



November 12, 2022

Rod K. Iwashita, P.E., F.ASCE, Chair
Engineering Criteria Review Board
San Francisco Bay Conservation and Development Commission
375 Beale St., Suite 510
San Francisco, CA 94105

RE: November 16, 2022 Engineering Criteria Review Board Meeting, Agenda Item #4

Dear Mr. Chairman and Board Members:

We appreciate the diligence of BCDC staff in seeking additional information from Cargill about its facilities and the ability to operate them safely, without risk to San Francisco Bay. After significant questions were raised last year regarding the draft Environmental Assessment for Cargill's Solar Sea Salt System Maintenance and Operation Activities, staff has diligently sought answers to pressing questions in order to establish appropriate permit guidelines and conditions. We appreciate the Board's attention to examine information collected to date and provide the staff with your additional input on the sufficiency of that information for crafting a permit. Our review of the staff report and supporting materials reveals significant additional questions we recommend the Board ask Cargill representatives and BCDC staff.

We remain deeply concerned that the extended storage of high volumes of bittern, which Cargill calls mixed sea salts (MSS) in ponds 12 and 13 immediately adjacent to the Bay, increases the stakes for effective maintenance of those pond berms, especially in a time of rising sea levels and increasing storm intensity and frequency. While Cargill has proposed a pipeline project with the East Bay Dischargers Authority to remove, dilute and discharge stored MSS over time, that project has not yet been approved, and the timing of its permitting, construction and operation are uncertain. Meanwhile, Cargill's annual salt production continues to add more bittern to the 6 million ton stockpile already in those ponds.

To provide additional relevant information for BCDC staff, other regulatory agencies and the public to assess past, current and future adequacy and integrity of the berms, the Engineering Criteria Review Board should ask for answers to questions on several topics. We appreciate you pursuing this information:

A) Seepage and Releases

The staff report represents seepage through berms as “highly limited,” [staff report p.8] also that there is no evidence of “prolonged seepage” of brine or MSS [staff report p.9]. Cargill also states there is no “significant evidence” of seepage [ECRB Presentation Package p. 39]. These statements indicate that Cargill has been monitoring for seepage, and that there has in fact been some seepage that the staff memo does not quantify or date. The report does not define the terms “highly limited,” “prolonged seepage,” or “significant evidence”.

- Has any brine of MSS exited from these ponds in the last 20 years via seepage, overtopping, leaks or in other ways, when and how much?
- Did Cargill report those releases to BCDC, the San Francisco Bay Regional Water Quality Control Board (RWQCB) or the U.S. Fish and Wildlife Service (USFWS)?
- How has Cargill monitored for seepage or other releases to reach the above conclusions? How did Cargill document that monitoring?
- Has BCDC obtained that documentation of seepage or other releases from Cargill and if not, why not?

B) Direct Inspections

- Has any staff from BCDC, RWQCB or USFWS inspected berms in these ponds in person, instead of relying solely on statements submitted by Cargill? If not, why not?

C) Ponds 12 & 13 Berm Core Compaction

The staff report contains the revelation that

“Cargill completed approximately four miles of berm core compaction, primarily prioritized around P-12 and P2-13 (see Figure 3-2a through Figure 3-2d of the Package). This berm core compaction involved extracting the existing berm soils and refilling and compacting the trench with imported materials.” [staff report p. 10]

Yet Cargill states that “no wide-scale repairs or berm reconstruction work has proven necessary due to seismic or erosive events.” [Cargill ECRB Presentation Package, p. 39]

- What led Cargill to determine this significant berm core compaction work was needed? Did Cargill observe seepage or other berm integrity issues that prompted the company to conduct core samplings or other investigations? Has Cargill provided that information to BCDC and if not, why not?
- Why did Cargill determine that extracting the existing berm soils and replacing them with new material was necessary, after asserting that its bay mud berms are impermeable to seepage from ponds? [Cargill ECRB Presentation Package p. 36]
- What imported materials were used to refill and compact berm this trench? Were these imported materials tested for permeability before placement, and for compaction after placement? Has Cargill provided that materials testing data to BCDC and if not, why not?
- Were imported materials tested for chemical composition in advance of placement to ensure protection of the Bay from toxic contamination, and was this material certified by the RWQCB in advance of placement? If not, why not?
- Were imported materials screened according to Cargill’s own specifications for acceptable riprap and clean material to ensure they are “free of debris, trash and other foreign material” [Draft Environmental Assessment, April 2021, Appendix 3]
- Was any of this extraction and refilling activity approved and permitted by BCDC or the RWQCB, and if not why not? Was this activity reported to these agencies in full through annual maintenance reports or other means before the current permit revision process was initiated?

D) Mixed Sea Salt Storage Volumes

Accurate assessment of berm safety and containment capability should be based on future MSS volumes stored in pond 12 and 13, and increasing potential for significant rainfall into the ponds from extreme storms added to MSS, not just current levels of MSS during extended drought conditions.

