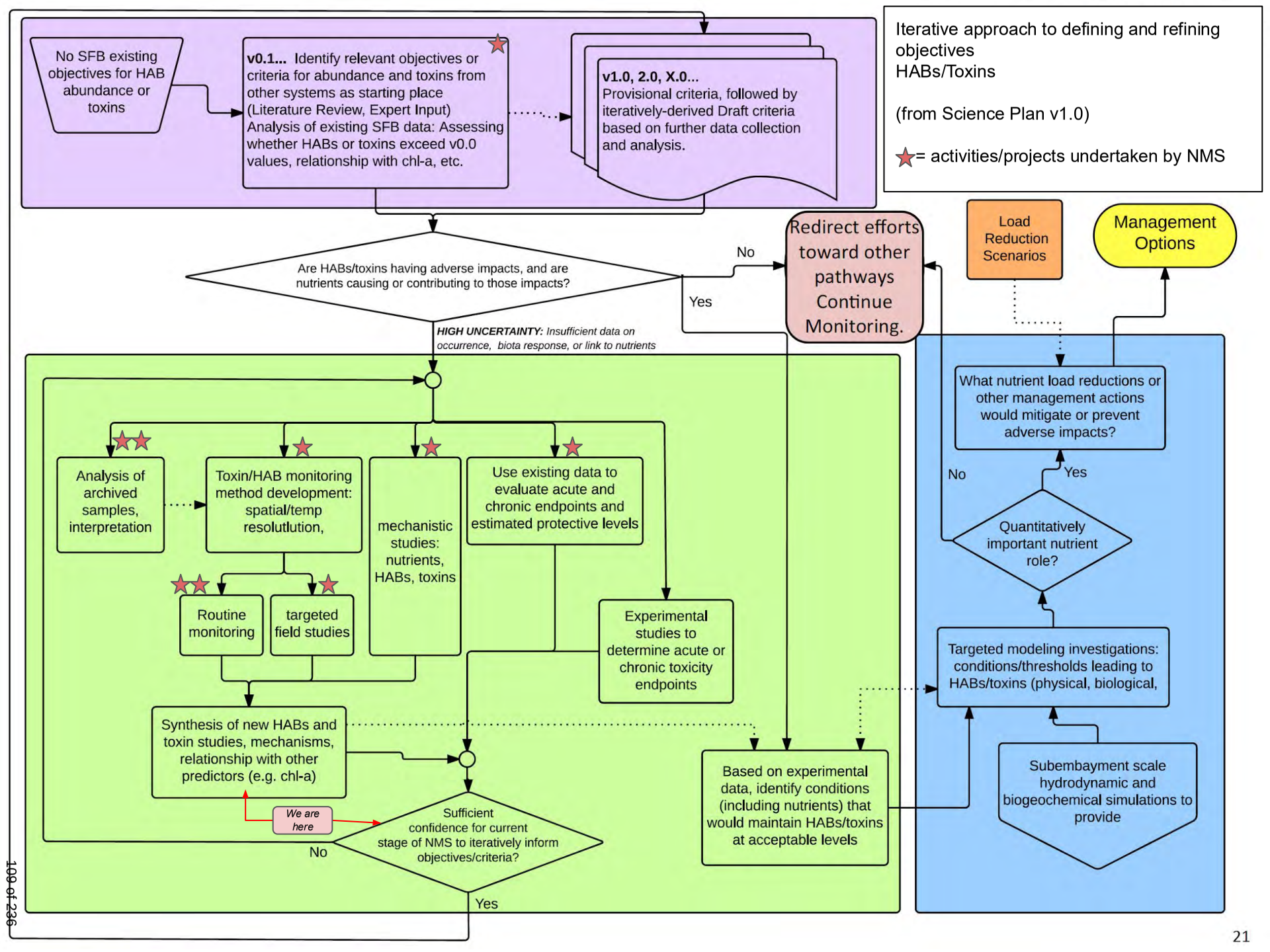
# Example Assessment Framework Draft WorkPlan - for DO Deep Subtidal and HABs/Toxins



# Connections and information flow between various components of the NMS



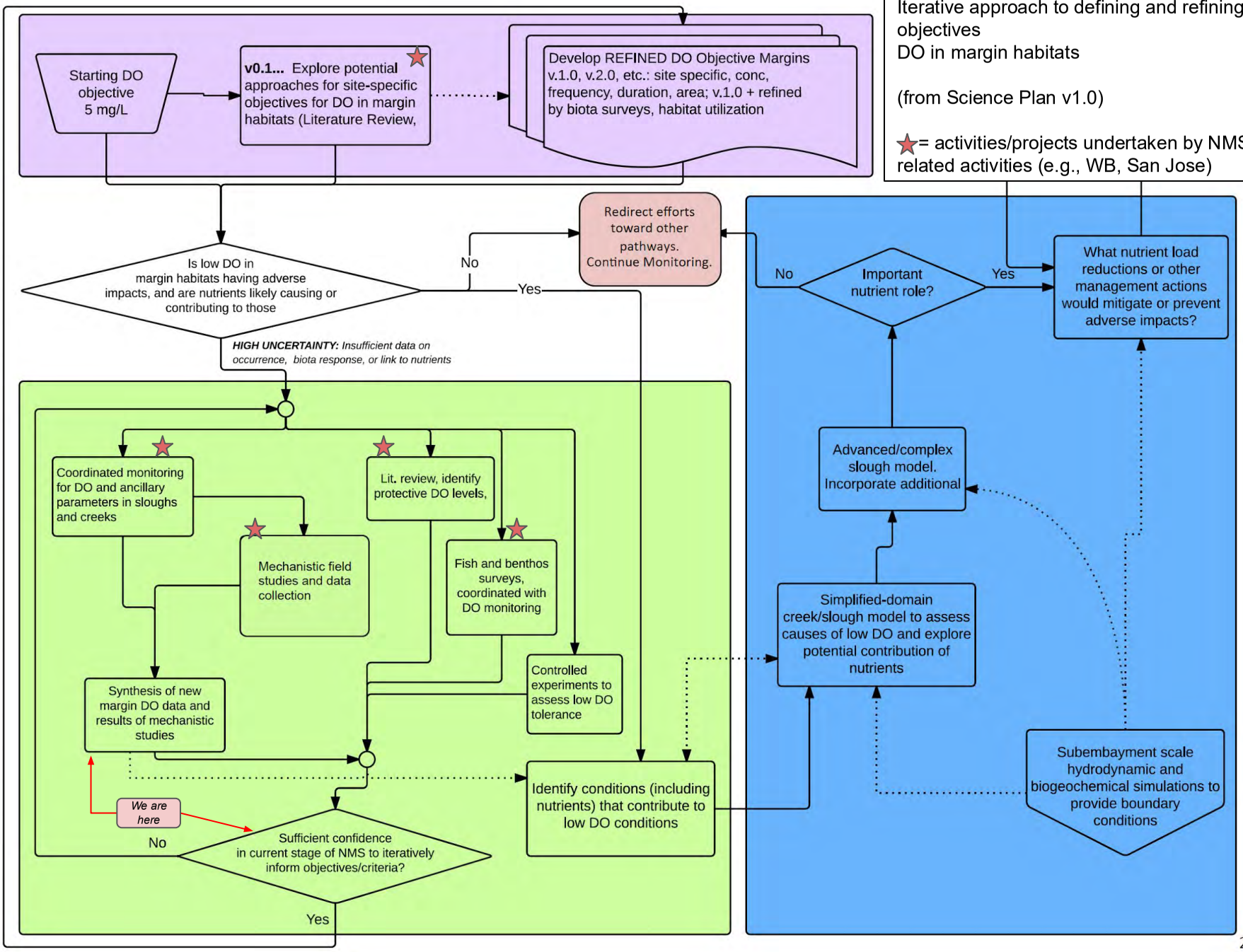

Assessment Framework: Identify Protective Conditions
Are HABs/toxins having adverse impacts, and are nutrients causing or contributing to those impacts?
No
Yes
HIGH UNCERTAINTY: Insufficient data on occurrence, biota response, or link to nutrients
Load Reduction Scenarios
Management options
Intensive Field Investigations
Data Analysis/Synthesis
Monitoring
Modeling


Iterative approach to defining and refining objectives
HABs/Toxins
(from Science Plan v1.0)
= activities/projects undertaken by NMS
No SFB existing objectives for HAB abundance or toxins
v0.1... Identify relevant objectives or criteria for abundance and toxins from other systems as starting place (Literature Review, Expert Input)
Analysis of existing SFB data: Assessing whether HABs or toxins exceed v0.0 values, relationship with chl-a, etc.
v1.0, 2.0, X.0...
Provisional criteria, followed by iteratively-derived Draft criteria based on further data collection and analysis.
Are HABs/toxins having adverse impacts, and are nutrients causing or contributing to those impacts?
No
Yes
Redirect efforts toward other pathways Continue Monitoring.
Load Reduction Scenarios
Management Options
HIGH UNCERTAINTY: Insufficient data on occurrence, biota response, or link to nutrients
Analysis of archived samples, interpretation
Toxin/HAB monitoring method development: spatial/temp resolutlution,
mechanistic studies: nutrients, HABs, toxins
Use existing data to evaluate acute and chronic endpoints and estimated protective levels
Routine monitoring
targeted field studies
Experimental studies to determine acute or chronic toxicity endpoints
Synthesis of new HABs and toxin studies, mechanisms, relationship with other predictors (e.g. chl-a)
We are here
Sufficient confidence for current stage of NMS to iteratively inform objectives/criteria?
No
Yes
Based on experimental data, identify conditions (including nutrients) that would maintain HABs/toxins at acceptable levels
What nutrient load reductions or other management actions would mitigate or prevent adverse impacts?
No
Yes
Quantitatively important nutrient role?
Targeted modeling investigations: conditions/thresholds leading to HABs/toxins (physical, biological,
Subembayment scale hydrodynamic and biogeochemical simulations to provide

Iterative approach to defining and refining objectives
DO in margin habitats

(from Science Plan v1.0)

★= activities/projects undertaken by NMS or related activities (e.g., WB, San Jose)



# Review of:
## *Scientific Basis to Assess the Effects of Nutrients on San Francisco Bay Beneficial Uses*

Prepared for:
BACWA

Draft report submitted:
August 16, 2016

LimnoTech
Water Environment | Scientists Engineers

a[illegible]he reviewers recognize the substantial expertise and effort represented by the authors of the document, and its value as a contribution to the larger San Francisco Bay Nutrient Management Strategy.

Particular strengths of the *SB* include the overall goals of the effort, the conceptual approach to realizing those goals, and the clear consideration of practicality in determining the implementation of the recommended characterization. In

Areas for improvement of the document, many of which are acknowledged as remaining areas for refinement by the *SB*'s authors, include: water and nutrient budgets; the role of numerical modeling; data analysis and the statistical basis for indicator thresholds; spatial and temporal resolution; linkage to beneficial uses; and consideration of other analogous estuaries and coastal systems.

Specific Points:

- Improve nutrient loads (LimnoTech rec 5.1)
- Improve process based modeling (LT rec 5.2)
- Improve chl-a-HAB & chl-DO relationship (AF 1.0) ) (LT recs 5.4, 5.5)
- Improve spatial and temporal integration for indicators (LT rec 5.6, 5.7)
- Pull in information/approaches from other estuaries (LT rec 5.9)
- Improve linkages between nutrients and beneficial uses (LT rec 5.3, 5.8)

**From:** William Tarpeh <wtarpeh@stanford.edu>
**Sent:** Thursday, October 31, 2019 11:15 PM
**To:** Sebastien Tilmans <stilmans@stanford.edu>
**Cc:** Lorien Fono <lfono@bacwa.org>; David Williams <dwilliams@bacwa.org>; Craig Criddle <criddle@stanford.edu>; Anna Kogler <akogler@stanford.edu>
**Subject:** Re: Follow up on Nutrients Removal Study

Hi David,

Here's some information on the workshop:

**Upcoming Workshop on Next-Generation Nutrient Removal (December 10)**
In collaboration with the New York City Department of Environmental Protection, ReNUWIt researchers are organizing a one-day workshop on next-generation nutrient removal and recovery technologies in New York City on December 10, 2019. The workshop offers an opportunity for knowledge exchange among utilities, consultants, and academics in order to promote rapid technology development and comparison, enabling science-based decisions for utilities facing nutrient removal requirements in coming decades.

If you are interested in attending and/or presenting, please complete the following form by **Friday Nov. 15**: https://stanfordgsb.qualtrics.com/jfe/form/SV_8wildurCoY8Djfv. Please contact Anna Kogler (akogler@stanford.edu) with any questions.

Lorien, thanks for sending out the survey information. Please let me know if you need any additional details.

Thanks and all my best,
Will

On Wed, Oct 30, 2019 at 6:09 PM Sebastien Tilmans <stilmans@stanford.edu> wrote:
Thanks Lorien for that opportunity. I think it would be great to put this out, but please highlight that time is running out for the survey!

Thanks,

Sebastien

On Oct 30, 2019, at 15:01, Lorien Fono <lfono@bacwa.org> wrote:

Sebastian, our newsletter, the BACWA Bulletin, will be going out in the next couple of days. Do you want me to add a blurb about this?

**From:** Sebastien Tilmans <stilmans@stanford.edu>
**Sent:** Wednesday, October 30, 2019 10:44 AM
**To:** David Williams <dwilliams@bacwa.org>
**Cc:** Lorien Fono <lfono@bacwa.org>; Craig Criddle <criddle@stanford.edu>; William Abraham Tarpeh <wtarpeh@stanford.edu>; Anna Kogler <akogler@stanford.edu>
**Subject:** Follow up on Nutrients Removal Study

Dear David and Lorien,

Thank you again for the opportunity to come to the recent BACWA board meeting.

At the meeting, I mentioned a WRF review study that Prof. Will Tarpeh is conducting at Stanford to examine the state of the art of nutrient removal technologies (described in more detail below). The final report of the study is due to be submitted March 1, 2020. I'm sure they will be happy to share the report with BACWA.

Dr. Tarpeh asked that I share the below survey with you to pass along to BACWA board members. Their participation will help improve the results by enlarging the pool of experts that weigh in.

**We need your input on next-generation nutrient removal!**

Stanford University researchers are synthesizing academic and practical literature on nutrient removal and recovery technologies. This work will promote rapid technology development and comparison, driving science-based decisions for utilities facing nutrient removal requirements in coming decades. Researchers aim to understand current practices and future plans for nutrient removal and recovery and which factors utilities, consultants, and other practitioners consider to inform decisions to adopt such technologies.

Please access the survey at the following link to provide your input: https://stanfordgsb.qualtrics.com/jfe/form/SV_09hCDmBQTgfZVlj

The survey will remain open until November 8 to allow time for analysis of results, which will be included in a project report published by WRF. Please contact Anna Kogler (akogler@stanford.edu) with any questions or additional feedback.

Warm regards,

Sebastien

Sebastien Tilmans, PhD, PE

Executive Director
William and Cloy Codiga Resource Recovery Center
Stanford University
Stanford, CA 94305

--
William Tarpeh, PhD
Assistant Professor of Chemical Engineering
Stanford University
387 Shriram Center
443 Via Ortega
Stanford, CA 94305
650-497-1324
tarpehgroup.stanford.edu

**From:** Kara Baker <kara.baker@stanford.edu>
**Sent:** Thursday, October 31, 2019 3:39 PM
**To:** David Williams <dwilliams@bacwa.org>
**Subject:** October 2019 ReNUWIt Industry Newsletter

View this email in your browser

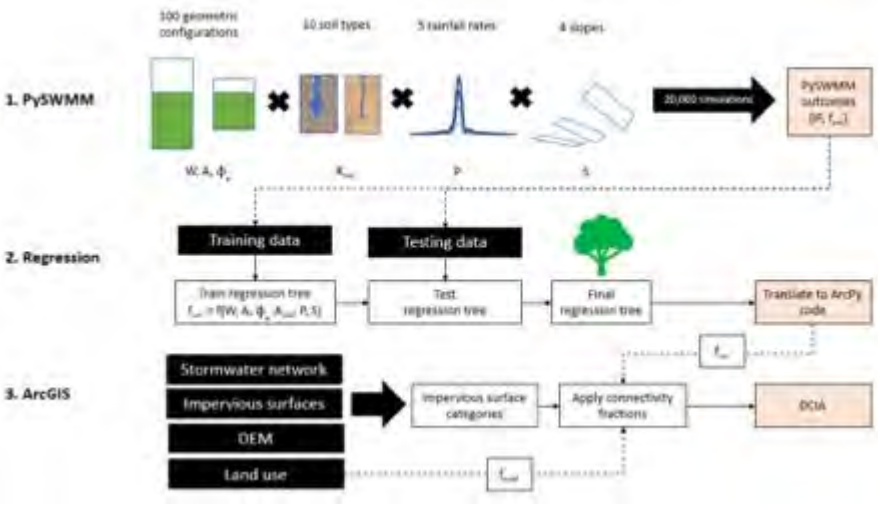
# Newsletter

**October 2019**

ReNUWIt
Re-inventing the Nation's
URBAN WATER
INFRASTRUCTURE

## PROJECT SPOTLIGHT

### Connected or unconnected? A new method for estimating connectivity of impervious surfaces across variable soils, slopes, and rainfall scenarios




Accurate methods to predict impervious surface connectivity are needed to improve hydrologic modeling and efficient siting of distributed stormwater technologies. ReNUWIt

researchers are developing a new method for estimating impervious surface connectivity across different soil types, slopes, rainfall scenarios and landcover parameters. The outcomes of this research may be used as hydrologic model inputs and to inform more efficient distributed stormwater BMP siting across heterogeneous urban landscapes.

https://renuwit.org/highlights/project-spotlights/

**Industry Members** can also log in to find more detailed information about this project (U1.7) and the following related ReNUWIt projects:

- **U2.5** Legal, policy, economic, and technical feasibility study for beneficial use of stormwater in a west Denver neighborhood redevelopment
- **U2.12** Integrated decision support tools (i-DST) for life-cycle cost and performance assessment and optimization of green, grey, and hybrid stormwater infrastructure
- **U2.13** Evaluating long-term feasibility of ReNUWIt stormwater technologies using the UWIN sustainability framework
- **U3.5** Assessing implementation opportunities and barriers for innovative green stormwater infrastructure
- **N1.4** Managed riparian zones to conserve and improve water quality and improve habitat
- **N2.7** Urban stormwater treatment at the Los Angeles Rory M. Shaw Wetlands Park

**IAB Member Login**

---

## UPCOMING EVENTS

### Seminars

Please join our upcoming ReNUWIt Student Leadership Committee (SLC) Students for Urban Water Infrastructure (SUWIR) seminars:

| | |
|---|---|
| **November 20, 2019** | UC Berkeley Professor David Sedlak - *Water For All* |
| **January 29, 2020** | Stanford's Water in the West Director of Urban Water Policy Newsha Ajami - *Urban Water Policy* |
| **February 12, 2020** | UC Davis Professor Emeritus George Tchobanoglous - *TBD* |
| **February 26, 2020** | Stanford Associate Professor Meagan Mauter - *Sustainability of Nano/Membranetech in Water* |

Connect via Zoom:
https://stanford.zoom.us/j/667609258
Dial: 650-724-9799 or 1-833-302-1536
Meeting ID: 667 609 258

## Meetings

**2020 Science Advisory Board (SAB) Meeting**
January 8 - 9, 2020
Location: Stanford University

**2020 Annual Meeting**
IAB Meeting: May 19-20, 2020
NSF Site Visit: May 20-21, 2020
Location: Stanford University

## Next-Generation Nutrient Removal Workshop & Survey

In collaboration with the New York City Department of Environmental Protection, ReNUWIt researchers are organizing a one-day workshop on December 10, 2019 in New York City on next-generation nutrient removal and recovery technologies. The workshop offers an opportunity for knowledge exchange among utilities, consultants, and academics in order to promote rapid technology development and comparison, enabling science-based decisions for utilities facing nutrient removal requirements in coming decades. If you are interested in attending and/or presenting at this workshop, please complete this form by Friday Nov. 8.

ReNUWIt researchers also need your input for this project! Researchers aim to understand current practices and future plans for nutrient removal and recovery and which factors utilities, consultants, and other practitioners consider to inform decisions to adopt such technologies. Please access the survey to provide your input. The survey will remain open until Nov. 22.

Please contact Anna Kogler (akogler@stanford.edu) with any questions.

---

## HOW TO ENGAGE

Please contact Kara Baker at kara.baker@stanford.edu with ideas for new collaborations, or if you would like to serve as an advisor on a particular ReNUWIt research project.

In addition, we welcome ReNUWIt industry partners to join our ReNUWIt LinkedIn group where you can find news articles on our research and post job openings.

---

## SOFTWARE LICENSING OPPORTUNITY

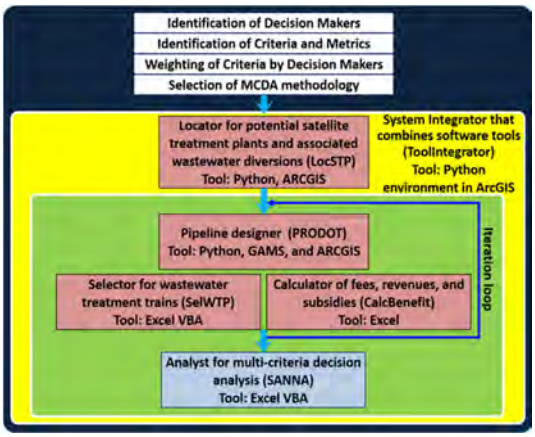
## IRIPT SOFTWARE TOOLKIT

ReNUWIt researchers have developed an integrated software toolkit called IRIPT (Integrated Urban Reclaimed Water Infrastructure Planning Toolkit) that integrates decision support tools for planning of recycled water infrastructure (Project U1.2). A marketing abstract for the IRIPT software toolkit is available HERE. If your agency or firm is interested in pursuing a licensing agreement, please contact Evan Elder or Ngan Tefera at the Stanford Office of Technology Licensing.

*Contact Information:*

Evan Elder
evan.elder@stanford.edu
650-725-9558

Ngan Tefera
ngan.tefera@stanford.edu
650-723-0690




## ReNUWIt WEBSITE CONTENT

IAB members can login to ReNUWIt's password protected website for additional information on all projects.

**IAB Member Login**

You are receiving this email because you are a ReNUWIt Industry Partner.

**Our mailing address is:**

Stanford University
437 Via Ortega, Room 119
Stanford, CA 94305

Add us to your address book

Want to change how you receive these emails?
You can update your preferences or unsubscribe from this list.

**Planning Subcommittee (PS) Meeting No. 41**
**November 8, 2019**
**10:00 am – 1:00 pm**
**Water Board Offices**
**Chair: Ian Wren**

**Meeting Summary**

**Attendees: David S., Ian W., Eric D., Tom M., Kevin L., Richard L., Robert S., & David W. plus Terry F. by phone on the HAB discussion**

1. **Agenda Modifications:** There were not modifications to the agenda.
2. **Review Outstanding Action items:** The Action Items were reviewed. All Action Items were completed except for the following three which are being held over for completion.

> ***Action Item: Prepare revisions to the Charter regarding chairing the SC meetings (IW).***
>
> ***Action Item: The Program Coordinator will work with the Water Board (WB) to help facilitate the development of the regulatory forecast for the 3rd Watershed Permit***
>
> ***Action Item: The SM is to report back to the PS and SC on how to best gear the four NMS projects slated for the LSB and possibly re-purpose the two projects related to fish in conjunction with the on-going UC Davis monitoring work. This item awaits the Assessment Framework update and is dependent on the DO workplan***

**3. Science Program update:** The Science Manager (SM) distributed handouts that showed the listing of FY 20 projects that have been approved by the Steering Committee (SC) and Their respective budgets. The projects total $3.5 M which includes borrowing against future funds for the science program. This amount includes $250 k provided by the RMP to the USGS for monitoring. Approximately 28% of the $1.6 M labor budget has been spent with overall spending and encumbrances amounting to approximately 48% of the budget. With the recent departure of a key modeler, the SM has been investing a lot of his time in overseeing the modeling efforts.

a. **Staffing –** There are two full time modelers on staff. In addition, Rusty Holleman, the previous chief modeler, is still active in the modeling efforts. An external consultant has been retained to fill the gap left by a recent departure of a modeler and this arrangement seems to be working fine. The consultant agreement will probably be extended for another year.

   There are 5 full time positions working on the SFEI science team plus there is one open position and a position that is being shared with the RMP.

b. **Other –** The group discussed how best to convey to the SC that the science plan will indeed be able to answer key questions in order to inform the need for management actions in the 3rd Watershed Permit. In order to do this, it would be helpful for the SM to provide more details on the core modeling and monitoring programs. The SM will need to explain how the list of projects will allow the model to predict nutrient loadings, impact on chl-a production, and the subsequent impact on the magnitude, duration, and frequency of dissolved oxygen concentrations in various part so the Bay. With the ability to

predict future DOs in the Bay, the Assessment Framework (AF) would then be used to determine if impairment is imminent.

The SM then discussed the challenges of a more than doubling of the expenditure on the science program and laid out the budget for the coming year. The group spent some time discussing the budget and the front loading of the science funding by BACWA. With the front loading approved, the SM should being using that amount of funding to lay out future year's projects.

4. **Priority Updates**
   a. **Report-Outs –** No report out
   b. **Current Issues –** No report out
   c. **NMS Calendar Review**
      i. **Review future SC and PS meeting schedules –** The next SC meeting is scheduled for December 13th. in advance of that meeting there will be a second meeting of the AF workgroup on November 18th and a PS meeting on December 4th. There will be no PS meeting in January, so the next PS meeting would be on February 5th

5. **Other Updates**
   a. **Discussion: HAB Proposal –** There is an opportunity to submit a grant to the EPA related to research on HABs. The grant is part of a $6 M grant program that is looking to fund roughly 10 projects. There was a lengthy discussion on the probability of getting a grant and whether or not to invest the time needed to prepare the grant application given the probability of receiving a grant. The grants are geared to projects that research how to prevent or reduce HABs and the national application of the research. A proposal, limited to no

more than 15-pages, describing the project is being requested as part of the grant application.
Following the discussion, it was decided to prepare a 1-page write-up of the approach the NMS would use to submit a grant application. It was suggested to have the write-up reviewed by EPA Region IX to get their input on the probability of being successful.

The write-up would focus on advancing new technologies and the use of natural systems for nutrient reductions, the linkage to NABs, and the potential for trading between subembayments. It was pointed out that one advantage to preparing the write-up is that it allows the NMS to put forward a vision for nutrient management in the Bay Area. ***Action Item: the Program Coordination team will prepare a brief write-up on a project approach for the EPA grant application by Monday November 11th and circulate to the PS members for review***

b. **Discussion: Nature-Based Solutions Scoping & Evaluation Plan –** BACWA reported that the Scoping & Evaluation (S&E) Plan will be submitted by December 1st in accordance with the 2nd WS Permit. It was confirmed that the S&E plan would focus on providing more details on NBS efforts that are already being pursued but also identify other opportunities for NBS to achieve multiple benefits which include nutrient reductions. It is hoped to have a draft of the S&E Plan to the Water Board before Thanksgiving.

c. **Discussion: AF Meeting Recap and Next Steps –** Time did not allow discussion of this agenda item. It was noted that all participants at the PS meeting were also participants in the AF Workgoup.

## 6. Planning the next Steering Committee meeting

a. **Agenda review and discussion – Dec 13 SC Mtng –** In addition to other topics, it was noted that the AF workplan should be presented to the SC at the next meeting. It was also suggested to ask the SC what level of detail they would like to see to be assured that the science plan will be able to address the key scientific questions that are needed to help inform the WB on any management actions for the 3rd WS Permit.

   The SM should also present to the SC the front loading of the science funding by BACWA which has been approved by the BACWA Board as follows:

   FY2019 200k (advanced funding for FY 20 already provided)
   FY2020 2.4M
   FY2021 2.8M
   FY2022 2.6M
   FY2023 2.0M
   FY2024 1.0M

   This amount totals the $11.0 M stipulated in the 2nd WS Permit.

b. **Review of Action items from meeting –** Action items were reviewed

c. **Next steps**

## 7. Adjourn or address Parking Lot items

**Parking Lot of Identified PS Future Agenda Items**

a. **Outreach to resource agencies re: DO objectives**
b. **Brainstorming on future priorities for the PS (ALL)**
c. **EPA nutrient criteria discussion**

d. **Discuss concept of holding an annual forum on nutrients**

**Bay Area Clean Water Agencies (BACWA)**
**Mercury/PCB Watershed Permit Risk Reduction Compliance Grant 2018-2019**

APA Family Support Services/ APIFRN FINAL REPORT
**"API SF Bay Fish Education and Engagement Project"**

Date: September 30, 2019

*Final Report: Description of the work performed* (Re: 03/1/2019-08/31/2019)

The "***API SF Bay Fish Education & Engagement Project***" has been significant in supporting our efforts to 1) promote awareness and understanding of fish consumption advisories, contamination issues, or health risks and benefits associated with eating San Francisco Bay fish; 2) and engage the community to reduce human exposure to mercury and PCBs from eating San Francisco Bay fish. The project involves educating consumers about the risks and benefits of SF Bay fish consumption and engaging them to take on a responsive attitude and action in addressing health effects; through (a) bilingual educational workshop (b) case management (c) and community forums.

