

# San Francisco Bay Conservation and Development Commission

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May 4, 2018

## Application Summary

(For Commission consideration on May 17, 2018)

**Number:** Consistency Determination No. C2018.003.00  
**Date Tendered:** April 26, 2018  
**Action Required By:** June 25, 2018 (Mandatory Time Extension July 10, 2018)  
**Staff Assigned:** Brenda Goeden (415/352-3623;  
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### Summary

**Applicant:** U. S. Army Corps of Engineers (USACE), San Francisco District

**Location:** In the Bay and Suisun Bay Primary Management Area, at the following deep water navigation channels (Exhibit A): (1) Oakland Inner and Outer Harbor Channels (Exhibit B); (2) Richmond Inner and Outer Harbor Channels (Exhibit C); (3) Pinole Shoal Channel (Exhibit D); (4) Suisun Bay Channel and New York Slough (New York Slough is outside of the Commission's jurisdiction) (Exhibit E); (5) Redwood City Harbor Channel (Exhibit F); and (6) the Petaluma River and Across the Flats, two shallow draft channels (Exhibit G); and also at (7) San Francisco Main Ship Channel (outside of the Commission's jurisdiction) (Exhibit H).

In the Bay, at the state- and federally-designated, dredged sediment disposal sites near Alcatraz Island (SF-11), Carquinez Strait (SF-9), Suisun Bay (SF-16), San Pablo Bay (SF-10) (Exhibit A) in San Francisco and Marin, Napa, Solano, and Marin Counties, respectively. At beneficial reuse sites including: Montezuma Wetland Restoration Project (Exhibit E) in the Commission's Suisun Marsh Primary Management Area, Cullinan Ranch Wetland Restoration Site (Exhibit D), and Schollenberger Park within the Commission's coastal zone

jurisdiction, Solano, Napa and Sonoma Counties, respectively. At the federally authorized ocean disposal sites, including San Francisco Bar (SF-8), the Ocean Beach Nourishment Site, and the San Francisco deep ocean disposal site (SF-DODS) (Exhibit H), outside the Commission's jurisdiction.

**Project:** During the calendar years 2018 and 2019, within the Commission's jurisdiction, maintenance dredge up to an estimated total volume of 5.35 million cubic yards (mcy) of sediment from seven federal navigation channels in San Francisco Bay; and dispose and/or beneficially reuse the dredged sediment at various sites including the state- and federally-authorized Suisun Bay, Carquinez Strait, San Pablo Bay and Alcatraz in-Bay disposal sites, the San Francisco Bar and San Francisco Deep Ocean Disposal Sites (SFDODS), and Montezuma Wetlands Restoration Project (Montezuma), Cullinan Ranch Wetlands Restoration Project (Cullinan), and Schollenberger Park placement site.

In 2018, the USACE proposes to dredge a maximum: (1) 950,000 cubic yards (cy) of sediment from Oakland Inner and Outer Harbor Channels; (2) 350,000 cy of sediment from Richmond Inner Harbor Channel; (3) 500,000 cy of sediment from Richmond Outer Harbor Channel; (4) 275,000 cy of sediment from Suisun Bay and New York Slough Channel; (5) 300,000 cy of sediment from Redwood City Harbor Channel; which totals 2.375 mcy of sediment from within the Commission's jurisdiction, and (6) dredge a maximum 350,000 cy of sediment from the San Francisco Main Ship Channel, outside the Commission's jurisdiction. The USACE proposes to dispose of 1,075,000 cy of sediment at in-Bay disposal sites (45%), 700,000 cy of sediment at SF-DODS (30%), and place 600,000 cy sediment at beneficial reuse sites (25%).

In 2019, the USACE proposes to: (1) dredge a maximum 950,000 cy of sediment from Oakland Inner and Outer Harbor Channel; (2) dredge a maximum 350,000 cy of sediment from Richmond Inner Harbor Channel; (3) dredge a maximum 275,000 cy of sediment from Suisun Bay and New York

Slough Channel; (4) dredge a maximum 500,000 cy of sediment from Pinole Shoal Channel; (5) dredge a maximum 300,000 cy of sediment from the Redwood City Harbor Channel; (6) dredge a maximum of 350,000 cy of sediment from the Petaluma River Channel, and (7) 250,000 cy from Across the Flats Channel; totaling 2.975 mcy of sediment from within the Commission's jurisdiction, and (8) dredge a maximum 350,000 cy of sediment from the San Francisco Main Ship Channel, outside the Commission's jurisdiction. The USACE proposes to dispose of 1.025 mcy of sediment at in-Bay disposal sites (45%), 1.65 mcy of sediment at SF-DODS or upland disposal (55%), and no beneficial reuse.

