San Francisco Bay Conservation and Development Commission
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May 8, 2015

Application Summary
(For Commission consideration on May 21, 2015)

Number: BCDC Permit Application No. 2013.010.00
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Staff Assigned: Jaime Michaels (415/352-3613; jaime.michaels@bcdc.ca.gov)

Summary

Applicant: City of Larkspur ("City")

Location: The proposed Bon Air Bridge project is located at Corte Madera Creek, approximately two miles west of its mouth at San Francisco Bay, in the Commission's certain waterway jurisdiction, in the City of Larkspur, Marin County (Figure 1).

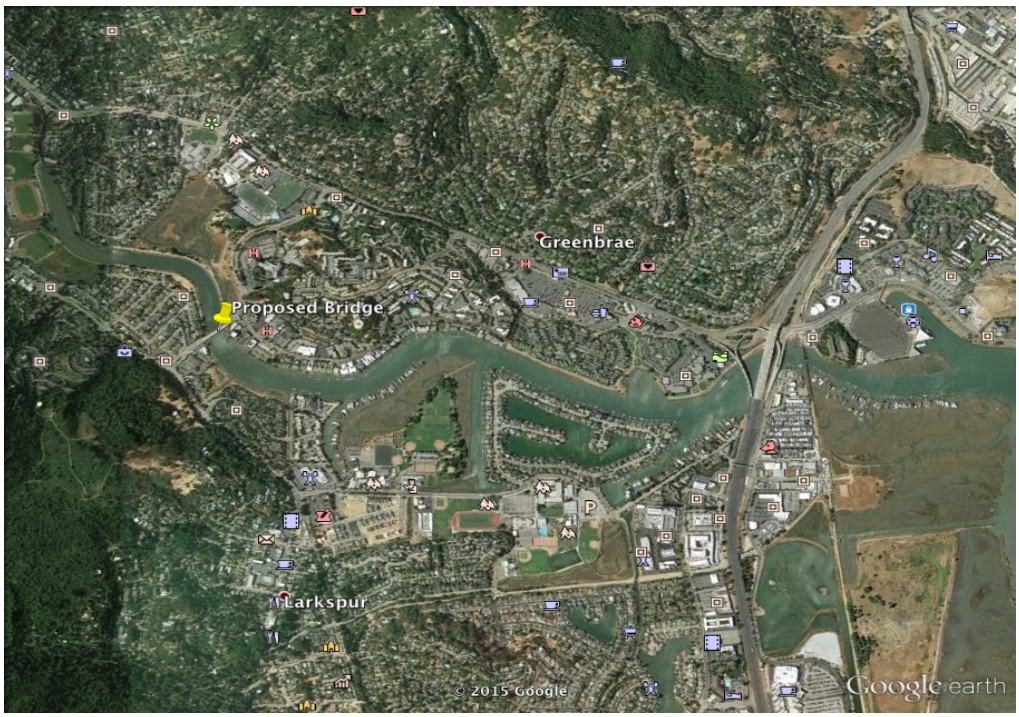

Figure 1 – Bon Air Bridge

Project: The Bon Air Bridge was constructed in 1958. In 1994, BCDC Permit No. M1994.015.00 authorized a bridge retrofit and widening to accommodate a Class I, eight-foot-wide bicycle lane. In 2012, the permit was amended to allow bridge repairs (BCDC Permit No. M1994.015.01). The ten-span steel, two-lane bridge, including a bike lane and a five-foot-wide sidewalk, measures approximately 18,500 square feet, of which approximately 15,000 square feet (0.34-acre/12 cubic yards (cy) of solid fill) are located in the Commission's jurisdiction.

The California Department of Transportation (Caltrans) has deemed the bridge "structurally deficient," a categorization mandating total replacement. An approximately 24,250-square-foot, five-span concrete bridge is proposed, of which approximately 21,000 square feet (0.49 acres) would be located in the Commission's jurisdiction at Corte Madera Creek. Eight, 8-foot-diameter columns (840 cy of solid fill) would support the bridge. Abutments at the northern and southern ends (approximately 40 cy of solid fill) would be located mostly outside of the Commission's jurisdiction.

To minimize disruption of traffic flow during demolition and replacement of the existing bridge, temporary trestles (pile-supported), access ramps, and coffer-dams are proposed at an approximately 21,000-square-foot (0.49-acre) area in the Commission's jurisdiction. The project also involves the relocation of two utility lines, one temporarily above Corte Madera Creek, northwest of the bridge, and a second permanently located below the creek bed, southeast of the bridge.

The proposed bridge would result in an approximately 6,387-square-foot (0.146-acre) net increase of pile-supported fill and 872 cy net increase of solid fill in the Commission's certain waterway jurisdiction. The construction-phase fill would affect an approximately 21,000-square-foot (0.49-acre) area of the water, but would be removed at the end of bridge construction. The utility cable relocations would involve temporary fill over and permanent fill below Corte Madera Creek without changing the Bay's surface area or volume.

The project would temporarily impact an approximately 870-square-foot (0.020-acre) area of marsh vegetation, which would be restored following construction. The project would permanently impact an approximately 44-square-foot (0.001-acre) area of tidal marsh. To mitigate these impacts, the City proposes to restore tidal marsh at an approximately 11,194-square-foot (0.257-acre) area located south of the bridge, adjacent to Piper Park, in the City of Larkspur (Figure 2). Additionally, the City has already provided funding ($45,000.00) to enhance conditions suitable for the federally-endangered Ridgway rail (a.k.a., California clapper rail) and salt marsh harvest mouse at nearby Creekside Park located immediately north of the bridge, in the City of Greenbrae. Although these mitigation projects would likely be required in a Commission permit for the proposed bridge replacement project, each mitigation project would be the subject of separate BCDC permit applications since they are geographically distinct from the Bon Air Bridge site. [1]

Figure 2 – Proposed Mitigation Sites

Taking into account the increased area of open Bay resulting from the proposed mitigation and the removal of the existing bridge, the proposed project would result in an approximately 4,807-square-foot (+0.110-acre) net increase in Bay surface area.

[1] The City has already submitted a BCDC administrative permit application for the Creekside Park mitigation activities.