Community Forums & Project Assessment; Staff Meetings, Project Reporting.

We held three community forums to highlight SF Bay Fish Education in conjunction with our agency's CBOs collaborative event for the community. The first forum was held during the Children's Day event on April 19, 2019, where we brought awareness to child abuse prevention month and resources that promote children's health. The second forum was held in collaboration with Sutter Health's California Pacific Medical Center and San Francisco Recreation and Park for our annual Community Family Day on June 7th, 2019 and most recently, our Back to School Health and Wellness Event on August 9th, 2019 with Dr. Jennifer Hsu from Chinese Community Health Care Association to facilitate a "Pediatrician Health Talk" with pregnant and new moms that included the discussion on nutrition and maintaining family's health. Participants received bilingual information, including the SF Bay Fish Consumption Advisory Guide. These forums allow us to gather feedback on the results of the community workshops' pre and post-tests from the first half of the project.

We also had two meetings with community partners and our eight community liaisons, assisting in-kindly on the project. We decided we wanted to gather more info from the community forum participants. One of the themes that raise more questions about our case management participants choices and the project's community forum discussion topic was the linkage, if any, between healthy food choices- including consumption of "potentially" contaminated fish or high consumption of accessible fish and food security. The other concern

we want to explore was what we could do to help families connect to resources, like CalFresh, Food Pantries, and other Food voucher programs. We develop a health and wellness population screening tool that included the workshops' pre and post-test questions as well as some demographic inquiries to help us understand who are the population at risk, in need, and how we can better align our work with existing resources to build healthy families and children.

Our findings from the 178 collected questionnaire tell us the participants that eat SF Bay Fish are low income; for example, families of five with at least two adults in the household would have a household income that falls between $13,521-$43,100.We find that many families would and could qualify for CalFresh but prefer to not apply because of their housing situation and residency status (due to sponsorship status or someone in the family is in the process of applying for citizenship, and they don't want to jeopardize it by reporting their "public charge"). Only 50% of the participants that reported Bay fish consumers, and are pregnant or have someone in their household pregnant are receiving WIC or CalFresh or receiving another type of food voucher or participate in other community food program. We find that 50% of the participants reported they worried about their food running out and 73% of the participants reported that the food they bought didn't last.

Engagement: Case Management.

We had continued to follow-up and assess the 28 out of the 35 participants that were recruited in the first half of the project for engagement-case management. Seven of the initially recruited participants had moved out of the San Francisco Bay Area, including 3 participants left-back to China and 2 of the participants left to the Philippines. We also enrolled and follow-up with three new Thai participants this reporting period. In total, we served 38 participants for engagement case management services. In summary, all 38 participants selected for case management indicated moderate to high amount of SF Bay Fish consumption. (Eating more servings of SF Bay Fish per week and the type of fish more contaminated as indicated in the SF Bay Fish Consumption Guide.) Including the three new participants, our case manager help, 29 out of 38 of the participants/families sign up for WIC, CalFresh, or food pantry and another food program. We also connected the participants to our ongoing case management services to assist the families in continuing to work on their service plans for family self-sufficiency. Our case manager will maintain and continue supporting 12 of the participants in this project internally as case management using another source of funding. Our case manager is helping these 12 participants and their families with other needs including housing application, employment assistance support, naturalization, and postpartum support, including accompanying participants to doctor appointments. Twenty of the participants are connected to our food pantry and hygiene pantry program (provided by SF Food Bank and Mothers against Poverty) and to our Diaper Bank (provided by Help a Mother Out and SF Human Services Agency/CalWorks).

Bay Fish Consumption Educational Workshop

We served 661 community members in our workshops. We were able to integrate SF Bay Fish Advisory Guide information and learning activity to our Healthy Living Support Groups, Prenatal Workshops, and Child Development Classes. Although 661 signed in, we only received 415 complete pre and post-tests. The results are reflected below. For this project, we enrolled a total of 1515 participants for our workshops.

**Workshops Pre-test and Post-test Results: N= 1076 SURVEYs**

1) **PRE-TEST**: 28% of participants know which type of fish that women age 18-45y/o and children 1-17 y/o can eat 2 servings per week. **POST-TEST**: 90% of participants learn/know which type of fish that women age 18-45y/o and children 1-17 y/o can eat 2 servings per week.

2) **PRE-TEST:** 79% of participants know that developing fetus is sensitive to the harmful effects of mercury and PCBs. **POST-TEST:** 98% of participants learn/know that developing fetus is sensitive to the harmful effects of mercury and PCBs.

3) **PRE-TEST**: 25% of participants know the correct servings amount that women over 45 and men over 17 can safely eat from San Francisco Bay. **POST-TEST:** 87% of participants learn/know the correct servings amount that women over 45 and men over 17 can safely eat from San Francisco Bay.

4) **PRE-TEST**: 27% of participants know the type of fish that has low levels of contaminants, high levels of omega-3, and can be eaten 2 times per week. **POST-TEST**: 89% of participants learn/know the type of fish that has low levels of contaminants, high levels of omega-3, and can be eaten 2 times per week.

5) **PRE-TEST:** 25% of participants know the type of fish that shouldn't be eaten by anyone from SF Bay. **POSTTEST:** 89% of participants learn/know the type of fish that shouldn't be eaten by anyone from SF Bay.

6) **PRE-TEST**: 34% of participants know how to prepare fish to reduce the amount of PCBS. **POST-TEST**: 95% of participants learn/know how to prepare fish to reduce the amount of PCBS.

7) **PRE-TEST:** 70% of participants know how to protect children by choosing less toxic products, eating the right foods, and keeping the air free of pollutants. **POST-TEST:** 98% of participants learn/know how to protect children by choosing less toxic products, eating the right foods, and keeping the air free of pollutants.

8) **PRE-TEST:** 43% of participants know the effect of lead poison to health, learning ability and behavior. **POSTTEST:** 97% of participants learn/know the effect of lead poison to health, learning ability and behavior.

9) **PRE-TEST:** 59% of participants know where lead can be found in the environment and where people may have daily contact. **POST-TEST:** 99% of participants learn/know where lead can be found in the environment and where people may have daily contact.

Participants in our health education and fish workshops, show improvement in their knowledge and understanding comparing their post-test results with their pretest results. Participants share they learn how to make better choices in preparing, portioning (servings), and consuming not only fish but also other food; which improve their health overall for their family.

The results from the assessment show that participants have increased knowledge on how to reduce their exposure to chemicals from eating SF Bay fish as well as identify the practices recommended as safer choices. We believe that consistent cultural education, follow-ups, discussion, and supportive options (identify other fish substitutes (instead of perch…substitute with salmon), assist in application of food vouchers and food pantries, linkages to health resources) will promote better attitude and a change in practice.

| Services | Grant Target | Progress Report (9/1/18-2/28/19) Numbers | Final Report (3/1/19-8/31/19) Numbers | Total (Year to Date) |
|---|---|---|---|---|
| **Workshops** | 1,500 participants | 854 participants | 661 participants | 1515 participants (1076 consumers completed pre and post-assessment) |
| **Case Management** | 40 at-risk or high-risk API SF Bay fish consumers | 35 API SF Bay fish consumers | 3 API SF Bay fish consumers | 38 API SF Bay fish consumers. (31 consumers completed final assessment) |
| **Community Forums** | 12 | 10 Community Forum | 3 Community Forum | 13 Forum |
| **Quarterly Meetings** | 4 | 2 Meetings | 2 Meetings | 4 Meetings |

**Summary of Accomplishments**

We reached 1515 participants for workshops and collected 1076 pre and post-tests. Although, we wish we could have received/collected 1515 pre and post-test. We are still content with 71% or 1,076 of the surveys received. We had 193 surveys that we did not include the results in the pre and post summary results because it was only a pre-test or a post-test that we

received and not both. From the 193 surveys, 131 of the survey had two or more of the questions not answered by participants.

For Case Management, we served 38 API SF Bay Consumers. Thirty of these participants were new or pregnant moms when they were enrolled in case management services. These participants were visited in their homes or at one of our centers in San Francisco to inquire about their consumption habits and behavior after participating in one of our workshops. These participants were also invited to take part in our community forums. Thirty-one of the participants were able to complete the final assessment. The final assessment tells us that change requires family and community support, consistent routine and resources or options (i.e. food bag and food vouchers) to make healthy choices. The final assessment also indicates that the consumption of SF Bay fish reduces. However, participants commented various factors that influence reduction: Some comments include: "Husbands reduce fishing activities, less fish caught in the Bay, concerns with unclean Bay water, Safety concerns in going out fishing, and high cost of fish to buy and to eat." Some participants reported their living situation change, and are living in SRO (Single Room Occupancy), or shelter, or with other relatives that prevent them from have the flexibility to cook and prepare fish as they wanted.

Community forums allow us to explore and inquire about more info from our workshop participants. Meetings allow providers and us to do a roundtable discussion on community needs, trends and how we can continue to advocate for families. Through this project, we learn how to better engage the community and advocate on issues for the community is by involving them in the planning and implementation of service activities. We plan to seek out future funding opportunities to continue our efforts but will continue to incorporate the topic in our service activities. Thank you for your support on behalf of our agency, community and the participants served through this funding project.

# 2.2 Coordinate and Integrate Federal, State, Tribal, and Local Water Reuse Programs and Policies

## Federal, state, tribal, and local programs and policies can be aligned and coordinated to encourage consideration of water reuse.

Laws, regulations, and policies can have a substantial bearing on the consideration, application, and implementation of water reuse. The Safe Drinking Water Act (SDWA) and CWA, for example, provide the framework and baseline requirements—e.g., the SDWA's Maximum Contaminant Levels, the CWA's NPDES and Effluent Limitations Guidelines (ELGs), water quality standards, and source water protection—to ensure drinking water and surface waters are protective of public health and the environment.

> *"Going forward, perhaps the most important action EPA can undertake is to maintain its stature as an honest broker for water reuse policy. As our nation's lead regulator for water policy, the Agency is in a unique position, one that if maintained allows the Agency to backstop sound local and state decision making."*
>
> — AWWA

In most cases, states have the primary role to implement these requirements and programs (i.e., cooperative federalism).

Beyond the CWA and SDWA, there are other federal, state, tribal, and local regulations, statutes, programs, and policies that can support water reuse as part of a watershed-scale integrated water resources management approach.

Several states have established regulations, policies, and programs specifically tailored to encouraging, managing, and/or regulating water reuse activities.[17, 18] Inset 13 describes examples of state-wide initiatives and policies intended to address water resource challenges. Some states have also established state-wide legislation and initiatives to encourage, foster, and/or require water reuse. States can benefit from sharing their successes and the challenges they face both facilitating and regulating the use of recycled water. The spectrum of experience and practice with water reuse at the state level is diverse across the country. Maryland and New Mexico are examples of states with very different interests and needs (see Insets 14 and 15).

The water sector has also played an important role in advocating water reuse, including, for example, the Water Environment Federation *Water Reuse Roadmap* (2018) and the recent *California WateReuse Action Plan*[19] released by WateReuse California earlier this year.

### Inset 13. Example State Actions Relating to Water Reuse

**California:** California's Recycled Water Policy from 2013 establishes a mandate to increase the use of recycled water by 200,000 acre-feet per year (afy) by 2020 and by an additional 300,000 afy by 2030.

**Florida:** Florida's state budget for fiscal year 2019–2020 appropriates $40 million toward advancing alternative water supplies.

**Hawaii:** The Fresh Water Advisory Council of the Hawaii Fresh Water Initiative developed a 2015 Blueprint for Action to make up the fresh water deficit facing the state by 2030. The blueprint identifies a strategic target of more than doubling the amount of wastewater reused to 50 million gallons per day.

**New Mexico:** New Mexico enacted a new law in 2019 (HB 546), effective July 1, for the protection of water quality by encouraging the oil and natural gas industry to favor reuse, recycling and treatment options over reliance on New Mexico's limited fresh water resources.

**Texas:** Texas' 2017 State Water Plan (one in a series published every five years) called for 4.5 million cubic meters per day of additional reuse capacity over a 50-year period with 85 projects specified.

**Alaska:** In 2013, Alaska issued the Alaska Water and Sewer Challenge, focused on decentralized water and wastewater treatment, recycling, and water minimization. Reuse approaches have high potential for use in the 3,300 homes currently lacking running water and flush toilets.

***The City of St. Petersburg's (FL) reclamation system provides 37 MGD of reclaimed water for non-potable uses including 300 fire hydrants.***

On May 15, 2019, the EPA released a draft of its *Study of Oil and Gas Extraction Wastewater Management Under the Clean Water Act*. The draft study describes input from states, tribes, and stakeholders on available approaches to manage produced water from onshore oil and gas extraction facilities and input on whether potential revisions to federal regulations that may allow for broader discharge of treated produced water to surface waters are supported.

### Inset 15. New Mexico's Management of Produced Water

Reuse, recycle, and treatment of water produced during oil and gas extraction can help provide a more sustainable fresh water supply for the State of New Mexico. As of 2018, the State of New Mexico is the third largest producer of oil in the country. For every barrel of oil, four to seven barrels of produced water may be generated, which totaled more than one billion barrels of produced water generated in 2018 alone. In 2019, the New Mexico Legislature passed the Fluid Oil & Gas Waste Act, clarifying jurisdiction of state agencies to regulate produced water. The law facilitates recycling and treatment of produced water, while providing regulatory oversight and conserving existing freshwater. It also authorizes development of regulations for use of treated produced water outside of oil fields, including in irrigation, road construction, and industrial applications.

### Inset 14. State Leadership: Maryland Develops State Water Reuse Strategy

The Maryland Department of the Environment (MDE) is currently adopting regulations for generating and using Class IV quality wastewater effluent (water with high potential for human contact) and is developing regulations to enable residential graywater reuse for outdoor irrigation, indoor toilet flushing, and fire suppression. The MDE is working with several jurisdictions on pilot projects to address local water and wastewater challenges to guide future reuse projects and help establish appropriate regulatory frameworks. The MDE will continue to provide outreach and tools via its Water Reuse Center.

> *"ACWA members are interested in updating current Effluent Limitation Guidelines (ELGs) for oil and gas extraction wastewater management. Water scarce states would benefit from more cost-effective treatment so that they can utilize produced water."*
>
> — ACWA and ASDWA

### Inset 16. Aquifer Recharge Terminology

**Aquifer recharge:** The replenishment of water in aquifers, either by natural or artificial (surface spreading, infiltration basins, or injection wells) processes.[20]

**Managed aquifer recharge (MAR):** The recharge of an aquifer using either surface or underground recharge techniques.[21] Synonyms include **enhanced aquifer recharge** (EAR),[22] **artificial recharge**,[23] **planned recharge**,[23] and **water banking**.[21]

**Aquifer storage and recovery (ASR):** The storage of water in an aquifer for later withdrawal and beneficial use.[24]

**Managed underground storage (MUS):** Encompasses a number of approaches that purposefully add water into (recharge) an aquifer system for later recovery and use.[25]

***Loudoun Water's Broad Run Water Reclamation Facility (VA) reclaims 1 MGD of its water (treated to drinking water quality) for irrigation, industrial cooling for data centers, and other non-potable uses.***

# Proposed Actions

## ACTION 2.2.1 Compile State Policies and Approaches to Implement Water Reuse Programs

Compile existing state-level statutes, regulations, policies, programs, frameworks, and/or approaches that are currently in place for water reuse. This would also include a compilation and description of water-reuse-related terms and opportunities for greater alignment. For example, Inset 16 provides examples of various terms used to describe aquifer recharge and recovery. Assembling this information will enable sharing across states. This could build on prior efforts, such as the State Water Policy and Program Database managed by Western Resource Advocates and state-based resources managed by the WateReuse Association.

## ACTION 2.2.2 Enhance State Collaboration on Water Reuse

The states, principally led by the ACWA, the ASDWA, and the Environmental Council of the States, will create ongoing forums for states to share and discuss experiences and attributes of their water reuse programs. The first such opportunity to engage a spectrum of states is expected to be initiated in September 2019.

## ACTION 2.2.3 Complete the EPA Study of Oil and Gas Extraction Wastewater Management

The EPA is continuing to review public input received on the May 15, 2019, draft *Study of Oil and Gas Extraction Wastewater Management Under the Clean Water Act* and anticipates finalizing the study in 2019. The final study will inform the EPA's consideration of potential regulatory and nonregulatory approaches for management of produced water under the CWA, including the potential for greater reuse opportunities. See https://www.epa.gov/eg/study-oil-and-gas-extraction-wastewater-management for more information.

## ACTION 2.2.4 Enhance Wastewater Source Control through Local Pretreatment Programs to Support Water Reuse Opportunities for Municipal Wastewater

Develop best practices describing how local pretreatment programs can mitigate and reduce problematic pollutants discharged into publicly owned treatment works and enhance reuse opportunities for reclaimed wastewater. For example, this might involve convening pretreatment program coordinators to compile, share, and advance approaches and strategies for wastewater source control to support water reuse.

## ACTION 2.2.5 Compile and Develop Protection Strategies for Different Sources of Waters for Potential Reuse

Pollution prevention concepts and best practices can be applied to sources of waters for potential reuse (e.g., industry process water, oil and gas produced water, agricultural return water, stormwater). Protecting various source waters from problematic contaminants can reduce treatment costs and expand opportunities to reclaim water. Compile and develop best practices for pollution prevention to reduce contamination and enhance opportunities for reclaimed water. For example, lessons learned from the drinking water source water protection program could be summarized and disseminated to local water managers.

*Scottsdale Water Campus (AZ) reuses up to 1.7 billion gallons of treated wastewater annually through aquifer recharge.*

## ACTION 2.2.6 Develop Informational Materials to Better Enable Water Reuse in CWA NPDES Permits

Develop informational materials describing how NPDES permits can enable reuse associated with municipal and industrial wastewater recycling and stormwater capture projects. This suite of materials (e.g., training programs) could be actively distributed to existing permit writers and inspectors to help foster better understanding of the potential for water reuse.

## ACTION 2.2.7 Convene a Federal Multi-Agency Working Group to Serve as a Forum for Coordinated Engagement on Water Reuse

Convene a working group (or groups) to serve as a forum for discussion of water reuse, including in federal installations and buildings. This would include working with all federal agencies that have designated responsibilities related to practices enabling water reuse. See Insets 17 and 18 as examples of federal leadership.

### Inset 17. Executive Order 13834, "Efficient Federal Operations"

Section 2 of EO 13834 establishes eight goals, one of which concerns water management. Federal agencies are directed to reduce potable and non-potable water consumption and comply with stormwater management requirements at federal facilities. Specifically, the Implementing Instructions issued by the Council on Environmental Quality in April 2019 recommend that agencies identify and implement measures to replace use of freshwater with **alternative water**, where feasible, and consider life cycle cost-effective measures,[26] consistent with state and local laws, to achieve performance toward the water management goal outlined in Section 2(c) of EO 13834.

The Implementing Instructions of EO 13834 define **alternative water** as water from non-freshwater sources, such as onsite harvested rainwater and stormwater, harvested sump pump/foundation water, gray water, air-cooling condensate, reject water from water purification systems, reclaimed wastewater, or water derived from other water reuse strategies.

### Inset 18.Reuse at U.S. Embassies

As a matter of standard practice, the State Department recycles water for irrigation in most new embassies and consulate projects undertaken through the Capital Security Construction Program. Modeled on existing requirements from California and Arizona, new onsite wastewater treatment plants treat effluent for drip or spray irrigation. Example projects include U.S. embassy buildings in Dakar, Senegal; Paramaribo, Suriname; Islamabad, Pakistan; and Tegucigalpa, Honduras. In water-scarce regions, the State Department considers further additional reuse design features. For example, the new embassy campus in Mexico City, currently under construction, will take reclaimed water from the city, treat it to a higher standard, and use it for evaporative cooling and sewage conveyance.

## ACTION 2.2.8 Advance Alternative Water Use in Federal Operations through the Federal Energy Management Program

The Implementing Instructions for Executive Order (EO) 13834, "Efficient Federal Operations" (see Inset 17) describe how the DOE's Federal Energy Management Program (FEMP) will consolidate previously issued guidance and technical materials into an integrated web resource and issue a plan on developing an updated federal water management resource guide that provides direction on how to design and optimize water use at federal facilities, track and report water use, expand use of alternative water, use water balance methodologies, and implement water conservation measures that promote energy efficiency in accordance with 42 U.S.C. § 6834(a)(3). In developing the updated federal water management resource guide, FEMP should consider the objectives in this draft Action Plan and opportunities to expand the use of alternative water sources, including reclaimed water, within federal facilities and operations.

***The Hart-Dole-Inouye Federal Center (MI) sends rainwater to a 125,000-gallon cistern, treats and filters the water, and uses it onsite for cooling tower make-up water and irrigation.***

## ACTION 2.2.9 Revise Guidance on "Disposal of Unused Medicines" to Better Reflect Source Control Benefits that Support Water Reuse and Recycling

Modify and align existing guidance to discourage any flushing of unused and/or expired medicines to sanitary sewers or septic systems. The guidance would describe alternative means for disposing of medicines (e.g., take-back programs) to provide further source control for difficult-to-treat compounds.

## ACTION 2.2.10 Incorporate Water Reuse Considerations in the Development of Civil Works Projects through the U.S. Army Corps of Engineers Civil Works Program

The Civil Works Program of the U.S. Army Corps of Engineers focuses on responsible development, protection, and restoration of the Nation's water and related land resources. Civil Works projects are developed, implemented, and operated with non-federal sponsors for flood risk management, commercial navigation, ecosystem restoration, recreation, and environmental stewardship. Clarification on how the civil works project development process can directly include water reuse considerations could enable better incorporation of such reuse features in projects authorized by Congress.

## ACTION 2.2.11 Incorporate Stormwater Capture Considerations in Assessment of Stormwater Finance Needs and Opportunities

Through the Environmental Financial Advisory Board's Stormwater Infrastructure Funding Workgroup/Task Force, evaluate costs and funding options regarding stormwater capture as part of overall assessments of stormwater program funding needs and opportunities.

## ACTION 2.2.12 Leverage U.S. Department of Agriculture Programs to Encourage Consideration and Integration of Agricultural Reuse

Key agencies at USDA, such as NRCS and Rural Development, are uniquely positioned to promote the consideration and integration of agricultural reuse through financing and grants, technical assistance, and conservation initiatives. Additional considerations may include:

1. Promotion and further development of environmental exchange partnerships at the local and state levels to facilitate "services exchanges" whereby entities can pay farmers to provide certain services;
2. Development of a pilot project to demonstrate cost-effective management of systems for monitoring, control, and automation of agricultural water reuse systems, including a decision support framework to help farmers integrate information; and
3. Inclusion of agricultural water capture and reuse practices in state nutrient reduction strategies.

## ACTION 2.2.13 Enhance Combined Sewer Overflow/Sanitary Sewer Overflow Abatement Strategies

Provide examples where water reuse strategies can support local efforts to achieve local wet weather management goals, such as combined sewer overflows and sanitary sewer overflows.

***The City of Columbia (MO) constructed wetlands in 1994 and 2001 as part of its wastewater treatment process. These deliver treated water into the Eagle Bluffs managed wetlands, providing managed habitat for migratory waterfowl and saving electrical costs.***

ACTION 2.2.14

## Promote Water Reuse through the Federal Emergency Management Agency's Hazard Mitigation Programs

Promote the consideration and inclusion of water reuse and stormwater capture and reuse through the Federal Emergency Management Agency's Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program projects to reduce long-term risk from natural hazards, as appropriate.

ACTION 2.2.15

## Work with Tribes to Support Water Reuse Solutions to Drought Challenges

Partner with the National Tribal Water Council, National and Regional Tribal Operations Committees, and the NDRP to identify strategies to support consideration of water reuse in tribal water supply and drought management planning.

> *"States are at various stages of water reuse development ranging from mature, multi-decade programs to very limited or no program. Additionally, it will be important for EPA to recognize the drivers for reuse and the type of water being reused will vary from state to state based on state and local conditions."*
>
> — Oklahoma Department of Environmental Quality

*Constructed wetlands in Orlando, Florida, provide advanced treatment for reclaimed water.*

*Wichita's Aquifer Storage & Recovery project (KS) diverts Little Arkansas River water above a minimum flow threshold, treats it to drinking water standards, and then injects it into the Equus Beds aquifer to meet water demand and ensure drought preparedness.*

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

**Date:** July 11, 2019
**To:** Greg Norby
**CC:** Karri Ving, Manon Fisher
**From:** Ryan Batjiaka
**Subject:** Impacts of PFAS on Wastewater Operations and Biosolids

**Background on PFAS**

Per and polyfluoroalkyl substances (PFAS) are a group of fluorinated compounds which are used for a variety of applications including firefighting foam, stain and water-resistant clothing, cosmetics, and food packaging. Two of these PFAS compounds, Perfluoroocatnesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) have been the focus of increasing regulatory scrutiny due to contamination of drinking water. Production of PFOS in the United States was phased out in 2002 while PFOA was phased out in 2015 (EPA, 2017). It is still possible for PFOS and PFOA to be inadvertently produced during the manufacture or degradation of other PFAS compounds. Because PFOS and PFOA are ubiquitous in households, trace amounts of PFOA and PFOS are found in biosolids.

**Regulatory actions around PFOS and PFOA**

The EPA has set a notification level of 70 parts per trillion (ppt) combined for PFOA and PFOS in drinking water (EPA, 2016) and is working on the development of a maximum concentration level (MCL) (EPA, 2019). The California State Water Board has established notification levels of 13 ppt for PFOA and 14 ppt for PFOS in drinking water (California State Water Board, 2019). The State Waterboard tested for PFOA and PFOS in drinking water sources across the state in 2013-2015 and identified several dozen drinking water sources with detectable concentrations of PFOS and PFOA. As of 2018 there were 18 drinking water sources over the notification level for PFOA and 25 over the notification level for PFOS (California State Water Board, 2019).

On March 6th 2018, the State Waterboard announced a phased investigation plan for PFAS. Phase I is currently underway and requires sampling of groundwater at airports, landfills, and drinking water sources previously identified during testing from 2013-2015 and wells within close proximity to these three types of sites. Phase II will investigate refineries, bulk terminal ports, non-airport fire training areas and the 2017-2018 urban wildfire areas. Phase III will investigate manufacturing sites which might have used PFOS and PFOA, select domestic wells and wastewater treatment plants (California State Water Board, 2019). The Phase III investigations were planned

for the Fall of 2019 but have now been pushed back to early 2020. The details of how the Phase III investigations will be executed have yet to be decided upon by the State Water Board. Statements made during the March 6th, 2018 meeting and in follow up emails with State Water Board staff suggest that testing of effluent from the wastewater treatment plant will occur as well as groundwater where biosolids are applied as a soil amendment. The ranches that currently use WWE biosolids as a fertilizer have application buffers of 100-500 feet around wells depending on the County and type of well. It is not clear if the State Water Board would use these wells or require the drilling of new wells for sampling purposes related to the aforementioned regulatory action.

**Transport of PFOS PFOA from biosolids**

PFOA and PFOS will appear in both biosolids and effluent unlike lipophilic pollutants which partition to solids and are highly immobile. This relative mobility of PFOA and PFOS across liquids and solids is what makes transport from biosolids a concern. There is a limited amount of research regarding the leaching of PFAS from biosolids into groundwater. A study in Canada found that groundwater 2 meters below a field that had received biosolids contained 3 ppt PFOA and 0.8 ppt PFOS, however concentrations in tile drainage (a system for increasing subsurface drainage) at a depth of 1.2 meters were higher at 23 ppt PFOA and 1.1 ppt PFOS. (Gottschall, et al., 2016). As part of a lawsuit between Los Angeles County Sanitation District and Kern County over the application of biosolids on an LACSD owned farm in Kern County, PFAS were found at concentrations of 11-30 ppt in groundwater however the specific PFAS compounds were not described. Additionally, the court ruled that biosolids could not be definitively shown as the source PFAS in groundwater (California Superior Court, 2016). WWE is currently participating in a research project with Purdue University that will help to further quantify leaching rates.

