CITIZENS COMMITTEE TO COMPLETE THE REFUGE

green foothills

December 12, 2024

Makena Wong, Project Manager
Summer Bundy, Director of Projects
OneShoreline
1700 S. El Camino Real, Suite 502
San Mateo, CA 94402
Via email: MBSRP@OneShoreline.org

RE: Comments on the Millbrae and Burlingame Shoreline Resilience Project (MBSRP)
Fall 2024 Update Alternatives

Dear Ms. Wong and Ms. Bundy,

Citizens Committee to Complete the Refuge (CCCR) and Green Foothills appreciate the opportunity to provide comments on the three new alternatives proposed in the 2024 Fall Update for the Millbrae and Burlingame Shoreline Resilience Project (Project). As you know, our organizations have been engaged with OneShoreline over the past year on this project, providing extensive written comments on November 30, 2023 and offering additional feedback and suggestions at several meetings.

We remain concerned that the issues regarding the approach to providing alternatives for feedback remain. When asked to provide input on the public outreach process, we had the following recommendations listed below in the sequence that we believe they should occur, all with the goal of being cognizant of planning costs, time and energy expended, and getting to a permittable project:

1. Consult with San Francisco International Airport (SFO) regarding impacts to SFO controlled or owned lands, as well as other major landowners, to ensure that any alternatives put forth will be acceptable to them.
2. Assemble a Living Shoreline peer review panel (Technical Advisory Committee – TAC) consisting of scientists, such as those who have been working on natural and nature-based solutions, e.g. San Francisco Estuary Institute, Julie Beagle of the U.S. Army Corps of Engineers (Corps) who wrote the *San Francisco Bay Shoreline Adaptation Atlas*, Christina Toms of the San Francisco Bay Regional Water Quality Control Board (Water Board), to review the proposed alternatives.
3. Meet with regulatory and resource agencies to identify critical pieces of information that will be necessary to reach a Least Environmental Damaging Practicable Alternative (LEDPA) during the permit review phase.
4. Public outreach regarding any proposed alternatives once pieces of critical information can be provided for public review and comment.

We are pleased that OneShoreline is striving to incorporate nature-based solutions and living shorelines in the new alternatives released this fall. The regrading and expansion of Bayfront Park for creation of an onshore levee slope, and the use of the 100-foot shoreline Buffer Zone from Bayfront Channel to Anza Fisherman's Park for creation of an inboard sloped flood protection levee are both great opportunities to use nature-based solutions in areas where grey infrastructure can be avoided.

The proposals for near shore sandbars and reefs are interesting elements in the new alternatives for creating diverse habitats, and oysters colonizing this part of the Bay is a possibility if the reefs are sited at optimal locations and depths.

The three new alternatives represent significant changes from the shoreline alternatives brought forward in the October 2023 *Millbrae-Burlingame Shoreline Protection Project Conceptual Alternatives Feasibility Analysis*. Previously, onshore sea level rise protection alternatives were limited to construction of measures on land. In contrast, new Alternatives A, B, and C have footprints that extend up to 200 feet, 570 feet and 750 feet respectively onto the mudflat adjacent to the urban shoreline.

We are deeply concerned that two of the new alternatives are again proposing to solve existing urban creek flooding Issues by building in the Bay. Alternatives B: Park Tunnels and C: Nearshore Waterway would cover substantial acres of valuable intertidal Bay habitat to construct offshore creek floodwater detention systems. Additionally, all three alternatives (including Alternative A: Remain on Shoreline), would build extensive levees outboard of either the existing urban shoreline or outboard of the newly-constructed stormwater detention structures in the Bay. These levees would cover additional acres of intertidal habitat, and information provided by OneShoreline in the 2024 Fall Update for the Project includes estimates of 70, 90 or 120 total acres of fill, depending on the alternative.

The size of the footprint and degree of bayfill associated with the three Project alternatives is unprecedented for any sea level rise or flood protection intervention in the Bay Area, and would certainly result in significant impacts to valuable tidal marsh and intertidal mudflat habit. Additionally, for a variety of reasons which we discuss below, the outboard levees, described as a “living shoreline”, are not likely to produce viable habitat for wildlife to mitigate what would be lost, or provide the effective, long-lasting sea level rise protection required for the community.

