EAST BAY DISCHARGERS AUTHORITY
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A Joint Powers Public Agency

ITEM NO. 11

REGULATORY AFFAIRS COMMITTEE AGENDA

Wednesday, January 15, 2020
9:00 a.m.

East Bay Dischargers Authority
2651 Grant Avenue, San Lorenzo, CA 94580

Committee Members: Johnson (Chair); Cutter

RA1. Call to Order

RA2. Roll Call

RA3. Public Forum

RA4. EBDA NPDES Performance – See Item OM4
(The Committee will review NPDES Permit compliance data for October 2019.)

RA5. Nutrients Update
(The Committee will discuss science related to nutrients in the Bay.)

RA6. California Water Resilience Portfolio Draft
(The Committee will discuss the recently released draft report.)

RA7. Adjournment

(Any member of the public may address the Commission at the commencement of the meeting on any matter within the jurisdiction of the Commission. This should not relate to any item on the agenda. It is the policy of the Authority that each person addressing the Commission limit their presentation to three minutes. Non-English speakers using a translator will have a time limit of six minutes. Any member of the public desiring to provide comments to the Commission on an agenda item should do so at the time the item is considered. It is the policy of the Authority that oral comments be limited to three minutes per individual or ten minutes for an organization. Speaker's cards will be available in the Boardroom and are to be completed prior to speaking.)

(In compliance with the Americans with Disabilities Act of 1990, if you need special assistance to participate in an Authority meeting, or you need a copy of the agenda, or the agenda packet, in an appropriate alternative format, please contact the Administrative Assistant at the EBDA office at (510) 278-5910 or kyambao@ebda.org. Notification of at least 48 hours prior to the meeting or time when services are needed will assist the Authority staff in assuring that reasonable arrangements can be made to provide accessibility to the meeting or service.)

(In compliance with SB 343. related writings of open session items are available for public inspection at East Bay Dischargers Authority, 2651 Grant Avenue, San Lorenzo, CA 94580. For your convenience, agenda items are posted on the East Bay Dischargers Authority website located at http://www.ebda.org.)

The next Regulatory Affairs Committee meeting is scheduled for Wednesday, March 18, 2020, at 9:00 a.m.

Agenda Explanation
East Bay Dischargers Authority
Regulatory Affairs Committee
January 15, 2020

ITEM NO. RA4 EBDA NPDES PERFORMANCE – NPDES PERMIT

Please see the Operations and Maintenance Committee agenda, Item No. OM4 for permit compliance data.

ITEM NO. RA5 NUTRIENTS UPDATE

Recommendation
For the Committee's information only; no action is required.

Background
While the loads of nutrients such as nitrogen and phosphorus to San Francisco Bay are higher than other estuaries, the Bay has historically been very resilient, and negative impacts of nutrient enrichment such as eutrophication have not occurred. Over the last decade, concerning trends caused the scientific and regulatory community to question whether the Bay's resilience is weakening. Bay Area wastewater agencies, through the Bay Area Clean Water Agencies (BACWA), have participated in a positive collaboration with a wide variety of stakeholders to implement a Nutrient Management Strategy that focuses on conducting scientific research and modeling to determine the effects of nutrients on the Bay ecosystem and protective levels of nutrient loading going forward.

An initial Watershed Permit for nutrients was adopted in 2014 and required BACWA to begin reporting on nutrient loads and trends, conduct a study estimating the cost for each plant to optimize or upgrade for nutrient reduction, and provide funding to advance the science. A second Watershed Permit went into effect on July 1, 2019 and includes continued annual regional reporting, Increased funding for scientific research on the fate and effects of nutrients in the Bay (BACWA is contributing $2.2M annually, of which EBDA will be responsible for $273k per year), and regional assessments of reducing nutrients through multi-benefit nature-based solutions, including wetlands and horizontal levees, and water recycling.

Discussion
Scientific research on nutrients in the Bay is conducted by a team at the San Francisco Estuary Institute (SFEI) under the direction of the multi-stakeholder Nutrient Management Strategy. To mark the close of the first five-year term of the science program, the SFEI team put together the attached summary of the state of the science. The document outlines what has been learned and what is still unknown, hinting at the next phases of work. The ongoing collaboration between SFEI scientists, the wastewater community, and the regulators has been extremely positive and critical to ensuring that the scientific work is focused on answering key management questions. As noted previously, Regional Water Board staff has expressed openness to extending the term of the current Watershed Permit beyond 2024 if additional research time is needed prior to implementing nitrogen load caps.