**Concentration of PFOS PFOA in WWE biosolids and comparison with other materials**

Although there is no regulatory requirement to do so, WWE has proactively tested its biosolids for PFAS compounds, including PFOA and PFOS. Concentrations of PFOA were reported as 1.15 ppb and 0.783 ppb in Oceanside and Southeast biosolids respectively and 14.9 ppb and 7.99 ppb for PFOS. Effluent from mid-sized treatment plants being reported as 15 ppt for PFOA and 14 ppt for PFOS in the Northeastern US (Beecher, 2018). Levels of PFOA in WWE's biosolids are actually lower than those found in food waste compost, which has been shown to contain approximately 2-10 ppb PFOA and <1ppb PFOS (Lee, 2018).

PFOS and PFOA are found in WWE's biosolids due to the ubiquitous nature of these compounds.

- Concentration in House Dust: The mean and median concentration of PFOA in house dust in the US was found to be 38.6 ppb and 9.0 ppb while the mean and median concentration of PFOS was 42.4 ppb and 14.1 ppb (Karaskova, et al., 2016). Previous studies found even higher concentrations in house dust of US homes, with a median of 44 ppb PFOA and 47 ppb PFOS from a study in Wisconsin (Knobeloch, Imm, & Anderson, 2012) and a median of 23.7 ppb PFOA and 26.9 ppb PFOS in dust from homes in Massachusetts (Fraser, et al., 2012).

- Concentration in Blood Serum: PFAS are detectable in the blood serum of 98% of the US population (Calafat, Wong, Kuklenyik, Reidy, & Needham, 2007) although levels are decreasing. Median concentrations of PFOA human blood serum across all populations in the US was 5.2 ppb in 1999 and 1.57 ppb in 2016, while PFOS was 30.2 ppb in 1999 and 4.8 ppb in 2016 (CDC, 2019).

- Concentration in Food: An FDA study of concentrations of PFAS in food detected PFOS in 10 out of 21 meat and seafood samples with concentrations ranging from 0.134 ppb to 0.865 ppb (Genualdi, deJager, & Begley, 2019).

**WWE engagement with PFAS**

WWE is engaged with the PFAS issue on several levels. We are one of five agencies working on a WRF study being executed by CDM Smith and Purdue University which will quantify rates of desorption and leaching. We are also developing a separate research project with Purdue University which will investigate mobility of PFAS from biosolids based soil amendments. In response to the State Water Board's planned testing of groundwater under areas of biosolids application, WWE is working with the California Association of Sanitation Agencies to ensure the Water Board's actions will be scientifically informed. Lastly, WWE staff participate in state and national groups which monitor and respond to regulatory developments around PFAS.

**References**


Beecher, N. (2018). *How did we get here? PFAS concerns affect wastewater and biosolids management.*

Calafat, A., Wong, L., Kuklenyik, Z., Reidy, J., & Needham, L. (2007). Polyfluoroalkyl Chemicals in the U.S. Population: Data from the National Health and Nutrition Examination Survey (NHANES) 2003–2004 and Comparisons with NHANES 1999–2000. *Environmental Health Perspectives*, 1596-1602.

California State Water Board. (2019, 6 20). *Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS)*. Retrieved from https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/PFOA_PFOS.html

California State Water Board. (2019). *PFAS Phased Investigation Approach.*

California Superior Court. (2016). *Los Angeles County v. County of Kern (Superior Court of the State of California, County of Tulare November 28, 2016).*

CDC. (2019). *Fourth National Report on Human Exposure to Environmental Chemicals.*

EPA. (2016). *PFOA & PFOS Drinking Water Health Advisories.*

EPA. (2017). *Technical Fact Sheet PFOS and PFOA.* Retrieved from W:\Biosolids Management System\Monitoring & Measurement\Constituents\Constituent background information\PFAS\EPA Technical Fact Sheet PFOS PFOA 2017.pdf

EPA. (2019). *Per- and Polyfuoroalkyl Substances (PFAS) Action Plan.*

Fraser, A., Webster, T.F., Watkins, D.J., Nelson, J.W., Stapleton, H., Calafat, A.M, . . . McClean, M.D. (2012). Polyfluorinated compounds in serum linked to indoor air in office environments. *Environmental Science & Technology*, 1209-1215.

Genualdi, S., deJager, L., & Begley, T. (2019). *Investigation of Per- and Polyfluoroalkyl Substances (PFAS) in US food products.* Center for Food Safety and Applied Nutrition, Food and Drug Administration.

Gottschall, N., Topp, E., Edwards, M., Payne, M., Kleywegt, S., & Lapen, D. (2016). *Brominated flame retardants and perfluoroalkyl acids in groundwater, tile drainage, soil, and crop grain following a high application of municipal biosolids to a field.* Science of the Total Environment.

Karaskova, P., Venier, M., Melymuk, L., Becanova, J., Votja, S., & Prokes, R. (2016). Perfluorinated alkyl substances (PFASs) in household dust in Central Europe and North America. *Environment International*, 315–324.

Knobeloch, L., Imm, P., & Anderson, H. (2012). Perfluoroalkyl chemicals in vacuum cleaner dust from 39 Wisconsin homes. *Chemosphere*, 779-783.

Lee, L. (2018). *PFAS Levels in Compost and Biosolids.*

# PFAS

## FACTSHEET

## What Are PFAS?

Per and polyfluoroalkyl substances (PFAS)[1] are a group of manmade fluorinated compounds which are used for a variety of applications by both industry and residential households. PFAS have been in commercial use since the 1940's and are abundant in today's society. These chemicals are widely in use because of their exceptional resistance to heat, water, and oil.

**PFAS are commonly found in every American household, and in products as diverse as non-stick cookware, stain resistant furniture and carpets, wrinkle free and water repellant clothing, cosmetics, lubricants, paint, pizza boxes, popcorn bags, and many other everyday products.**

Two of the most common types (PFOS and PFOA) were phased out of production in the United States (US) in 2002 and 2015 respectively, but are still present in some imported products. PFOA and PFOS are found in every American person's blood stream in the parts per billion range, though those concentrations have decreased by 70% for PFOA and 84% for PFOS between 1999 and 2014, which coincides with the end of the production and phase out of PFOA and PFOS in the US[2].


November 1, 2019

## PFAS Are Ubiquitous in Our Homes and Our Environment

Several recent legislative and regulatory efforts across the US to address PFAS have focused on limiting levels in drinking water. However, there has been relatively little conversation about the presence of these chemicals in our everyday lives and the public's sheer exposure to PFAS through primary contact from commercial products used in our everyday lives. Several peer reviewed studies have shown that the mean and median concentration of PFOA in household dust in the US was found to be between approximately 10,000 and 50,000 parts per trillion (ppt)[3]. These studies highlight the fact that there is significantly more PFOA in the ambient dust in the average home than the levels currently being discussed as thresholds for drinking water. Because PFAS is in the products we use, is transported through air and water and has been found in the food we eat, there are numerous public exposure pathways for PFAS beyond drinking water.

**These studies highlight the fact that there is significantly more PFOA in the ambient dust in the average home than the levels currently being discussed as thresholds for drinking water.**

## Importance of Human Health Protection

Entities providing essential public services such as safe drinking water, wastewater treatment, water recycling, biosolids recycling, and municipal solid waste management firmly believe in our **collective mission to ensure safe drinking water, wastewater treatment, and sanitation services.** We acknowledge and embrace our role as environmental and public health stewards and our continued responsibility and commitment to providing a healthy and clean environment now and for future generations. To that end, we support actions and regulations intended to ensure delivery of those services as long as they are based on credible science and developed after due deliberation. There is concern that in the case of PFAS, due to the complexities inherent with them, notification levels, thresholds, and in some cases limits are being developed rapidly and in advance of the scientific and public process.

## PFAS Producers and Heavy Users Are Not the Same as PFAS "Receivers"

Drinking water treatment systems, wastewater treatment facilities, and municipal solid waste landfills are not "producers" or users of PFAS, and **none of these essential public service providers utilize or profit from PFAS chemicals. Rather, they are "receivers" of these chemicals used by manufacturers and everyday consumers, and merely convey and/or manage the traces of PFAS** coming into our systems daily. In order to address the true sources of these chemicals, it is imperative to discontinue and phase out production and use (both domestic and foreign) at manufacturing facilities and find safer alternatives for heavy use areas such as firefighting training sites. As long as PFAS are elements of products used in our everyday lives, and background levels resulting from decades of manufacturing and use persist, these chemicals will continue to be found in "receiver" streams.

## Placing PFAS in Context: Distinguishing Highly Contaminated Sites From Background Levels

Recent legislative and regulatory efforts to address PFAS contamination tend to not differentiate between concentrations at producer and heavy user contaminated sites and common background concentrations in

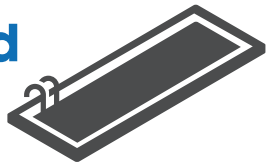
drinking water, groundwater, recycled water, wastewater, biosolids, or landfill leachate. The concentrations of PFAS found in these two scenarios are dramatically different and must be managed separately in public policy and regulation. Sites found near PFAS manufacturers have found contamination at concentrations reaching 100,000 to 500,000 ppt. In the same context, firefighting training sites, including military complexes, PFAS concentrations have been found as high as 6,950,000 ppt.[4] In these circumstances, PFAS producers and heavy users have created severely contaminated sites that must be remedied. In contrast, the action levels currently discussed for drinking water systems range from 5–40 ppt, an exceptionally small fraction of the concentrations found at highly contaminated sites. Because of this vast disparity in relative contributions, it is imperative that policy and regulation reflect product manufacturer responsibility and stewardship, as well as cleanup and remediation at highly contaminated sites, differentiated from those that are receiving PFAS in their systems at significantly smaller concentrations.

**In contrast, the action levels currently discussed for drinking water systems range from 5–40 ppt, an exceptionally small fraction of the concentrations found at highly contaminated sites.**

## Regulatory Thresholds and Unintended Consequences

The USEPA has set a drinking water health advisory level of 70 ppt individually or combined for PFOA and PFOS in drinking water. Through USEPA's Action Plan[5] the Agency is currently evaluating the need to develop maximum contaminant levels (MCL) for these and possibly other PFAS compounds. The Agency similarly proposed preliminary groundwater remediation goals for PFOA and PFOS at 70 ppt combined in areas where groundwater may be used for drinking water. **For perspective, one part per trillion is the equivalent of four grains of sugar in an Olympic sized swimming pool, or the equivalent of one second in 32,000 years, or $1.50 out of all the US currency in the world.** Even as EPA's work continues, states have begun setting their own PFAS standards for drinking water at a rapid pace and without following some of the usual regulatory and scientific review and public involvement procedures. The public and political concern about PFAS is leading several states to move forward with regulatory standards or notification levels while the science is developing. For example, New Hampshire[6] has adopted regulatory standards of 12 ppt for PFOA and 15 ppt for PFOS in drinking water, the California State Water Board[7] has established notification levels of 6.5 ppt for PFOS and 5.1 ppt for PFOA in drinking water, while other states have adhered to the USEPA health advisory level of 70 ppt for both PFOA and PFOS combined. States adopting different standards for the same PFAS compounds are creating confusion and risking undermining public confidence at a time when greater consistency is needed. **In fact, stringent state requirements could have significant unintended impacts on public municipalities and individuals, if public systems are deemed unusable and/or need to install prohibitively expensive supplemental treatment systems. Similarly, policies that limit the landfill disposal of PFAS containing wastes could force alternative means of disposal that are less protective of public health and the environment.**

**4 grains of sugar in an Olympic-sized swimming pool**



## Background Levels of PFAS in Wastewater Effluent, Recycled Water, Biosolids, and Leachate

States that are establishing, or have adopted, strict PFAS standards for drinking water could also ultimately impact discharge limits on wastewater treatment plants effluent, recycled water, as well as the management of biosolids and leachate. Because PFAS are ubiquitous in households, consumer products, food, and the environment generally, some trace levels reflecting this ubiquitous broad use of these compounds will make their way into the wastewater and solid waste streams. From wastewater treatment plants, some of these trace amounts of PFAS may also be found in biosolids. Trace amounts will also make their way to landfills and resulting leachate. In response to the phase out of PFAS use and appropriate source control and product substitution, continued reduction of trace levels is anticipated. It is important to note that PFAS are also found in paper mill residuals, digestates, composts, and soils. Given the ubiquity of PFAS, and the comparative background levels which may be found in wastewater, biosolids, and leachates, setting requirements near analytical detection limits on these sources may not provide a discernable benefit to protecting public health.

## A Measured, Scientifically Sound Response to PFAS Contamination is Needed

**Legislators, regulators, and drinking water, wastewater, and solid waste agencies must work collaboratively to examine how to manage PFAS holistically,** with science driving the decision making. We acknowledge and embrace our role as public health and environmental stewards to ensure safe drinking water and sanitation services. However, we know that science is still evolving to understand the fate, exposure, and toxicity of PFAS in various environmental media. The analytical methods needed to study and accurately monitor these chemicals at such trace concentrations are still in development for media other than drinking water. In addition, the extent of public health impacts remains unclear and is not fully understood. This underscores the need to better understand the complex science of PFAS exposure and impacts, verifiable analytical methods, and real-world risk before setting exceedingly stringent thresholds or limits. **The goal of any PFAS policy or regulation should be to determine the most effective steps needed to reduce human exposure and implement them within the broad context of protecting human health.** This requires differentiating high concentration sites from background concentrations and taking action to mitigate concentrations at high use sites. It also demands both a reassessment of products we produce and use daily, and a realistic assessment of how to control PFAS chemicals already in the background environment. The most significant action we need to take today is to remove these chemicals of concern from the stream of commerce and pursue cleanup and remediation at highly contaminated sites. Source reduction and pollution prevention can serve as the most efficient means of addressing the persistent background presence of PFAS and effectively limit exposure to PFAS going forward.

1. PFAS is the broader class of chemicals that includes PFOA, PFOS, and many others.
2. Centers for Disease Control and Prevention. Fourth Report on Human Exposure to Environmental Chemicals, Updated Tables, (January 2019). Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. cdc.gov/exposurereport
3. Trudel et al., Risk Analysis Vol. 28 No. 2, 2008
4. ewg.org/interactive-maps/2019_pfas_contamination/map
5. https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf
6. https://www4.des.state.nh.us/nh-pfas-investigation/
7. https://www.waterboards.ca.gov/press_room/press_releases/2019/pr082319_pfoa_pfos_guidelines_news_release.pdf

DRAFT

# Executive Board Special Meeting Agenda

SF Bay Regional Water Board / BACWA Executive Board Joint Meeting

Wednesday January 8, 2020, 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** | • Presentation – Scoping and Evaluation Plan for Regional Evaluation of Potential Nutrient Discharge Reduction by Natural Systems (Ian Wren)<br>• Presentation – Scoping and Evaluation Plan for Regional Evaluation of Potential Nutrient Discharge Reduction by Water Recycling (Mike Falk)<br>• Discussion of vision for third Watershed Permit | 10:15 |
| **2. Basin Plan Amendments** | • BACWA Update on progress on Chlorine Residual BPA<br>• Other items to incorporate into BPA or separate BPA, such as Bacterial Objectives | 11:20 |
| **3. Enterococcus monitoring** | • BACWA's update on enterococcus wet weather sampling effort | 11.30 |
| **5. CECs** | • BACWA's response to RMP CECs synthesis stakeholder questions<br>• Finalization of CECs White Paper and funding of CECs POTW monitoring<br>• Discussion of potential State Water Board requirement to monitor PFAS | 11:35 |
| **7. Toxicity** | • Update on adoption | 11:45 |
| **8. Sunnyvale and San Jose receiving water monitoring requirements** | • (tentative) | 11:50 |

**ADJOURNMENT**

**AGREEMENT: DEPOSIT AND DISBURSEMENT OF FUNDS FOR S.F. BAY IRWMP: MARIN MUNICIPAL WATER DISTRICT TRUST FUND**

**PERTINENT FACTS**

A. The State Coastal Conservancy ("the Conservancy") is an agency of the State of California, with the authority under Division 21 of the California Public Resources Code to undertake projects to protect and enhance California coastal resources, including water and water-related resources within the San Francisco Bay Area.

B. Alameda County Flood Control and Water Conservation District, Zone 7 Water Agency ("Zone 7"), is a special district authorized to supply wholesale water and provide flood management in the Tri-Valley portion of Alameda County.

C. Marin Municipal Water District ("MMWD") is a special district, authorized to provide water supply to retail customers in central and southern Marin County.

D. Contra Costa County Flood Control and Water Conservation District ("CCCFCWCD") is a special district the purposes of which include controlling flood and storm waters and conserving such waters for beneficial uses.

E. Bay Area Clean Water Agencies ("BACWA") is a joint powers authority among several cities and water districts created to collect, manage and interpret data related to the aquatic life and quality of the waters of San Francisco Bay, and to carry out related activities.

F. Department of Water Resources ("DWR") is an agency of the State of California, authorized to manage State water resources and to award grants under various bond acts for preparation and implementation of Integrated Regional Water Management (IRWM) Plans to encourage integrated regional strategies for management of water resources and to provide funding for projects that protect communities from drought, protect and improve water quality, and improve local water security by reducing dependence on imported water.

G. The Conservancy and Zone 7 were each awarded a grant by DWR pursuant to Chapter 8 of Proposition 50 and its IRWM Program guidelines to undertake components of the planning work for the IRWM Plan for the San Francisco Bay Area ("the Plan"). Pursuant to those grants, and in accordance with a process described in a Letter of Mutual Understandings (LOMU) among 19 special districts, local agencies and the Conservancy, the Plan was completed on November 1, 2006.

H. After the Plan was completed, it was adopted by the governing body of 24 separate conservation, water and waste water agencies, cities, counties and associations within the San Francisco Bay Area.

I. As the Plan is implemented, ongoing technical environmental services are needed to assist in developing, evaluating, and monitoring implementation activities under the Plan to ensure that they are in compliance and consistent with the requirements various grant program

2010
CCC BOS ~~Sept 11, 2007~~

guidelines. Compliance with the IRWM grant program guidelines will also require updates to the Plan. These activities are referred to in this agreement as "the Updating and Implementation Activities". The Conservancy, CCCFCWCD, and BACWA (hereafter, collectively "the Managing Parties"), all of which participated in development of and adopted the Plan, along with MMWD, are willing to manage certain Updating and Implementation Activities on behalf of all Contributing Entities defined below.

J. On behalf of agencies affiliated with the same respective functional area of the Plan, the Conservancy, CCCFCWCD, and BACWA desire to provide monetary contributions to MMWD for disbursement by MMWD for the services related to the Updating and Implementation Activities described in the preceding paragraph. Specifically, the Conservancy will contribute $25,000 on behalf of Bay Area watershed and ecosystem restoration organizations; CCCFCWCD will contribute $25,000 on behalf of Bay Area flood protection agencies; and BACWA will contribute $60,000 on behalf of Bay Area clean water agencies. In addition, certain other public water resource agencies in the San Francisco Bay Area also desire to provide monetary contributions to MMWD for the same purpose. The Bay Area Water Agency Coalition (BAWAC), representing the wholesale and major retail water agencies in the San Francisco Bay Area, will contribute $63,000 on behalf of Bay Area water supply agencies. This funding will be provided through MMWD, the organization representing BAWAC. BACWA, CCCFCWCD and the Conservancy are referred to in this agreement as "the Contributing Entities".

K. As the Plan is implemented, ongoing technical services are also needed to assist in public outreach and input through maintaining, updating and further developing the Plan website (referred to in this agreement as "the web-related activities).

L. Consistent with the requirements referenced in the preceding paragraph, this agreement is intended to set forth the purposes for which the Contributing Entities are providing contributions to MMWD in trust and the specific conditions imposed on MMWD in receiving, holding and disbursing the contributions.

**MMWD, CCCFCWCD, BACWA, AND CONSERVANCY AGREE AS FOLLOWS**, in light of the Pertinent Facts, above.

**1. TERM OF AGREEMENT**

This agreement shall become effective as of the date signed by all parties ('the effective date"). This agreement shall remain in effect for a period that extends for one year after the termination date of any contract that has been funded under this agreement.

**2. CONTRIBUTIONS**

The Contributing Entities will contribute to MMWD a cumulative total of at least one hundred and ten thousand dollars ($110,000) as described in the Pertinent Facts, above, for the purpose of undertaking activities related to the Updating and Implementation Activities. (Any contribution shall be referred to in this agreement as a "Contribution". Collectively, all contributions shall be referred to as the "Contributions").

In connection with any Contribution, the entity making the Contribution shall submit two executed originals of the "Acknowledgement of Contribution and Requirements for Use and Disbursement", in the form attached as Exhibit A to this agreement, by which the entity making the Contribution agrees that the terms of this agreement shall govern the receipt, management and disbursement of the Contribution and agrees to be bound by the actions and approvals of the Managing Parties under this agreement. Upon receipt of any Contribution and prior to deposit, MMWD shall execute the two original Acknowledgements of Contribution and Requirements for Use and Disbursement, acknowledging receipt of the Contribution and agreeing to be bound by the terms of this agreement, and then shall return one executed copy to the party making the Contribution. Thereafter, MMWD shall deposit the Contribution into a subaccount, entitled "SFB IRWMP - Update and Implementation" ("Account"), under a separate account in the MMWD accounting system. If MMWD fails to execute and return the Acknowledgement, it shall promptly return the Contribution to the party making the Contribution.

By signing this agreement and providing the referenced contribution herein, any Managing Entity satisfies the terms of this Section, and is therefore not required to submit the Acknowledgement of Contribution and Requirements for Use and Disbursement.

Separate accounting for the Account will be maintained.

**3. ADMINISTRATION OF ACCOUNT**

MMWD shall have the sole responsibility for administration and management of the Account, provided, however, that any disbursement of Contributions from the Account shall comply with the conditions, requirements and limitations set forth in this agreement.

**4. USE OF CONTRIBUTIONS**

The Contributions held in the Account shall ~~generally~~ be used for services needed for the Updating and Implementation Activities. MMWD will provide these services through one or more contracts with a third party.

**5. PROCESS FOR CONTRACTING**

Prior to entering into any contract to be funded by Contributions to the Account, MMWD will select a contractor through the appropriate process required by State law and subject to the requirements of State law. MMWD will have the sole discretion to determine the appropriate process for and method of selection and to determine the contractor(s) to be retained under that process. Notwithstanding the foregoing, MMWD shall regularly consult and coordinate with the Managing Parties throughout the process of selecting and retaining any contractor. In addition, the Managing Parties shall participate in the process of selecting and retaining a contractor and MMWD shall obtain the approval of the Managing Parties as follows:

a. Scope of Work. Prior to initiating the process for selecting a contractor, MMWD, with the cooperation and assistance of the Managing Parties, shall prepare a proposed scope of work to be used as the basis for the solicitation and selection of a contractor. The scope of work must include a detailed description of proposed tasks or deliverables to be completed by the contractor(s). Upon completion of a final scope of work, MMWD shall provide it to the

Managing Parties for review and approval of the content of the scope of work and approval of the funding of a contract for that scope of work by Contributions to the Account.

b. Request for Proposal/Statement of Qualifications/Bids. In addition to the approved scope of work, the request for proposal, statement of qualifications or bid shall specify the basis on which a contactor will be selected. In addition, as appropriate, a request for proposal or statement of qualifications may also specify the relevant education, qualifications and experience and other factors on which the contractor shall be evaluated and selected. Prior to distribution, any request for proposal, statement of qualifications or bid shall be provided to the Managing Parties for their review and written approval.

c. Selection of the Contractor. To the extent that the selection process may involve the evaluation, ranking or rating of any proposed contractor under previously specified criteria, MMWD shall involve the Managing Parties in such evaluation, ranking or rating in a reasonable manner consistent with State statutory requirements.

d. Contract with the Contractor. Prior to entering into a written contract with any contractor selected to carry out activities to be funded by Contributions to the Account under this agreement, MMWD shall submit the proposed written contract to the Managing Parties for review and written approval of the essential terms of the contract. As used in this section, the phrase "essential terms of the contract" means the scope of work detailing the tasks to be performed, a schedule for performing the tasks and a budget itemized by task.

Each such contract must include provisions acceptable to the Managing Parties requiring the contractor to fully indemnify the Contributing Entities, MMWD, and their governing boards, officers, and employees (collectively "the Indemnitees") and requiring the contractor to provide workers compensation insurance and commercial general liability insurance and automobile liability insurance naming the Indemnitees as additional insureds and requiring written notice to the Indemnitees of policy lapse, cancellation, or material change in coverage.

Once MMWD has obtained the approvals of the Managing Parties as specified above, MMWD may enter into a contract with a selected contractor and will be entitled to disburse funds for costs incurred under that contract from the Contributions to the Account, provided that the disbursement is consistent with the requirements of the "Disbursement of Funds" section, below.

## 6. ADMINISTRATION OF THE CONTRACT

MMWD will have the sole responsibility for administering and managing all aspects of work under any contract to be funded by Contributions to the Account. MMWD shall advise and inform and seek the input of the Managing Parties with respect to major issues that may arise in connection with the administration and management of any such contract. The Managing Parties shall, in a timely fashion, cooperate with and provide input, information, documentation or any other thing requested by MMWD to facilitate its efforts to administer and manage any such contracts.

## 7. AMENDMENTS TO THE CONTRACT

The Managing Parties or MMWD may propose to the other parties that an amendment to any contract for service that is being funded with the Contributions, with respect to the scope of agreement, term or other provisions, is necessary or appropriate. If all parties are in agreement, MMWD, with the cooperation and assistance of the Managing Parties, will prepare a proposed amendment to the contract. MMWD shall not agree to any amendment to any contract without the prior review and written approval of the Managing Parties.

**8. DISBURSEMENT OF FUNDS.**
The disbursement of any portion of the Contributions from the Account shall be administered by MMWD in its sole discretion. Disbursement shall be made upon the submission of an invoice by the contractor, subject to satisfactory progress by the contractor(s) consistent with the scope of work, budget and schedule. Prior to disbursement, MMWD shall provide to the Managing Parties for review and written approval any invoice received from the contractor.

9. **TERMINATION OF AGREEMENT**. Any party to this agreement, including MMWD, may terminate this agreement upon written notice to all other parties. The termination shall become effective upon the disbursement by MMWD of all funds remaining in the Account in accordance with this section.

If MMWD has not received Contributions from the Contributing Entities in the cumulative total amount of one hundred and ten thousand dollars ($110,000) within 90 days of the effective date of this agreement, MMWD may thereafter provide notice of termination to the Managing Parties.

Within 30 days of receipt of any such notice to terminate or concurrent with MMWD providing such notice, MMWD shall provide a separate notice to terminate to any contractor retained under this agreement. Thereafter, ~~the Conservancy~~ MMWD shall disburse funds remaining in the Account in the following order of priority: (see)

a. First, to any contractor retained by MMWD under a contract approved under this agreement: for costs incurred prior to the contractor's receipt of the MMWD notice of termination.
b. Second, to any contractor retained by MMWD under a contract approved under this agreement: for any costs associated with reasonable and non-cancelable obligations incurred by the contractor in the performance of the contract prior to the date of the MMWD notice to terminate.

c. Third, to each of the Contributing Entities: upon completion of the disbursements pursuant to subsections a and b, above: a pro rata share of the remaining balance of funds in the Account in proportion to the amount a given party contributed to the total amount of Contributions.

**10. PROCESS FOR REVIEW AND APPROVAL**
In any instance in which the approval of the Managing Parties is required, MMWD shall submit a request for approval and all documentation needed by the Managing Parties to make an informed judgment on the matter on which approval is sought. Within a reasonable time, but in no event later than 10 business days, after receipt of the request and documentation, the Managing Parties shall provide their written approval or explanation for not providing approval.

If any of the Managing Parties fail to provide any response within 10 business days, the matter shall be deemed approved by the party failing to respond.

No party to this agreement may unreasonably withhold approval or unreasonably delay approval.

**11. NOTIFICATION ADDRESS**

Any request, documentation, information, notice or written approval or explanation required by this section may be provided by first class mail or by facsimile to the parties to this agreement, sent to the following address:

State Coastal Conservancy
State Coastal Conservancy
1330 Broadway, 13th Floor
Oakland, CA 94612
Attn: Melanie Denninger
SFB IRWMP Project Manager
Facsimile: (510) 286-0470

BACWA
Bay Area Clean Water Agencies
PO Box 24055, MS702
Oakland, CA 94623
Attn: Amy Chastain
Executive Director
Facsimile: (510) 287-1351

CCCFCWCD
Contra Costa County Flood Control and
Water Conservation District
255 Glacier Drive
Martinez, CA 94553
Attn: Mitch Avalon
Deputy Director
Facsimile: (925) 313-2333

MMWD
Marin Municipal Water District
220 Nellen Avenue
Corte Madera, CA 94925
Attn: Paul Helliker
General Manager
Facsimile: (415) 927-4953

Any party may change its notification address by written notice provided to all other parties.

**12. RESOLUTION OF DISPUTE**. MMWD shall have the sole discretion to resolve any bona fide dispute with any contractor retained under this agreement, on terms and conditions that MMWD determines are fair and reasonable. Prior to reaching an agreed resolution of any such dispute, MMWD shall confer with and obtain the advice of the Managing Parties.