**Issues**

**Raised:**

The staff believes that the consistency determination raises three primary issues: (1) whether the volume of sediment proposed for in-Bay disposal is consistent to the maximum extent practicable with the LTMS Management Plan and the San Francisco Bay Plan; (2) whether the proposed minimization measures are sufficient to protect native species and their habitat, and specifically species that are experiencing a steep population decline, including state- and federally- listed species; and (3) whether the proposed maintenance dredging of federal navigation channels is consistent to the maximum extent practicable with the Commission's laws and the Bay Plan policies regarding dredging including maximizing beneficial use of dredged sediment as a resource; fish, other aquatic organisms, and wildlife; subtidal areas; mitigation; water quality; and navigation safety and oil spill prevention.

### Background

The U.S. Army Corps of Engineers (USACE) has the responsibility to maintain the federal navigation channels in San Francisco Bay to provide a reliable federal navigation system that is essential to the economic well-being and national defense of the country. To accomplish this goal, the USACE annually dredges deep water navigation channels in San Francisco Bay used by the US Coast Guard, ports, oil terminals and refineries, and other commercial and recreational users. The USACE estimates that between 4,000 and 5,000 deep draft vessels enter the Bay and use the navigation channels annually. According to the USACE, the goods-

movement industry accounts for 51 percent of the total regional economic output and 32 percent of the total regional employment.<sup>1</sup> The Bay Area ports and harbors play a major role in efficient movement of goods throughout the region, as well as in California and the West Coast of the United States. Ensuring that the federal deep-draft navigation channels are maintained is vital to the region's economy, and reduces the risk of vessel collisions, groundings, allisions, and oil spills.

In addition to deep draft channels, the USACE was authorized by Congress to maintain several shallow draft channels in the Bay, including the San Rafael Canal, Petaluma River, Napa River, Suisun City channel, and the Jack T. Maltester channel, which are primarily used for recreational boating, though some do support the local economies and maritime commerce. In the past two decades, the USACE has received little funding to dredge these shallow draft federal channels, and all are overdue for dredging, with the exception of portions of the Napa River channel, which was dredged in 2016. In 2019, the USACE plans to dredge the Petaluma River and Petaluma River Across the Flats, a large mudflat with delta-like feature at the mouth of the Petaluma River.

The USACE has determined that the proposed project is consistent to the maximum extent practicable with the Commission's laws and policies, and requests Commission concurrence for maintenance of six deep water channel and two shallow draft channels in 2018 and 2019.

**Federal Law.** The USACE undertakes maintenance dredging of federal navigation channels and the disposal of dredged sediment under 33 Code of Federal Regulations (CFR) 335 through 338, and in accordance with Section 404(b)(1) of the Federal Clean Water Act (33 U.S.C. 1251 *et seq.*), as administered by the San Francisco Bay Regional Water Quality Control Board (Water Board), and the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1401 *et seq.*) (commonly referred to as the Ocean Dumping Act (ODA)), as administered by the US Environmental Protection Agency (EPA), and Section 307(c) of the Coastal Zone Management Act of 1976 (16 U.S.C. 1456 (c)), as amended and administered by the Commission.

These regulations describe the processes the USACE should undertake in evaluating the proposed project and requesting authorization to proceed from the Water Board, EPA and BCDC. The LTMS Management Plan is an officially adopted federal, state and regional program and includes policies applicable to the USACE maintenance dredging program.

**Coastal Zone Management Act.** Section 307(c) of the Coastal Zone Management Act of 1976, 16 USC 1456(c) directs the USACE to seek consistency with the provisions of the federal Coastal Zone Management Act of 1972, as amended (CZMA). NOAA's regulations, under the Department of Commerce, govern the Commission's decisions on federal consistency matters. The Commission's Coastal Management Program (CZMP) is based on the provisions and policies of, among other things, the McAteer-Petris Act, the Suisun Marsh

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<sup>1</sup> California Department of Transportation. 2014. *San Francisco Bay Area Freight Mobility Plan, Final Report*. March 2014. Available at: <http://www.dot.ca.gov/hq/tpp/offices/ogm/regionallevel/FR3SFBAFMSFinalReport.pdf>. (Accessed on 5 April 2015).