San Francisco Bay Nutrient Management Strategy Science Program

State of the Science: Major observations (entering fy2020)

1. Anthropogenic nutrient loading rates to San Francisco Bay (SFB) rank at the 90%ile among estuaries worldwide (kg N /m^2/ d; kg P/ m^2/d).
    - Treated effluent from wastewater treatment plants (WWTPs) represent the primary N and P source throughout most of SFB and most of the year. Suisun Bay is a notable exception, because it receives substantial inputs from the Delta (some of which is WWTP-sourced).
    - Nutrient loads to SFB are increasing. For example, combined N loads from the region's five largest WWTPs have increased 25-30% between 2000 and 2018.
2. Nutrient loads and concentrations are sufficiently high that adverse impacts are plausible. Plausible impacts include: large phytoplankton blooms and low dissolved oxygen (DO) in open-Bay and slough/creek habitats; harmful algae blooms (HABs) in open-Bay and slough/creek habitats; and impacts within coastal habitats related to nutrients exiting SFB via the Golden Gate.
3. Despite high nutrient concentrations, DO levels in open-Bay habitats (deep subtidal) appear to be at acceptable levels most of the time (>5 mg/L), and, although substantial phytoplankton blooms do occur seasonally, they tend to be short-lived.
    - The generally low phytoplankton levels and sufficient DO occur because a combination of physical (strong tides, turbid waters) and biological (clam grazing) factors effectively cap phytoplankton growth and also ventilate the water column. Some factors that have regulated phytoplankton blooms have changed have changed over time (suspended sediments, clam grazing), leading to increased phytoplankton biomass during some seasons and in some regions of SFB.
4. In Lower South Bay's slough and creek habitats, elevated phytoplankton biomass and low DO are frequently observed.
    - *Impacts of low DO?* It has not yet been determined whether observed drops in DO are causing adverse impacts. During summer months, DO concentrations do commonly fall below the Basin Plan 5 mg/L standard, however the DO dips tend to be short-lived (hours; influenced by tidal action). In addition biological survey data indicate that fish abundance and diversity are high relative to other SFB margin habitats.
    - *high nutrients → high phyto biomass → low DO ?* It stands to reason that elevated nutrients contribute to the elevated biomass in sloughs and creeks. It is also entirely plausible that the increased biomass loading to sloughs and creeks contributes to the DO drops. On-going projects are exploring causal factors for low DO -- i.e., the degree to which DO deficits are caused by excess nutrients. Field observations suggest that on-going salt pond restoration efforts, combined with elevated nutrients, contribute to the elevated phytoplankton biomass and low DO events. Salt ponds' physical environment-- shallow, long residence time, warmer temperature -- allows for high phytoplankton growth rates. The restoration of hydraulic connections between the Bay and salt ponds allows: i) Delivery of WWTP-derived nutrients to

the salt ponds via tidal exchange, thereby fueling phytoplankton growth within ponds; and ii) Export of phytoplankton biomass to slough and open-Bay habitats, where its respiration can draw down DO levels. Additional work is needed to better quantitatively understand the combined physical-biogeochemical interactions and the effects on SFB water quality, in particular, to evaluate how changes in salt pond management (opening/closing gates; opening up new salt ponds to tidal exchange) could impact water quality in the future.

- There is also legitimate concern that high-nutrient/high-productivity conditions in restored ponds could foster harmful algae growth. Only some limited survey work has been conducted thus far, and more work is needed in the future to evaluate the importance of this issue.