In the event of a dispute between the parties to this agreement concerning the rights and obligations of a party under the terms of this agreement, any party shall, prior to initiating any legal action, first provide a "Notice of Dispute" to the other parties. The Notice of Dispute shall detail the nature of the dispute, the facts in support thereof and propose a resolution. The parties shall then, in good faith, attempt to negotiate a resolution of the dispute.

**13. WAIVER AND RELEASE**.

If MMWD materially complies with the procedures and obtains the approvals specified above, the Managing Parties waive any objection to and release MMWD from any claim, liability or cause of action related to or arising out of any disbursement of the Contributions made pursuant to those procedures and approvals.

**14. LIABILITY IN PROPORTION TO FAULT**

To the extent not covered by the contractor's indemnification and insurance, MMWD and the Managing Parties agree that liability for economic and non-economic damages arising out of performance of this agreement or arising out of acts or omissions with respect to any contract funded under this agreement shall be allocated in direct proportion to each party's percentage of fault. If any party satisfies or is obligated to satisfy more than its proportional share of the costs of defending and satisfying a claim for such damages, that party is entitled to recover its proportionate contributions of such costs from the other parties.

**15. AMENDMENT**

Except as expressly provided in this agreement, no changes in this agreement are valid unless made in writing and signed by the parties to the agreement. No oral understanding or agreement not incorporated in this agreement is binding on any of the parties.

**16. LOCUS**

This agreement is deemed to be entered into in the County of Marin.

**STATE COASTAL CONSERVANCY**

By: _____ 11/23/10
Samuel Schuchat — Date
Executive Officer

**MARIN MUNICIPAL WATER DISTRICT**

Paul Helliker

By: _____ June 29, 2010
Paul Helliker — Date
General Manager

**CONTRA COSTA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT**

By: _____ October 18, 2010
Mitch Avalon — Date
Deputy Director

**BAY AREA CLEAN WATER AGENCIES**

By: Amy Chastain
Amy Chastain
Executive Director

June 29, 2010
Date

Contra Costa County
Flood Control
& Water Conservation District

Brian M. Balbas,
ex officio Interim Chief Engineer
Mike Carlson,
Deputy Chief Engineer

Date DRAFT

DRAFT

Matthew Sagues
Marin Municipal Water District
220 Nellen Avenue
Corte Madera, CA 94925-1169

RE: Bay Area IRWMP 4-Party Agreement Funds
Our File: 030-35-03

Dear Matthew:

In light of recent conversations surrounding the 4-party agreement between State Coastal Conservancy (SCC), the Bay Area Clean Water Agencies (BACWA) and our agencies, I propose that we terminate the agreement and return the funds to those who contributed on a pro rata basis as directed in the agreement. A copy of the latest agreement is attached for your convenience.

Per the spreadsheet you sent me I have calculated the pro rata share to be sent to each party to be as follows:

**Amount remaining in fund:**
**$45,247.43**

**Contribution and Pro Rata Share by Association**

| Association | Contribution | % Contribution | Pro Rata Share of Remaining Funds |
|---|---|---|---|
| SCC | $25,000 | 14.45% | $6,538.65 |
| BAFPAA | $25,000 | 14.45% | $6,538.65 |
| BACWA | $60,000 | 34.68% | $15,692.75 |
| BAWAC | $63,000 | 36.42% | $16,477.38 |
| | **$173,000** | **100.00%** | **$45,247.43** |

Should you have any questions, please contact me at (925) 313-2274.

Sincerely,

Mark Boucher

Sr. Hydrologist
Flood Control

MB:clerical
G:\fldctl\IRWMP - Bay Area\4-Party Agreement 7-29-2010\Letter to Propose Termination of the 4-Party AgreementDate.docxEnclosures

c: David Williams, Executive Director
Bay Area Clean Water Agencies
PO Box 24055, MS 59
Oakland, CA 94623
Brenda Buxton, SCC
State Coastal Conservancy
1330 Broadway, 14th Floor
Oakland, CA 94612
Tim Jensen, Flood Control
Mike Carlson, Administration

**From:** Brian Mendenhall <BMendenhall@valleywater.org>
**Sent:** Tuesday, November 5, 2019 1:23 PM
**To:** 'Mark Boucher' <mark.boucher@pw.cccounty.us>; 'Munoz, Cheryl' <cmunoz@sfwater.org>; 'Buxton, Brenda@SCC' <brenda.buxton@scc.ca.gov>; David Williams <dwilliams@bacwa.org>; 'Chang, Taylor' <TaChang@sfwater.org>; 'Matthew Sagues' <msagues@marinwater.org>
**Cc:** Brad Arnold <BArnold@valleywater.org>; 'mnvotny@sfwater.org' <mnvotny@sfwater.org>; 'sritchie@sfwater.org' <sritchie@sfwater.org>; Lisa Bankosh <LBankosh@valleywater.org>; 'Novotny, Michelle S' <MNovotny@sfwater.org>
**Subject:** RE: Use of Bay Area IRWMP 4-Party Funds

Good afternoon,
I look forward to our discussion this afternoon.

**AGENDA**

1. Introductions
2. Status of 4-Party funds
3. Discussion on options for use of 4-Party funds
4. Next steps – including approval by 4 parties (if expenditure is deemed appropriate), and communications with IRWM Coordinating Committee

Thank you,
Brian Mendenhall

-----Original Appointment-----
**From:** Brian Mendenhall
**Sent:** Thursday, October 31, 2019 8:37 AM
**To:** Brian Mendenhall; 'Mark Boucher'; 'Munoz, Cheryl'; 'Buxton, Brenda@SCC'; 'David Williams'; 'Chang, Taylor'; 'Matthew Sagues'
**Cc:** Brad Arnold; mnvotny@sfwater.org; sritchie@sfwater.org; Lisa Bankosh; Novotny, Michelle S
**Subject:** Use of Bay Area IRWMP 4-Party Funds
**When:** Tuesday, November 05, 2019 4:00 PM-5:00 PM (UTC-08:00) Pacific Time (US & Canada).
**Where:** Conference Call

Good morning,
Following a discussion at the October 28, 2019 Bay Area IRWM Coordinating Committee (CC) meeting, I am organizing this conference call to discuss possible use of remaining 4-Party funds for IRWM activities. The discussion may consider any reasonable use of the funds (consistent with the purposes of the agreement for "updating and implementing" activities for the IRWM Plan – see attached) but should include subjects raised at the last CC meeting, including:

1. Using Estuary Magazine to highlight IRWM process and project benefits
2. Updating Bay Area IRWM webpage
3. Improving Bay Area IRWM forms for project proponents
4. Expanding on DACTIP efforts not currently covered by secured grant funding

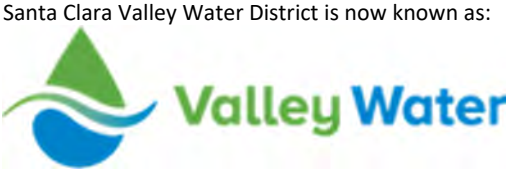
The goal of the meeting will be to come up with a recommendation to share at the next CC meeting on December 2, 2019. We may hold a subsequent meeting to extend the discussion or invite others as deemed necessary. I will send out an agenda and meeting materials in advance of the call.

After checking in with invitees, Tues, November 5th seems to work the best for the group.
CALL IN NUMBER
Dial 888-363-4735. Enter code 7776449.

Thank you, Brian

Brian Mendenhall
Project Manager
Water Resources Planning and Policy Unit
Santa Clara Valley Water District
Tel. 408.630.3093
bmendenhall@valleywater.org

Santa Clara Valley Water District is now known as:




Clean Water • Healthy Environment • Flood Protection
5750 Almaden Expressway, San Jose CA 95118
www.valleywater.org

**POTW Participation in CECs Studies**

**BACWA White Paper**

**DRAFT**

# Contents



# Background

The Regional Monitoring Program (RMP) forms the core of water quality, sediment quality, and tissue monitoring in the San Francisco Bay. Historically, each Publicly Owned Treatment Works (POTW) was responsible for performing receiving water monitoring as part of its individual NPDES Permit. The RMP was created in 1993 through Regional Board Resolution No. 92-043 that directed the Executive Officer to implement a Regional Monitoring Plan in collaboration with permitted dischargers pursuant to California Water Code, Sections 13267, 13383, 13268, and 13385. The goal was to replace individual receiving water monitoring requirements for dischargers with a comprehensive Regional Monitoring Program.

The Regional Monitoring Program's specific objectives are to:

- Describe the distribution and trends of pollutant concentrations in the Estuary;
- Project future contaminant status and trends using best understanding of ecosystem processes and human activities;
- Describe sources, pathways, and loading of pollutants entering the Estuary;
- Measure pollution exposure and effects on selected parts of the Estuary ecosystem (including humans);
- Compare monitoring information to relevant benchmarks, such as total maximum daily load (TMDL) targets, tissue screening levels, water quality objectives, and sediment quality objectives; and
- Effectively communicate information from a range of sources to present a more complete picture of the sources, distribution, fate, and effects of pollutants and beneficial use attainment or impairment in the Estuary ecosystem.

The RMP has been investigating Contaminants of Emerging Concern (CECs) since 2001, and established a formal workgroup to address the issue in 2006. The RMP Emerging Contaminants Workgroup (ECWG) includes representatives from RMP stakeholder groups including POTWs, regional scientists, and an advisory panel of expert researchers that work together to address the Workgroup's guiding management questions.

- Which CECs have the potential to adversely impact beneficial uses in San Francisco Bay?
- What are the sources, pathways and loadings leading to the presence of individual CECs or groups of CECs in the Bay?
- What are the physical, chemical, and biological processes that may affect the transport and fate of individual CECs or groups of CECs in the Bay?
- Have the concentrations of individual CECs or groups of CECs increased or decreased in the Bay?
- Are they predicted to increase or decrease in the future?
- What are the effects of management actions?

The overarching goal of the ECWG is to develop cost-effective strategies to identify and monitor CECs to support management actions to minimize impacts to the Bay. The ECWG guides an annual process of contaminant evaluation and long-term planning and optimization to respond to new RMP data and the rapidly evolving body of science on CECs.

Following this process for over a decade, the RMP has generated one of the world's most comprehensive datasets for CECs in an estuarine ecosystem. While RMP stakeholders are the primary audience and user of RMP data and communications, the Program informs broader decision-making through outreach to state and federal agencies.

The RMP first published a formal CEC Strategy in 2013 as part of a continuous effort to refine approaches for supporting the management of CECs in San Francisco Bay. Periodic revision of the Strategy is essential given the rapid evolution of the science surrounding emerging

contaminants; in 2017, the RMP completed its first revision of the RMP's CEC Strategy, which was then updated in 2018.

For CECs known to occur in the Bay, the RMP prioritizes CECs using a tiered risk-based framework, as illustrated in Figure 1. This prioritization framework guides future monitoring proposals for each of these contaminants, the results of which, in turn, provide key data to update evaluations of potential risk. The criteria listed below are used for placement in each tier.

Figure 1. RMP's Risk-based tiered framework

| | RISK LEVEL DESCRIPTION | MONITORING STRATEGY | WATER QUALITY MANAGEMENT ACTIONS |
|---|---|---|---|
| HIGH CONCERN | Bay occurrence data suggest a high probability of a moderate or high level effect on Bay wildlife. | Studies to support TMDL or alternative management plan. | 303(d) listing.*<br>TMDL or alternative management plan.*<br>Aggressive control/treatment actions for all controllable sources. |
| MODERATE CONCERN | Bay occurrence data suggest a high probability of a low level effect on Bay wildlife. | Consider including in Status and Trends monitoring.<br>Special studies of fate, effects, sources, pathways, and loadings. | Action plan/strategy.<br>Aggressive pollution prevention.<br>Low-cost control/treatment actions. |
| LOW CONCERN | Bay occurrence data suggest a high probability of no effect on Bay wildlife. | Discontinue or conduct periodic screening level monitoring in water, sediment, or biota. For CECs previously considered moderate concern, maintain Status and Trends monitoring for at least two cycles.<br>Periodic screening level monitoring for chemical(s) detected in wastewater or stormwater to track trends. | Low-cost source identification and control.<br>Low-level pollution prevention.<br>Track product use and market trends. |
| POSSIBLE CONCERN | Potential for concerns or uncertainty in measured Bay concentrations or toxicity thresholds suggest uncertainty in the level of effect on Bay wildlife. | Screening level monitoring to determine presence in water, sediment, or biota.<br>Screening level monitoring for presence in wastewater or stormwater. | Maintain (ongoing/periodic) effort to identify and prioritize emerging contaminants of potential concern.<br>Track international and national efforts to identify high priority CECs.<br>Develop biological screening methods and identify available analytical methods. |

Up to date information, including the most recent CEC Strategy, can be found at the RMP's Emerging Contaminants webpage[1].

### Benefits of CECs Program Management through RMP

Different approaches have been discussed for monitoring CECs in aquatic ecosystems through the State of California, including requirements in individual NPDES permits, and a State-wide monitoring program. The San Francisco Bay Region is fortunate to have a mature and sustainable CECs program. Among the advantages of this program, over once where

- CEC science and strategy planning happens under one umbrella and is directed by scientists and stakeholders. There are not competing or duplicative studies.
- CECs monitoring is tailored to the specific questions that need to be answered in the SF Bay to maximize use of limited funds.
- Quality control for CECs monitoring data is managed by the RMP science team. In a system where dischargers directly input lab data into a database, this level of quality assurance is not present.

## POTW Participation in RMP CECs Program

POTWs are a key pathway for some CECs to the SF Bay, including the CECs that are identified to be of "moderate" concern, such as fipronil, PFOS/PFOA, microplastics, and nonylphenols. Sampling of CECs in wastewater effluent has been a component of many of the studies conducted through the RMP. Past studies have looked at POTWs as sources of pharmaceuticals, pesticides, and more recently, microplastics. Over the previous decade, the need for effluent studies was identified by the RMP staff and ECWG, then a call was put out to POTWs to volunteer in these studies.

The Bay Area Clean Water Agencies (BACWA), a joint powers agency whose members own and operate POTWs throughout the SF Bay Region, has worked with the RMP to ensure that there was participation in these studies by the POTW community. Involvement in these studies has been on a volunteer basis. As the CECs program moves forward, there is interest in ensuring that the POTWs participating in these studies are representative of wastewater effluent quality from all POTWs, and studies do not just focus on the subset of agencies who repeatedly volunteer to participate.

### Identifying Representative Facilities for future studies

It does not make sense to sample effluent at every POTW when a smaller number of representative POTWs can yield the information that is being sought in a particular study. One of the purposes of this White Paper is to provide information about BACWA's member agencies that can be used to identify "representative" participants for future studies. The following characteristics were identified as

[1] https://www.sfei.org/programs/sf-bay-regional-monitoring-program#tab-1-4

pertinent because of their potential impacts on CECs in wastewater effluent. The information about each of the POTWs in the Region is included in the Appendices as listed below.

- Location by subembayment – Appendix 1
- Number of connections – Appendix 2
- Population served – Appendix 2
- Average dry weather flow treated – Appendix 2
- Discharge volume to Bay – Appendix 2
- Type of Treatment – Appendix 3
    - Secondary
    - Advanced Secondary/Filtration
    - Disinfection type
- Source water – surface vs. groundwater, potential agricultural impacts – Appendix 4

Industrial inputs to POTWs will also be important for some CECs. POTWs over 5 mgd maintain pretreatment programs whereby they regulate industrial users that contribute significant flow or federally regulated pollutants to the collection system. However, many CECs may be discharged from facilities that are not traditionally regulated, such as nursing homes, pet grooming facilities, hotels, and plant nurseries.

Keeping a comprehensive list of businesses that may be associated with CECs in each agency's jurisdiction is not feasible, due to the changing identity and location of these businesses over time, and uncertainty in which CECs will be important in future studies. When an industrial use is associated with a CEC that is being studied, BACWA will work with the RMP to perform an online search for the businesses and industries of interest, then work to identify in which POTW's jurisdiction or sewershed they operate. To help in this effort, BACWA is soliciting GIS shape files from its member agencies to develop a POTW "sewershed" map.

## Case study – selecting a suite of representative POTWs to participate in CEC study

To illustrate the process of selecting representative POTW, a case study is illustrated below. In the summer of 2019, the RMP conducted a study of ethoxylated surfactants (ES). The proposal for the study is provided in Appendix 5. The goal for POTW selection was to recruit a selection of POTWs with the following characteristics:

- Geographical diversity to help interpret observed surface water concentrations
- Diversity of treatment technologies to understand impact of treatment processes on ES compounds
- Facilities with higher flow rates to capture a significant portion of the total wastewater loading of ES compounds to the bay

In a literal sense, some of these criteria are mutually exclusive. For example, sampling at the EBDA outfall would allow capture of a greater portion of the loading to the Bay, but since the outfall discharge is made up of effluent from six different POTWs with different treatment trains, no information about individual treatment processes would be available from sampling at EBDA. Likewise, sampling at

SFPUC's Southeast Plant would have allowed capture of more of the total load to the SF Bay, but SFPUC uses the same secondary treatment technology, high purity oxygen activated sludge, and discharges to the same subembayment as EBMUD, so smaller facilities with different treatment technologies that discharge to different subembayments were selected.

The final selection of treatment facilities is presented in Table 1.

**Table 1. POTW sampling design for ethoxylated surfactants.**

| | Facility | Annual Average Daily Effluent 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** | **(discharge through EBDA outfall)** | 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 | | 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 |

## POTWs funding for RMP CECs Program

The RMP participants, including dredgers, stormwater agencies, and municipal and industrial dischargers that hold Water Board permits for waste discharge into the Estuary, fund the RMP as a requirement of their permits. Each year a portion of this funding was allocated to CECs studies, but by 2016, as overall RMP funding was decreasing due to diminishing contribution from the dredgers, an alternative source of funding was sought.

In 2015, BACWA worked with the SF Regional Water Board to review the costs and benefits of the routine monitoring required by agencies' individual NPDES permits, and concluded that significant resources were being spent on monitoring for pollutants that were rarely detected. BACWA and the SF Regional Water Board reached an agreement to reallocate resources from low-value effluent testing to the RMP. The strategy reflects the need to shift our effort from contaminants that were of concern historically, largely due to industries that are no longer located in the region, to emerging priorities. In April 2016, the Regional Water Board adopted order R2-2016-0008, which establishes opt-in Alternative Monitoring and Reporting Requirements for municipal NPDES permittee, and which can raise a maximum of $289K per year for RMP studies.

Because of the limited funding available to the RMP for CECs studies, POTW effluent monitoring is not included in some RMP studies where it is a lower priority than monitoring other matrices. In the past, individual POTW have volunteered to fund effluent monitoring for studies that are managed by RMP staff. A recent example of this approach is the 2017 *Screening of Pharmaceuticals in San Francisco Bay Wastewater* Study[2]. Because relying on agency volunteers to fund these special studies puts an unfair burden on those agencies who step up, when agencies throughout the Region benefit, beginning in FY21 BACWA is considering providing a budget derived from member dues for POTW-specific CEC studies led by the RMP.

# CEC Management in SF Bay – Next Steps

As described in the Tiered Risk Framework, CECs in the "moderate" tier are subject to management plans and pollution prevention. While BACWA welcomes information about removal efficacy for CECs through different wastewater treatment trains, we view pollutant prevention as the most important strategy for reducing CEC loading to receiving waters.

BACWA's Bay Area Pollution Prevention Group (BAPPG) funds public outreach, and professional outreach and training for both traditional pollutants such as Fats, Oils, and Grease, mercury, and copper, as well emerging contaminants such as pharmaceuticals. In Fiscal Year 2021, microplastics and PFAS will be added to the list of prioritized pollutants. BAPPG's public facing website, baywise.org, contains public outreach materials that can be used by member and partner agencies.

In addition to public outreach, BAPPG also supports regulatory advocacy for pollutants such as pesticides, including fipronil. POTWs don't have direct authority to regulate pesticides in their service

[2] See full report:
https://www.sfei.org/sites/default/files/biblio_files/BACWA%20Pharmaceutical%20Report_103018.pdf

area. However, over the past few years, BAPPG has partnered with the SF Regional Water Board to comment on EPA's pesticide reregistrations, to urge them to consider pathways to the sewer when doing risk assessments. More information about BAPPG's Pollution Prevention activities can be found in their 2018 Annual Report[3].

DTSC's Safer Consumer Products initiative is another pathway to address the use of CECs of moderate or higher concern[4]. DTSC maintains this program to identify and develop a regulatory response for chemicals, formulations, or products that may pose a human health or ecological risk.

Finally, POTWs, either individually or through BAPPG, CASA, or other associations, support legislation to control products leading to CEC pollution. Support of pharmaceutical take-back programs is an example of effective advocacy in the past.

The RMP's CEC Program has been key to our understanding of emerging concerns in the San Francisco Bay. Moving into the future, the CEC program through the RMP will continue to inform BACWA's pollution prevention efforts, and BACWA is committed to its continued support.



[3] https://bacwa.org/document/bappg-2018-annual-report/
[4] https://dtsc.ca.gov/scp/safer-consumer-products-program-overview/

# Appendix 1: POTW Location

**Figure A1. POTW Location by subembayment**

# Appendix 2: Population and Flows

**Table A2: Population and flows**

| | # connections served (2014) | Estimated Population | 2014 ADWF (mgd) | 2017/18 Flow to Bay |
|---|---|---|---|---|
| American Canyon | 5,562 | 16,800 | 1.2 | 1.4 |
| Benicia | 9,569 | 28,000 | 2 | 2 |
| Burlingame | 1,600 | 37,000 | 2.7 | 2.8 |
| CCCSD | 115,109 | 500,000 | 33.8 | 35.4 |
| CMSA | 52,161 | 105,000 | 4.7 | 9.3 |
| Delta Diablo | 57,700 | 200,000 | 12.5 | |
| DSRSD | 53,509 | | 9.2 | 9.6 |
| EBDA[a] | | | | 59.7 |
| EBMUD | 160,000 | 685,000 | 49 | 52.5 |
| FSSD | 38,800 | 140,000 | 11.8 | 13.4 |
| Hayward[a] | 32,000 | 153,000 | 11.1 | |
| Las Gallinas | 15,800 | 30,000 | 2.1 | 1.4 |
| Livermore | 29,500 | 83,600 | 6.7 | |
| Millbrae | 6,550 | 22,000 | 1.6 | 1.5 |
| Mt. View SD | 10,500 | 21,900 | 1.2 | 1.3 |
| Napa SD | 36,000 | 82,700 | 12.6 | 4.6 |
| Novato SD | 28,700 | 60,000 | 4.1 | 3 |
| Oro Loma SD[a] | 47,000 | 126,000 | 12 | |
| Palo Alto | | 220,000 | 18 | 18.4 |
| Petaluma | 25,300 | | ? | 3.2 |
| Pinole | 11,215 | 40,000 | 2.8 | 2.5 |
| Richmond [b] | 20,000 | | 6 | |
| Rodeo | 2,967 | 8,900 | 0.4 | 0.6 |
| San Jose | 483,667 | 1,400,000 | 76 | 87 |
| San Leandro[a] | 15,300 | 60,000 | 4.86 | |
| San Mateo | 37,823 | 155,000 | 10.3 | 10.4 |
| Sewerage Agency of Southern Marin | 14,800 | 29,500 | 2.8 | 2.3 |
| SFO | n/a | n/a | 1.1 | 1.2 |
| SFPUC | 450,000 | 580,000 | 58 | 57.4 |

| | | | | |
|---|---|---|---|---|
| Sausalito Marin City Sanitary district | 6,500 | 10,756 | 1.3 | 1.2 |
| SSF | | 110,500 | 8.4 | 7.6 |
| Sunnyvale | 28,314 | 148,000 | 12.9 | 10.6 |
| Sonoma | 17,200 | 36,000 | 3 | 0 |
| Silicon Valley Clean Water | | 199,000 | 13.7 | 14 |
| Treasure Island | | 2,900 | | 0.3 |
| Union Sanitary District[a] | 111,184 | 347,000 | 22 | |
| Vallejo | 37,845 | 117,000 | 9 | 9.2 |
| West County WD [b] | 32,300 | 100,000 | 8 | |
| West County Agency [b] | | | | 9.8 |

[a]EBDA provides the outfall to the SF Bay for the City of Hayward, Oro Loma Sanitary District, the City of San Leandro, and Union Sanitary District.

[b]West County Agency provides the outfall to the SF Bay for the City of Richmond and West County Wastewater District.

## Appendix 3: Treatment Technology

Treatment technology can impact the removal of CECs through wastewater treatment by biodegradation and partitioning to solids. Disinfection technology will impact the formation of disinfection byproducts. Table 3 shows the treatment technologies used at each POTW.

**Table A3. Treatment Technologies.**

AS = Activated Sludge; TF = Trickling Filter; BNR = Biological Nutrient Removal; MBR = Biological Membrane Reactor

| | **Secondary Treatment Type** | **Disinfection Type** | **Advanced secondary/filtration (y/n)** |
|---|---|---|---|
| American Canyon | MBR | UV | y |
| Benicia | AS and Rotating Biological Contactor (RBC) | Liquid Chlorine | n |
| Burlingame | AS | Sodium Hypochlorite | n |
| CCCSD | AS | UV | n |
| CMSA | TF/AS | Liquid Chlorine | n |
| Delta Diablo | TF/Solids contact | Sodium Hypochlorite | n |
| DSRSD | AS | Liquid Chlorine | n |

| | | | |
|---|---|---|---|
| EBMUD | High Purity Oxygen | Sodium Hypochlorite | n |
| FSSD | Oxidation Towers/AS | UV | y |
| Hayward | TF/Solids contact | Sodium Hypochlorite | n |
| Las Gallinas | Rock TF, nitrification TF, deep bed granular filter | Liquid Chlorine | n |
| Livermore | AS | Sodium Hypochlorite | n |
| Millbrae | AS | Sodium Hypochlorite | n |
| Mt. View SD | TF, nitrification biotower | UV | y |
| Napa SD | AS | Sodium Hypochlorite | n |
| Novato SD | AS | UV | n |
| Oro Loma SD | AS | Sodium Hypochlorite | n |
| Palo Alto | TF/AS | UV | y |
| Petaluma | AS/BNR | UV/Sodium Hypochlorite | n |
| Pinole | AS | Liquid Chlorine | n |
| Richmond | AS | Sodium Hypochlorite | n |
| Rodeo | AS | Sodium Hypochlorite | n |
| San Jose | AS/BNR | Liquid Chlorine | y |
| San Leandro | TF/AS | Sodium Hypochlorite | n |
| San Mateo[a] | AS | Sodium Hypochlorite | n |
| Sewerage Agency of Southern Marin | TF | Liquid Chlorine | n |
| SFO | AS | Liquid Chlorine | n |
| SFPUC | High Purity Oxygen | Sodium Hypochlorite | n |
| Sausalito Marin City Sanitary district | TF | Liquid Chlorine | n |
| SSF | AS | Liquid Chlorine | n |
| Sunnyvale | TF/DAF/Dual Media Filtration | Chlorine Gas | y |
| Sonoma | AS | Chlorine Gas | n |
| Silicon Valley Clean Water | TF/AS | Liquid Chlorine | n |

| | | | |
|---|---|---|---|
| Treasure Island | TF | Sodium Hypochlorite | n |
| Union Sanitary District | AS | Sodium Hypochlorite | n |
| Vallejo | TF/Solids Contact | Liquid Chlorine | n |
| West County WD | AS | Sodium Hypochlorite | n |

[a] San Mateo is in the process of an upgrade to BNR/MBR

## Appendix 4: Water sources

There are six major water wholesalers and large retailers serving residents in the service area of Bay area POTWs:

- Contra Costa Water District (CCWD) - CCWD's primary source of water supply is the United States Bureau of Reclamation's Central Valley Project (CVP).
- East Bay Municipal Utilities District (EBMUD) - EBMUD delivers water from the Mokelumne River watershed, supplemented with water from East Bay watershed reservoirs. Water from the EBMUD is not expected to include groundwater, or be influenced by agricultural drainage.
- SFPUC Region Water System (RWS) – The SFPUC delivers water imported from the Hetch Hetchy reservoir, as well as reservoirs in the Alameda Watershed and Peninsula Watershed. Beginning in 2017, SFPUC began accessing local groundwater supplies. Water from the SFPUC is not expected to be influenced by agricultural drainage.
- Santa Clara Valley Water District – SCVWD – Sources of supply for the District include natural groundwater recharge, local surface water, imported surface water from the State Water Project (SWP) and CVP, and transfers. Imported water from the SWP and CVP is expected to have some impact from agricultural drainage at its source in the SF Delta.
- Sonoma County Water Agency (SCWA) – The Russian River provides most of the Water Agency's water supply with groundwater supply from the Santa Rosa Plain as a secondary source. Water from the Russian River is expected to have some impact from agricultural drainage.
- Zone 7 –The SWP is Zone 7's largest water supply, and is supplemented by local surface water and groundwater. Imported water from the SWP and CVP is expected to have some impact from agricultural drainage at its source in the SF Delta.