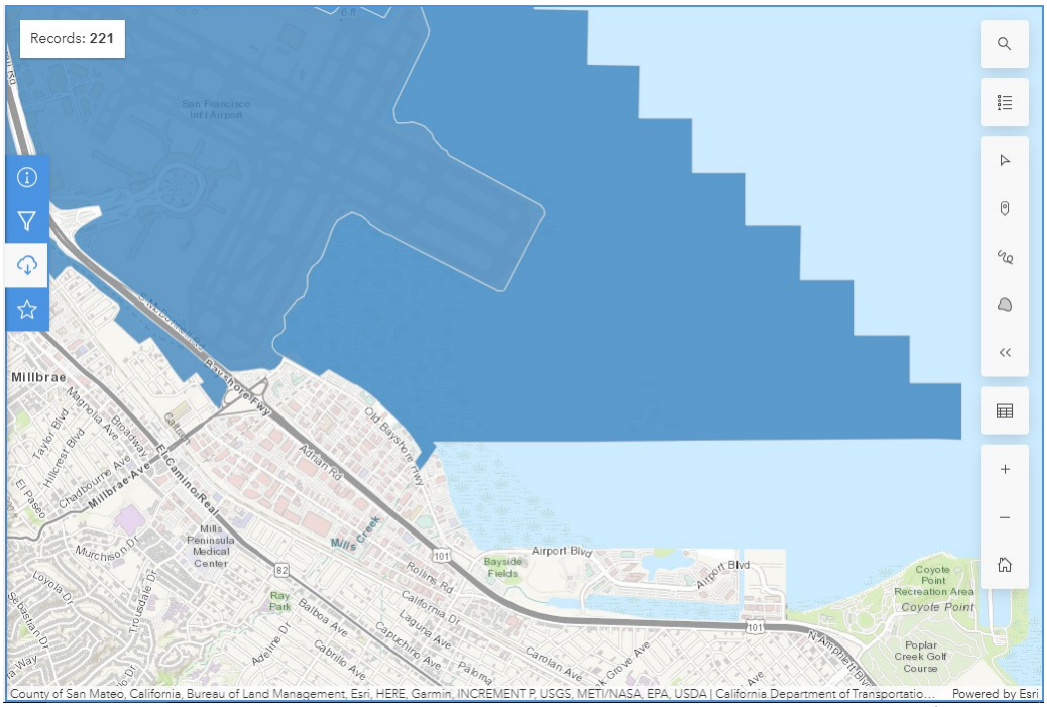
Insufficient detail has been provided to inform a preference for any of the alternatives proposed. We have endeavored to present pertinent information that should be considered before proceeding further, as well as concerns we have identified.

Comments Related to All Three Alternatives

Nearshore Airport Property

The section of shoreline from Highline Canal to Mills Creek is directly adjacent to the property boundary of San Francisco International Airport (SFO) as shown in the graphic below. It appears that the outboard footprint of all three new alternatives would encroach on airport property within the Bay. For the previous Offshore Barrier/Lagoon Alternative, correspondence from the San Francisco City Attorney indicated that authorization for construction of that alternative on airport property would not be granted.

Will SFO give OneShoreline permission to construct the Project on their property for any of the three new alternatives? This critical question must be answered before the alternatives analysis and selection process proceeds further. If encroachment on SFO property is not an option, the Project plans for the shoreline reaches from Highline Canal to Mills Creek will need to be reconsidered.



San Francisco Airport boundary (dark blue) from the California State Geoportal[1].

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Significant Impacts to Bay Habitats

Impacts to Existing Tidal Marsh

Tidal marsh habitat occurs at two locations in the Project area. There is a larger marsh at the western end adjacent to San Francisco International Airport, Highline Canal and El Portal Creek, and a marsh further east at Mills Creek. The tidal marsh in the Project area provides foraging and nesting habitat for the federal and state endangered California Ridgway's Rail and salt marsh harvest mouse, as well as Essential Fish Habitat and support for fisheries.