Preservation Act of 1977, the San Francisco Bay Plan (Bay Plan), the Suisun Marsh Protection Plan, and the Commission's administrative regulations. Under the CZMA, the USACE is required to carry out their activities and programs in a manner “consistent to the maximum extent practicable” with the Commission’s CZMP.<sup>2</sup> The term “consistent to the maximum extent practicable” means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency.<sup>3</sup> 15 CFR 930.32 further states that federal agencies shall not use a general claim of a lack of funding as a basis for being consistent to the maximum extent practicable with an enforceable policy of a management program. In cases where the cost of being consistent with the management program was not included in the Federal agency's budget and planning processes, the Federal agency should seek additional federal funds necessary to be consistent with the management plan. Federal agencies should include the cost of being fully consistent with the management programs in their budget and planning processes to the same extent they would plan for the cost of complying with other federal requirements<sup>4</sup>. As mentioned above, the CZMP for San Francisco Bay includes the Bay Plan and, therefore, the USACE should endeavor to plan and fund their projects in a way that is consistent with enforceable Bay Plan policies.

**LTMS Management Plan.** Historically, most of the material dredged from the Bay was disposed of in the Bay. During the late 1980s and early 1990s, dredging became highly controversial due to the capacity problems at the Alcatraz disposal site and concerns raised by the resource agencies, and the environmental and fishing communities regarding the impacts of the disposal of dredged sediment on Bay natural resources and water quality. As a result, the LTMS was developed and adopted by the USACE, the EPA, the Water Board, the State Water Resources Control Board (SWRCB), and the Commission, collectively the LTMS agencies. The overarching goal of the LTMS is to gradually decrease in-Bay disposal by maximizing beneficial reuse of sediment and other disposal alternatives, including the ocean as a stop-gap option when beneficial reuse was infeasible. The LTMS Management Plan is incorporated into the Bay Plan dredging policies and has become the dredging management plan for the region. The four goals include:

- Maintain in an economically and environmentally sound manner those channels necessary for navigation in San Francisco Bay and Estuary and eliminate unnecessary dredging activities in the Bay and Estuary;
- Conduct dredged material disposal in the most environmentally sound manner;
- Maximize the use of dredged material as a resource; and
- Maintain the cooperative permitting framework for dredging and disposal applications.

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<sup>2</sup> 16 USC Section 307(c)(A)(1)

<sup>3</sup> 15 CFR 930.32(a)(1)

<sup>4</sup> 15 CFR 930.32(a)(3)

As part of the implementation of the LTMS Management Plan, a twelve-year transition period from the historic practice of in-Bay disposal to maximizing beneficial reuse was included to allow the dredging community time to plan and budget for the change in practice and for beneficial reuse sites to be brought on line. The twelve-year transition period was completed in 2012. At that time, the in-Bay disposal target volume was reduced to 1.25 mcY per year, as averaged over consecutive three-year periods. 2018 marks the end of the current three-year averaging period. Currently, to meet the LTMS goals, eighty percent of material from all large and medium sized dredging projects should be placed out of Bay, preferably at a beneficial reuse site, and twenty percent at the in-Bay disposal sites. In the event that the dredging community does not voluntarily meet the LTMS goals, the dredging policies provide for the Commission to consider initiating an allocation strategy. To date, the LTMS program has consistently met the reduced in-Bay disposal targets, alleviating the need to implement regulatory allocations. Most dredging projects are meeting those goals, with ocean disposal being used when beneficial reuse is not feasible.

As an LTMS partner and the largest dredger in the Bay, the USACE has been instrumental in implementing the LTMS Program. In 1999, at the completion of the environmental review process, the USACE signed the Record of Decision, stating that the LTMS program alternative selected in the state and federal environmental documents incorporated all the policy level minimization measures and therefore includes all practical means to avoid or minimize harm as required by the National Environmental Policy Act (NEPA). Prior to the issuance of the LTMS Management Plan, the USACE worked to beneficially reuse dredged sediment at a number of sites throughout the Bay Area to reinforce levees and to restore marsh habitat; and to reduce in-Bay disposal through upland placement at disposal ponds, and ocean disposal. During the LTMS transition period, the USACE has placed approximately 19.8 million cy at beneficial reuse sites, including Montezuma, Hamilton Wetland Restoration Project, Winter Island, and the Middle Harbor Enhancement Project; 19.8 million cy of sediment was disposed of at the San Francisco Deep Ocean Disposal Site (SF-DODS); and 19.5 million cy was disposed of in the Bay. Much of the beneficial reuse during this period was due to the Port of Oakland 50-Foot Deepening Project, which had a large volume of dredged sediment (17 million cy), a federal funding stream and a local project sponsor. The deepening project was completed in 2009, and since that time, the dredging activity undertaken by the USACE in the Bay has been only maintenance of existing federal channels.