5. HAB-forming phytoplankton species are commonly detected throughout the Bay, and multiple HAB-toxins (domoic acid, DA; microcystins, MCY; saxitoxin, STX) occur in water and biota.
   - Water: (spatially-integrated measurements, SPATT; and discrete, particulate toxin, PTOX). Dissolved MCY and DA have been consistently detected by SPATT over several years of sampling (>70% and >90%, respectively). In addition, PTOX-MCY and PTOX-DA levels have varied substantially in space and time, with a high number of non-detects.
   - Biota: Multiple HAB-toxins are frequently detected in naturally-occurring mussels collected biweekly along the Central Bay and South Bay perimeters.
     - DA_{mussel} levels are typically much lower than advisory levels for human consumption (20,000 ppb).
     - MCY_{mussel} levels, though, have regularly approached and sometimes exceeded advisory thresholds (10 ppb).
     - STX_{mussel} levels have, in general, been well-below regulatory thresholds. However, STX_{mussel} levels exceeded human health thresholds at Central Bay sites in Spring 2018, resulting in a California Department of Public Health advisory against shellfish consumption.
   - The effects on wildlife from multiple toxin exposure at the levels observed in SFB are unknown.
6. Identifying the sources of HAB-organisms and their toxins -- in particular determining the degree to which SFB's elevated nutrients favor their growth and toxin production -- is highly-relevant to management decisions, and therefore a high priority, but will be challenging to nail down.
   - It is certainly likely that some fraction of the HAB-organisms and toxins observed in SFB were transported into the system (e.g. MC from the Delta and local Bay Area watersheds; DA and STX from the coastal ocean).
   - While HAB growth and toxin production within SFB are also possible, the extent to which SFB's elevated nutrients contribute to HAB occurrence is poorly understood. A complex combination of environmental forcings and cues influence HAB events, making it difficult to isolate the contributions of individual causal factors. Over the past few years, additional HAB-related monitoring and targeted studies have been launched to more thoroughly assess condition and, to the extent possible, help illuminate underlying causes.

7. Current estimates suggest that SFB is a large source of nutrients to the coastal ocean. While insufficient data currently exist to examine how these nutrient exports impact condition along the coast, conceptual models point to several endpoints worthy of investigation, including: increased phytoplankton production, contributing to bottom water hypoxia or acidification; and increased growth of harmful algae that impact conditions along the coast or are transported into and affect conditions within SFB.
8. Nutrients: cycling/transformations, assimilative capacity, source attribution
    - Data analysis and early modeling indicate that substantial nutrient transformations (e.g., nitrification) and losses (denitrification) occur within SFB. The importance of those processes varying seasonally temporally and spatially.
    - Limited experimental/field data are available to constrain rates for these important biogeochemical processes
    - Major advances in numerical modeling capabilities over past ~3 years:
        - Substantial progress has been made developing and refining models to simulate transport, phytoplankton blooms, oxygen cycling, nutrient transformations, and other processes. Key aims for the model include: developing subembayment-level (or finer) nutrient mass balances and tracking individual nutrient sources; accurately predicting phytoplankton events and DO levels under a range of representative conditions; forecasting how various nutrient management actions (e.g., load reductions) will influence ecosystem responses.
        - A recent modeling workplan charts a 5-yr path for continued development to improve model skill; simulations that target key science and management questions; and characterization of uncertainties associated with model forecasts. For on-going model development to be successful, important data gaps related to biogeochemical transformation rates will need to be addressed through targeted studies.
9. Several major topics have received limited attention to date but are slated to receive additional attention over the next several years.
    - Process measurements (rates) for biogeochemical transformations
    - Determining healthy DO-related habitat conditions in Lower South Bay sloughs/creeks and other margin habitats
    - Forecasting conditions under potential future scenarios
    - Fate of nutrients that leave SFB, effects along the coast from SFB nutrients
    - Mechanistic link between HABs/toxins and nutrients
    - Effects of chronic algal toxin exposure on wildlife.

Agenda Explanation
East Bay Dischargers Authority
Regulatory Affairs Committee
January 15, 2020

ITEM NO. RA6 CALIFORNIA WATER RESILIENCE PORTFOLIO DRAFT

Recommendation
For the Committee's information only; no action is required.

Background
In April 2019, Governor Newsom adopted an Executive Order directing a multi-agency effort to develop a climate-resilient water portfolio for the state. In testimony at a listening session at the Regional Water Board, and in written comments through the Bay Area Clean Water Agencies (BACWA), EBDA staff provided input that the water portfolio should support and provide funding for water recycling and for multi-benefit projects that foster resilience, such as horizontal levees.