Alternative C would construct a seawall through the large tidal marsh near the airport, connecting the SFO Reach 14 seawall to the new offshore levee. This marsh has confirmed nesting Ridgway's Rail. Both during construction and post-construction, the proposed barrier will likely have significant and adverse impacts to the tidal wetlands inboard and outboard of the proposed barrier and would permanently impede wildlife movement between the two areas, adversely impacting tidal marsh habitat. **All of the marshes internal to the proposed barrier would be within the created, artificial lagoon and would be subject to the hydrologic changes related to altered tidal flows and detention of freshwater flows from the creeks**. Protection of this existing tidal marsh must be given high priority in the analysis of alternatives, especially with respect to impacts on endangered species.

Additionally, the footprints of all three alternatives extend well into the Bay in reaches near the airport marsh and the proposed flood protection and levee structures in these footprints could alter the tidal hydrology in this relatively protected part of the Bay.

[1] https://gis.data.ca.gov/datasets/a65054bafb5345fb9884cce83c0dfe88/explore?location=37.618019%2C-122.353154%2C13.61

Alternatives B and C could also significantly impact the amount of sediment reaching the marsh adjacent to SFO by blocking or rerouting creek flows from Highline Canal and El Portal Creek to Mills Creek, reducing this marsh's capacity to keep up with sea level rise.

The tidal marsh at Shorebird Preserve near the mouth of Mills Creek would also be impacted by elements of all three alternatives, but Alternatives B and C would drastically alter the hydrology and salinity in the marsh by either turning the area into a forebay for a creek tide gate/pumpstation, or placing the marsh entirely inside a nearshore waterway.

Impacts to Foraging Shorebirds on the Intertidal Mudflat

The *San Francisco Bay Subtidal Habitat Goals Report Conservation Planning for the Submerged Areas of the Bay* (2010) describes the value of mudflat habitat to birds and emphasizes the importance of protecting mudflats to prevent their loss. The amount of fill in Bay waters (70, 90, 120 acres) and the size of the Project footprint on the mudflat (extending up to 200 ft.,570 ft., or 750 ft. from the shoreline) described for the three alternatives is not insignificant, and is unprecedented in the Bay for the specific purpose of protecting urban landscapes from sea level rise or stormwater flooding. (OneShoreline graphics depicting the footprints of each alternative are attached in Appendix 1.)

In particular, the **nearshore areas** of mudflats on San Francisco Bay (and elsewhere in the world) are disproportionally important to foraging shorebirds[2,3,4], being the first areas exposed and available for foraging during a falling tide. These nearshore areas, being closest to the shore, are at particularly high risk from coastal development. In southern San Francisco Bay, 86% of foraging Western Sandpipers foraged on the mudflats within 100 to 200 meters from the shore during one survey, emphasizing, "… *the high importance of foraging areas near shorelines*…"[5].

According to information provided in the Fall 2024 MBSRP Update, the offshore footprints of the three alternatives currently being considered range from 60 to 230 meters from the shore, which could **significantly or completely cover critical mudflat foraging habitat** currently being utilized by migratory and wintering shorebirds.

Need for an Alternative with Land-Based Flood Protection Measures

Clearly, there would be substantial impacts to both tidal marsh and mudflat habitat and associated wildlife from all three alternatives, although the impacts from Alternatives B and C are by far more significant. The OneShoreline Updated Draft Alternatives chart compares the three alternatives in different categories, one of which is "Habitat Functionality". The only information listed in this category is "living shoreline and fish passage"; unfortunately, there is no mention of the loss of habitat functionality, or a comparison of the degree of habitat impacts for the three proposals. It is very disconcerting that the public outreach information fails to accurately identify or disclose this important criterion for comparison of alternatives. As the process for evaluating and selecting alternatives moves forward, it's imperative that OneShoreline corrects this oversight.

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[2] Rowan, A et al. 2011. Effects of the South Bay Salt Pond Restoration Project (San Francisco Bay, California) on Mud Flats and their Carrying Capacity for Small Shorebirds RLF contract #2009-0210. https://www.southbayrestoration.org/sites/default/files/documents/Rowan_CarryingCapacity2011.pdf

[3] Mu T, Wilcove DS. 2020. Upper tidal flats are disproportionately important for the conservation of migratory shorebirds. Proc. R. Soc. B 287: 20200278. http://dx.doi.org/10.1098/rspb.2020.0278 (https://royalsocietypublishing.org/doi/10.1098/rspb.2020.0278)

[4] Granadeiro, JP et al. 2006. Variation in numbers and behaviour of waders during the tidal cycle: implications for the use of estuarine sediment flats. Acta Oecologica 29, 293–300. (doi:10.1016/j.actao.2005.11.008)

[5] op. cit. Rowan, A et al. 2011.