Information about the water supplies in the sewersheds of each POTW is presented in the Water Agencies' Urban Water Management Plans (UWMP), which are available on DWR's website[5]. The POTWs for each Water Agency are reported in Table 6.3 of each UWMP. For each POTW, Table x identifies the Water Agencies supplying their service area, the agencies' water sources, and whether there may be an agricultural influence on the source water supply, or if groundwater is a significant supply source. Most areas are served by smaller retailers who provide a combination of water purchased from wholesalers, and local surface or groundwater.

[5] https://wuedata.water.ca.gov/uwmp_plans.asp

**Table A4: Source Water Supplies**

| WW Agencies | Water Agency | Sources | Groundwater supply (y/n) | Potential Agricultural Impacts (y/n) |
|---|---|---|---|---|
| American Canyon | American Canyon City Of | SWP, City of Vallejo (see below) | n | y |
| Benicia | City of Benicia | SWP, Sacramento River, Solano Project (Lake Baryessa), local surface water | n | y |
| Burlingame | Hillsborough Town Of | SFPUC RWS | n | n |
| | Burlingame City Of | SFPUC RWS | n | n |
| CCCSD | Martinez City Of | CCWD | n | y |
| | Contra Costa Water District | Central Valley Project, other Delta supplies | n | y |
| | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |
| CMSA | Marin Municipal Water District | Local surface water | n | n |
| Delta Diablo | Contra Costa Water District | Central Valley Project, other Delta supplies | n | y |
| | Antioch City Of | Delta, and Contra Costa Canal (CCWD) | n | y |
| | Pittsburg City Of | CCWD, and local groundwater | y | y |
| | Golden State Water Company - Bay Point | CCWD, and local groundwater | y | y |
| DSRSD | Zone 7 | State Water Project, Local surface Water, Local Groundwater, Imported Surface Water from Byron-Bethany Irrigation District | y | y |
| | Pleasanton City Of | Zone 7, and local groundwater | y | y |
| | Dublin San Ramon Services District | Zone 7 | y | y |
| | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |
| EBMUD | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |

| | | | | |
|---|---|---|---|---|
| Fairfield-Suisun Sewer District (FSSD) | Suisun - Solano Water Authority | SWP, Solano Project (Lake Barryessa) | n | y |
| Hayward | Hayward City Of | SFPUC RWS | n* | n |
| LGVSD | Marin Municipal Water District | Local surface water | n | n |
| Livermore | Zone 7 | State Water Project, Local surface Water, Local Groundwater, Imported Surface Water from Byron-Bethany Irrigation District | y | y |
| | California Water Service Company Livermore | Zone 7 (SWP), and local groundwater | y | y |
| | Livermore City Of | Zone 7 | y | y |
| | Pleasanton City Of | Zone 7, and local groundwater | y | y |
| Millbrae | Millbrae City Of | SFPUC RWS | n | n |
| Mt. View Sanitary District | Contra Costa Water District | Central Valley Project, other Delta supplies | n | y |
| | Martinez City Of | CCWD | n | y |
| Napa Sanitation District | American Canyon City Of | State Water Project, City of Vallejo (see below) | n | y |
| | Napa City Of | SWP, local surface water | n | y |
| Novato Sanitary District | North Marin Water District | SCWA, local surface water | y | y* |
| Oro Loma Sanitary District | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |
| Palo Alto | California Water Service Company Los Altos/Suburban | SCVWD (State Water Project, Central Valley Project), Local Groundwater | y | y |
| | California Water Service Company Mid-Peninsula | SFPUC RWS | n | n |
| | East Palo Alto City Of | SFPUC RWS | n | n |
| | Mountain View City Of | SFPUC RWS, SCVWD, and local groundwater | y | y |
| Petaluma | City of Petaluma | SCWA, local groundwater | y | y |
| Pinole/Hercules | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |
| Richmond | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |
| Rodeo Sanitary District | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |

| | | | | |
|---|---|---|---|---|
| San Jose | Milpitas City Of | SFPUC RWS, and SCVWD (CVP and SWP, not GW) | n | y |
| | San Jose City Of | SFPUC RWS, SCVWD (surface), and local groundwater | y | y |
| | San Jose Water Company | SCVWD, and local groundwater | y | y |
| | Santa Clara City Of | SFPUC RWS, SCVWD (surface), and local groundwater | y | y |
| | Great Oaks Water Company Incorporated | Local groundwater | y | n |
| San Leandro | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |
| San Mateo | California Water Service Company Mid-Peninsula | SFPUC RWS | n | n |
| | Hillsborough Town Of | SFPUC RWS | n | n |
| Sanitary District No. 5 (Tiburon) | Marin Municipal Water District | Local surface water | n | n |
| | SCWA | Russian River | n | y |
| Sewerage Agency of Southern Marin | Marin Municipal Water District | Local surface water | n | n |
| | SCWA | Russian River | n | y |
| Sausalito-Marin City Sanitary District | Marin Municipal Water District | Local surface water | n | n |
| | SCWA | Russian River | n | y |
| SFPUC | San Francisco Public Utilities Commission | SFPUC RWS (Hetch Hetchy, and local surface water, local groundwater) | y | n |
| SFO | SFO | SFPUC RWS | n | n |
| Silicon Valley Clean Water | California Water Service Company Bear Gulch | SFPUC RWS, local surface | n | n |
| | East Palo Alto City Of | SFPUC RWS | n | n |
| | Menlo Park City Of | SFPUC RWS | n | n |
| | Mid-Peninsula Water District | SFPUC RWS | n | n |
| Sonoma | Sonoma County Water Agency (SCWA) | Russian River, local groundwater | y | y |

| | | | | |
|---|---|---|---|---|
| South San Francisco and San Bruno | California Water Service Company South San Francisco | SFPUC RWS, and local groundwater | y | n |
| Sunnyvale | California Water Service Company Los Altos/Suburban | SCVWD (State Water Project, Central Valley Project), Local Groundwater | y | y |
| | Sunnyvale City Of | SFPUC RWS, SCVWD (surface), and local groundwater | y | y |
| Treasure Island | Treasure Island Water System | SFPUC RWS | n | n |
| Union Sanitary District | Alameda County Water District | SWP, SFPUC RWS, local groundwater | y | y |
| Vallejo Sanitation & Flood Control District (VFCSD) | Vallejo City Of | SWP, Solano Project (Lake Barryessa), local surface water | n | y |
| West County Wastewater District | East Bay Municipal Utility District | Mokelumne Watershed, local surface water | n | n |

# Appendix 5 – Special Study Proposal: Ethoxylated Surfactants in Ambient Water, Margin Sediment, and Wastewater

**RMP Statewide CECs data synthesis and evaluation**
**BACWA's responses to RMP questions**

**Background**
The State and Regional Water Boards are developing a statewide Constituents of Emerging Concern initiative that will coordinate ongoing CEC monitoring efforts in the state and develop a framework for statewide prioritization and management of CECs on an ongoing basis. The CEC initiative will be implemented in phases, with the initial effort focusing largely on data compilation and evaluation of existing data.

The Aquatic Science Center (www.sfei.org) has been tasked with synthesizing and evaluating statewide CEC data within a tiered risk framework that will be used to inform statewide CEC monitoring and management strategy. This synthesis is expected to include information on CECs in ambient surface water and sediment, aquatic biota, relevant transport pathways (wastewater and stormwater), and recycled water.

To guide the scope of this work, we are soliciting input from stakeholders. Your responses are important to guide and ensure the success of this initiative. As part of the initiative, the State Water Board will also be convening a Science Panel early next year (2020) to further develop CEC monitoring strategy for the state through a separate project and contract with Southern California Coastal Water Research Project. The reporting from this synthesis will inform the Science Panel. A summary of stakeholder responses that are aggregated will be provided to the Water Board and inform the Science Panel.

We would like to schedule a call to discuss the following general questions:

1. **How would you define what chemicals are CECs? How can a statewide CECs synthesis and the larger Water Boards CEC initiative best support or complement your mission?**

   By definition, CECs are compounds that are not yet regulated. They are of "emerging" concern either because their use and/or occurrence is increasing, because we have new analytical tools to look for them in the environment, or because we haven't chosen to look for them previously for various reasons. PFAS is an example of an emerging contaminant that is beginning to be regulated in drinking water, and POTW monitoring may be required. Therefore, moving forward, PFAS should not be considered an emerging contaminant. NDMA is another example of a pollutant that has undergone this transition. To best use existing resources, this initiative should also exclude compounds that are being considered by other state initiatives, such as pesticides.

   POTWs in our Region are interested in CECs that occur in our influent and effluent, and which may have an impact on aquatic life or impact our treatment processes. While we are well served by the RMP CEC program, a statewide initiative could help inform our program by serving as a venue for information sharing between Regional and local programs in different parts of the State as well as academia.

2. **What are your CECs data needs and priorities?**

**This may include data gaps concerning specific CECs or classes of CECs; information needs on a specific matrix (e.g., sediment); minimum analytical methods information or data quality; specific types of data analysis; relevant risk thresholds or toxicological characteristics; and/or current plans and efforts in monitoring CECs and their effects, including an assessment of what level of effort and resources may be involved. You may rank your needs and priorities, if appropriate. We are also interested in guidance concerning types of CECs or matrices to exclude, particularly if they are being evaluated and managed through other efforts.**

Our most pressing priorities are two-fold. The first is investigations into toxicity thresholds that are meaningful. With advances in analytical technologies, we can detect arbitrarily low concentrations of most compounds in current use, and find that "everything is everywhere". However, without understanding of toxicity thresholds we can't parse the meaning of the observation data, or target management actions towards the compounds that may have an impact.

The second priority is that for any CEC whose occurrence or toxicity is high enough, methods need to be developed that are standardized and reproducible between labs. We understand that preliminary occurrence data may be collected through experimental methods. However, if public resources are used to reduce or manage a particular CEC, it is imperative that the compound can be reliably quantified.

3. **What are the CECs data sources you rely on and would consider valuable additions to a statewide CECs synthesis? This may include a synopsis of existing data and monitoring you have or have done, if any, including what matrices (e.g., surface water, sediment, biota), classes of CECs, analytical methods used, and any risk assessment or toxicological evaluation taken.**

Historically in our Region, CECs work has been conducted by the emerging contaminants group through the RMP, and we continue to strongly support that approach.

We recognize that CEC monitoring is unique because most of the cutting edge work is done using experimental analytical methods. BACWA supports the use of these methods in preliminary studies in a new CEC, however, we believe it is important that the data that is gathered using non-validated and unapproved methods is qualified accordingly both in this synthesis as well as all documents moving forward.

As methods evolve, the information that they give may change over time, so that an apples to apples comparison may not possible between different studies. Studies of aggregate classes of compounds, such as PFAS ("graduated" as a CEC as described above, but used here to illustrate an aggregate pollutant), may identify different compounds, such that data from different studies cannot be compared. Microplastic is

another important example, where different methods have varying capacity to differentiate plastic versus naturally-derived particles. One role of this synthesis should be to evaluate the comparability between different existing studies and data sets.

4. **Are there specific management decisions over the next 3-5 years that this Water Boards initiative could or should inform?**

   BACWA supports pollution prevention as the primary means of addressing CEC loading to surface waters. We recommend that research into occurrence and toxicity go hand in hand with consideration of source control.

   Many wastewater agencies are considering upgrades in the next several years in response to pressures such as potential nutrient load caps, the desire to increase production of recycled water, interest in wetland projects to enhance shoreline resilience, new biosolids and organics receiving projects in response to SB1383, and in general, facilities reaching their end of their planned lifespans. Some agencies are considering emerging treatment technologies for which little is known about CECs removal. As agencies plan for the future, it will be important to understand how new treatment strategies may impact loads of CECs in effluent and biosolids.

   There has been a push among legislators and State agencies to mandate large increases in diversion of discharges to coastal areas to reuse projects. One role of this initiative should be to evaluate what types of reuse projects would result in lower CEC loadings to receiving waters. For example, what kinds of treatment processes destroy CECs, and which concentrate them in reverse osmosis concentrate which is then discharged, or transfer CECs to biosolids that will then be used for land application.

5. **What are potential challenges or concerns to note moving forward, including any takeaways from your experience with previous local, regional, or state efforts in the CECs arena?**

   The CEC arena is potentially endless due to the large and increasing number of compounds that can be observed, and endless resources can be spent doing studies. Rather than identifying a preferred program and then hoping to find funding for it, we recommend that the State follow the RMP's approach of establishing a budget based on available funding sources, and then prioritizing studies that will be funded within that budget. This approach means that studies will need to be strategically developed to target the research needs of each Region, based in part on the beneficial uses in each Region, rather than developing blanket monitoring requirements to be carried out throughout the State.

6. **Are you aware of multi-beneficial approaches that overlap the CEC initiative and climate-resilient water system portfolio management (http://waterresilience.ca.gov/)?**

One item that several of our agencies are exploring is the use of wetlands projects, and horizontal levees in particular, that are sustained with wastewater effluent and provide sea level rise protection of upgradient infrastructure. Work at UC Berkeley has shown that treatment through horizontal levees reduces concentrations of CECs in effluent, including those of CECs that are recalcitrant via other treatment technologies.

7. **Would you like to maintain engagement with the Water Boards CEC initiative moving forward through an email listserv?**

   Yes

8. **Are there additional stakeholders you would recommend we interview?**

   The other POTW Regional Associations – SCAP and CVCWA, as well as CASA.

# NOTICE OF PROPOSED RULEMAKING

## TITLE 22. SOCIAL SECURITY
## DIVISION 4. ENVIRONMENTAL HEALTH
## CHAPTER 19 (Certification of Environmental Laboratories)

**NOTICE IS HEREBY GIVEN** that the State Water Resources Control Board (State Water Board) proposes to amend, adopt, or repeal the Environmental Laboratory Accreditation Program (ELAP) regulations described below after considering all comments, objections, and recommendations regarding the proposed action.

---

## SUMMARY OF PROPOSED REGULATORY ACTION

The State Water Board proposes to amend California Code of Regulations, Title 22, Division 2, Chapter 19, to update requirements and standards for accreditation of environmental testing laboratories. These proposed amendments are administrative and technical in nature and make the necessary improvements needed to operate a fully functional and effective Environmental Laboratory Accreditation Program.

## PUBLIC HEARING

The State Water Board will hold an Administrative Procedure Act (APA) public hearing during a Board workshop to receive written and oral comments regarding the proposed regulations. The hearing will include a presentation by State Water Board staff on the proposed regulations. During the comment period, the public will be allowed three minutes to provide oral comments, unless additional time is approved. While a quorum of the State Water Board may be present, this hearing is for the public to provide comments in accordance with the APA, and the State Water Board will take no formal action.

The public hearing will be held as detailed below.

**Wednesday, December 18, 2019 – 9:30 a.m.**
Joe Serna Jr. CalEPA Headquarters Building
1001 I Street, Second Floor
Sacramento, CA 95814

The State Water Board will consider adoption of the proposed ELAP regulations at the Board's March 17, 2020 State Water Board meeting. The location and start time of the Board meeting are provided below:

**Tuesday, March 17, 2020 – 9:30 a.m.**
Joe Serna Jr. CalEPA Headquarters Building
1001 I Street, Second Floor
Sacramento, CA 95814

Additional information on Board meetings, hearings, and workshops is available on the State Water Board's Meeting Information webpage.

## SPECIAL ACCOMMODATION REQUEST

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided, including any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Moisés Moreno-Rivera at (916) 341-5261 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

## SI NECESITA ARREGLOS ESPECIALES

Conforme a la Sección 7296.2, del Código del Gobierno de California, los siguientes servicios o arreglos especiales pueden ser solicitados:

- Servicio de intérprete durante la audiencia;
- Documentos en otro idioma o en un formato alterno;
- Arreglos razonables relacionados a una discapacidad.

Para solicitar estas adaptaciones especiales o servicios de idioma, puede contactar a Moisés Moreno-Rivera al (916) 341-5261 lo más pronto posible y a más tardar 10 días hábiles antes de la fecha de la audiencia de la Junta (Board). Los usuarios del Sistema TTY/TDD/Voz-a-Voz pueden marcar el 7-1-1 para utilizar el California Relay Service.

**WRITTEN COMMENT PERIOD**

Any interested person, or their authorized representative, may submit written comments relevant to the proposed regulatory action to the Clerk of the State Water Board. Any written comments pertaining to these regulations, regardless of the method of transmittal, must be received by the Clerk to the State Water Board by **12:00 noon on Friday, December 20, 2019**, which is hereby designated as the close of the written comment period. Comments received after this date will not be considered timely. Note that comments previously submitted about the preliminary drafts of the proposed regulatory action will not be part of the rulemaking record. Outstanding comments about the proposed regulatory action must be resubmitted during the written comment period to be included in the rulemaking record.

You may submit written comments via any of the following:

- Electronic mail (email): commentletters@waterboards.ca.gov
- U.S. Postal Service:

  Ms. Jeanine Townsend, Clerk to the Board
  State Water Resources Control Board
  P.O. Box 100. Sacramento, CA 95812-2000

- Hand Delivery:

  Ms. Jeanine Townsend, Clerk to the Board
  State Water Resources Control Board
  1001 I Street, 24th Floor, Sacramento, CA 95814

  Persons delivering comments must check in with lobby security and have them contact Ms. Jeanine Townsend at (916) 341-5600

Also, please indicate in the subject line and/or on the cover page of submittals: **"Comments – Proposed Environmental Laboratory Accreditation Program Regulations."**

All comments should include the author's name and U.S. Postal Service mailing address or email in order for the State Water Board to provide any notices that may be required in the future.

Due to limitations of the email system, emails larger than 15 megabytes (MB) may be rejected and will not be delivered and received by the State Water Board. Therefore, emails larger than 15 MB should be submitted in several separate emails or another form of delivery should be used.

The State Water Board requests but does not require that written comments sent by mail or hand-delivered be submitted in triplicate.

The State Water Board requests but does not require that reports or articles in excess of 25 pages be submitted in conjunction with the comments, that the commentator provide a summary of the report or article and describe the reason for which the report or article is being submitted or is relevant to the proposed regulation.

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

## AUTHORITY AND REFERENCE

Pursuant to Health and Safety Code Sections 100829 and 100830, the State Water Board is authorized to adopt the subject regulations. This action is proposed to implement, interpret, and make specific Health and Safety Code Sections 100825-100830, 100837-100845, 100850, 100852, 100860.1, 100865-100872, 100880, 100886, 100895, 100905-100915.

## INFORMATIVE DIGEST/POLICY STATEMENT OVERVIEW

### Background and Summary of Existing Relevant Regulations:

In 1988, the California Environmental Laboratory Improvement Act (ELIA) became law and established ELAP to evaluate and provide accreditation to environmental testing laboratories in California. In 1994, the Environmental Laboratory Accreditation Act (Health and Safety Code, Section 100825-10090), and California Code of Regulations, Title 22, Division 4, Chapter 19 were codified to provide the authority and structure of a laboratory accreditation program to standardize and accredit laboratories that analyze environmental regulatory samples and provide data used for important human health and environmental decision making in California. Furthermore, the statutes for state regulatory agencies, such as the State Water Board, the Department of Toxics Substance Control, and the Department of Public Health, require that any analysis of material required by their programs be conducted by a laboratory accredited by ELAP.

Pursuant to Health and Safety Code 100825, only those laboratories that chose to perform analyses on environmental samples for regulatory purposes are subject to regulations adopted under the California Code of Regulations. Therefore, participation in ELAP is voluntary and is a business decision for a laboratory.

### Policy Statement Overview and Summary of Proposed Regulatory Action:

*Problem Statement:*

The current regulations were established in 1994. Over time, the requirements for operation of the accreditation program have become outdated, and criteria for determining the competency of a laboratory performing environmental testing has not kept up with the fundamental elements of accreditation standards. Examples of fundamental elements that are lacking in the current regulations include quality system

requirements, ethics and integrity policy requirements, data traceability requirements, method validation requirements, sample handling policies, and enforcement. The inadequate requirements in the current regulations have resulted in an ineffective accreditation program and a laboratory community that operates without effective regulatory oversight.

Furthermore, the lack of specificity and detail in the current regulations has impacted ELAP's ability to consistently assess the quality and competency of laboratories. Similarly, differing interpretation of the current regulations has created an unequal playing field where laboratories operate to different standards and can gain an unfair business advantage over other laboratories. This jeopardizes the validity of the data produced by accredited laboratories and creates a lack of trust in data used to make decisions regarding human health and the environment.

*Objective (Goal):*

The broad objective of the proposed regulations is to modernize the accreditation program within the authority granted by the Environmental Laboratory Accreditation Act. The proposed regulations include:

- Updates to the administrative process for operating an accreditation program.
- Modification or elimination of outdated requirements.
- Replacement of existing accreditation standards with a standard that results in data of known and documented quality that state agencies can rely on to make regulatory and policy decisions that affect public health and the environment. To achieve this goal, ELAP is proposing to incorporate by reference into the regulations the nationally recognized, consensus-based 2016 TNI Standard – Revision 2.1, Volume 1, Management and Technical Requirements for Laboratories Performing Environmental Analysis (2016 TNI Standard), with two exceptions.

*Benefits:*

The benefits of the proposed regulations are discussed below.

*Benefits to the Laboratories*

- Reduces misinterpretation and confusion by clearly defining administrative and technical requirements.
- Promotes elevated performance by specifying the managerial and technical activities that can affect the quality of results.
- Allows for flexibility in the implementation of the standards and accommodates operation and management of laboratories of all sizes and scopes.

- Provides clarification on the types of activities and conditions that lead to enforcement.
- Promotes a fair business environment, where all laboratories are held to the same standards.

*Benefits to the State Regulatory Agencies:*

- Ensures laboratories produce data of known and documented quality by adopting essential quality system elements.
- Consistency of results across laboratories by standardizing laboratory activities and practices.
- Improved confidence that the data produced has been sufficiently scrutinized through appropriate quality assurance measures before being released by the laboratory.
- Greater legal defensibility of data by having supported documentation for traceability, such that the history of samples and associated data is easily retraceable.
- Accommodates needs of state agencies that rely on ELAP accredited laboratories by allowing ELAP greater flexibility to change what analytical methods are offered for accreditation.

*Benefits to the Accreditation Program:*

- Allows ELAP to efficiently and effectively help laboratories navigate and interpret the regulations by providing clarity and specificity to requirements of the program.
- Eliminates the need for ELAP to dedicate resources to maintaining the relevance and pertinence of the accreditation standards, and instead relies on Expert Committees of TNI, with representative members from the national laboratory community, to improve the TNI Standard based on best professional practices in the industry. ELAP would still be required to adopt changes or updates to the 2016 TNI Standard approved by TNI Expert Committee into the regulations by the formal rulemaking process.
- Creates only one accreditation standard for all laboratories, which will simplify on-site laboratory assessments, fee structure, and employee training.
- Addresses resource challenges that ELAP faces by allowing laboratories to contract with third-party laboratory assessment firms to satisfy the onsite assessment requirement of the accreditation program.
- The specificity of the proposed regulations will help with enforcement against noncompliant laboratories.

**Evaluation of Consistency or Compatibility with Existing State Regulations:**

The State Water Board evaluated whether the proposed regulations are inconsistent or incompatible with existing state regulations and has determined that no other state regulations address the same subject matter and that the proposed regulations are consistent and compatible with other existing state regulations.

**FORMS INCORPORATED BY REFERENCE**

The proposed regulation incorporates by reference the 2016 TNI Standard, accreditation standards published by the NELAC Institute (TNI), a 501(c)(3) non-profit organization whose mission is to foster the generation of environmental data of known and documented quality through an open, inclusive, and transparent process that is responsive to the needs of the community. TNI was established for the long-term management of the National Environmental Laboratory Accreditation Program (NELAP) and the continued development of accreditation standards. The organization is managed by a Board of Directors and is governed by organizational bylaws.

The standards produced by TNI are integrated documents containing language from relevant International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) standards, and therefore, are copyright protected and provided through a license agreement. The State Water Board has made the 2016 TNI Standard publicly available for viewing at the CalEPA Headquarters Office in Sacramento, each of the nine (9) Regional Water Quality Control Board Offices, and twenty-four (24) Division of Drinking Water District Offices. Interested parties may contact any of the offices to view the 2016 TNI Standard in the designated public record document review area.

Additionally, TNI has provided access to a read-only, unlicensed version of the 2016 TNI Standard for all interested parties on the TNI website. To access the documents, enter the password: T6E79WS. The link to this document will remain active until public access to the document is no longer needed for the rulemaking process. To obtain a copy of the 2016 TNI Standard, interested parties may contact TNI's Executive Administrator, Suzanne Rachmaninoff, at suzanne.rachmaninoff@nelac-institute.org. Discounted rates for the 2016 TNI Standard are available for a limited time.

**MANDATED BY FEDERAL LAW OR REGULATIONS**

The proposed regulations are not federally mandated. However, the accreditation requirements of the proposed regulations align with requirements of the federal Safe Drinking Water Act (SDWA) (42 U.S.C. §300f-300j) and the National Primary Drinking Water Regulations (40 CFR §141) for laboratories that analyze drinking water for regulatory compliance. The SDWA is the federal law that protects public drinking water supplies by granting the United States Environmental Protection Agency (EPA) the authority to establish minimum water quality standards to protect drinking water supplies and requires all owners or operators of public water systems to comply with the health-related water quality standards. Under the SDWA, laboratories performing drinking water analyses for compliance monitoring must be certified by the

EPA or an authorized state-run laboratory certification program (i.e. California ELAP). The proposed regulations fulfill the state-run certification program requirements.

## OTHER STATUTORY REQUIREMENTS

### Exemption from Peer Review

Health and Safety Code § 57004, mandates that proposed regulations be peer reviewed when the regulation includes a "scientific basis" or "scientific portions". However, when certain circumstances exist, exemption is warranted. As stated in the *Unified California Environmental Protection Agency Policy and Guiding Principles for External Scientific Peer Review,* March 13, 1998 (Cal/EPA Guiding Principles) these circumstances include:

- A particular work product that has been peer reviewed with a known record by a recognized expert or expert body.
- Administrative standards and rules which are primarily management directives for which the underlying scientific principles, computer models, or decision tools have already been appropriately reviewed.

The State Water Board finds that the 2016 TNI Standards are consensus-based standards, developed in accordance with rigorous democratic procedures and the requirements of the federal Office of Management and Budget Circular A-119, and that circumstances exist to warrant exemption of peer review. The State Water Board further finds that the management and technical requirements in the 2016 TNI Standard have been appropriately reviewed and recognized by the United States Environmental Protection Agency as meeting requirements for regulatory compliance in the analysis of drinking water, wastewater, and hazardous waste. Therefore, the State Water Board finds that pursuant to CalEPA Guiding Principles the proposed regulations are categorically exempt from CalEPA requirements for peer review of regulations.

## LOCAL MANDATE

The State Water Board has determined that the proposed regulations do not impose a mandate on local agencies or school districts, or a mandate that requires reimbursement pursuant to part 7 (commencing with section 17500) of the Government Code, division 4. Local agencies that have laboratories may incur costs to implement the new regulations; however, these costs are not the result of a "new program or higher level of service" within the meaning of Article XIIIB, Section 6 of the California Constitution. The presumed costs apply generally to all individuals and entities that operate laboratories that analyze environmental samples for regulatory purposes in California and do not impose unique requirements on local governments (County of Los Angeles v. State of California, *et al*., 43 Cal. App. 34, 46 (1987)). In addition, the local agencies can pass on the costs to the laboratory by increasing service charges or fees to the public. Therefore, no state reimbursement of these costs is required.

## FISCAL IMPACT

The State Water Board has made the following determinations:

- The proposed regulations do not result in a cost to any local agency or school district that must be reimbursed in accordance with Government Code sections 17500 through 17630.
- The proposed regulations do not result in a cost or savings in Federal funding to the State.

### Fiscal Effect on Local Government/Other Nondiscretionary Cost or Savings Imposed Upon Local Agencies

For the proposed regulations, the State Water Board considers public water and wastewater treatment facility laboratories as “local government,” and considers the economic impact of the proposed regulation on public water and wastewater treatment facility laboratories as a fiscal impact. The State Water Board estimates that for public laboratories the total costs of the proposed regulation during the three-year implementation period could be $17,268,908.00, and the cost for any 12-month period after full implementation could be $9,448,908.00.

### Fiscal Effect on State Government

The proposed regulations may have a fiscal effect on State government because of increased time that ELAP staff will dedicate to program tasks and core functions. At least initially, the on-site assessments will take longer as staff get familiar with the new accreditation standards. The cost to the State for additional time to perform onsite assessments is $63,198.72.