The proposed bridge would have two 11.6-foot-wide vehicle lanes, two 7-foot-wide bike lanes and two 10-foot-wide sidewalks. The bike and pedestrian facilities would comply with the Americans with Disabilities Act ("ADA") standards. The proposed structure would generally follow the existing bridge alignment, although the western side of the bridge would be widened by 13 feet to accommodate the wider bike and pedestrian paths. These paths would connect to existing public pathways at the northern and southern ends of the bridge. These proposed public access improvements would cover an area totaling approximately 13,192 square feet (.302 acres) of which 11,322 square feet (0.259 acres) would be located within the Commission's jurisdiction (Exhibit A).

The proposed bridge soffit would be located at elevations that would allow under-bridge clearance for non-motorized boats. However, the proposed deck would be about one foot thicker than the existing deck to allow for greater length between—and fewer number of—columns in the creek, but more restricted under-bridge clearance towards the bridge ends. The applicant proposes to offset this impact to navigation by implementing ADA upgrades at two nearby public boat dock facilities, in the City of Kentfield and in the City of Greenbrae (Figure 3). Since these sites are geographically distinct from the bridge, the upgrades would be authorized through separate permit applications, but likely be a requirement of a Commission permit for the Bon Air Bridge.

Figure 3 – Public Dock Improvement Sites

Issues Raised: *The staff believes that the application raises five primary issues: (1) whether the proposed fill would be consistent with the McAteer-Petris Act and the relevant San Francisco Bay Plan (Bay Plan) policies including those related to fish and wild-life, water surface area and volume, and water quality; (2) whether the proposed project would be constructed in a manner that meets sound safety standards and be resilient to sea level rise; (3) whether project impacts would be adequately mitigated; (4) whether proposed public access improvements, including view opportunities, would be the maximum feasible consistent with the project and be reasonable in light of the project scope; and (5) whether the project would ensure safe navigation conditions in the creek.*

Project Description

Project Details: The applicant, the City of Larkspur, proposes the following project:

In a certain waterway:

a. Demolish an approximately 14,985-square-foot (0.34-acre) portion of the Bon Air Bridge, including 12 cubic yards (cy) of solid fill to minus 2 feet below the mudline, and dispose demolition materials at an authorized site located outside the Commission's jurisdiction;

b. Install, use, and maintain in-kind a temporary facility covering approximately 21,372 square feet (0.49 acre), including 30-foot wide trestles supported by approximately 128, 12- to 14-inch pilings, and eight 500-square-foot coffer-dams, remove the fill to minus 2 feet below the mudline no later than three years from the date of installation, and dispose the fill at an authorized site located outside the Commission's jurisdiction;

c. Construct, use, and maintain in-kind an approximately 21,372-square-foot (0.49-acre) section of a replacement bridge supported by eight, 8-foot-diameter columns (840 cy of solid fill) and abutments (44 cubic yards of solid fill), with the following features: two 11.6-foot-wide vehicle lanes; two 7-foot-wide Class II bicycle lanes; two 10-foot-wide sidewalks; two 46.5-inch-high barriers separating vehicle lanes from bike lanes; two 42- to 44-inch-high outer railings; 12 approximately 20-foot-tall light standards; utilities; signage; and seismic instrumentation equipment.

d. Install (via horizontal directional drilling), use, and maintain in-kind an approximately 535-foot-long, 30-inch-diameter telecommunication line located east of the bridge at depths up to 33 feet below the creek bed;

e. Install, use, and maintain in-kind (temporarily) a 12kV electric line suspended approximately 40 feet above Corte Madera Creek northwest of the bridge, and, upon completion of bridge construction and no later than three years after project commencement, relocate and place the utility on the replacement bridge; and

f. Restore, manage, and monitor an approximately 870-square-foot (0.020-acre) area of marsh vegetation, upon the completion of bridge construction.

Fill and Mitigation: In the Commission's certain waterway jurisdiction, the proposed project involves the demolition of a 14,985-square-foot (SF) section of a bridge and its replacement with a 21,372-square-foot section of a new bridge. A temporary structure of approximately the same size as the proposed bridge needed to facilitate traffic flow during demolition and construction would be removed upon project completion. The total net increase of permanent pile-supported fill would be approximately 6,387 square feet (0.146 acres (AC)). Proposed mitigation for impacts of the temporary and permanent fill includes restoration of marsh at an approximately 11,200-square-foot (0.257-acre) area in the City of Larkspur. In light of the mitigation and resulting increased open water area, the project would result in an approximately 4,807-square-foot (+0.110-acre) net decrease of total Bay surface area.

Proposed Fill	**SF**	**AC**	**CY**
Permanent Fill	21,372	0.49	884
Temporary Construction Fill	21,372	0.49	--
Existing Bridge Removed	14,985	0.34	12
Increased Open Water Area (via mitigation)	11,194	0.257	--
Net Increase in Fill	+4,807	+0.110	+872

Public Access: The proposed bridge would include a public access area totaling approximately 13,192 square feet (0.302 acres), including two, ADA-compliant 7-foot-wide, Class II bike lanes and two 10-foot-wide sidewalks (Exhibit A). The bridge would allow under-bridge access for non-motorized boats, but the new deck would be thicker than the existing one and, consequently, slightly restrict boat clearance at the bridge ends. The applicant proposes to offset this impact by implementing ADA upgrades at two nearby public boat dock facilities at the Bon Air Landing (on South Eliseo Drive, City of Kentfield), and the Marin Rowing Club (50 Drakes

Landing Road, City of Greenbrae). Since both sites are geographically distinct from the Bon Air Bridge site, the dock upgrades would be authorized through separate permit applications but be a requirement of Commission approval for the proposed bridge (Exhibit B).

Proposed Public Access	Total SF/AC	SF in Commission's Jurisdiction/AC
On-Bridge Bike Paths and Sidewalks	13,192/0.303	11,322/0.259
Public Docks (off-site)	To be determined	To be determined

Priority Use: The proposed project is not located in a priority use area.

Schedule and Cost: The City of Larkspur anticipates beginning construction in 2015 and completing the bridge in three years. The total project cost is estimated at $16,000,000.