Current beneficial reuse and upland disposal options are limited but include Montezuma Wetland Restoration Project, Cullinan Ranch Restoration Project, and Van Sickle Island levee project. Bel Marin Keys and Eden Landing are in environmental review and the South Bay Salt Ponds, and Skaggs Island are in planning phases.

**Pending Litigation.** On June 4, 2015, the Commission conditionally concurred in the USACE's consistency determination for annual operation and maintenance dredging of the Bay's deep draft federal navigation channels from 2015 through 2017. The Commission's concurrence included conditions requiring the USACE to: (1) starting in 2017, beneficially reuse a minimum of 40% of the dredged material and dispose of a maximum of 20% of the dredged material in unconfined in-Bay disposal sites; (2) starting in 2017, reduce the use of

hydraulic dredges to only one in-Bay channel per year (either Richmond Outer Harbor or Pinole Shoal Channel); (3) develop a strategy to obtain additional funds, if necessary, to implement the foregoing two conditions; and (4) obtain a water quality certification for the USACE's dredging activities from the San Francisco Bay Regional Water Quality Control Board.

The USACE initially signed the Commission's Letter of Agreement, which specified the Commission's conditions, on June 23, 2015. However, by letter dated November 15, 2015, the USACE stated that the Commission's requirements for beneficial reuse and the reduction of hydraulic dredge use exceeded the constraints established by the USACE's "federal standard," and that the USACE lacked the necessary authority to request additional funding to comply with those conditions. Also, on November 15, 2015, the USACE submitted a nearly identical letter to the Water Board stating that the parallel requirement in the Water Board's water quality certification which similarly mandates the reduction of hydraulic dredging to one channel per year, exceeded the constraints established by the USACE's "federal standard."

On September 22, 2016, after the USACE rejected the Commission's request to mediate with the NOAA Office of Coastal Management, the Commission filed a lawsuit in federal district court in San Francisco, seeking to compel the USACE to comply with the four conditions summarized above in the Commission's concurrence with the USACE's 2015-2017 consistency determination. *San Francisco Bay Conservation and Development Commission v. United States Army Corps of Engineers*, N.D. Cal. Case No. 3:16-cv-05420-RS. On April 25, 2017, the Court granted the motion of San Francisco Baykeeper to intervene in the case.

On January 12, 2017, the USACE adopted what it referred to as "Course of Action # 2" that, according to the USACE, would comply with both its "federal standard" and the Commission and Water Board requirements to reduce the use of hydraulic dredges to only one channel per year. Under Course of Action # 2, the USACE will dredge either at Richmond Outer Harbor or Pinole Shoal with a hydraulic dredge in alternating years while deferring dredging of the other of these two channels in alternating years, rather than continuing to dredge each channel annually as it had done in the past and had previously planned to do in the future. On June 20, 2017, the Commission filed a supplemental complaint in the federal court action, challenging the USACE's decision to adopt Course of Action #2. The case remains pending and is expected to be resolved by way of cross-motions for summary judgment later this year.

## Project Description

### Project

#### Details:

The USACE 2018 and 2019 consistency determination describes the project as follows:

In the Bay and the Suisun Marsh Primary Management Area:

1. In 2018 and 2019, dredge from Oakland Inner and Outer Harbors (project depth: -50 feet MLLW, plus two feet over-dredge depth) a maximum of 950,000 cy of sediment each year and dispose of the dredged sediment at either the federally authorized San Francisco deep ocean disposal site (SF-DODS) or beneficially reuse at an approved site;
2. In 2018 and 2019, dredge from Richmond Inner Harbor (project depth: -38 feet MLLW, plus two feet over-dredge depth) a maximum of 350,000 cy of sediment each year, for a total of 700,000 cy of sediment and dispose of the dredged sediment at the federally authorized San Francisco deep ocean disposal site (SF-DODS) or beneficially reuse at an approved site;
3. In 2018 only, dredge from Richmond Outer Harbor (project depth: -45 feet MLLW, plus two feet over-dredge depth) a maximum of 500,000 cy of sediment and dispose of the dredged sediment in the Bay at the state and federally authorized Alcatraz Island (SF-11) and/or San Pablo Bay (SF-10) disposal sites;
4. In 2018 and 2019, dredge from Suisun Bay Channel (project depth: -35 feet MLLW, plus two feet over-dredge depth) a maximum of 225,000 cy of each year, for a total of 550,000 cy of sediment and dispose of the sediment in the Bay at the state and federally authorized Suisun Bay (SF-16) and/or Carquinez Strait (SF-9) disposal site or beneficially reuse at an approved site;
5. In 2018 and 2019 as needed, conducted up to 50,000 cy of advanced maintenance dredging to a depth of -37 MLLW plus two feet of over dredge depth allowance at the Bulls Head Reach area within Suisun federal navigation channel boundaries (between station 62+00 and 88+00) and dispose of the sediment in the Bay at the state and federally authorized Suisun Bay (SF-16) and/or Carquinez Strait (SF-9) disposal site or beneficially reuse at an approved site;
6. In 2019 only, dredge from Pinole Shoal (project depth: -35 feet MLLW, plus two feet over-dredge depth) a maximum of 500,000 cy of sediment and dispose of the sediment at the state and federally authorized Alcatraz Island (SF-11) and/or San Pablo Bay (SF-10) disposal site;

7. In 2018 and 2019, dredge from Redwood City Harbor (project depth: -30 feet MLLW, plus two feet over-dredge depth) a maximum of 300,000 cy of sediment each year, for a total of 600,000 cy of sediment and dispose of the dredged sediment in the Bay at the state and federally authorized Alcatraz Island (SF-11) disposal site or the federally authorized SF-DODS;
8. In 2019 only, dredge from the Petaluma River (project depth: -8 feet MLLW, plus two feet over-dredge depth) a maximum of 350,000 cy of sediment and dispose of the dredged sediment at Schollenberger Park disposal site located in the City of Petaluma, Sonoma County;
9. In 2019 only, dredge from the Petaluma River Across the Flats Channel (project depth: -8 feet MLLW, plus two feet over-dredge depth) a maximum of 250,000 cy of sediment and dispose of the dredged sediment in the Bay at the state and federally authorized San Pablo Bay (SF-10) disposal site; and
10. In 2018 and 2019, dredge from the San Francisco Main Ship Channel (project depth: -55 feet MLLW, plus two feet over-dredge depth) a maximum of 350,000 cy of sediment each year, for a total of 700,000 cy of sediment and dispose of the sediment at the San Francisco Bar Channel (SF-8) disposal site or at the Ocean Beach nourishment site (SF-17), (both dredging and disposal sites are outside the Commission's jurisdiction);

The proposed projects are dredged annually with the exception of Petaluma River and Across the Flats, which are dredged periodically, and according to the USACE, are reliant on sufficient annual Congressional funding to accomplish their work plan. If Congressional funding is not sufficient to support the full program, the USACE may limit the volume of sediment or depth of any channel, to accomplish their dredging priorities for that year.

**Public**

**Benefits:**

The proposed project would result in the maintenance of existing deep water channels and the shallow draft Petaluma River Channel, thereby ensuring that such channels remain navigable as well as safe and efficient for use by commercial, military, and recreational vessels. Dredged sediment taken to the Montezuma, or Cullinan Ranch restoration projects would augment the natural sedimentation process at these locations, thereby accelerating the creation of tidal marshes and improving the overall health of the Bay ecosystem while providing these projects with a better chance of maintaining marsh vegetation as sea level rises. Placement of dredged sediment at the deep ocean disposal site or other upland locations would reduce in-Bay disposal and further the goals of the LTMS Management Plan. However, these disposal options would waste sediment, which is critically needed at restoration sites. Reducing in-Bay disposal would improve water quality and further protect fish and wildlife in the Bay.

**Schedule:** The USACE expects that the projects would begin June 1, 2018 and be completed by December 31, 2019.

### Staff Analysis

A. **Issues Raised.** The staff believes that the consistency determination raises three primary issues: (1) whether the volume of sediment proposed for in-Bay disposal is consistent to the maximum extent practicable with the LTMS Management Plan and the San Francisco Bay Plan; (2) whether the proposed minimization measures are sufficient to protect native species and their habitat, and specifically species that are experiencing a steep population decline, including state- and federally- listed species; and (3) whether the proposed maintenance dredging of federal navigation channels is consistent to the maximum extent practicable with the Commission’s laws and the Bay Plan policies regarding dredging including maximizing beneficial use of dredged sediment as a resource; fish, other aquatic organisms, and wildlife; subtidal areas; mitigation; water quality; and navigation safety and oil spill prevention.