Additionally, due to the substantial impacts of all three alternatives to valuable Bay habitats, and likely regulatory permitting challenges, we were surprised to see that there was no alternative brought forward at this time in which the footprint of sea level rise and flood protection measures were sited at, or landward of, the actual existing shoreline. As mentioned previously, OneShoreline considered an earlier alternative, Shoreline Barrier and Tide Gates (designated Alternative 2 in the Project *October 2023 Conceptual Alternatives Feasibility Analysis*), **that had minimal impacts to existing near-shore habitats.** The Shoreline Barrier and Tide Gates alternative could be used as a foundation for a hybrid design alternative comprised of grey infrastructure and where feasible, elements of living shoreline.

Feasibility of Outboard Levees and Other Elements of "Living Shoreline"

As mentioned earlier, reaches in all three alternatives include sections of levee located on the mudflat offshore of the present shoreline to create what is described as a "gradually sloped living shoreline". that would extend 200 feet or more into the Bay.

Guerry et al (2022)[6] determined that the physical conditions at the site are amenable to nature-based adaptation measures including beach and eelgrass, but not an ecotone levee. Their findings corroborate the strategies identified in the *SFEI and SPUR. 2019. San Francisco Bay Shoreline Adaptation Atlas: Working with Nature to Plan for Sea Level Rise Using Operational Landscape Units.* What criteria did the consultant use to determine that the physical conditions in this section of the Bay were appropriate for a 10:1 sloped dirt levee in Bay waters?

According to NOAA's Living Shorelines Guiding Principles[7], encouraging, *"…shoreline protection methodologies that avoid or minimize channel-ward encroachment into subtidal habitat*" should be considered. NOAA further recommends 1) analyzing "…*site-specific differences in factors such as wave energy, habitat types, and geologic setting in planning the appropriate living shorelines*"[8] to ensure that these features will succeed; and 2) *"… incorporating the best available regional and local shoreline science and practices into the siting, design, construction, evaluation and adaptive management of projects.*"[1]

The California State Coastal Conservancy and San Francisco Bay Restoration Authority's 2022 "*Regionally Advancing Living Shorelines in San Francisco Bay*" project[9] is funding the planning and permitting of ten new living shoreline climate adaptation projects in the Bay, in part for, *"(1) monitoring of existing living shorelines pilot projects to inform design of future living shoreline projects, (2) development of Regional Design and Constructability Guidance…"* Will OneShoreline be following these projects and incorporating the results of these pilot projects into the design of the proposed living shoreline elements in the Project alternatives?

We have been supportive of the construction of ecotone (horizontal) levees in diked non-tidal baylands (i.e. areas not exposed to tidal action) that are later restored to tidal marsh, but have serious concerns about construction of these levees in open Bay waters. To the best of our knowledge, an unvegetated

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[6] Guerry, A.D. et al. 2022. Protection and restoration of coastal habitats yield multiple benefits for urban residents as sea levels rise. Urban Sustainability 2:13; https://doi.org/10.1038/s42949-022-00056-y

[7] Op. cit. NOAA Guidance for Considering the Use of Living Shorelines 2015

[8] NOAA Guidance for Considering the Use of Living Shorelines 2015 at https://www.habitatblueprint.noaa.gov/wp-content/uploads/2018/01/NOAA-Guidance-for-Considering-the-Use-of-Living-Shorelines_2015.pdf

[9] https://scc.ca.gov/webmaster/ftp/pdf/sccbb/2022/2212/20221201Board09_Regionally_Advancing.pdf; https://www.sfbayrestore.org/sites/default/files/2022-06/Item%2014_Living%20Shorelines.pdf

levee with a 10:1 slope has never been successfully constructed in San Francisco Bay in an area exposed fully to the tides and wave action, without the need for implementing significant remedial actions. If the levee fails, what is the remedy? Will OneShoreline request an emergency permit to line the shoreline with rip-rap?