Staff Analysis

A. **Issues Raised**: *The staff believes that the application raises five primary issues: (1) whether the proposed fill would be consistent with the McAteer-Petris Act and the relevant San Francisco Bay Plan (Bay Plan) policies including those related to fish and wildlife, water surface area and volume, and water quality; (2) whether the proposed project would be constructed in a manner that meets sound safety standards and be resilient to sea level rise; (3) whether project impacts would be adequately mitigated; (4) whether proposed public access improvements, including view opportunities, would be the maximum feasible consistent with the project and be reasonable in light of project scope; and (5) whether the project would ensure safe navigation conditions in the creek.*

1. **Bay Fill.** The Commission may allow fill when it meets the requirements of Section 66605 of the McAteer-Petris Act, which states, in part: (a) fill should be limited to water-oriented uses and the public benefits of fill must clearly exceed the detriment from the loss of water areas; (b) no alternative upland location exists for the fill; (c) the fill should be the minimum amount necessary; (d) the fill should minimize harmful effects to Bay resources; (e) the fill should be constructed in accordance with sound safety standards; and (f) the fill should be authorized when valid property title has been obtained.

   a. **Water-Oriented Use and Public Benefits.** The Bon Air Bridge was built in 1958 and provides a critical connection between Magnolia Avenue (City of Larkspur) and Sir Francis Drake Boulevard (City of Greenbrae) over Corte Madera Creek. It is an important link to Marin General Hospital and U.S. Highway 101. The bridge provides access to motorists, bicyclists, and pedestrians, and accommodates approximately 11,800 average daily trips (ADT), a volume expected to increase to 12,600 ADT by 2036.

The applicant proposes to replace the 56-year-old bridge, which has been deemed "structurally deficient" by Caltrans. Section 66605 of the McAteer-Petris Act defines bridges as a water-oriented use. The City states that: "[ti]dal flow has eroded the [existing] supporting bridge piles and caused cracks and deterioration…. In 2000, inspections of the bridge indicated crumbling at several support locations. Further inspections in 2003 revealed severe deterioration of the bridge concrete, including visible cracks and spalls with exposed rebar on some supports and poor deck conditions. Steel girders and bearing plates show excessive rust. Concrete spalls directly below the bearing plates result in multiple locations where bearing plates are mostly unsupported. The condition of the bridge continues to deteriorate and will likely result in restrictions on…use unless mitigation [i.e., replacement] occurs."

The proposed bridge would result in a 6,387-square-foot (0.146 acres) net increase of pile-supported fill and approximately 872 cubic yards (cy) of solid fill. The structure would generally follow the existing bridge alignment, but be straighter and the pilings supporting the bridge would be oriented in relation to creek flow to reduce scouring at the piers, abutments and adjacent embankments, The bridge would have two 11.6-foot-wide vehicle lanes, two 7-foot-wide bike lanes, and two 10-foot-wide pedestrian sidewalks. The bridge would be wider along the upstream edge to widen existing bicycle and pedestrian pathways. The applicant proposes to mitigate project-related impacts to Bay resources in part by restoring on-site impacted marsh following bridge construction and implementing off-site mitigation, as discussed below. [2] In light of the increased Bay surface area resulting from implementation of mitigation and the removal of the existing bridge, the bridge project would result in an approximately 4,807-square-foot (+0.110-acre) net increase of Bay fill.

To maintain access along this transportation corridor during proposed construction, the applicant would temporarily place approximately 21,000 square feet (0.49-ac.) of fill for pile-supported trestles and embankment access ramps. These structures would facilitate a phased-construction approach to ensure generally continuous traffic flow during construction, and, in the case of proposed cofferdams, segregate construction activities in the creek to protect sensitive resources. At project completion, all temporary fill would be removed resulting in no permanent change of water surface area or volume. Marsh vegetation damaged during construction would be restored at project completion.

The applicant also proposes to temporarily install and suspend approximately 40 feet above the creek an electrical utility line west of the bridge. Following construction, the line would be relocated onto the proposed bridge structure. An approximately 500-foot-long telecommunication line is also proposed for installation via horizontal directional drilling (HDD) west of the bridge and below the creek bed, resulting in no effects on water surface area or volume. The Bay Plan Other Uses of the Bay and Shoreline Policy 6 states, in part, that "[p]ower distribution and

[2] Although discussed in this summary, the applicant is not seeking authorization at this time for the mitigation projects. Instead authorization would be sought under separate permit applications.

telephone lines should either be placed underground (or in an attractive combination of underground lines with streamlined overhead facilities)…near the shores of the Bay."

According to the applicant, "HDD is less intrusive than traditional open-cut trenching and avoids direct soil disturbance of environmentally sensitive resources. The drilling will involve the use of high-pressure drilling fluids (bentonite slurry or similar)…." The applicant proposes to minimize risk of an accidental discharge of drilling fluids through the creek bottom through the preparation and implementation of various spill contingency plans, the application of best management practices (BMPs), and compliance with conditions required in state and federal authorizations for the project, including the San Francisco Regional Water Quality Control Board (RWQCB).

The Commission should consider whether the proposed project meets the definition of a water-oriented use and whether the public benefits of the permanent and temporary fill would outweigh the detriments.

b. **Alternative Upland Location and Minimum Amount of Fill.** The Initial Study (May 2011) for the bridge identified project objectives, including correcting structural deficiencies, minimizing traffic disruption during construction, providing an "aesthetically-pleasing signature design," and protecting the natural and recreational uses associated with the creek. Early public comments emphasized that the replacement bridge be "aesthetically similar" to the existing one, "retain a minimal elevation profile," and be "the least visually-detracting…relative to the surrounding scenery." Hence, the City of Larkspur did not consider elaborate structural features (trusses, arches, cable stays, suspension or support-towers, etc.), which could have allowed a creek crossing with no or fewer support structures.

According to the City, the proposed design involving the placement of piers in the creek was selected because building a free-span option would require raising the elevation of adjoining roadways, which is not proposed at this time. Because the bridge is part of "the main arterial between Larkspur and Highway 101 and between Larkspur and the nearest hospital," the City states that vehicular access "must be preserved to the greatest extent possible during construction [and] the bridge has to be replaced one half at a time," which is possible through proposed temporary construction facilities—to be removed completely at project completion. According to the City, "the construction phasing requirement for the sake of public safety makes infeasible the use of free-spanning truss and tied-arch bridges or suspension and cable stay structure types."

The City states that "[t]he existing [bridge] right-of-way is limited…and there is limited space on either side of the existing bridge for expansion or re-alignment of the bridge. The approach roadway tie-ins are adjacent to sensitive wetland habitats…. Entire new alignments crossing Corte Madera Creek would result in significant impacts to existing sensitive habitats and adjacent natural and visual resources, rendering alternative alignments far more impracticable." The thickness

of the proposed bridge deck would be approximately 4.8 feet thick compared with the existing 3.5-foot-depth. The thicker deck is stronger and allows for greater length between—and fewer number of—support piers. The reconfigured support system facilitates pier and abutment placement in the direction of creek flow, and opens up watershed views along the creekside. The applicant proposes to remove the existing and temporary bridge structures to two feet below the creek mudline.