Time dedicated to laboratory community outreach will also increase dramatically with the adoption of proposed regulations. The outreach would be necessary with the adoption of any new accreditation standard and could include answering questions from laboratories about the standard, putting together informational items and tools for laboratories, hosting webinars on the standard, or any activity that helps the laboratory during the transition to the 2016 TNI Standard. The assumption is that there will be one staff member from ELAP dedicated to laboratory outreach at an annual cost to the State of $53,484.00.

The total annual cost of the regulation to the State government could be $116,682.72, which equals the sum of the costs of increased time to perform onsite assessments and the costs of an employee dedicated to laboratory outreach.

## HOUSING COSTS

The proposed regulations do not have an effect on housing costs.

## SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESS, INCLUDING ABILITY TO COMPETE

The State Water Board has done an economic impact assessment of the proposed regulations, as described below, and has determined that the proposed regulations may have a significant statewide adverse economic impa ct directly affecting environmental laboratories in California.

The proposed regulations make changes to California's state laboratory accreditation program and effects the requirements that the environmental testing laboratories must meet to analyze environmental samples for regulatory purposes in California. Laboratories that participate in the ELAP program must be compliant with the requirements of the 2016 TNI Standard, with two exceptions. The 2016 TNI Standard is a quality management system-based accreditation standard, which requires processes and procedures for the management of laboratory operations to assure the quality of the test results it generates.

Although the proposed regulations do not specifically require the purchase of new technology or laboratory equipment, hiring new personnel, or any additional investments to comply; to provide conservative estimates of potential costs, the economic assessment assumed that small laboratories (approximately 80% ELAP accredited laboratories) would hire a laboratory consultant to assist in implementation of the new requirements and 70% may employ one additional full-time person. Medium laboratories (approximately 10% ELAP accredited laboratories) were also assumed to hire a laboratory consultant to assist in implementation of the new requirements and 50% may employ one additional part-time employee. Large laboratories (approximately 10% ELAP accredited laboratories) were assumed to only hire a laboratory consultant to aid in the implementation of the 2016 TNI Standard.

In addition to the requirement to comply with the 2016 TNI Standard, the proposed regulations require laboratories accredited in methods that utilize sophisticated technology to use third-party assessment firms to fulfill the on-site assessment requirement. This requirement is aimed at offsetting programmatic costs and redistributing staff responsibilities. Although the use of third-party assessment firms is allowed in state statute, the use of third-party assessment firms is not currently required in the regulations or utilized as an option by the program. Therefore, qualifying laboratories will incur costs for services provided by third-party assessment firms because of the proposed regulations.

The proposed regulations would not impact the ability of laboratories to compete with laboratories from other states, because all laboratories analyzing environmental samples for regulatory purposes in California would have to be accredited by ELAP and meet the proposed requirements. Furthermore, if environmental laboratories in California want to provide services to other states, then the proposed regulations would not apply because the laboratory would have to comply with that state's regulations, accreditation standards, and requirements. However, adopting the 2016 TNI Standard

would make it easier for California laboratories to meet the requirements of a state accreditation program that utilizes the TNI Standard, such as Oregon.

The State Water Board has considered proposed alternatives that would lessen any adverse economic impact on business and invites you to submit proposals. Submissions may include the following considerations:

(I) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to businesses.

(II) Consolidation or simplification of compliance and reporting requirements for businesses.

(III) The use of performance standards rather than prescriptive standards.

(IV) Exemption or partial exemption from the regulatory requirements for businesses.

## STATEMENT OF THE RESULTS OF THE ECONOMIC IMPACT ASSESSMENT

The State Water Board estimates the cost for any 12-month period during the three-year implementation phase of the proposed regulations is $14,031,206.53. The estimated cost for any 12-month period after full implementation of the proposed regulations is $22,257,719.60. As noted above, these are conservative estimates that assume that small laboratories may hire a full-time employee and a laboratory consultant, that medium laboratories may hire a part-time employee and a laboratory consultant, and that large laboratories will only hire a laboratory consultant. Laboratories may, however, find less costly ways to comply.

### Creation of Businesses

The State Water Board recognizes that to help successfully implement the proposed regulations, laboratories may choose to hire a laboratory consulting firm. Currently, there are three laboratory consulting firms in California and the proposed regulations are assumed to create an additional nine. These businesses are not prevalent in California because the current regulations limit their ability to prosper in California. However, the proposed regulations utilize the national consensus TNI standards, which laboratory accreditation consulting firms across numerous states support, and could spark the creation and growth of laboratory accreditation consultant businesses in California.

The proposed regulations also allow laboratories to use third-party assessment firms to perform on-site assessments. This is an option that is currently not utilized by laboratories in California because of the current state-specific accreditation standards. However, the national consensus TNI Standard is an accreditation standard that third-party assessment firms have experience assessing laboratories to. The State Water Board expects the size and untapped potential of the third-party assessor market in California could be inviting enough to create additional jobs in California.

**Expansion of Businesses**

The State Water Board assumes that any regulatory samples that are being analyzed by laboratories that are unable or unwilling to comply with the proposed regulations will still need to be analyzed and reported by an ELAP-accredited laboratory. Therefore, the State Water Board assumes laboratories that remain accredited would see an increase in business and revenues from the loss of accreditation or closure of some laboratories.

**Creation of Jobs in California**

The State Water Board estimates that the proposed regulations will create a total of 355 jobs. It is assumed that 332 jobs will be created in the environmental laboratory industry and 23 jobs will be created in supporting industries.

**Elimination of Businesses**

The State Water Board assumes that the proposed regulatory action may result in up to ten laboratory closures. Although, other state accreditation programs that converted their program's accreditation standards to the nationally recognized consensus-based TNI Standard observed that some laboratories closed, particularly the small ones, it is difficult for the State Water Board to know how many laboratory businesses will be eliminated because of the proposed regulations. Laboratories face pressures like heightened competition and pricing constraints, that can also result in closures. Additionally, a saturated laboratory industry in California has resulted in a number of laboratory consolidations and purchases. Therefore, the State Water Board is unable to determine if a closure is a result of a proposed regulation or because of current industry conditions.

**Elimination of Jobs in California**

The State Water Board assumes that there will 20 job positions eliminated by the proposed regulations, but there would be no net elimination of jobs because of the proposed regulations. This is because if the proposed regulations result in closures of laboratories, the regulatory samples that were being analyzed by those laboratories would still have to be analyzed by other ELAP-accredited laboratories. This resulting increase in business at labs that take on the business from closed laboratories could result in the hiring of additional laboratory personnel. If the samples stay local, then it is reasonable to assume that the same individuals that lost employment when a laboratory closed could be hired by the other laboratories picking up the additional sampling.

**Benefits of the Regulation to the Health and Welfare of California**

Data produced for regulatory purposes by accredited laboratories is used in state-wide assessment and monitoring programs for protection of human health and the environment. The proposed regulations update California's accreditation standards with a national and industry-recognized accreditation standard and will help ensure that environmental and human health related decisions by state regulatory agencies and

other data users are based on data of known and documented quality. In turn, this will benefit the health and welfare of California residents and the environment.

## COST IMPACTS ON REPRESENTATIVE PERSON OR BUSINESS

The costs to implement and maintain compliance with the 2016 TNI Standard are assumed to comprise the main economic impacts a laboratory may experience from implementation of the proposed regulations. Although the proposed regulations do not specifically require the purchase of new technology or laboratory equipment, hiring new personnel, or any additional investments to comply, the State Water Board is assuming for the purposes of the economic impact assessment that laboratories will hire new personnel and/or a laboratory consulting firm to help with the implementation process. Based on those assumptions, the State Water Board estimates the cost to implement the proposed regulations for a typical laboratory ranges from $40,000.00 to $77,334.40.

## BUSINESS REPORT

The proposed regulations require laboratories to comply with notification, reporting, and records retention requirements of state and federal agencies that data is being reported to. It is necessary that these reporting requirements apply to businesses, including laboratories, in order to protect the health, safety, and welfare of the people of the state.

## SMALL BUSINESS

The proposed regulations will impact less than 500 small businesses. For the purposes of this analysis, the State Water Board considers laboratories that run less than 50 fields of accreditation to be “small businesses,” because it assumes that such laboratories are generally independently owned and operated, and not dominant in their field of operation.

It is difficult for the State Water Board to estimate the number of small laboratory closures that could result as a result of the proposed regulations because small laboratories are already especially vulnerable to other industry pressures that could induce closure or sale, independent of the proposed regulations. Although the TNI Standard can be implemented in any laboratory regardless of size or complexity, other state programs have suggested that smaller laboratories may need more time to implement the TNI Standard. ELAP is, therefore, proposing a three-year, staged implementation period to implement the regulations, and assistance to small laboratories to comply with the TNI requirements. Nonetheless, the State Water Board assumes a total of ten small laboratories will be unable or unwilling to comply with the proposed regulations and will voluntarily forgo ELAP accreditation. Some of those small laboratories may be in-house laboratories at drinking water and wastewater facilities that decide not to actually close, but to forgo ELAP accreditation and remain operational to analyze non-regulatory samples for day-to-day needs of the facility.

Because the State Water Board is concerned about small laboratory closure, it has initiated a Laboratory Mentorship Program. This program partners ELAP-accredited laboratories that have TNI accreditation with laboratories that service remote areas and

communities in the state where a laboratory closure may result in loss of service for that community. This mentorship program is helping laboratories with the implementation process and identifying needs of the laboratory to become compliant with the 2016 TNI Standard. Similarly, professional associations like the California Water Environment Association (CWEA) are sponsoring trainings for their small laboratory members. The CWEA training focuses on best practices for aligning with the 2016 TNI Standard and tools and resources for efficient implementation.

Therefore, although the regulations may have an impact on small businesses, the State Water Board plans to assist in compliance to reduce those impacts, as described above.

**ALTERNATIVES STATEMENT**

The State Water Board considered two alternative accreditation standards to incorporate into the proposed regulations: (1) a state-created accreditation standard, and (2) a modified version of an existing accreditation standard (the alternative accreditation standard developed by a Subcommittee of the Environmental Laboratory Technical Advisory Committee (ELTAC) is considered as a modified version of an existing standard). The State Water Board's reasoning for rejecting the alternatives is that they are less effective than the 2016 TNI Standard in carrying out the purpose and objectives for which the action is proposed, represent the status quo, and lack credibility.

The State Water Board engaged in a multi-year, stakeholder-involved process to evaluate the accreditation standard options and select the best accreditation standard for the program. All advisory committees involved in the selection process agreed that the selected accreditation standards should have quality system requirements. A quality system requires direct management and constant improvement of laboratory processes and procedures to ensure quality of the data. This is a core requirement of a modernized accreditation standard and a requirement that encompasses all areas of the laboratory. The quality system requirements described in the 2016 TNI Standard are specific, thorough, and consistently upgraded through a consensus-based standard development process that incorporates best industry practices.

Quality system requirements are a new concept to ELAP and would be a new requirement for laboratories to comply with, so all alternative accreditation standards would result in similar challenges and costs to implement. Therefore, alternatives were assessed based on the effectiveness of the accreditation standard.

The alternative accreditation standard developed by a Subcommittee of ELTAC lacked the necessary quality system requirements to ensure that data produced by laboratories was of known and documented quality. Furthermore, the alternative only required that content of a quality system be included or referenced in a laboratory Quality Manual but does not provide the specificity and detailed criteria of each quality system requirement. Without the specificity and detailed criteria of each requirement, laboratories can interpret and implement these requirements differently, which disqualifies this alternative as a standard because it does not standardize laboratory activities and

practices. Additionally, the lack of specificity and detailed criteria of each requirement makes the alternative not auditable for compliance purposes, which is a fundamental problem with the current accreditation standard.

The alternative standard proposed by the ELTAC Subcommittee, which has not been reviewed or considered by the Environmental Protection Agency (EPA) as an alternative to the federal laboratory certification program, was developed by three ELTAC members and five public participants and is not comparable to the TNI Standard in effectiveness and acceptability by stakeholders. TNI updates the TNI Standard through a consensus-based standard development program where expert committees, made up of national experts in the environmental laboratory community, develop and maintain the standards. The alternative accreditation standard developed by the ELTAC Subcommittee, would require ELAP to review and update the requirements independently, resulting in additional costs to the State Water Board. Furthermore, the TNI Standard, which is approved by the EPA as an acceptable alternative to the federal laboratory certification program and can be used by state laboratory accreditation programs to retain certification authority of laboratories analyzing drinking water samples for compliance monitoring, has been widely effective and successful for other state programs in part because of the known and inclusive consensus-based standard development process.

## CONSIDERATION OF ALTERNATIVES

The State Water Board must determine that no reasonable alternative it considered or that has otherwise been identified and brought to its attention would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law. The State Water Board invites interested persons to present alternatives to the proposed regulation during the public comment period.

## AVAILABILITY OF TEXT OF PROPOSED REGULATIONS, INITIAL STATEMENT OF REASONS, AND THE RULEMAKING FILE

The State Water Board has prepared and is making available the proposed regulation text, which constitute the express terms of the proposed actions, and an Initial Statement of Reasons for the proposed regulatory action. The Initial Statement of Reasons includes the specific purpose for the regulations proposed for adoption, and the rationale for the State Water Board's determination that the adoption is reasonably necessary to carry out the purpose for which the regulations are proposed. All of the information upon which the proposed regulations are based, with the exception of the 2016 TNI Standards, is contained in the rulemaking file, which is available for inspection and copying throughout the rulemaking process. To inspect or copy the rulemaking file at the State Water Board office, contact Andrew Hamilton, identified below ("Contact Persons").

As noted above, because the standards produced by TNI are copyright protected and provided through a license agreement, these sections are incorporated by reference rather than set out in the regulations. The State Water Board has made the 2016 TNI Standard publicly available for viewing at each of the nine (9) Regional Water Quality Control Board Offices, and twenty-four (24) Division of Drinking Water District Offices. Interested parties may contact any of the offices to view the 2016 TNI Standard in the designated public record document review area. Refer to the "Forms Incorporated By Reference" section above for instructions to access a read-only, unlicensed version of the 2016 TNI Standard. Copies of the standard may also be purchased by contacting TNI's Executive Administrator, Suzanne Rachmaninoff, at suzanne.rachmaninoff@nelac-institute.org.

## AVAILABILITY OF CHANGED OR MODIFIED TEXT

After holding the APA hearing and considering relevant comments received by 12:00 noon on December 20, 2019, the State Water Board is proposing to adopt the proposed regulations at its March 17, 2020 board meeting in Sacramento, CA. The specific room location will be set out in the State Water Board's agenda and will be made available to the public at least 10 days in advance. If the State Water Board makes modifications that are substantially related to the originally proposed text, the State Water Board will make the modified text – with changes clearly indicated – available to the public for at least 15 days before the March 17, 2020 board meeting. Any such modifications will also be posted on the State Water Board Web site. Please send request for copies of any modified regulations to the attention of the contact persons provided below ("Contact Persons"). The State Water Board will accept written comments on the modified regulation for 15 days after the date on which they were made available.

Updates to these proposed regulations may be received by subscribing to an e-mail notification list on the State Water Board's e-mail subscriptions webpage

Subscribe under General Interests, Environmental Laboratory Accreditation Program (ELAP).

## AVAILABILITY OF FINAL STATEMENT OF REASONS

After the Water Board's adoption of the regulations, the State Water Board will make available the Final Statement of Reasons, which will include responses to comments submitted during the comment period. Copies may be requested from the contact person(s) named in this notice or may be accessed on the Web site address provided below ("Internet Access").

## INTERNET ACCESS

Copies of this Notice of Proposed Rulemaking, the Initial Statement of Reasons, and the text of the regulations may be found on the ELAP's Regulations webpage

Updates to the rulemaking file, including any modifications to the proposed regulatory text, comments on the regulations, and the final statement of reasons, will also be posted to the webpage.

Documents relating to this proposed action may also be found on ELAP's Regulations webpage

**CONTACT PERSONS**

Requests for copies of the proposed regulatory text, the initial statement of reasons, any subsequent modifications of the proposed regulatory text, timely submitted comments, the final statement of reasons, or other inquiries concerning the proposed action may be directed to:

Jacob Oaxaca
Senior Environmental Scientist, Supervisor
State Water Resources Control Board
Environmental Laboratory Accreditation Program
1001 I Street, 17th Floor
Sacramento, CA 95814
Telephone: (916) 323-3433
Electronic mail address: jacob.oaxaca@waterboards.ca.gov

In the event Mr. Oaxaca is not available to respond to requests or inquiries, please contact:

Andrew Hamilton
Environmental Scientist
State Water Resources Control Board
Environmental Laboratory Accreditation Program
1001 I Street, 17th Floor
Sacramento, CA 95814
Telephone: (916) 323-3427
Electronic mail address: andrew.hamilton@waterboards.ca.gov

October 11, 2019
Date

Jeanine Townsend
Clerk to the Board

October 21-22, 2019
Scottish Rite Center, 1547 Lakeside Drive, Oakland, CA


GREAT EGRET, VERNE NELSON

# 14th Biennial State of the San Francisco Estuary Conference

## Plenary Program — MONDAY, OCTOBER 21, 2019 — Grand Auditorium (4TH Floor)

**9:00 AM** **Ohlone Welcome and Land Acknowledgement**
*Kanyon Sayers-Roods (Hahashkani), Costanoan Ohlone and Chumash*

**9:05 AM** **Welcome**
*Libby Schaaf, Mayor of Oakland*

**9:10 AM** **Opening Remarks**
*Mark Gold, Deputy Secretary for Ocean and Coastal Policy and Director of the Ocean Protection Council, California Natural Resources Agency*

**9:25 AM** **Climate Change and the Future of California's Water**
*Geeta Persad, Senior Climate Scientist, Western States Office, Union of Concerned Scientists*

**9:45 AM** **Toward Social-Ecological Resilience: The State of the Estuary Report 2019**
*Letitia Grenier, Resilient Landscapes Program Director, San Francisco Estuary Institute*
*Gabby Trejo, Executive Director, Sacramento Area Congregations Together*
*Jacqueline Zipkin, General Manager, East Bay Dischargers Authority*
*Will Dominie, Policy Manager of Housing and Equitable Development, Bay Area Regional Health Inequities Initiative*

**10:20 AM** *Jean Auer Award*

**10:40 AM** *Break* — Blue Room (3RD Floor)

**11:00 AM** **Building Trust: Striving Toward Equitable and Inclusive Outcomes**
Moderator: *Nahal Ghoghaie Ipakchi, Director, EcoEquity*
Panelists:
*LaDonna Williams, Programs Director, All Positives Possible*
*Violet Saena, Resilient Communities Program Manager, Acterra*
*Beth Rose Middleton, Associate Professor, UC Davis*
*Yana Garcia, Assistant Secretary for Environmental Justice and Tribal Affairs, CalEPA*
*Josue Medellin-Azuara, Associate Professor, UC Merced*

**12:15 PM** *Lunch* — Grand Ballroom (1ST Floor)

### Drone Demonstration
*Pete Kauhanen, SFEI*
Participants can pick up their lunch and cross the street to participate in a 20-minute lunchtime demonstration of an unoccupied aerial vehicle (UAV) flight on the shoreline of Lake Merritt (approximate start time is 12:35 PM).

### Equity and the State of the Estuary Conference: A Roundtable Discussion – Gold Room (4TH Floor)
An open conversation about integrating social equity into the planning of this conference—please grab your lunch and join the chat (approximate start time is 12:35 PM).

www.sfestuary.org/soe

SAN FRANCISCO ESTUARY PARTNERSHIP

# Concurrent Sessions Monday Afternoon, October 21, 2019

Denotes Panel

## Grand Auditorium—4TH Floor
## Habitats & Living Resources

### From Regional to Local: Integrated Monitoring for Healthy Wetlands

**1:35 PM** Introduction
*Heidi Nutters, SFEP*

**1:40 PM** A Regional Vision for Coordinated Monitoring: The Wetland Regional Monitoring Program
*Luisa Valiela, U.S. EPA and Xavier Fernandez, SF Bay Water Board*

**2:00 PM** Connecting the Dots on Regional Sediment Management: Coordinating Sediment Monitoring in the Watersheds, the Bay, and the Wetlands
*Jeremy Lowe, SFEI and Brenda Goeden, BCDC*

**2:20 PM** South Bay Salt Pond Restoration Project: Science and Adaptive Management in Action
*Rachel Tertes, USFWS*

**2:40 PM** Integrating our Past and Future Monitoring in the South Bay Salt Pond Restoration Project
*Dave Halsing, SBSP Restoration Project*

**3:00 PM** Panel Discussion

**3:20 PM** *Break*–Blue Room (3RD Floor)

### Monitoring with New or Emerging Technologies

**3:40 PM** Introduction
*Tony Hale, SFEI*

**3:45 PM** Using Satellite Imagery to Detect Turbidity Levels in Relation to Freshwater Flows
*Christine Lee, NASA*

**4:05 PM** New Applications of Remote Sensing for Mapping Vegetation
*Iryna Dronova, UC Berkeley*

**4:25 PM** Use of High-Resolution In-Situ and Remote Sensing for Water Quality and Mercury Monitoring
*Mark Marvin-DiPasquale, USGS*

**4:45 PM** Panel Discussion

## Banquet Room—3RD Floor
## Climate Resilience

### Forward-Looking Science in the San Francisco Estuary

**1:35 PM** This panel will discuss how the science enterprise across the estuary can best support strategic and forward-looking management and stakeholder needs in the face of a rapidly changing environment.

Moderator: *Yumiko Henneberry, Delta Science Program-Delta Stewardship Council*

Panelists:
*Steve Brandt, Delta Independent Science Board*
*Liz Whiteman, Ocean Science Trust*
*Jessie Lacy, USGS*
*Mike Chotkowski, Pacific Region, USGS*
*Steve Goldbeck, BCDC*

**3:20 PM** *Break*–Blue Room (3RD Floor)

### Policy Updates to Support a Healthy, Resilient Estuary

Moderator: *John Callaway, Delta Science Program–Delta Stewardship Council/USF*

**3:40 PM** Advancing Policies for a Rising Bay: BCDC's Long-Range Planning Efforts
*Shannon Fiala, BCDC*

**3:50 PM** Water Board Policy Update on Wetlands and Climate Change
*Christina Toms, SF Bay Water Board*

**4:00 PM** The BRRIT: Coordinated Permitting for San Francisco Bay Restoration Projects
*Amy Hutzel, State Coastal Conservancy*

**4:10 PM** Using Best Available Science to Update the Ecosystem Chapter of the Delta Plan
*Ron Melcer, Delta Stewardship Council*

**4:20 PM** Panel Discussion

## Red Room—4TH Floor
## Water Quality

### Contaminants of Emerging Concern in the Estuary

**1:35 PM** Introduction
*Kelly Moran, TDC Environmental*

**1:40 PM** Elevating the Status of Emerging Contaminants in San Francisco Bay
*Melissa Foley, SFEI*

**2:05 PM** California's Safer Consumer Products Program Overview and Efforts to Protect Aquatic Health
*Anne-Cooper Doherty, DTSC*

**2:30 PM** Pesticides in Surface Water: Sources, Pathways, and Fate
*Jennifer Teerlink, DPR*

**2:55 PM** Microplastics Everywhere: Understanding Microplastics in the Bay and Recommended Actions
*Diana Lin, SFEI*

**3:20 PM** *Break*–Blue Room (3RD Floor)

### Nutrients in the Estuary

**3:40 PM** Introduction
*Eric Dunlavey, City of San Jose*

**3:45 PM** Bay-Delta Nutrient Science Update
*Dave Senn, SFEI*

**4:10 PM** Wastewater Treatment Plant Upgrades and Nature-Based Solutions for Reducing Nutrient Loads from Wastewater
*Holly Kennedy, HDR and Ian Wren, SF Baykeeper*

**4:35 PM** Potential Effects of the Sacramento Regional Wastewater Treatment Plant Upgrade
*Tamara Kraus, USGS*

## Gold Room—4TH Floor
## Human Dimensions

### The Next Wave in Conservation: Community-Based and Design Approaches

**1:35 PM** Introduction
*Allison Brooks, Bay Area Regional Collaborative*

**1:40 PM** Designing the Colma Creek Project
*Richard Mullane, Hassel Studio*

**2:00 PM** Parks as Resilient Infrastructure in the Wild West: A Houston Example
*Amy Morris, Land and Water Connections Consulting*

**2:20 PM** Nature as Infrastructure in the SF Bay Area: A Brief History of the Long Path to Conservation for Coyote Valley
*Amanda Brown-Stevens, Greenbelt Alliance*

**2:40 PM** An Ecological Framework for Urban Infrastructure Planning to Improve Human Health
*Brent Bucknum, Hyphae Design Lab*

**3:00 PM** Panel Discussion

**3:20 PM** *Break*–Blue Room (3RD Floor)

### Humanizing Homelessness for Healthier Creeks and Communities

**3:40 PM** Throughout the estuary, practitioners are working across traditional divides to take a human-centered approach to the challenges created by unsheltered and vulnerable communities along creeks, resulting in benefits to people, water quality, and habitat. Panelists will discuss successes, challenges, and ways they have formed innovative partnerships to foster collaborative solutions to the regional crisis of homelessness.

Moderator: *Mike Antos, Stantec*

Panelists:
*Chris Brokate, Clean River Alliance*
*Julia Lang, Downtown Streets Team*
*Cori Ring-Martinez, Environmental Justice Coalition for Water*
*Talia Rubin, City of Oakland*

**5:00 PM – 7:00 PM** *Poster Session, Reception, and Arts Showcase* Grand Ballroom—1ST Floor

**Exploratorium Field Station: Arts & Artifacts from the Fisher Bay Observatory Gallery**

www.sfestuary.org/soe

## Green is the New Gray: Nature-Based Infrastructure

**9:00 AM Introduction**
*Thomas Mumley, Assistant Executive Officer, San Francisco Bay Regional Water Quality Control Board*

**9:05 AM To Resiliency and Beyond: Multi-Benefit Highway 37**
*Ashley Nguyen, Director of Design and Project Delivery, Metropolitan Transportation Commission*

**9:25 AM Green Infrastructure Implementation Challenges and Opportunities: Navigating Constraints and Issues of Scale**
*Keith Lichten, Division Chief, San Francisco Bay Regional Water Quality Control Board*

**9:45 AM Living Shorelines: Linking Estuary Habitats and Building Capacity to Adapt to Rising Seas**
*Katharyn Boyer, Professor of Biology, Estuary & Ocean Science Center—San Francisco State University, and Marilyn Latta, Project Manager, State Coastal Conservancy*

**10:05 AM** *Outstanding Environmental Awards and Creative Environmental Award*

**10:25 AM** *Break*—Blue Room (3RD Floor)

## Zooming Out to the Full System

**10:45 AM Welcome**
*John Callaway, Lead Scientist, Delta Science Program-Delta Stewardship Council and University of San Francisco*

**10:50 AM One Delta, One Estuary: Connecting California through Water**
*Felicia Marcus, Former Chair, State Water Resources Control Board*

**11:10 AM Viewing Estuaries from a Macroscope**
*Jim Cloern, Senior Scientist Emeritus, U.S. Geological Survey*

**11:30 AM Standing Too Close to the Elephant: Addressing Scales in Restoration and Fisheries Conservation**
*Rachel Johnson, Research Fisheries Biologist, National Marine Fisheries Service and UC Davis*

**11:50 AM The Sacramento-San Joaquin Delta National Heritage Area: California's First Heritage Area**
*Erik Vink, Executive Director, Delta Protection Commission*

**11:55 AM San Francisco Bay is a Hope Spot for People and Ocean Wildlife**
*Karina Nielsen, Executive Director and Professor of Biology, Estuary & Ocean Science Center—San Francisco State University*

**12:00 PM** *Lunch*—Grand Ballroom (1ST Floor)

### Oakland Green Infrastructure Walking Tour

Participants can pick up their lunch and cross the street to participate in a 30-minute lunchtime walking tour (approximate start time is 12:35 PM).