- What is the rate at which additional MSS is being added annually to the existing stockpile in ponds 12 and 13?
- How could these additions affect the integrity of the berms and the risk of seepage, spilling, or overtopping in combination with other factors, until the proposed pipeline to remove stockpiled MSS is approved, constructed and begins operating – which would be at least two years from now or longer depending on approval, permitting and construction delays [Cargill ECRB presentation package, p. 27]?
- If the pipeline does begin operation and removes MSS at the maximum rate proposed, and new material is being added to the stockpile at the same annual rate, what will be the net change in material volume each year?
- Has Cargill or BCDC modeled the impact of significant precipitation adding to combined MSS and water levels in ponds 12 and 13? What would be the impact of this added hydraulic pressure on seepage, risk of overtopping and berm integrity during all normal and extreme tide conditions?

E) Water Level Variation – Differential and Overtopping

Cargill's earthen berm maintenance and sea level rise assessment includes a figure presenting a "typical berm cross-section" [ECRB Presentation Package, figure 3-1] but does not detail how much variability in berm height and width, and internal and external berm water levels are present in ponds 12 and 13, and the potential for more significant differential water head to increase berm seepage.

Cargill also states "Although Bay water levels fluctuate tidally, on average there is typically less than a foot of difference between average water levels inside the ponds compared to average water elevations in the tidally influenced Bay." [Cargill ECRB Presentation Package, p. 39]. Reliance on "average" water levels does not address the risks to berm integrity, overtopping or other releases from ponds to the Bay by the much more significant differences between water levels inside the ponds and in the Bay from daily tidal fluctuations, seasonal variation, extreme storm precipitation and wind conditions, and the combination of these factors.

In addition, Cargill's sea level rise assessment notes, "overtopping only considers astronomical tide and storm tide and does not account for wave overtopping, which may occur along bayfront segments of the berms prior to still water overtopping." [AECOM Final Sea Level Rise Assessment, p. 13] The Assessment notes additional caveats regarding its inundation maps [AECOM p. 18]:

- maps "represent stillwater elevations and do not account for storm waves, rainfall or other potential variations in conditions that could affect the depth of overtopping at any given location.... Increases in storminess were not considered in this analysis. Various physical processes are typically grouped together under the term "storminess" including frequency and intensity of storms, shift in storm tracks, magnitude of storm surges, and wave heights."
- Maps "do not account for localized flooding associated with rainfall events or any changes to rainfall patterns, frequency, or intensity. During heavy rain events, berms along stormwater channels have experience occasional overtopping and scour in the past."
- "The maps do not account for potential berm failures or breaching that may occur due to scouring of berm walls during flood events or chronic inundation due to sea level rise."

- How much does the difference between internal and external berm water levels vary daily and seasonally in ponds 12 and 13? What combination of conditions creates the greatest difference in these levels, and what is the risk to berm integrity and exchange of water between ponds and the Bay under those conditions?
- Do Cargill operations dictate specified differential water head, and do they dictate a specific amount of combined mixed sea salts, brine and rainwater that can be safely stored in ponds 12 and 13?
- Has BCDC considered mandating restrictions on differential water head in Cargill's permit to ensure margin of safety against seepage or other release to the Bay?

F) Other Ponds

Several other ponds in addition to ponds 12 and 13 contain hypersaline materials.

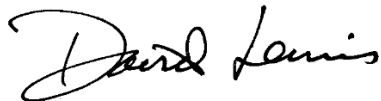
- How will BCDC evaluate and verify the integrity of these other berms and risk of seepage or failure there?

G. Vinyl Sheet Pile

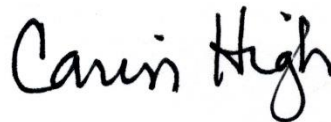
The draft Environmental Assessment for this permit revision references a pilot study proposed by Cargill to install vinyl sheet pile in its earthen berms to improve their structural integrity.

- Has BCDC evaluated the feasibility, benefits and impacts of such installation?
- Has the RWQCB determined that placement of vinyl sheet pile in these berms is consistent with water quality protection guidelines?

Thank you again for your attention to these important issues. Sincerely,



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About Save The Bay

Save The Bay is the largest organization working to protect and restore San Francisco Bay for people and wildlife, with 60 years of accomplishments and tens of thousands of supporters. We led the movement to halt unlimited filling of the Bay in the 1960s, and sponsored the legislation to establish BCDC with the mandate to minimize fill and maximize public access to the Bay. We advocate to reduce pollution, expand wetlands and accelerate region-wide adaptation to sea level rise and other climate impacts. We annually engage more than 5,000 volunteers to restore the Bay shoreline, and educate thousands of students about the Bay.

About the Citizens Committee to Complete the Refuge

The Citizens Committee to Complete the Refuge (CCCR), has an ongoing history of interest in wetlands protection, wetlands restoration and wetlands acquisition. Our senior members were part of a group of citizens who joined together, and with the support of Congressman Don Edwards, requested that Congress establish the Nation's first national wildlife refuge in an urban setting. In 1972 legislation was passed to form the San Francisco Bay National Wildlife Refuge ("Refuge"). We turned to Mr. Edwards again, and in 1988, his legislation to double the size of the Refuge was signed into law. CCCR has taken an active interest in the protection of tidal wetlands and the habitats and species supported by complete tidal wetlands habitats, and in the McAteer-Petris Act and BCDC's Bay Plan. As such we regularly comment on permit applications, policies and potential permit non-compliance.