The applicant states that the various design alternatives would result in a similar area and volume of fill as the proposed project with the exception of one alternative that would involve constructing abutments further upland of the creek. This alternative would have involved a greater number of pier bents and pilings and hence, more fill. The purpose of most of the net increase in fill is to provide improved access over the creek for all users. The impacts of this additional fill would be mitigated through marsh restoration and nearby public dock upgrades. The applicant states that the bridge has no upland alternative and involves the minimum amount of fill necessary to achieve the project purpose.

The Commission should consider whether the bridge has no upland alternative and if, as designed, the proposed project constitutes the minimum necessary fill.

c. **Bay Resources.** In addition to the provisions of Section 66605 of the McAteer-Petris Act regarding fill effects on resources, the Bay Plan contains the following relevant policies:

Fish, Other Aquatic Organisms, and Wildlife Policy 2, states, in part: "...habitats that are needed to conserve, increase, or prevent the extinction of any native species, species threatened or endangered…should be protected…." Policy 4 states, in part: "[t]he Commission should: (a) consult with the California Department of Fish and Game and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service whenever a proposed project may adversely affect an endangered or threatened… species….; [and] (c) give appropriate consideration to the recommendations of the [resource agencies] in order to avoid possible adverse effects of a proposed project on fish, other aquatic organisms and wildlife habitat."

Tidal Marshes and Tidal Flats Policy 1 states, in part: "…[f]illing, diking, and dredging projects that would substantially harm tidal marshes…should be allowed only for purposes that provide substantial public benefits and only if there is no feasible alternative." Policy 2 states: "[a]ny proposed fill, diking, or dredging project should be thoroughly evaluated to determine the effect of the project on tidal marshes and tidal flats, and designed to minimize, and if feasible, avoid any harmful effects." Further, the Bay Plan Subtidal Areas Policy 1 states, in part, projects in subtidal areas "should be designed to minimize and, if feasible, avoid any harmful effects" on Bay resources.

Water Surface Area and Volume Policy 1 states, in part: "[f]illing and diking that reduce surface area and water volume should therefore be allowed only for purposes providing substantial public benefits and only if there is no reasonable alternative." Policy 2 states, in part: "[a]ny proposed fills, dikes, or piers should be thoroughly evaluated to determine their effects upon water circulation...."

The Bay Plan Water Quality Policy 2 states: "[w]ater quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the Regional Water Quality Control Board's Basin Plan. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the Regional Water Quality Control Board, should be the basis for carrying out the Commission's water quality responsibilities." Policy 3 states, in part: "[n]ew projects should be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay…." Policy 5 states, in part: "…new development should be sited and designed consistent with standards in municipal stormwater permits and state and regional stormwater management guidelines, where applicable, and with the protection of Bay resources."

• **Fish and Wildlife**. On March 30, 2012, the National Marine Fisheries Service (NMFS) issued a biological opinion (BO) regarding the proposed project's effects on: the federally-threatened Central California Coast (CCC) steelhead and southern Distinct Population Segment (DPS) of the North American green sturgeon, and their designated critical habitat; CCC coho salmon designated critical habitat; and Essential Fish Habitat (EFH) for Pacific salmon, groundfish, and coastal pelagic species. The opinion states that pile driving and temporary water quality impacts could affect green sturgeon and steelhead, and their critical habitats. In June 2014, NMFS reviewed modifications to the originally-considered design and determined that the 2012 BO remained valid.

To minimize effects, NMFS recommended that the applicant include the following measures when undertaking the proposed project: restrict in-water work to September 1 through November 30, the time of year where protected species are least likely to be present; use a bubble curtain to dampen in-water sound levels from driving piles with an impact hammer (unless work is conducted inside a cofferdam); use vibratory hammers to drive pilings associated with the temporary trestle, the bridge foundations, and the cofferdams, and use impact hammers to drive piles to their final depths; cease impact hammer pile driving by November 15; avoid night-time work; employ a biologist to monitor installation and dewatering of cofferdams; use screens on pumps during cofferdam dewatering to prevent entrainment and, if needed, conduct fish salvage in cofferdams; and implement a hydro-acoustic monitoring and reporting plan to ensure in-water sound pressure levels from pile driving do not exceed those considered by NMFS.

In addition, NMFS determined that EFH could be affected through the removal and installation of proposed temporary and permanent fill from the related shading, turbidity, sound, and fill coverage. To minimize these effects, NMFS recommended conducting in-water work at low tide to minimize turbidity impacts. In conclusion, NMFS concluded that the project "is not likely to jeopardize the continued existence" of CCC steelhead or southern DPS green sturgeon, and "is not likely to adversely modify or destroy designated critical habitat for CCC steelhead, CCC coho salmon, or southern DPS green sturgeon."

On April 12, 2012 and on June 10, 2014, the U.S. Fish and Wildlife Service (USFWS) issued a BO on the project's effects on the federally-endangered Ridgway rail and the salt marsh harvest mouse. The opinion identified a "saline emergent wetland [located] to the northeast of the Bon Air Road Bridge [that] provides suitable habitat for salt marsh harvest mouse [as well as adjacent refugia areas]," and suitable areas for Ridgway rail at areas upstream and downstream of the bridge. Further, it stated that project construction noise, vibration, and night-time work could cause flushing and behavior disruption for the species of concern, and work-site trash could increase the number of predators in the area. Potential colonization by invasive vegetation at construction areas could also degrade natural conditions.

To minimize these impacts, USFWS recommended that the City of Larkspur incorporate measures in implementation of the project, including: conducting construction outside the Ridgway rail breeding season (February 1 through August 31) unless surveys show the rail is not present within 700 feet of project site; implementing a spill prevention plan, a Stormwater Pollution Prevention Plan (SWPPP), and Best Management Practices (BMPs); containing on-site trash; hand removing tidal marsh and upland refugia vegetation at the project site; installing exclusionary fencing to prevent sensitive species from entering the construction site; and minimizing night-time work and lighting near marsh. The BO also stated that habitat suitable for the salt marsh harvest mouse and Ridgway rail in the project vicinity should be improved. The BO evaluates the proposed mitigation, as discussed further below.