Discussion
On January 3, 2020, the Newsom Administration released its draft 2020 Water Resiliency Portfolio. The draft can be found at the following link, and the Executive Summary is attached. http://waterresilience.ca.gov/wp-content/uploads/2020/01/California-Water-Resilience-Portfolio-2019-Final2.pdf

The report includes an overview of California's existing water systems, as well as a wide range of proposals to improve the resiliency of the state's water supply. Among the proposals to support supply diversification is the following:

4. Support local and regional agencies to recycle or reuse at least 2.5 million acre-feet a year in the next decade.
    - 4.1 Increase financial capacity to support recycling, reuse, and wastewater projects through the Clean Water State Revolving Fund and other state and local funding mechanisms.
    - 4.2 Complete raw water augmentation regulations and treated drinking water augmentation regulations, as required by AB 574 of 2017, to allow purified recycled water to be moved directly into distribution systems.
    - 4.3 Implement 2018 legislation (SB 966) that requires creation of risk-based water quality standards for onsite collection and non-potable reuse of water in apartment, commercial, and mixed-use buildings.
    - 4.4 Update 20-year-old "purple pipe" regulations to eliminate outdated and overly prescriptive requirements in order to expand use of non-potable recycled water while protecting food safety and the environment.

Additional proposals address stormwater capture, water quality, and other topics of interest to the wastewater community. Staff will be participating in efforts by BACWA and California Association of Sanitation Agencies (CASA) to submit comments by the February 7, 2020 deadline.

Executive Summary

Water is central to nearly everything we value in California. Healthy communities, economies, farms, ecosystems and cultural traditions depend on steady supplies of safe and affordable water.

Those values are increasingly at risk as California confronts more extreme droughts and floods, rising temperatures, depleted groundwater basins, aging infrastructure and other challenges magnified by climate change. For some of California's most vulnerable populations, the risks are particularly acute.

Recognizing the need for action, Governor Gavin Newsom issued an Executive Order in April 2019 directing state agencies to develop recommendations to meet these challenges and enable water security for all Californians.

The Governor emphasized the need to harness the best of science, engineering, and innovation to prepare for what's ahead and support long-term water resilience and ecosystem health.

To that end, state agencies have developed this draft water resilience portfolio to improve California's capacity to prepare for disruptions, withstand and recover from climate-related shocks, and adapt into the future.

Building on state and local initiatives already underway and months of public input, the draft portfolio helps empower local and regional entities to meet their unique challenges, while delivering on the state's responsibility to provide tools and leadership, advance projects of statewide scale and importance, and help address challenges that are beyond the scope of any region.

Because no single solution can fully address the state's water challenges, the draft portfolio embraces a broad, diversified approach. Goals and actions are organized into four categories:

1. **Maintain and diversify water supplies:** State government will continue to help regions reduce reliance on any one water source and diversify supplies to enable flexibility as conditions change. Diversification will look different in each region based on available water resources, but it will strengthen water security and reduce pressure on river systems across the state.
2. **Protect and enhance natural ecosystems:** State leadership is essential to restore the environmental health of many of our river systems in order to sustain fish and wildlife. This entails effective standard setting, continued investments, and more adaptive, holistic environmental management.
3. **Build connections:** The state aims to improve physical infrastructure to store, move, and share water more flexibly and integrate water management through shared use of science, data, and technology.
4. **Be prepared:** Each region must prepare for new threats, including flashier floods, deeper droughts, and hotter temperatures. State guidance will enable preparation, protective actions, and adaptive management to weather these stresses.

It will require time, effort, and funding to carry out this portfolio. The pace of implementation will depend upon the feasibility and availability of resources and competing priorities. But this portfolio sets a direction and creates a collective recognition of the ways we can manage water to build climate adaptability in California that works for people, the environment, and the economy.

Water resilience will be achieved region by region based on the unique challenges and opportunities in each area. Local, regional, and tribal leadership is therefore critical. Moving forward, separate agencies and groups must better integrate their water planning and management to steward shared watersheds and aquifers as threats evolve.

State government must focus on enabling regional resilience while continuing to set statewide standards, enable projects of statewide scale and importance, and help address challenges beyond the scope of any region. This portfolio will improve tools to local and regional entities building resilience, encourage collaboration, and support a cohesive, resilient "water system of systems" across California.

Carrying out this portfolio will require a new emphasis on cooperation across state agencies and with regional groups and leaders. Likewise, this portfolio will advance Newsom Administration priorities to build climate resilience across all sectors and make possible opportunity and prosperity for all Californians. This water resilience portfolio will serve as an important step toward achieving these ambitious goals.