# Concurrent Sessions Tuesday Afternoon, October 22, 2019

Denotes Panel

## Grand Auditorium—4TH Floor
## Habitats & Living Resources

### The Sierra Nevada to the Farallones: How Birds, Fish, and Mammals Connect the Estuary and Ocean

**1:20 PM** Introduction
*Kathy Hieb, CDFW*

**1:25 PM** From the Bay to the Gulf and Beyond: What 20 Years of Seabird Monitoring Tells Us About Food Webs
*Dan Robinette, Point Blue Conservation Science*

**1:50 pm** Whales, Dolphins, and Porpoises: Harbingers of Recovery and Changing Seas
*Tim M. Markowitz, UC Berkeley/ TMMC/SFSU*

**2:15 PM** Vital Signs of the San Francisco Estuary Fish Community
*Christina Swanson, NRDC and Jon Rosenfield, SF Baykeeper/ The Bay Institute*

**2:40 PM** Identifying Habitat Needs and Management Goals for Waterfowl Wintering Across the Delta-Bay-Ocean Continuum
*Susan De La Cruz, USGS*

**3:05 PM** *Break*–Blue Room (3RD Floor)

### From Tidal Wetlands to the Uplands: Fish and Wildlife as Indicators

**3:25 PM** Introduction
*Steve Culberson, IEP*

**3:30 PM** A Fish-Eye View of Habitat Quality in San Francisco's Brackish Tidal Wetlands
*Levi Lewis, UC Davis*

**3:55 PM** Mice in the Middle: The Special Case of Terrestrial Wildlife in the Marshes of the San Francisco Estuary
*Katie Smith, UC Davis/WRA, Inc.*

**4:20 PM** Tidal Marsh Birds: Indicators of Habitat Quality of the Wetland/Upland Transition Zone
*Nadav Nur, Point Blue Conservation Science*

## Banquet Room—3RD Floor
## Climate Resilience

### Regional Science for Decision-Making in Uncertain Times

**1:20 PM** Introduction
*Julie Beagle, SFEI*

**1:25 PM** A Risk Management Approach to Delta Water Supply Vulnerability
*Andrew Schwarz, Delta Stewardship Council*

**1:50 PM** Underappreciated Effects of Sea-Level Rise on Groundwater
*Phil Gregory, Cal Engineering & Geology, Inc.*

**2:15 PM** Sediment Dynamics and Wave Attenuation at the Marsh Edge
*Jessie Lacy, USGS*

**2:40 PM** Informing Development and Evaluation of Nature-Based Shoreline Adaptation Strategies in a Changing Climate
*Maya Hayden, Point Blue Conservation Science*

**3:05 PM** *Break*–Blue Room (3RD Floor)

### Planners and Engineers and Regulators…Oh My! Roles in Regional Governance

**3:25 PM** Recent work by Dr. Mark Lubell, UC Davis, has identified governance as a critical impediment to successful regional implementation of sea level rise adaptation strategies. Numerous agencies and organizations in the Bay Area have been taking action to fill this gap and provide leadership in a variety of ways, resulting in a complex landscape. This panel will explore the roles and strategies of various organizations, and discuss how they can fit together to achieve a sound strategy for regional governance.

Moderator: *John Bourgeois, ESA*

Panelists:
*Jessica Fain, BCDC/ART*
*Jessica Law, Delta Stewardship Council*
*Mark Lubell, UC Davis*
*Jim McGrath, SF Bay Water Board*
*Mike Mielke, Silicon Valley Leadership Group*
*Erika Powell, CHARG and San Mateo SLR Agency*

## Red Room—4TH Floor
## Water Quality

### Integrating Green Stormwater Infrastructure into the Bay Area's Urban Landscape

**1:20 PM** Introduction
*Melody Tovar, City of Sunnyvale*

**1:25 PM** A 15-year Retrospective: Large-scale Green Infrastructure Changes via Private Redevelopment in the South Bay
*Chris Sommers, EOA/SCVURPPP*

**1:50 PM** Getting It Done: Public Right-of-Way Green Stormwater Infrastructure
*Terri Fashing, City of Oakland and Amanda Booth, City of San Pablo*

**2:15 PM** Modeling and Planning for Long-Term Green Infrastructure Implementation in San Mateo County
*Matt Fabry, City/County Association of Governments of San Mateo County*

**2:40 PM** What's So Hard About Digging a 40" Hole? Perspectives on Green Infrastructure
*Municipal Staff and Water Quality Regulators*

**3:05 PM** *Break*–Blue Room (3RD Floor)

### Accelerating Improvement of Water Quality and Habitat on Working Lands

**3:25 PM** Moderator
*Frances Knapczyk, Napa County RCD*

**3:30 PM** Improving Water Quality and Achieving TMDL Compliance in Suisun Marsh
*Stuart Siegel, SFSU/SF Bay NERR*

**3:50 PM** LandSmart Program: Helping Vineyard Managers Meet Resource Conservation Goals in the North Bay
*Lucas Patzek, Napa County RCD*

**4:00 PM** Managing Grazed Rangelands for Water Quality in Alameda County
*Alyson Aquino, USDA-NRCS Alameda County*

**4:10 PM** Cows, Water, and Wildlife in the North Delta
*Wendy Rash, USDA-NRCS Solano County*

**4:20 PM** Panel Discussion

## Gold Room—4TH Floor
## Human Dimensions

### Urban Biodiversity and Human Health

**1:20 PM** Introduction
*Micaela Bazo, SFEI*

**1:25 PM** Using Science to Guide Urban Design for Biodiversity and Human Health
*Erica Spotswood, SFEI*

**1:50 PM** Flora, Fauna, and Folks: Reimagining the City as a Park
*Chryl Corbin, UC Berkeley*

**2:15 PM** Design and the Interconnected Scales of Well-Being
*Chris Garvin, Biome Impact LLC*

**2:40 PM** Biodiversity for All at the Presidio of San Francisco
*Michael Bolland, Presidio Trust*

**3:05 PM** *Break*–Blue Room (3RD Floor)

### Public Learning in an Era of Climate Crisis

Through presentation of recent projects both within the Exploratorium and out in communities, the panelists will discuss and evaluate approaches that integrate informal environmental education and the humanities (arts, social science, literature) and share lessons learned, with particular focus on fostering climate change resilience strategies.

**3:25 PM** Moderator
*Moira McEnespy, SCC*

**3:30 PM** Public Education at the Exploratorium—Science, Art, and Social Connection
*Susan Schwartzenberg and Shawn Lani, Exploratorium*

**3:50 PM** Paired Conversations with Curators, Artists, Social/Cognitive Scientists

- Middle Ground: Social Perspectives on Collaborative Engagement
  *Shawn Lani and Heike Winterheld, Exploratorium*
- The Brain and Observation: Towards a Language of Resilience
  *Susan Schwartzenberg, Exploratorium and Pireeni Sundaralingam, Poet/ Cognitive Scientist*

**4:20 PM** Panel Discussion

**4:45 PM** *Adjourn*

**From:** Engelage, Samantha <Samantha.Engelage@CityofPaloAlto.org>
**Sent:** Thursday, November 7, 2019 2:39 PM
**To:** David Williams <dwilliams@bacwa.org>
**Cc:** Lorien Fono <lfono@bacwa.org>; karin.north@cityofpaloalto.org; Lorrie O'Neill <loneill@bacwa.org>
**Subject:** RE: Request for Support of Grant Application for Horizontal Levee

Hi Dave,

We are close to receiving a grant from the Coastal Conservancy under Prop 1 for the Palo Alto Horizontal Levee Pilot Project that BACWA expressed support for earlier this year. To finalize the award of the grant, the Coastal Conservancy is now requesting official letters of support to be included in the Board Packet. Attached is a draft letter of support. Can this request be considered at the 11/15 BACWA Executive Board meeting?

Signed letters can be sent electronically to me and I can consolidate for ultimate transmittal to the Coastal Conservancy. I'm asking that letters be submitted to me by 11/29/19.

Thanks,
Sam

**From:** David Williams [mailto:dwilliams@bacwa.org]
**Sent:** Thursday, April 18, 2019 9:37 AM
**To:** Engelage, Samantha
**Cc:** Lorien Fono; Sherry Hull; North, Karin
**Subject:** RE: Request for Support of Grant Application for Horizontal Levee

Samantha, BACWA is pleased to support the City of Palo Alto's application. Feel free to list us as a supporter.

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

**From:** Engelage, Samantha <Samantha.Engelage@CityofPaloAlto.org>
**Sent:** Monday, April 15, 2019 4:05 PM
**To:** David Williams <dwilliams@bacwa.org>
**Cc:** Lorien Fono <lfono@bacwa.org>; Sherry Hull <shull@bacwa.org>; North, Karin <Karin.North@cityofpaloalto.org>
**Subject:** Request for Support of Grant Application for Horizontal Levee

Hi Dave,

The City of Palo Alto in collaboration with the San Francisco Estuary Partnership would like you to consider supporting our application under the Coastal Conservancy's current funding opportunity through Proposition 1. We are applying for funds to complete the design and permitting of a horizontal

levee pilot project within Palo Alto. Horizontal levees incorporate green infrastructure, including habitat enhancements, into traditional greyscape solutions to flood control and sea level rise (i.e., levee system with rip-rap). A horizontal levee includes a vegetated, gently sloped, ecotone on the bayside of the levee that would provide transitional and refugia habitat for marsh species such as the endangered salt marsh harvest mouse and Ridgeway's rail. One of the exciting and novel parts of the Palo Alto Horizontal Levee Pilot Project is that it would utilize highly treated wastewater to irrigate the vegetated ecotone thus providing additional benefits of polishing treatment of the wastewater prior to discharge into the Bay and decreasing potable water demands for the system. This project would help the City implement goals from both the City's Baylands Comprehensive Conservation Plan and the newly adopted Sea Level Rise Policy.

A conceptual design has been completed for this project and is available here for your reference. We are currently working on a preliminary design for the Palo Alto Horizontal Levee Pilot Project which would progress the project to a 30% design and are trying to secure funding that would allow us to complete the design and permitting tasks.

No support letter is required, but we ask that you **reply to this email by Friday, 4/19/19,** indicating BACWA's support for this project and permission for us to list BACWA as a supporter in our application package.

Thank you for your time and feel free to contact me with any questions.

CITY OF PALO ALTO

Samantha Engelage, P.E.
Senior Engineer, Environmental Services Division
2501 Embarcadero Way | Palo Alto, CA 94303
D: (650) 329-2123
Samantha.Engelage@CityofPaloAlto.org

BACWA
BAY AREA
CLEAN WATER
AGENCIES

November 13, 2019

Douglas Bosco, Chair
State Coastal Conservancy
1515 Clay Street, 10th Floor
Oakland, CA 94612

Dear Mr. Bosco:

I am writing this letter to express support on behalf of the Bay Area Clean Water Agencies (BACWA) for the Palo Alto Horizontal Levee Pilot Project's application to the Coastal Conservancy Proposition 1 Grant Program for funds needed to progress the project's design.

The San Francisco Estuary Partnership (SFEP), in collaboration with the City of Palo Alto, has been working on a preliminary design for a horizontal levee pilot project located in the Palo Alto Baylands. The project will provide multiple benefits to residents and visitors, and will incorporate public access, green infrastructure solutions including habitat enhancements, and protection from flooding and sea level rise. This innovative approach works with nature instead of applying traditional greyscape solutions. We expect the project will provide transitional and refugia habitat for marsh species such as the endangered salt marsh harvest mouse and Ridgeway's rail. This transitional habitat has been decimated by development along the shoreline and is a high restoration priority for resource agencies. Finally, the project will utilize highly treated wastewater to irrigate the vegetated ecotone thus providing additional benefits of polishing treatment of the wastewater prior to discharge to the Bay. This novel aspect will provide valuable information to other wastewater treatment plants and agencies in the region that are also evaluating their sea level rise adaptation and beneficial reuse of treated wastewater.

This funding proposal will support community engagement and advance the project's design to bring it to a "shovel ready" stage and well poised for implementation. Approval of this grant application will afford multiple benefits to regional efforts to promote horizontal levees as viable, multi-beneficial alternatives to traditional flood-control levees.

We are hopeful this grant application will be given strong consideration.

Sincerely,

David R. Williams

David R. Williams
Executive Director

cc: BACWA Executive Board
Samantha Engelage, City of Palo Alto

Pardee Technical Seminar 2020

The October dates that are available include:

- October 20 – 23
- October 27 – 30

BACWA has the following dates on hold:

- September 14 – 18
- September 21 -25

BACWA BAY AREA CLEAN WATER AGENCIES

**BAY AREA CLEAN WATER AGENCIES**
**DRAFT ANNUAL MEETING PROGRAM**
**JANUARY 10, 2020**

**Open your browser**
**ENTER: pollev.com/bacwa**
**For Ranking questions: use the lines to the right to arrange your answers**

| TIME | SUBJECT | DESCRIPTION | SPEAKER | Notes |
|---|---|---|---|---|
| QUESTION 0 | | | | |
| 8:30 am - 9:00 am | Coffee and Refreshments/Check-in | (note: provide the tri-fold Op/Upgrade brochure as handout at registratrion table) | | |
| | | | | |
| 9:00 am - 9:15 am | Welcome | Introduction and Year in Review (including business issues) | Lori Schectel, Chair | |
| | | | | |
| 9:15 am - 10:30 am | BAAQMD/EPA/SWRCB/RWQCB/ Priorities | Moderator | Amit Mutsuddy | |
| | | BAAQMD APCO | Jack Broadbent (accepted) | |
| | | EPA Region IX, NPDES Permits Section | Tomas Torres (accepted) | |
| | | SWRCB Board Member | Tam Doduc (accepted) | |
| | | RWQCB Executive Officer | Michael Montgomery (accepted) | |
| | | Q&A | | |
| | | | | |
| 10:30 am - 10:45 am | Break | | | |
| | | | | |
| | BACWA Hot Topics | Moderator | Jackie Zipkin | |
| | | | | |
| 10:45 am - 11:20 am | | CECs (State Panel, microplastics, PFAS) | Becky Sutton and/or other SFEI staff | |
| | | | | |
| 11:20 am - 11:35 am | | ELAP | Jason Mitchell or Dan Jackson | |
| | | | | |
| 11:35 am - 11:50 am | | Recycled water permit transition | Stefanie Olson or Justin Waples | |
| | | | | |
| | | | | |
| 11:50 am - 11:55 am | BACWA Leadership Recognition | (scrolling screen with Committee Accomplishments) | Lori Schectel, Chair | |
| | | | | |
| 11:55 am - 12:25 pm | Lunch | table stands for folks to interact with committee of interest | | |
| | | | | |
| 12:25 pm - 12:35 pm | Arleen Navarret Award presentation and BACWA Leadership Recognition | presentation of award | Amy Chastain | |
| | | | | |
| 12:35 pm - 12:45 pm | Institute for Sustainable Infrastructure | presentation on Envision | Justin Waples | |
| | | | | |
| | BACWA Hot Topics | Moderator | Jackie Zipkin | |
| 12:45 pm - 1:10 pm | | AIR Issues/Climate Adaption | Sarah Deslauriers | |
| | | | | |
| 1:10 pm - 1:20 pm | | Bay Area Biosolids Coalition | Sarah Deslauriers | |
| | | | | |
| 1:20 pm - 1:30 pm | | Chlorine Basin Plan Amendment | Tom Hall | |

| | | | | |
|---|---|---|---|---|
| **1:30 pm - 1:35 pm** | **Nutrients - Overview** | Overview of 2nd WS Permit/Governance Update | David Williams | |
| | | | | |
| | | | | |
| **1:35 pm - 2:20 pm** | **Nutrients - Regulatory Update** | **Moderator** | **Eileen White** | |
| | | 2018 Group Annual Report | Falk, HDR | |
| | | Q & A | | |
| | | Nature Based Solutions Study | Ian Wren, SFEI | |
| | | Regional Recycled Water Report | Kennedy, HDR | |
| | | | | |
| | | | | |
| **2:20 pm - 2:50 pm** | **Nutrients - Technical Update** | **Moderator** | **Eric Dunlavey** | |
| | | **Update on the Science Plan and Findings** | David Senn, SFEI | |
| | | | | |
| | | | | |
| **2:50 pm - 3:00 pm** | **Annual Meeting Wrap-Up** | | **Lori Schectel, Chair** | |
| | | | | |

4imprint – Aluminum – BPA free – no lining

Product Details | Sending Artwork

Request A Free Sample

- With its single-wall aluminum construction, this reusable printed bottle is a winner for cold drinks and a great alternative to disposable bottles.
- Screw-on lid with metal carabiner clip makes this imprinted bottle portable in a variety of settings.
- Larger capacity and lightweight construction are just right for longer treks where water isn't readily available.
- For the 17-oz version of this logo water bottle, see item #109484-17.
- Size: holds 26-oz.
- Your price includes a one-color wrap imprint on the sport bottle.
- Set-up charge: add $55.
- Imported, logo applied in USA.
- Maximum number of imprint colors: 1
- Ready to ship in : 2 business days *.

** Excludes art preparation time, applies only to orders of 500 items or fewer.*


☐ : Bottle ☐ : Lid

## Choose Your Quantity:

Enter the quantity you'd like, or drag our orange 'i' to find a quantity and price that's best for you.

Pat. 7,979,318

125

75 — 5000

| Quantity | Price Each |
|---|---|
| 125 | $3.53 |

Total **$441.25**

You save $20.00 *over minimum quantity pricing*

Relax - you're covered by our 360° Guarantee.
Learn More

Customize Your Imprint

Quantity: 125

$752.75

$6.02/each


Quantity: 125

$1,146.50

$9.17/each

- FREE SHIPPING on this item over $75
- 26 oz. Single Wall Stainless Steel Water Bottle
- Comes with Silicone Ring and Carabiner

## 26 oz. Bullet Sports Water Bottles | SB117

Product Specs | FAQ

| | |
|---|---|
| Material | Stainless Steel |
| Dimensions | 10.25" H x 2.75" W |
| Imprint Area | 3.5" H x 2" W |
| Laser Area | 3" H x 1.5" W |
| Capacity | 26 oz. |
| Case Pack | 25 |
| Weight | 12.8lbs |

### Product Description:

Available silver, these Bullet cheap sports bottles feature a twist cap, carabiner and up to 26 oz. of liquid capacity. Order our engraved sports bottles personalized with your custom logo and save with our cheap prices. Get started on your order of cheap water bottles and you may also order printed with your logo or graphic design.

Clean Water Summit Partners
1225 8th Street Suite 595
Sacramento, CA 95814
p: 916.446.0388



October 28, 2019
9:30 AM – 1:30 PM
Sutter Club
1220 9th Street, Sacramento, CA 95814

# AGENDA

**9:30 a.m. Call to Order, Peter Vroom, President, SCAP**
- Welcome and Introductions
- Review and Adjust Agenda

**9:40 a.m. Legislative Update and Strategic Discussions** (Gauger/Link)
- CASA Nonflushables Legislation - AB 1672 (Bloom)
- Federal NPDES Permit Terms Legislation - HR 1764 (Garamendi)
- Strategy for Potential Return of Ocean Discharge Ban Legislation

**10:00 a.m. Potential Educational Seminar on Advanced Treatment**
- Possible seminar/workshop on advanced treatment technologies, what it can do and can't do, disadvantages, and costs (Williams)

**10:30 a.m. Key Issues Update**
- **Toxicity**
  - State Water Board Toxicity Plan (Link)
  - Litigation Update (Jepsen)
- **ELAP Regulations**
  - Testimony, CAL Update, Regulations Release (All)
- **Sewer Exfiltration / *County of Maui* Case Update** (Jepsen/Link)
- **PFAS (All)**
  - Phase 3 Monitoring Outreach and Preparation (Link/Voskuhl)
  - General Unified Strategy (All)
- **SB 1383 Regulations** (Kester)

**11:30 a.m. Working Luncheon: Guest, Eileen Sobeck, Executive Director, State Water Resources Control Board**

**12:45 p.m. Regional Updates**

**1:15 p.m. Honoring Retiring Executive Directors**

**1:30 p.m. Adjourn**
- Next Meeting: Spring 2020

CALIFORNIA ASSOCIATION of SANITATION AGENCIES

1225 8th Street, Suite 595• Sacramento, CA 95814 • TEL: (916) 446-0388 • www.CASAweb.org

October 28, 2019

The Honorable Peter DeFazio
Chairman
Committee on Transportation & Infrastructure
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Sam Graves
Ranking Member
Committee on Transportation & Infrastructure
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Grace P. Napolitano
Chairwoman
Subcommittee on Water Resources and Environment
Committee on Transportation & Infrastructure
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Bruce Westerman
Ranking Member
Subcommittee on Water Resources and Environment
Committee on Transportation & Infrastructure
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairs and Ranking Members:

On behalf of the California Association of Sanitation Agencies (CASA), I write to express our appreciation and support for your effort to renew the Clean Water Act's SRF Program and to ensure adequate resources are available to meet the current and future water quality infrastructure needs of California and the nation. We look forward to working with the Committee as Congress considers H.R. 1497.

CASA is an association dedicated to protecting public health and the environment through effective wastewater treatment. We promote sustainable practices such as water recycling, biosolids management, and renewable energy production. We represent over 120 public agencies in California and focus on advocacy, education, and leadership.

We appreciate the Committee's efforts to incorporate provisions that modernize the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) program to better align NPDES permit terms to the realities of planning, designing, constructing and operating today's modern water quality treatment systems. Over the past several weeks, CASA has provided information on how best to design an NPDES permitting system that would provide states and USEPA with the discretionary authority to issue permits for terms up to ten years. It is our understanding that the Committee's review of this matter yielded an approach that would provide authority to regulators to issue an extended permit under specified circumstances, including where the permittee demonstrates it has performed as a good actor and is in compliance with water quality standards. While several important details remain to be worked out with these conditions on extended permit term eligibility, we will continue our efforts to work through them and come to a positive resolution.

In contrast, the Committee's consideration of an SRF reauthorization also includes provisions that would terminate a regulator's authority to issue administrative extensions of five-year permits and shift permit

development and issuance to USEPA when such permit renewals are delayed. We cannot support such a provision for a number of reasons.

Administrative extensions are a necessary part of the permit renewal process in some cases as local permittees and regulators work through issues relating to renewal of an NPDES permit. Many permits are delayed due to legal and technical issues that necessitate additional time to address, not because of failure on the part of regulators but because of complexity, emerging science and local concerns. Immediately elevating permits to USEPA will result in loss of local control, and place permitting in the hands of USEPA staff who may lack the specialized understanding of the intricacies of local watershed issues and needs. Additional financial, legal, and public participation concerns will inevitably result from interfering with the existing process of administratively extending five-year permits.

In our discussions with the Committee, we have explained the factors that make such an extraordinary change in the NPDES permitting process unreasonable. First and foremost, the priority to provide regulators with the discretionary authority to tailor permits to the permitted facility was in no way intended to disrupt the existing permitting program. The proposed provision unfortunately does precisely this by mandating that administrative extensions would be eliminated and requiring USEPA to renew the permit. Simply elevating the decision making will only serve to impose additional delays upon the renewal of a permit as USEPA restarts the permit renewal process. For this and other reasons, the imposition of such a mandate on five-year permit renewals is counterproductive. We request that this provision be removed from any attempts to provide discretionary authority to federal and state regulators to issue extended permit terms where circumstances warrant such permitting.

To be clear, while we whole-heartedly support the SRF reauthorization and the approach to include extended permit terms as part of that effort, we are vigorously opposed to any provisions that interfere with administrative extension of five-year permits. We will continue to work with the Committee to seek an approach on this matter as the legislation proceeds.

Again, we are grateful for the commitment that the committee has given to address the overwhelming needs of the nation's water infrastructure and look forward to working with you in the months ahead.

Sincerely,

Adam D. Link
Director of Operations

cc: The Honorable John Garamendi
The Honorable Jared Huffman
The Honorable Julia Brownley
The Honorable Alan Lowenthal
The Honorable Mark DeSaulnier
The Honorable Harley Rouda
The Honorable Doug LaMalfa

## Lorrie O'Neill

**From:** Eric Sapirstein <esap@ensresources.com>
**Sent:** Monday, October 28, 2019 4:29 PM
**To:** federal-legislative-affairs@lists.casaweb.org
**Cc:** alink@casaweb.org; jgauger@casaweb.org
**Subject:** Update on H.R. 1497 and Permit Terms
**Attachments:** CASA.H.R.1497.Position.Ltr.pdf

FLC Members,

After weeks of discussions and negotiations, House Committee on Transportation & Infrastructure staff reached an agreement over the weekend on legislation to address NPDES ten year permits, renew SRF funding, reauthorize the Alternative Water Source Act, codify the green infrastructure program, authorize a study into the presence of pathogens and need to revise secondary treatment standards, authorize funding for CSO/stormwater grants, and study workforce training needs.

### Extended NPDES Permit Terms Addressed

A key provision, Section 7, would establish a process to issue extended NPDES permit terms. The provision is outlined below. CASA, Committee staff and stakeholders have been negotiating and discussing potential language to get the concept of extended NPDES permit terms into this package for several months. While it is a significant win to get the concept included in this vehicle, CASA and other stakeholders actively worked against a separate committee Democratic staff provision to effectively eliminate administrative extensions of existing five year permits. Unfortunately, that provision ultimately ended up in this version of the bill. CASA submitted a letter (attached) outlining our general support for the SRF reauthorization and extended permit terms, while clearly stating our opposition to any language that would impact administrative extensions of five year permits.

### Next Steps

The Committee on Transportation & Infrastructure will consider the attached bill on Tuesday, October 29.

It will be a bipartisan bill, the Water Quality Protection and Job Creation Act (H.R. 1497).

We expect that Rep. Garamendi and others will highlight the need for revisions to the elimination of administrative extensions authority, potentially setting the stage for potential modifications to the provision in anticipation of House floor debate and a vote later this year or early next year. At the same time, we believe the Senate will be disinclined to accept the House committee action to eliminate administrative extensions when it considers a water infrastructure bill next year. Because of this, we are optimistic that the onerous provisions of the House bill related to administrative extensions will be addressed as part of any Senate bill that would lead to a conference committee negotiation next year.

The relevant provisions of the legislation are outlined in greater detail below. We will send out a follow up note later this week to report on the outcome of the markup.

- Eric

**Key Provisions of House Committee on Transportation & Infrastructure SRF Legislation**

**Section 7, National Pollutant Discharge Elimination System**

As drafted, the amendment to reauthorize the Clean Water Act SRF Program includes a handful on non-SRF provisions (attached). This includes Section 7, a new subsection, to authorize a state permitting authority to issue NPDES permit for a period of up to ten years. As drafted after weeks of negotiations between committee Democrat and Republican staff, and with input from stakeholders, including CASA, the measure, if enacted into law, would provide for the following:

- NPDES permits for POTWs (municipal sewage, recycled or reclaimed, and combined sewer overflow) could be issued for a period of up to ten years within the following understanding:
    - An extended permit would be subject to review by a state if a triggering event occurs within 60 days of such an event. If a state determines a modification is necessary, the modification must be made not later than 90 days after making a determination that modification is necessary. If a state fails to make a publicly available determination, USEPA would be required to make such modifications.
    - For purposes of any challenge to a USEPA modification, the state would only be considered the administrator of the permit.

- A municipality that is eligible to receive an extended permit term is one that has a history of compliance with the Clean Water Act that would be defined by USEPA rules subsequent to consultations with the public, including specifically POTWs.

- Triggering events that would cause a review of an extended permit's conditions are events:

  - State receives information that may be subject to existing regulatory requirements for review of a permit conditions

  - State identifies that a discharge of a permitted pollutant is made into an impaired water body (section 303(d) of CWA)

  - USEPA approves a new or modified TMDL that would apply to a permitted pollutant discharge

  - USEPA or State determines that a permitted pollutant discharged is directly related to contamination of "designated" public water supply source pursuant to section 303 of CWA and the discharge is related to a water quality standard violation or the pollutant is subject to a Safe Drinking Water Act Advisory issued by USEPA

- USEPA has one year to issue guidance and rules for determining eligibility for extended permits.

## Other Provisions

The bill would address several matters of interest to CASA that would benefit or impact CASA agencies. The following summarize these provisions:

- **Section 2. Wastewater Infrastructure Workforce Investment:** Within 2 years, USEPA must report to Congress on current and future workforce needs of POTWs and actions that USEPA has taken to address such needs.

- **Section 3. State Management Assistance:** A five year authorization of section 106 for state management assistance totaling $1.295 billion is provided.

- **Section 4. Watershed, Wet Weather, and Resiliency Projects:** An authorization of $110 million is provided to support efforts by POTWs to conduct studies, plans and construction to address resiliency through:

  - Water conservation or water use efficiency

  - Enhanced wastewater management by increasing watershed preservation and protection through green infrastructure, water reuse, and aqifer recharge

  - Modernization or relocation of facilities

    - Enhancement of energy efficiency or use of recovered or renewable energy

A setaside of 15% per year is required to support communities less than 10,000 population.