The applicant proposes to implement the project in a manner that would be fully consistent with the construction and mitigation measures in the NMFS' and USFWS' biological opinions.

• **Water Surface Area and Volume**. The application states that the bridge "project site is located in the Corte Madera Watershed, also referred to as the Ross Valley watershed, which drains a 28-square-mile area of eastern Marin County…." Further, the application states that "[t]he tidal reaches of the system are heavily impacted and have been modified for flood management…"and that "Corte Madera Creek is a flat-bottomed tidal channel with a direct connection to San Francisco Bay." In addition, the project site is influenced by tide fluctuations from the Bay.

According to the applicant, the area is "composed of fine-grained colluvium derived from the erosion of nearby hills and alluvial deposits of marsh sediments and Bay mud. The lower reaches of Corte Madera Creek are subject to ongoing siltation supplied by both [the Bay and Creek watershed]. Sand and gravel are deposited in the flood control channel downstream from Ross [north of the bridge] during major rainstorm events in the winter months, while sediment from the Bay…is transported by summer winds and circulated throughout the Bay by tidal currents."

The proposed pier design is partly intended to orient the bridge support system in the direction of creek flow to improve the creek's conveyance and reduce potential for scouring and erosion at the site. According to the applicant, "[b]ased on the hydraulic model, it was determined that the proposed bridge would have no significant effect on the water surface elevation and flow velocities at the Project site…."

• **Water Quality**. On May 16, 2014, the San Francisco Bay Regional Water Quality Control Board (RWQCB) issued a water quality certification for the proposed project. In evaluating the project, the RWQCB found that water quality could be impacted during bridge construction and operation due to increased impervious bridge surfaces and construction in tidal marsh and open water areas. To address these impacts, the certification requires that the applicant, among other things, prepare a stormwater control plan for Magnolia Avenue for the RWQCB's review and approval, and install, operate and maintain construction and post-construction BMPs to reduce erosion and control pollution sources. The applicant proposes to implement these measures, ensure that construction complies with maximum thresholds for turbidity and water quality provisions established by the RWQCB, and comply with other measures contained in the certification. [3]

On February 9, 2015, the RWQCB issued an addendum to the certification to cover the installation of the telecommunication line under the creek, in which it found that the activity would potentially impact water quality, in part, from the potential release of HDD drilling fluids and related materials. To address this impact, the amended certification requires the applicant to, among other things: prepare and implement a drilling contingency plan to minimize potential for release of drilling fluids to the creek and ensure an adequate response in the event of a release. The applicant proposes to comply with the measures contained in the amended certification.

The Commission should consider whether the proposed project would adequately protect fish, wildlife, water surface and volume, and water quality in part by complying with federal and state recommendations and authorizations to protect these Bay resources.

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[3] On November 12, 2014, the RWQCB issued an addendum to the original water quality certification for the project to cover the proposed ADA public dock improvements which, as previously stated, would be approved under a separate Commission permit.

d. **Sound Safety Standards.** In addition to the provisions of Section 66605 of the McAteer-Petris Act regarding fill safety standards, the Bay Plan Safety of Fill Policy 1 states, in part: "…the Engineering Criteria Review Board [ECRB]…review[s] all except minor projects for the adequacy of their specific safety provisions…." Further, Policy 3 states, in part: "[t]o provide vitally needed information on the effects of earthquakes on all kinds of soils, installation of strong-motion seismographs should be required on all future major land fills." Policy 4 states, in part: "[a]dequate measures should be provided to prevent damage from sea level rise and storm activity that may occur on fill or near the shoreline over the expected life of a project…. New projects on fill or near the shoreline should either be set back from the edge of the shore so that the project will not be subject to dynamic wave energy, be built so the bottom floor level of structures will be above a 100-year flood elevation that takes future sea level rise into account for the expected life of the project, be specifically designed to tolerate periodic flooding, or employ other effective means of addressing the impacts of future sea level rise and storm activity."

On December 5, 2012, the Commission's ECRB reviewed the proposed project focusing on, among other issues, whether the structural and geotechnical design criteria (based on Caltrans bridge design criteria) would adequately address the load capacities of the bridge in light of potential ground liquefaction and seismic loading at the project site, whether seismic instrumentation on the proposed structure would be appropriate, and how the bridge would respond to future flood conditions. The ECRB requested additional information on the engineering criteria to which the City responded and the ECRB found sufficient. The City also responded to the ECRB's advice on seismic instrumentation with a proposal including, the specific instrument installation method, management, and maintenance, and data collection and distribution, which the ECRB reviewed and endorsed. The ECRB also requested additional information on future flooding, including a fuller description of how the bridge could be adapted to address future flood conditions. The applicant responded by preparing a risk assessment, which the ECRB endorsed and is discussed below.

In 2013, the City of Larkspur modified the proposed design of the bridge bents and piers, which had been reviewed by the ECRB in 2012. According to the applicant, the revised design was intended "to have the location of the center span correspond to the center of the [creek] channel as well as correspond to the high point on the bridge profile, resulting in the largest opening for recreational water craft use while providing a superior aesthetic appearance." According to the City, the revised design would not result in a change in the number of bridge spans, the bridge's hydraulic characteristics, or design criteria. Therefore, the modified project did not warrant a second formal review by the ECRB.

The Commission should determine whether the proposed project would be consistent with its law and policies regarding the safety of construction and operation of fill in the Bay.

e. **Valid Title.** In 1957, the California State Lands Commission issued a Life-of-Structure Permit to the City and the County of Marin for construction, operation, and maintenance of the Bon Air Bridge. On April 23, 2015, the State Lands Commission issued a new General Lease to the City, including for areas affected by construction and staging, which is valid through 2040. Since the City of Larkspur proposes to construct a bridge with a 75-year life span extending beyond the term of the lease, it has stated that it would, prior to April 23, 2040, secure a renewed lease and provide evidence of such a lease to the Commission for its review. The applicant has been informed that in the absence of a renewed lease and, hence, valid title to the subject property, the fill associated with the proposed project would need to be removed.

The Commission should determine whether the fill proposed for the proposed project is consistent with the Commission's law and policies regarding valid title of fill lands.