In 2022, Coastal Ecologist Dr. Peter Baye provided comments to Citizens Committee on a project proposal that included the construction of ecotone levees in areas exposed to the tides and wave action. The concerns he stated regarding the proposed construction of "ecotone" levees in areas exposed to tidal action and waves are also pertinent for the alternatives proposed for the Burlingame shoreline. In his comments, Dr. Baye included an example of a levee project at Sears Point in the San Pablo Bay National Wildlife Refuge. Below is an excerpt from his comments:

> *"…**Risks of ecotone slope wave erosion.** The project proposes placing unconsolidated earthen fill at and below the high tide line, exposing the unconsolidated fill to potential high wind-wave attack during the next perigee spring high tides of winter. Even if vegetation establishment in the salt marsh-terrestrial ecotone proceeded at optimum rates (ample rainfall, minimal storm wave impacts), the soil shear strength and vegetation roughness required to damp wave energy and resist erosion subsequently would take at least several years to develop, and much longer if severe drought or storm impacts overlapped with the post-construction period. Once wave erosion initiates a steep scarp profile that reflects high wave energy (turbulent scour zones below the scarp), positive feedback processes can intensify erosion and delay vegetation recovery. The Sears Point Wetland Restoration Project (Petaluma; San Pablo Bay National Wildlife Refuge) is a potent example, where most of the ecotone slope eroded within a few years after construction, leaving a wave-cut bench at middle marsh zone elevation range (see figures below). The project proposal includes no mitigation measures to address predictable winter storm wave erosion in the vulnerable years after construction, prior to full vegetative stabilization. The project's inclusion of a local "wave-break" feature to protect the north end of the levee, however, provides a clear indication that the potential for significant wind-wave erosion exists at the shoreline. The feasibility of constructing an ecotone slope in a wave-exposed tidal shoreline is not indicated by the design and project location."*

Figure 3.2-1. Sears Point Wetland Restoration Project ecotone levee wind-wave erosion 3-6 years after construction. San Pablo Bay National Wildlife Refuge. Ecotone slope erosion was severe, leaving a wave-cut bench with the Mean High Water line close to the eroded scarp by 2021.

The proposed levees in the alternatives for the Burlingame shoreline do not include plans to vegetate the bayside levee slopes, but instead assume natural recruitment of vegetation; therefore, the adverse impacts of erosion, and establishment of non-native weedy species, could be exacerbated. It would be irresponsible to leave unvegetated slopes that are vulnerable to tidal and wave action, to erode and become colonized by non-native invasive species.

We are concerned that toe erosion, such as that seen in the Sears Point project, is likely and without addressing this issue up front during the design process, could result in further impacts to the environment if rip-rap is proposed as the "fix" to the problem. None of the alternatives show the nearshore profile, which determines wave energy at the shoreline, and feasibility of shore treatment types. Additionally, the alternatives appear to be inconsistent with how bay beaches fit in the shoreline. This area was historically part of a major shell-sand beach shore. Beaches are the primary shoreline, and the alternatives are missing design elements for this shore treatment. With an unprecedented and over-reaching design, the burden of proof for feasibility and effectiveness is with the applicant.

All of these issues and more should be considered during a Technical Advisory Committee (TAC) review of the living shoreline elements as the alternatives are further refined.

Nearshore Reefs/Oyster Bags

According to SFEI[10], nearshore reefs are defined as, "*Nearshore (lower intertidal/subtidal) reefs made of structures such as bags of oyster shell… that provide hard substrate for shellfish including native Olympia oysters (Ostrea lurida) and other aquatic plants and animals*", "*Best suited to shallow water in areas of low wave action, at the low end of mudflats*" and in "*areas of low turbidity*".