- **Section 5. Pilot Program for Alternative Water Source Projects:** The expired Alternative Water Source Act would be renewed to provide USEPA grants to communities seeking to construct water supply projects. As drafted, the program would:
    - Authorize $150 million to support grants
    - Limit assistance to project that have NOT received Title XVI construction assistance
    - Require 15% of appropriated assistance to support projects serving fewer than 10,000 individuals
    - Limit grants assistance to a project that has received funding under Title XVI (non-construction assistance) to $20 million or 25% of project cost (whichever is less)
- **Section 6. Sewer Overflow and Stormwater Reuse Municipal Grants:** The grants program is extended to 2025 and provides that the federal share of assistance shall be not less than 75% federal grants assistance to financially distressed communities. In addition, not less than 20% of grants shall be provided to communities with populations less than 20,000.
- **Section 8. Reports to Congress:** A report on the costs to implement resiliency and sustainability needs of POTWs is directed.
- **Section 9. Indian Tribes:** USEPA must reserve 2% or $30 million (greater of two) for tribal needs.
- **Section 10. Capitalization Grants:** Revisions to the use of SRF capitalization grants are directed to allow for efficient energy use including technologies to recapture and reuse energy produced in wastewater treatment process. A state would be directed to reserve not less than 15% of SRF grant to support green infrastructure, water or energy efficiency improvements or environmentally innovative activities.
- **Section 11. Water Pollution Control Revolving Loan Funds:** Use of funds is expanded to allow for grants in addition to existing purposes. A state is authorized to use up to 30% of its annual capitalization grant award (or annual average of prior ten year amounts deposited into SRF by a state that exceed its mandatory 20% contribution) to support at least 10% of its fund to provide additional subsidization.
- **Section 12. Allotment of Funds:** Authorizes a state to reserve up to 1% of its SRF allotment to support workforce development.
- **Section 13. Reservation of Funds for Territories of the U.S.:** Requires a 1.5% setaside for Territories prior to state allotments being made.
- **Section 14. Authorization of Appropriations:** $14 billion authorized over five years for the SRF.
- **Section 15. Technical Assistance By Municipal Ombudsman:** Authorizes assistance to small, rural and triable communities to comply with CWA.
- **Section 16. Report on Financial Capability of Municipalities:** Requires USEPA to conduct a study into the ability of municipalities to implement mandates of CWA. Requires review of reports conducted by National Environmental Justice

Advisory Council and report prepared by AWWA, NACWA, WEF. Consideration of USEPA Environmental Finance Advisory Board also to be required.

- **Section 17. Review of Secondary Treatment Technologies:** USEPA is to seek information from public on POTW capabilities to reduce effluent concentrations of pathogens. Once data collection completed, USEPA to determine whether secondary treatment standards for pathogens should be revised. Until such time as a determination of standards effectiveness is made, USEPA would be barred from changing wastewater blending, bypass or peak wet weather discharges.

**Bay Area Clean Water Agencies**
**Executive Director Recruitment Ad List**
**September 2012**

| Publication/Site Name | Actual Cost |
|---|---|
| **American Public Works Association** | $ 150.00 |
| **American Water Resources Association** | $ 495.00 |
| **American Water Works Association** | $ 349.00 |
| **National Association of Clean Water Agencies** | $ 250.00 |
| **Brown and Caldwell Water jobs** | $ 200.00 |
| **California Water Environment Association** | $ 275.00 |
| **CASA** | $ - |
| **Careers in Government** | $ 125.00 |
| **League of California Cities Online Posting** | $ 250.00 |
| **LinkedIn** | $ 295.00 |
| **Jobs Available Bulletin** | $ 472.50 |
| **Water Environment Federation** | $ 250.00 |
| **Total Cost** | **$ 3,111.50** |

BACWA
BAY AREA
CLEAN WATER
AGENCIES

# Executive Director Opportunity

## ABOUT BACWA

BACWA is a joint power agency (JPA), formed under the California Government Code by the five largest wastewater treatment agencies in the San Francisco Bay Area. Our members include the many municipalities and special districts that provide sanitary sewer services to more than 7.1 million people. BACWA is dedicated to working with our members, state and federal regulatory agencies, and non-governmental organizations to improve and enhance the San Francisco Bay environment. We provide technical expertise and a public utility perspective to ensure that regulations affecting our members are well-informed, thoughtful, and effective. More information about BACWA can be found at www.bacwa.org.

## MISSION

Through leadership, service and advocacy for its members, BACWA provides an effective regional voice for the clean water industry's role in stewardship of the San Francisco Bay environment.

## VISION

Develop a region-wide understanding of the watershed protection and enhancement needs of the San Francisco Bay Estuary, through reliance on sound scientific, environmental and economic information, and ensure that this understanding leads to long-term stewardship of the Estuary.

## ABOUT THE POSITION

BACWA seeks a dynamic, results-oriented Executive Director committed to supporting BACWA's diverse membership and promoting stewardship of the Bay environment on a regional level.

The new Executive Director will promote BACWA's high standards for quality services through effective communication, progressive visionary leadership, and consensus building to foster collaborative partnerships with member agencies, legislators, regulatory agencies (i.e., including but not limited to U.S. EPA, the State Water Resources Control Board, the San Francisco Bay Regional Water Quality Control Board and the Bay Area Air Quality Management District) non-governmental organizations, the scientific community, industry associations and BACWA's counterparts around the state.

The Executive Director will support all activities related to the management and governance of the organization, report to the Executive Board, and promote progressive programs, services, and advocacy efforts in support of BACWA's public utility members and the clean water community in the San Francisco Bay region. From a strategic perspective, leadership and collaboration will be vital to the role of the Executive Director. The new Director will also provide effective administration for the JPA, including financial and contract management as well as member coordination and support. The Executive Director is supported by an Assistant Executive Director and a Regulatory Program Manager.

## DESIRABLE QUALITIES OF THE EXECUTIVE DIRECTOR

- Effective strategic thinker and planner.
- Track record of building coalitions and resolving conflicts.
- Collaborative and engaging style, responsive and approachable.
- Clear communicator
- Analytical, objective, and fair with solid creative problem-solving skills.
- Skill in effective governance, management, budget administration, and contract management.
- Politically astute with an ability to work effectively with a large and diverse set of stakeholders.
- A strong technical understanding of processes, methods, and technology related to wastewater management and water quality.
- Possesses exceptional organization skills with the ability to shift strategies and drive new solutions.

## THE IDEAL CANDIDATE POSSESSES

- A strong background in building relationships with a wide variety of stakeholders within a major public service industry, such as wastewater, water, or similar JPA, NGO, or professional membership association.
- A solid understanding of the Basin Plan and other guiding documents for water quality regulation in the Bay.
- The ability to quickly analyze situations, identify the most critical issues, and develop appropriate courses of action.
- A knowledge of current environmental regulatory issues facing the wastewater industry in California and nationally and the skillset to address them and guide the Board to appropriate solutions.
- Familiarity with issues related to nutrients in the Bay, including the San Francisco Bay Nutrient Watershed Permit, and wastewater treatment plant discharge permits.
- Ability to maintain and enhance the current cohesive and respectful relationship amongst the Board as well as the BACWA membership.
- Active and genuine commitment to inclusion and equity in the workplace and encouraging high performing teams.
- Ability to improve internal policies and procedures as necessary to improve the effectiveness of the JPA.
- Any combination of wastewater treatment operation, engineering, or regulatory experience.

## LICENSE

Valid California class C driver's license with satisfactory driving record may be required to effectively meet the mobility demands of the position.

## COMPENSATION

The Executive Director serves as an independent contractor. Compensation will be based upon candidate qualifications.
For more information on other allowances and expenses associated with the position, please visit K&A Recruiting's site at: https://koffassociates.com/category/opportunities/.

## APPLICATION PROCESS

To apply for this outstanding opportunity, please visit http://koffassociates.com/opportunities/. You may also mail your cover letter and resume to Koff & Associates, 2835 Seventh Street, Berkeley, CA 94710. If you have any questions, please email the Koff & Associates recruitment representative, Brandon Romo, at bromo@koffassociates.com.
*BACWA is an equal employment employer encouraging workforce diversity.*
**Deadline to apply is Monday, November 25th.**

Collection Systems Committee Report to BACWA Board

Collection Systems Committee Meeting on: 10/24/19
Executive Board Meeting Date: 11/15/19
Committee Chairs: Andrew Damron and Steve Sauter

**Committee Request for Board Action: None**

**36 attendees, representing 21 member agencies.**

**Regional Water Board report**

Jessica Watkins gave an update from the Regional Water Board. She listed the following as their enforcement priorities for FY20:

- Reporting violations
- Spills greater thank 50K gallons
- CIPs

The Regional Water Board is no longer using a spreadsheet approach to identify agencies to select agencies for inspection, but is instead randomly selecting facilities from among the top bracket of agencies reporting high numbers of SSOs. This change is aimed at unbiasing the selection process.

There was a discussion about requiring PSL ordinances as a "feasible alternative" for agencies requesting permission to blend. Ross Valley Sanitary District reported that they adopted an ordinance in their District.

Jessica gave a summary of Region 2's comments to the State Water Board regarding the SSS WDR:

- Recommended that the 48-hour water quality sampling deadline is too long, since water quality impacts will have dissipated
- Requested feedback on whether the 50K gall threshold for technical reporting is a net or gross volume
- Recommended requiring photographs of spills
- Requested feedback on the bacterial indicators that should be monitored for after a spill
- Recommended that the State Water Board develop a 1-page flow chart to summarize requirements

Region 2 did not comment on issues relating to exfiltration.

**SSS WDR Update (Paul Causey)**

The adoption date for the revised SSS WDR has been pushed back to 2021. There will likely be a stakeholder review draft in the next two to three months. State Water Board staff are developing metrics for well-performing agencies, but it is difficult to determine how to make apples-to-apples comparisons between agencies. The intention is to post the names of the well performing agencies. For those who are not well-performing, that State Water Board will want to see progress reducing SSO rates with every audit. There is a new definition proposed in the WDR: a "Non-Federal Water", which would apply to groundwater. "Exfiltration" is now being referred to as "leakage". NGOs have been pushing for the the SSS WDR to be an NPDES permits, but that has not gained traction so far. Diana Messina gave a presentation at the October 17 CWEA Sewer Summit that will be shared with the committee.

**PG&E's Public Safety Power Shut-Offs**

Several agencies were affected by the first round of PSPS outages. Central San had 8 to 9 pump stations in areas without power, all of which had backup generators. Fuel distribution was the biggest concern. NapaSan lost power for 40 hours. Agencies discussed rescheduling routine maintenance and inspections during PSPS events.

**Enforcement – Smoke testing and illicit connections at private residences**

There was a discussion about different options for compelling homeowner compliance with sewer lateral ordinances, such as disconnecting service. Agencies may be able to do the work themselves, then charge the owner, or add the cost to property tax bills. State law requires agencies hold a hearing for noncompliance properties that can lead to condemnation of the noncompliant property. The Alto Sanitary Distract will provide information on related statute that can be used by other agencies.

**Next Collection System Committee Meeting**

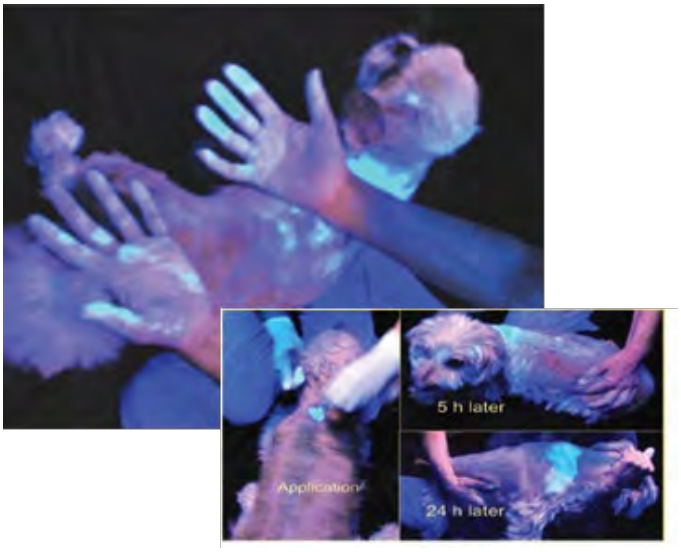
Our next committee meeting will be held on January 23, 2020.

# Help Pet Owners Avoid Exposure to the Toxic Chemicals in Topical Flea & Tick Control Products

**Indoor Flea and Tick Treatments Leading to Environmental and Public Health Concerns**

To avoid exposing pets, their owners, and Bay Area waterways to toxic pesticides, members of the Bay Area Clean Water Agencies (BACWA) are urging veterinarians and other animal care professionals to recommend their clients to use oral medications for fleas and tick control, and to discourage the use of topical treatments.

There is increasing evidence that pesticides from flea and tick control products such as spot-on treatments, collars, indoor foggers and sprays are finding their way into our local waterways, sometimes at concentrations above toxicity thresholds for aquatic species. The California Department of Pesticide Regulation (DPR) is also currently reviewing uses of fipronil and imidacloprid, the active ingredient in many common spot-on topicals, due to possible human health risks.




*The photos above are part of a study in which researchers incorporated a fluorescent dye into a spot treatment to document the spread of the application. Photographs are reprinted from Bigelow Dyk, M., et al. (2012). Fate and distribution of fipronil on companion animals and in their indoor residences following spot-on flea treatments, Journal of Environmental Science and Health, Part B: Pesticides, Food Contaminants, and Agricultural Wastes, 47(10): 913-924. Reprinted by permission Taylor & Francis LLC.*

**Helpful tips:**

- **Oral medications may be more effective than topical spot treatments while reducing the pet owner's exposure to toxic chemicals.** According to some scientific studies, oral flea and tick medications appear to be more effective than topical treatments and collars possibly because they are easier to use as directed. Some oral flea control products *also* control ticks and other parasites, such as hookworms, roundworms, and/or heartworms.
- **The best way for pet owners to avoid flea problems may be to use oral medications *and* vacuum at home regularly to thoroughly remove larvae and eggs.** It is estimated that adult fleas only account for five percent of the total flea population. The other 95 percent are eggs, larvae and pupae laying around the home.
- **Vets are a trusted source for flea and tick control information.** Please help us educate Bay Area pet owners about the efficacy of oral medications and the toxicity of pesticides in spot-on treatments.

In response to this emerging concern, BACWA has compiled relevant information on our website to help veterinarians and other animal care professionals better understand human health and environmental concerns with topical indoor flea and tick control. For scientific insights, links to ongoing studies, and recommendations for your clients, visit: baywise.org/business/veterinary. Information for pet owners can be found at: baywise.org/residential/pets.

*BACWA represents 55 publicly owned wastewater treatment facilities and collection system agencies serving nearly 7.2 million San Francisco Bay Area residents. BACWA is concerned with pesticides that have transport pathways to the sanitary sewer; even the most sophisticated wastewater treatment plants cannot fully remove complex chemicals like pesticides.*

BACWA BAY AREA CLEAN WATER AGENCIES

# Operations and Maintenance Infoshare Group Report to BACWA Board

Committee Meeting on: 10/30/19
Executive Board Meeting Date: 11/15/19
Committee Chairs: Kevin Dickison and Joaquin Gonzales

Committee Request for Board Action: None

**11 attendees representing 5 member agencies**

**Highlights of New Items Discussed and Action Items**

**Roundtable discussion - Onboarding new staff**

EBMUD has formalized its process for onboarding new staff into a manual and checklist. They shared this material with the group. Delta Diablo also has a formal 24-wekk onboarding process.

There was a discussion about the following elements:

- Appropriate level of supervision, and supervision timeline for new staff.
- Subjective versus objective assessments for new staff prior to promotion
- Requirements of unions for onboard process
- Preferred level to hire at (OIT vs. Level I, etc.)
- Whether a solo Operations staff person can oversee the plant at night

**Round Table Discussion – PSPS Shutdowns**

Agencies discussed the impacts of the various PG&E Public Safety Power Shutdowns in October. The consensus was that the attendees were able to secure adequate backup power, but in the event of an extended shutdown, acquiring and distributing fuel would be the biggest challenge. It was noticed that the City of Windsor WWTP was shut down because the town was evacuated. There was a discussion about cogeneration facilities at WWTP – whether the plants that are tied to the grid can "island" themselves during a shutdown. Facilities may also be impacted by contractors who may lose power – for example, CalTest lost power in the shutdowns and only had backup power generation to cover their refrigeration units.

**FSSD Tour**

Attendees were invited to tour FSSD's new blower.

**Next Meeting: Oro Loma SD, date tbd**

# Executive Director's October 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.
-Participated in a conference call of the NBS CMG on the preparation of the Scoping and Evaluation Plan required by the WS Permit.
-Met with the NMS Planning Subcommittee to discuss the possibility of extending the WS Permit beyond five years.
-Participated in a conference call to discuss the n ext steps in the development of the Assessment Framework
-Coordinated with HDR consultant team on the Scoping and Evaluation Plan for the Regional Recycled Water Report required under the 2nd Watershed Permit.
-Coordinated with HDR in planning for the next Group Annual Report

**BACWA BOARD MEETING AND CONFERENCES:**

-Worked with staff in preparing for the September Pardee Technical Seminar.
-Conducted the monthly agenda review with the Chair of BACWA
-Held the Annual Pardee Technical Seminar
-Continued to track all action items to completion.

**ASC/SFEI:**

-As the Chair of the Governance Committee, coordinated with the SFEI Executive Director on committee activities.

**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.

**FINANCE:**

-Reviewed the monthly BACWA financial reports with the RPM.
-Worked with the AED/EBMUD to send out the Principal's invoices for FY 20.
-Coordinated with the consultant on the internal audit report

**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
-Coordinated with CASA and SCAP on commenting on the upcoming PFAS monitoring program
-Coordinated with the consultant on completing the chlorine residual Basin Plan Amendment (BPA)
-Discussed options with San Jose for establishing a Reporting Limit for the BPA.
-Met with the Water Board staff to discuss how best to set a Reporting Limit for the BPA and approach to the meeting with the SWRCB staff on sensitive species testing

**AIR COMMITTEE:**

-Planned for and held the annual coordination meeting with BAAQMD staff.

**BAPPG COMMITTEE:**

-Coordinated with the RPM on the next steps for preparation of the CEC White Paper.

**COLLABORATIONS:**

-Coordinated with CASA Regulatory Program Manager and Executive Director on regulatory issues of mutual concern.
-Continued serving as contract administrator for a research effort with UC Merced.

**WOT:**

-Worked with the Executive Committee to plan the direction of the BACWWE program.

**BACC:**

**-**Coordinated with DSRSD on the transfer of the Bay Area Chemical Consortium activities to BACWA and attended the annual wrap-up meeting for FY 19 held for the participants in the BACC.

**MANAGER'S ROUNDTABLE**

-Planned for the October quarterly Bay Area Manager's Roundtable Meeting.

**ADMINISTRATION:**

-Planned for and conducted the monthly BACWA staff meeting to prepare for the Board Meeting and to coordinate and prioritize activities.
-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 RPM 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.

**MISCELLANEOUS MEETINGS/CALLS:**

-BACWA Chair and Committee Chairs on items that arose during the month
-Water Board staff on coordinating the nutrient activities
-Other miscellaneous calls and inquiries regarding BACWA activities
-Participated in coordination calls with the consultants working on the reports required under the 2nd Watershed Permit.
-Responded to Board members requests for information

**BACWA BOARD CALENDAR**
**October 2019 to September 2020**

| DATE | AGENDA |
|---|---|
| **11/15/2019** | **Consent** |
| **Monthly Board Mtg** | Previous Board Meeting Minutes |
| Items due: 11/8 | Monthly Financial Report |
| Schectel, Mutsuddy, White, Zipkin, Chastain | **Authorizations & Approvals** |
| Williams; Fono; O'Neill | Approval: Adoption of FY19 Annual Reports |
| | **Other Business - POLICY/STRATEGIC** |
| | Discussion: Risk reduction update |
| | Discussion: Water Board Jt Mtg Draft Agenda |
| | Discussion: ReNUWIt 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 |
| **12/17/2019** | |
| **Joint Meeting - Water Board** | **Other Business: Discussions** |
| Schectel, Mutsuddy, White, Zipkin, Chastain | |
| Williams; Fono | |
| **12/20/2019** | **Consent** |
| **Monthly Board Mtg** | Previous Board Meeting Minutes |
| Items due: 12/13 | Monthly Financial Report |
| Schectel, Mutsuddy, White, Zipkin, Chastain | **Authorizations & Approvals** |
| Williams; Fono; O'Neill | **Other Business - POLICY/STRATEGIC** |
| **HOLIDAY & COMMITTEE** | Discussion: Water Board Jt Mtg Debrief |
| **LEADER APPRECIATION** | Discussion: Update on CASA Climate Change Program |
| **LUNCH** | **Other Business - OPERATIONAL** |
| | Discussion: Annual Meeting Agenda |
| | Discussion: Budget Schedule & Key Issues |
| | Discussion: ED Recruitment |
| | **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, Mutsuddy, White, Zipkin, Chastain | RMP & NMS Update |
| Williams; Fono; O'Neill | EPA, CWRCB, RWCB, Air Dist, |
| **2/21/2020** | **Consent** |
| **Monthly Board Mtg** | Previous Board Meeting Minutes |
| Items due: 2/8 | Monthly Financial Report |
| Schectel, Mutsuddy, White, Zipkin, Chastain | **Authorizations & Approvals** |
| Williams; Fono; O'Neill | Approval: |
| | **Other Business - POLICY/STRATEGIC** |
| | Discussion: Pesticides Update |
| | Discussion: Joint Meeting Debrief |
| | **Other Business - OPERATIONAL** |
| | Discussion: 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, Mutsuddy, White, Zipkin, Chastain | **Authorizations & Approvals** |
| Williams; Fono; O'Neill | **Other Business - POLICY/STRATEGIC** |
| | Discussion: Water Board Jt Mtg Debrief |
| | Discussion: Update on CASA Climate Change Program |
| | **Other Business - OPERATIONAL** |
| | Discussion: Second Draft of FY21 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, Mutsuddy, White, Zipkin, Chastain | |
| Williams; Fono | |

| | |
|---|---|
| **4/19/2020** | **Consent** |
| **Monthly Board Mtg** | Previous Board Meeting Minutes |
| Items due: 4/12 | Monthly Financial Report |
| Schectel, Mutsuddy, White, Zipkin, Chastain | **Authorizations & Approvals** |
| Williams; Fono; O'Neill | Approval: FY21 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 |

| | |
|---|---|
| **5/15/2020** | **Consent** |
| **Monthly Board Mtg** | Previous Board Meeting Minutes |
| Items due: 5/10 | Monthly Financial Report |
| Schectel, Mutsuddy, White, Zipkin, Chastain | **Authorizations & Approvals** |
| Williams; Fono; O'Neill | 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 |

| | |
|---|---|
| **6/19/2020** | **Consent** |
| **Monthly Board Mtg** | Previous Board Meeting Minutes |
| Items due: 6/14 | Monthly Financial Report |
| Schectel, Mutsuddy, White, Zipkin, Chastain | **Authorizations & Approvals** |
| Williams; Fono; O'Neill | Approval: FY21 Agreements |
| | Approval: Officers: Chair & Vice-Chair FY21 |
| | **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

**?/?/2020**

**Joint Meeting - Water Board**

Schectel, Mutsuddy, White, Zipkin, Chastain

Williams; Fono

**7/17/2020**

Items due: 7/12

Schectel, Mutsuddy, White, Zipkin, Chastain

Williams; Fono; O'Neill

Monthly Financial Report

**Authorizations & Approvals**

Approval: Annual Nutrient WS Payment
Approval: FY21 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

**8/21/2020**

**Monthly Board Mtg**

Items due: 8/9

Schectel, Mutsuddy, White, Zipkin, Chastain

Williams; Fono; O'Neill

**Consent**

Previous Board Meeting Minutes
Monthly Financial Report

**Authorizations & Approvals**

Approval:

**Other Business - POLICY/STRATEGIC**

Discussion: Water Board Jt Mtg Debrief
Discussion: Nutrient removal from RO concentrate by BAC
Discussion: Agenda for AIR meeting with BAAQMD on 9/3
Discussion: CASA Climate Change update

**Other Business - OPERATIONAL**

Discussion: Pardee Agenda

| | |
|---|---|
| | **Reports**<br>Committee Reports (Committee Chairs)<br>Board Reports (Executive Board)<br>ED Report (ED)<br>RPM Report (RPM)<br>Other BACWA Representative Reports |
| **To Be Determined**<br>**Pardee Technical Seminar**<br>Schectel, Mutsuddy, White, Zipkin, Chastain<br>Williams; Fono; O'Neill | **No Board Actions Permitted** |
| **10/18/2019**<br>**Monthly Board Mtg**<br>Items due: 10/11<br>Schectel, Mutsuddy, White, Zipkin, Chastain<br>Williams; Fono; O'Neill | **Consent**<br>Previous Board Meeting Minutes<br>Monthly Financial Report<br>**Authorizations & Approvals**<br>Approval:<br>**Other Business - POLICY/STRATEGIC**<br>Discussion: Pardee Debrief & Survey<br>Discussion: RABAC Presentation (Standford)<br>**Other Business - OPERATIONAL**<br>Discussion: ED Recruitment<br>**Reports**<br>Committee Reports (Committee Chairs)<br>Board Reports (Executive Board)<br>ED Report (ED)<br>RPM Report (RPM)<br>Other BACWA Representative Reports |

***CURRENTLY UNSCHEDULED & SIGNIFICANT***

Suggestions for Monthly Meeting Guest Speakers/Presenters

* Jim McGrath, State Water Board in 2020

# BACWA ACTION ITEMS

| Number | Subject | Task | Responsibiity | Deadline | Status |
|---|---|---|---|---|---|
| | **Action Items from October 18, 2019 BACWA Executive Board Meeting** | | | | |
| 2019.8.17 | Forum for Innovative Technology | Consider options for members to learn about innovative nutrient treatment technologies | ED | 11/10/2019 | complete |
| 2019.8.16 | Bacterial objectives BPA | Bring to Board proposal to support adding Bacterial Objectives BPA to Nov Board meeting | ED | 11/10/2019 | complete |
| 2019.8.15 | Annual Meeting supplies | Water bottles, name tags, lanyards, table stands, | AED | 12/15/2019 | |
| 2019.8.14 | Use of NBS Funds for existing wetland projects | Contact Regional Water Board to ensure they are in agreement with approach | ED | 11/10/2019 | complete |
| | **Action Items Remaining from Previous BACWA Executive Board Meetings** | | | | |
| 2019.8.12 | BAAQMD Permit Backlog | Set up separate meeting to discuss with Air District management | RPM/ED | 11/30/2019 | pending |
| 2019.7.05 | Sewer Rate Survey | Post as Google Sheet, and publicize update | RPM | 8/31/2019 | pending |
| 2018.4-93 | Website Policy | Add reference to regulatory requirements for Agency websites | ED | 4/30/2019 | pending |

FY20: *14 of 17 Action Items completed*
FY19: *109 of 110 action Items completed*
FY18: *66 of 66 Action Items completed*
FY17: *90 of 90 Action Items completed*

# Regulatory Program Manager's Report to the Board

**October 2019**

**NUTRIENTS:** Review of draft Scoping and Evaluation Plans for RW Evaluation and NBS study.

**BACWA BULLETIN**: Drafted October Bulletin.

**COLLABORATIONS:** Attended RMP Annual meeting and State of the Estuary meeting.

**CECs:** Finalized BACWA Microplastics Fact Sheet. Attended SFEI/5 Gyres Microplastics Symposium. Discussed RMP CECs Synthesis with SFEI staff and hosted conference call. Met with State Water Board staff on PFAS monitoring plans.

**TOXICITY:** Met with State Water Board staff on Sensitive Species Screening. Testified at State Water Board Toxicity hearing.

**CHLORINE RESIDUAL:** Worked with consultant to distribute survey on chlorine and SBS use.

**HG/PCB WATERSHED PERMIT:** Reviewed APAFSS risk reduction Final Report.

**COMMITTEE SUPPORT:**
**BABC –** Scheduled remaining meetings for 2019.
**BAPPG –** Updated Baywise website.
**Biosolids –** Began soliciting information for 2019 Solano County Biosolids application report.
**Collection Systems –** Developed agenda and attended meeting and performed followup. Drafted Board report.
**Laboratory -** Planned meeting and attended meeting. Drafted Board Report.
**Permits –** Drafted agenda and planned meeting with Chair. Attended meeting.
**Recycled Water –** Developed meeting notes and Board report.
**Executive Board –** Worked to post agenda for special Executive Board meeting. Updated and posted Regulatory Issues Summary.

**ADMINISTRATION/STAFF MEETING –** Met with BACWA staff to plan Executive Board meeting, and discuss BACWA operations. Managed committee Google Groups. Worked with AED to provide training on BACWA operations. Finalized text for FY19 BACWA Annual Report.

**MEETINGS ATTENDED**:
Sensitive Species Screening Meeting with SWB staff (10/1), Microplastics meeting (10/2), SWB toxicity hearing (10/3), Lab Committee (10/8), Permits committee (10/8), CECs call with RMP (10/8), RMP Annual Meeting (10/10), NBS meeting (10/11), Meeting with SWB on PFAS (10/15), Executive Board meeting (10/18), State of the Estuary meeting (10/21), Collection Systems Committee (10/24), O&M Infoshare (10/30).