2. **Mitigation.** The Bay Plan Mitigation Policy 1 states, in part, that projects should avoid adverse environmental impacts and, if unavoidable, impacts minimized to the greatest extent practicable and, moreover, require measures to compensate for such impacts. Policy 2 states, in part: "…compensatory mitigation projects should be sited and designed…as close to the impact site as practicable…." The Bay Plan Mitigation Policy 4 states, in part: "[t]he amount and type of compensatory mitigation should be determined…based on a clearly identified rationale that includes an analysis of: the probability of success of the mitigation project; the expected time delay between the impact and the functioning of the mitigation site; and the type and quality of the ecological functions of the proposed mitigation site as compared to the impacted site." Policy 5 states, in part: "[t]o increase the potential for the ecological success and long-term sustainability of compensatory mitigation projects…transition zones and buffers should be included in mitigation projects…. In addition, mitigation site selection should consider site specific factors that will increase the likelihood of long-term ecological success, such as…connections to other habitats." Policy 6 states, in part, mitigation should occur "prior to, or concurrently with those parts of the project causing adverse impacts." Policy 7 states, in part, that the program should include goals, performance standards to evaluate success, and plans for site monitoring, adaptation, maintenance, and management.

A narrow fringe of tidal marsh occurs in the area around the northeast and southwest ends of the existing Bon Air Bridge. The proposed project would temporarily impact an approximately 870-square-foot (0.020 acre) area of marsh where construction-related activities would occur and permanently impact an approximately 45-square-foot (0.001-acre) area of tidal marsh. According to the USFWS biological opinion, the project would also affect 0.153 acres of habitat for the Ridgway rail and salt marsh harvest mouse in the project vicinity.

The applicant proposes to mitigate these impacts by, at project completion, restoring the 870 square feet (0.020 acres) of marsh that would be temporarily impacted by construction. In addition, the City proposes to restore, manage, and monitor an approximately 11,200-square-foot (0.257-acre) area located adjacent to nearby Piper Park, in

the City of Larkspur. The Piper Park mitigation project would involve restoring tidal marsh at an area presently used as a dog park. The mitigation area is mostly located outside the Commission's jurisdiction, with the exception of one small area where an existing berm would be partly removed to reintroduce tidal action. The project would involve creating conditions that would promote the establishment and growth of pickleweed, saltgrass, alkali heath, and bulrush, and transition zones. Soil would be removed to achieve elevations determined by the hydrological conditions of nearby tidal channels as appropriate for wetland hydrology and marsh formation. If natural vegetation colonization does not occur after the first year, a planting plan would be implemented. According to the application, "[o]nce the vegetation matures, it is expected to replicate the species composition and structure of the naturally occurring habitats in nearby wetlands." The applicant has developed a full set of biological and physical goals, and performance criteria for assessing the success of mitigation.

In addition, the City has already provided funding ($45,000.00) to enhance habitat suitable for the Ridgway rail and salt marsh harvest mouse at Creekside Park located north of the bridge, in the City of Greenbrae. This project would occur at an area with a breeding population of Ridgway rail and with habitat suitable for the salt marsh harvest mouse, which is impacted by recreational users and domestic pets. The goal is to improve 20,000 square feet (0.459 acres) of high tidal marsh plain and high-tide upland refugia habitat by: promoting growth of gumplant at the top of banks above areas populated with native cordgrass to provide rail nesting area and high-tide refugia; providing high-tide refugia (e.g., gumplant) at high marsh transition zones; and expanding high marsh plain vegetation into bare areas. The effort would involve planting in channels, high elevation areas, and unvegetated areas. The City would also fund site monitoring over a five-year period.

Both mitigation sites are located within one mile of the bridge. The City has already provided funds for the Creekside Marsh improvements, and a BCDC permit application for the work is currently under review by Commission staff. Because both sites are geographically distinct from the bridge site, they would be authorized under separate Commission permit applications and, likely be a requirement (i.e., Special Condition) of a Commission approval for the bridge.

The Commission should consider whether the proposed program would adequately mitigate for the impacts associated with the proposed bridge.

3. **Climate Change.** The Bay Plan Climate Change Policy 3 states in part: "…a risk assessment should be prepared by a qualified engineer and should be based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current flood protection and planned flood protection that will be funded and constructed when needed to provide protection for the proposed project or shoreline area. A range of sea level rise projections for mid-century and end of century based on the best scientific data available should be used in the risk assessment. Inundation maps used for the risk assessment should be prepared under the direction of a qualified engineer. The risk assessment should identify all types of potential flooding, degrees of

uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices." Policy 4 states in part: "[t]o protect public safety and ecosystem services, within areas that a risk assessment determines are vulnerable to future shoreline flooding that threatens public safety, all projects—other than repairs of existing facilities, small projects that do not increase risks to public safety, interim projects and infill projects within existing urbanized areas—should be designed to be resilient to a mid-century sea level rise projection. If it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise based on a risk assessment using the best available science-based projection for sea level rise at the end of the century." Policy 7 states in part: "[u]ntil a regional sea level rise adaptation strategy can be completed, the Commission should evaluate each project proposed in vulnerable areas on a case-by-case basis to determine the project's public benefits, resilience to flooding, and capacity to adapt to climate change impacts. The following specific types of projects have regional benefits, advance regional goals, and should be encouraged, if their regional benefits and their advancement of regional goals outweigh the risk from flooding: a transportation facility, public utility or other critical infrastructure that is necessary for existing development or to serve planned development…."

The expected life of the proposed bridge is 75 years. The bridge deck and soffit would be shaped as a gentle arc to connect, at the northern and southern ends, with the land area where existing elevations would remain unchanged. The elevations along the proposed bridge deck would range from 12.53 feet NAVD88, the lowest point at north end, to 18.14 feet NAVD88, the highest point at Bent No. 4. The elevations at the soffit would range from 7.03 feet NAVD88, the lowest elevation at the northern end, to 12.64 feet NAVD88, the highest point at Bent No. 5.

In determining the effects of future sea level rise at the proposed bridge, the applicant's engineer considered a combination of downstream conditions at the mouth of Corte Madera Creek, and upstream conditions (mostly related to fluvial or riverine forces) at the project site, which is located approximately two miles from the creek mouth. In addition, the following future sea level rise projections were taken into account: 16 inches (1.33 feet) NAVD88 in 2050, resulting in a projected tidal elevation of 9.15 NAVD88 at the proposed bridge, and 55 inches (4.58 feet) NAVD88 in 2100, resulting in a projected tidal elevation of 10.72 feet NAVD88 at the bridge.