[10] Point Blue Conservation Science, San Francisco Estuary Institute, and County of Marin. 2019. Sea Level Rise Adaptation Framework - A user guide to planning with nature as demonstrated in Marin County. Point Blue Conservation Science (Contribution #2239), Petaluma, CA. San Francisco Estuary Institute (Publication #946), Richmond, CA. Version: 1.0, August 2019. Report is available at www.pointblue.org/slrAdaptationFramework and at adaptationatlas.sfei.org

Has the suitability of this specific shoreline been analyzed by a scientist(s) familiar with the use of these structures in San Francisco Bay? How would altering creek outflow locations affect water turbidity in the area? Would sediment from possible erosion of the proposed outboard levees impact the ability of oysters to colonize and thrive offshore?

Upstream Stormwater Capture

OneShoreline is working collaboratively with cities within San Mateo County to achieve reduction of stormwater flows upstream of the bayfront. OneShoreline, *"…secured approximately $8,000,000 from the State on behalf of the City of Belmont to support the development of engineering design, California Environmental Quality Act (CEQA) review, and environmental permitting, as well as the construction of the stormwater infrastructure…"* for the Belmont Creek Stormwater Detention and Creek Restoration Project to reduce flooding in Belmont and San Carlos. (https://oneshoreline.org/projects/belmont-creek/) This project involves a temporary stormwater detention basin under Twin Pines Park.

Has OneShoreline considered providing similar support to the cities of Millbrae, Burlingame and Hillsborough to explore opportunities for temporary subsurface water retention of upstream creek flows on city-owned property? For example, in Burlingame, Mills Creek and Sanchez Creek pass through, or are adjacent to, several city-owned properties on their way to the Bay.

Comments on Alternative C

Alternative C: Nearshore Waterway would construct an offshore levee in the Bay that would be about one mile long, creating a narrow artificial lagoon from the SFO floodwall to just beyond Easton Creek to the south. The lagoon would be used to temporarily store creek and stormwater runoff during high tides. Alternative C has the largest footprint extending onto the intertidal mudflat (750 feet) and the greatest amount of fill (120 acres). This alternative also creates similar serious concerns to those identified by environmental groups, regulatory agencies and SFO for the larger lagoon proposed in the earlier Offshore Barrier /Lagoon Alternative, including the airport safety hazard from creation of an attraction for larger birds.

The description of this alternative does not provide information on what types of bay habitats are expected to develop within the waterway, but we would expect the following water quality issues affecting wetlands and wildlife that were outlined in our 2023 NOP comment letters. These issues include dramatic shifts in water salinity and temperature from freshwater flows being detained in the lagoon, accumulation of excess nutrients and organic matter from upstream creeks causing low oxygen levels in the water due to eutrophication, creation of conditions conducive to Harmful Algal Blooms causing fish kills, and sedimentation within the lagoon which necessitates dredging and regular disturbance of any habitat that might develop within the lagoon, and deprives the bay habitats outside of the lagoon of much-needed sediment.

For all of the reasons cited above, we believe this is not a viable alternative for the Project, and we recommend that Alternative C be removed from further consideration.

Need for Consultation with Bay Ecologists

The proposed alternatives are precedent setting in the amount of fill proposed atop tidal wetlands and tidal mudflats. In addition, the "ecotone" levees are being constructed in areas exposed to the tides and wave action with no indication of how massive erosion of these slopes will be avoided both during the

initial post-construction period, or during the time it takes for them to vegetate with hopefully native vegetation. Other proposed features of the alternatives are untested within the Bay Area and supporting information as to their adequacy or likelihood of success have not been provided. For all the reasons we have stated, it is imperative that a Living Shoreline peer review panel is created, comprised of scientists familiar with shoreline adaptation, such as the SFEI scientists currently involved with the Living Shorelines Collaborative, and others.

Citizens Committee and Green Foothills have stated from the beginning that we recognize climate change shoreline adaptation will be required for this reach of the San Mateo County shoreline. We reiterate that we have laid out the process we believe needs to take place to be mindful of costs, people's time and energy, and the goal of getting to a permittable project. We submit these comments for OneShoreline's consideration to help ensure Project alternatives are carefully designed and evaluated to cause minimal harm to Bay habitats, and to create effective and enduring living shorelines and flood protection strategies.

We appreciate the opportunity to provide this feedback. Please keep us informed of future opportunities to participate in this important planning process.

Best regards,

Gail Raabe Carin High

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Attachments: Appendix 1

Appendix 1: Alternatives A, B and C Footprints

Source: OneShoreline

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