Consequently, when water surface elevation reaches 9.15 NAVD88, the bridge deck and most of the soffit—except at the northern and southern ends which would be located, respectively, at 7.03 and 7.55 feet NAVD88—would be located above water. Further, when water surface elevation reaches 10.72 feet NAVD88, the bridge deck would be located above water while the soffit's northern and southern ends, as well as the area at Bent No. 2 (located at 9.20 feet NAVD88) would be located below water.

To ensure that the future submerged bridge elements would be resilient, the applicant proposes to use the following strategies: apply epoxy coating and concrete clear cover on all exposed steel, and use stainless or galvanized steel on exposed structural steel to prevent corrosion; design bridge bents while taking into account applicable water loads according to Caltrans standards, and the anticipated channel velocity and the possibility of accumulation of debris at the bents and superstructure during an extreme storm event; at each abutment, use vertical restrainers to prevent un-seating of the girders and bearing uplift during an extreme storm event; construct the abutment bearings with steel reinforced elastomeric bearing pads, which do not have exposed moving parts; and use an open railing system at the bridge deck to allow flood waters to pass through and over the roadway, if needed.

It is important to note that in the future, flooding is expected to occur at the bridge roadway (Bon Air Bridge Drive) approaches located outside the Commission's jurisdiction. Specifically, at the roadway located approximately 100 feet from the northern bridge end where the existing elevation is approximately 9.57 feet NAVD88, future flooding is expected. Similarly, at the roadway located approximately 100 feet from the southern bridge end, where the elevation is approximately 10.34 feet NAVD88, flooding is expected to occur in the future. As stated earlier, the City of Larkspur is not currently planning to raise these roadway elevations, but is contemplating future protective measures, e.g. a floodwall system built along Corte Madera Creek.

The Commission should determine whether the proposed fill and strategies for responding to future sea level rise would be consistent with its laws and policies.

4. **Public Access and Appearance, Design and Scenic Views.** In assessing whether a project would provide maximum feasible public access consistent with the proposed activity, the Commission relies on the McAteer-Petris Act, Bay Plan policies, previous requirements of similar projects, and on relevant court decisions. In assessing whether a proposed public project, such as the City of Larkspur's, would provide the maximum feasible public access consistent with the project, the Commission also evaluates whether the proposed access is reasonable given the scope of the project.

   The McAteer-Petris Act Section 66602 states, in part, "…that existing public access to the shoreline and waters of the San Francisco Bay is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided." The Bay Plan Public Access Policy 1 states "[a] proposed fill project should increase public access to the Bay to the maximum extent feasible, in accordance with the policies for Public Access to the Bay." Policy 4 states, in part, "[p]ublic access should be sited, designed and managed to prevent significant adverse effects on wildlife." Policy 5 states, in part, "[p]ublic access should be sited, designed, managed and maintained to avoid significant adverse impacts from sea level rise and shoreline flooding." Policy 7 states, in part, "…improvements should be designed and built to encourage diverse Bay-related activities and movement to and along the shoreline, should permit barrier free access for persons with disabilities to the maximum feasible extent, should include an ongoing maintenance program, and should be identified with appropriate signs." Policy 10

states, in part, "[t]he roadway…should provide for safe, separated, and improved physical access to and along the shore…." Policy 12 states, in part, "…[t]he Design Review Board should advise the Commission regarding the adequacy of the public access proposed."

The Bay Plan Transportation Policy 4 states, in part, "bridges over…certain waterways should include pedestrian and bicycle paths that will either be a part of the Bay Trail or connect the Bay Trail with other regional and community trails."

The Bay Plan Appearance, Design, and Scenic Views Policy 6 also states, in part, "[n]ew or remodeled bridges…should be designed to permit maximum viewing of the Bay and its surroundings by both motorists and pedestrians. Guard rails and bridge supports should be designed with views in mind."

According to the applicant, aside from the proposed design needing to achieve seismic stability and resilience against the salinity of the creek, it is also intended to meet the local community's aesthetic recommendations including: the creation of a seamless connection to nearby multi-use paths; the use of aesthetic treatments on the sides of the bridge; the use of light fixtures, which are short and project downward; and the retention of views of surrounding hills.

The proposed bridge is designed with ADA-compliant, seven-foot-wide bike lanes and 10-foot-wide sidewalks traveling in both directions. At the northern end of the bridge, the bike paths and sidewalks would connect to: a multi-use path traveling west adjacent to Corte Madera Creek; a multi-use path traveling along northwest side of Bon Air Drive; and a bike lane traveling west at South Eliseo Drive, which ultimately connects to the San Francisco Bay Trail near the intersection of Sir Francis Drake Boulevard and Highway 101. At the southern end of the bridge, the bike paths and sidewalks would connect to a multi-use path traveling along the west side of Bon Air Drive and a bike lane at Bon Air Drive, both intersecting with Magnolia Avenue.

A 46.5-inch-high barrier would separate the bridge bike lanes from adjacent vehicle lanes. Outer bridge railings would be 42- to 44-inch-high and are designed to preserve views of the creek for those traveling on the bridge. The City would install signage at the bridge to aid users of the bike paths and sidewalks. Lighting fixtures on the bridge would illuminate the bike paths and sidewalks, and are designed to minimize effects of lighting on creek wildlife. The City of Larkspur would maintain the public bike paths, sidewalks, and associated facilities.

As previously discussed, in 2050 when water levels are expected to reach an elevation of 9.15 NAVD88, the bridge deck with the proposed bike path and sidewalks would be above flood levels. At the roadway located approximately 100 feet from the northern bridge end, where the existing elevation is (and would remain) approximately 9.57 feet NAVD88, and, at the roadway located approximately 100 feet from the southern bridge end, where the elevation is (and would remain) 10.34 feet NAVD88, projected mid-century and end-of-century flood conditions are expected to affect the bridge approaches and, hence, the off-bridge accessways to the proposed bike paths and side-

walks. According to the City, at that time, the possible design and implementation of a creek-wide program to protect such areas from flooding or raise existing elevations may occur to address this issue. These areas, however, are located outside the Commission's jurisdiction, and, at this time, addressing this particular issue is not part of the City's proposal.

The applicant states that the proposed project will be more attractive than the existing bridge and takes maximum advantage of the setting. The proposed bridge would be constructed with eight piers in Corte Madera Creek, which would be slightly bulkier than existing bridge columns but significantly fewer in number and would, hence, enhance the watershed views for visitors adjacent to and at the creek. The new bridge would also include railings that provide greater transparency than the existing railings, and lighting on the proposed bridge would be improved.

On December 10, 2012, the Commission's Design Review Board (DRB) reviewed the proposed project and requested that the applicant return for a second review with additional information concerning: the effects of bridge lighting on wildlife in the creek, and the proposed lighting's capacity to ensure safe conditions for pedestrians and cyclists; the proposed design of bridge railings and associated visual impacts; the off-bridge bike and pedestrian connections; and the amount of under-bridge clearance for non-motorized boats in light of future flooding conditions.

On February 11, 2013, the applicant returned to the DRB. Regarding the effects of proposed lighting on Bay resources, the applicant stated that the proposed "acorn-style lights" would meet the International Dark Sky Association's standards thereby minimizing light pollution on resources and also meeting national lighting safety criteria for pedestrians and bikes. The applicant also presented a revised barrier design with a reduced height—from 54 inches to 42 inches—to increase visibility of Corte Madera Creek for all users of the bridge. Further, the applicant clarified how the on-bridge bridge bike lanes and sidewalks would connect to pathways located at the bridge ends. Lastly, it was stated that non-motorized boats would continue to have under-bridge access at the structure's center point with clearance becoming more restricted when water levels reach 10.72 feet NAVD88; at that time, approximately two feet of under-bridge clearance would be possible.

In terms of public access, the proposed bridge compares favorably to other bridges the Commission has authorized. In July 2014, the Commission issued Permit No. 2013.008 for the construction of an approximately 4,900-square-foot bridge at a certain waterway in the City of Fremont, which included two sidewalks (9.5 and 5.5 feet wide) and two 5.0-foot-wide Class II bike lanes. In 2007, the Commission issued Permit No. 2007.002 for reconstructing a 27,500-square-foot bridge at Lake Merritt Channel, which resulted in about 11,000 square feet of net fill in the Bay. The public access provided on the bridge included a five-foot-wide sidewalk and a twelve-foot-wide multi-use path, and, off the bridge, two six-foot-wide bike lanes approaching the bridge. By comparison, the proposed bridge, which would result in approximately 4,800 square feet of net fill in a certain waterway, would provide two, ADA-compliant seven-foot-wide bike lanes and

two 10-foot-wide sidewalks on the bridge providing connections to off-bridge bike and pedestrian facilities. Further, the proposed project would improve two nearby public docks.

The Commission should consider whether the project would provide the maximum feasible public access consistent with the proposed project, and whether the proposed access improvements would be reasonable given the scope of the project, would be consistent with the Bay Plan's appearance, design, and scenic views, and whether the proposed access would be designed and managed to avoid impacts of future flooding.

5. **Navigation**. Navigational Safety and Oil Spill Prevention Policy 1 states, in part, "[p]hysical obstructions to safe navigation, as identified by the U.S. Coast Guard [USCG] and the Harbor Safety Committee of the San Francisco Bay Region, should be removed to the maximum extent feasible when their removal would contribute to navigational safety and would not create significant adverse environmental impacts. Removal of obstructions should ensure that any detriments arising from a significant alteration of Bay habitats are clearly outweighed by the public and environmental benefits of reducing the risk to human safety or the risk of spills of hazardous materials, such as oil."

   The City of Larkspur received approval from the USCG under the federal General Bridge Act of 1946, which requires approval of location and plans for bridges prior to construction. The USCG found that the subject waterway is considered "navigable, but not actually navigated by other than logs, log rafts, rowboats, canoes, and small motorboats. In such cases, the [proposed] clearances provided for high water stages will be considered adequate to meet the reasonable needs of navigation."

   The Commission should consider whether the proposed project would ensure safe conditions to navigate Corte Madera Creek.

B. **Review Boards**

1. **Engineering Criteria Review Board (ECRB).** The Commission's Engineering Criteria Review Board (ECRB) reviewed the proposed project on December 5, 2012. The results of the review is summarized in Section A.1.d, above.

2. **Design Review Board (DRB).** The Commission's DRB reviewed the proposed project on December 10, 2012, and on February 11, 2013. The results of both reviews are summarized in Section A.4, above.

C. **Environmental Review.** Pursuant to California Environmental Quality Act (CEQA), the City of Larkspur approved a mitigated negative declaration (MND) on August 1, 2012 (Exhibit C). The City's MND evaluated the potential impacts of constructing the replacement bridge, and included mitigation measures to reduce such impacts to "less-than-significant" levels, including measures to restore temporarily and permanently impacted tidal wetland vegetation and to protect special-listed species. Since federal funds from the Federal Highway

Administration would be partly used to construct the proposed bridge, compliance with the National Environmental Policy Act (NEPA) is also required. Caltrans is acting as the federal lead agency under NEPA. NEPA approval, in the form of a Categorical Exclusion, was issued May 15, 2012.

On October 8, 2014, the City of Larkspur issued and certified a supplement to the MND to cover activities that were not addressed in the MND adopted in August 2012, including the temporary cofferdams associated with bridge construction and the installation of the telecommunication line under Corte Madera Creek. In certifying the supplemental declaration, the City found that these activities were "minor technical additions" to the original project that were identified with refinement of project design. Further, the City declared that the activities would not cause "significant new environmental effects" or substantially increase the effects of the original project for which mitigation measures were previously identified.

D. **Relevant Portions of the McAteer-Petris Act**

1. Section 66605
2. Section 66602

E. **Relevant Portions of the San Francisco Bay Plan**

1. Bay Plan Policies on Public Access
2. Bay Plan Policies on Other Uses of the Bay and Shoreline
3. Bay Plan Policies on Fish, Other Aquatic Organisms, and Wildlife
4. Bay Plan Policies on Tidal Marshes and Tidal Flats
5. Bay Plan Policies on Water Surface Area and Volume
6. Bay Plan Policies on Water Quality
7. Bay Plan Policies on Safety of Fills
8. Bay Plan Policies on Mitigation
9. Bay Plan Policies on Climate Change
10. Bay Plan Policies on Public Access
11. Bay Plan Policies on Transportation
12. Bay Plan Policies on Appearance, Design, and Scenic Views
13. Bay Plan Policies on Navigational Safety and Oil Spill Prevention

Exhibits

A. Proposed Public Access (on-bridge)

B. Proposed Off-Site Public Access Improvement Locations

C. Mitigated Negative Declaration (excerpt)