Section 6666.3 of the McAteer Petris Act states “the Legislature hereby finds and declares that because of the shallowness and high sedimentation rate of San Francisco Bay, dredging is essential to establish and maintain navigational channels for maritime commerce, which contributes substantially to the local, regional and state economies, as well as for military navigation, flood control, recreational boating and other public purposes.” It is USACE’s primary mission to maintain safe navigation of its channels, and maintenance dredging of the federal deep-draft navigation channels is vital to ensuring safe and efficient movement of good to and from Bay Area ports and harbors.

1. **LTMS Management Plan and Dredging Policies.** The Legislature amended the McAteer Petris Act Sections 66663 through 66666 and the Commission amended its Bay Plan policies and regulations to incorporate the LTMS Management Plan’s goals and measures. The LTMS program provides for economically and environmentally sound dredging while providing programmatic efficiencies to the regulatory process, creating more certainty for the dredging, resource and regulatory communities. All maintenance dredging projects are coordinated and managed through the LTMS program.

The Bay Plan Dredging Policy No. 1 states, in part, that “[d]redging and dredged material disposal should be conducted in an environmentally and economically sound manner. Dredgers should reduce disposal in the Bay over time to achieve the LTMS goal of limiting in-Bay disposal volumes to a maximum of 1.0 million cubic yards per year....”The policy also describes a regulatory disposal volume allocation strategy if the “voluntary targets” are exceeded. The one million cubic yards per year described in the Bay Plan polices does not include the 250,000 cy assigned to small dredgers on an average year.

The Bay Plan Dredging Policy No. 2 states, in part, that “[d]redging should be authorized when the Commission can find: (a) the applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose; (b) the materials to be dredged meet the water quality requirements of the

San Francisco Bay Regional Water Quality Control Board; (c) important fisheries and Bay natural resources would be protected through seasonal restrictions established by the California Department of Fish and Game, the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service, or through other appropriate measures; (d) the siting and design of the project will result in the minimum dredging volume necessary for the project; and (e) the materials would be disposed of in accordance with Policy 3.”

The Bay Plan Dredging Policy No. 3 states, in part, that “[d]redged materials should, if feasible, be reused or disposed outside the Commission's Bay and certain waterways jurisdictions. Except when reused in an approved fill project, dredged material should not be disposed of in the Commission's Bay and certain waterways jurisdiction unless disposal outside these areas is infeasible and the Commission finds: (a) the volume to be disposed is consistent with applicable dredger disposal allocations and disposal site limits adopted by the Commission by regulation; (b) disposal would be at a site designated by the Commission; (c) the quality of the material disposed of is consistent with the advice of the San Francisco Bay Regional Water Quality Control Board and the interagency Dredged Material Management Office (DMMO); and (d) the period of disposal is consistent with the advice of the California Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.”

Bay Plan Policy 4 states “if an applicant proposes to dispose dredged material in tidal areas of the Bay that exceeds either disposal site limits or any disposal allocation that the Commission has adopted by regulation, the applicant must demonstrate that the potential for adverse environmental impact is insignificant and that non-tidal and ocean disposal is infeasible because there are no alternative sites available or likely to be available in a reasonable period, or because the cost of disposal at alternate sites is prohibitive. In making its decision whether to authorize such in-bay disposal, the Commission should confer with the LTMS agencies and consider the factors listed in Policy 1.

Bay Plan Dredging Policy 5 states, in part, that “[t]o ensure adequate capacity for necessary Bay dredging projects and to protect Bay natural resources, acceptable non-tidal disposal sites should be secured, and the deep ocean disposal site should be maintained. Further, dredging projects should maximize use of dredged material as a resource consistent with protecting and enhancing Bay natural resources, such as creating, enhancing, or restoring tidal and managed wetlands, creating and maintaining levees and dikes, providing cover and sealing material for sanitary landfills, and filling at approved construction sites.”

The Bay Plan Dredging Policy No. 6 states, in part, that “[d]redged materials disposed in the Bay and certain waterways should be carefully managed to ensure that the specific location, volumes, physical nature of the material, and timing of disposal do not create navigational hazards, adversely affect Bay sedimentation, currents or natural resources, or foreclose the use of the site for projects critical to the economy of the Bay Area.”

Lastly, Dredging Policy 12 directs the Commission to continue to participate in the LTMS, the Dredged Material Management Office, and other initiatives conducting research on Bay sediment movement, the effects of dredging and disposal on Bay natural resources, alternatives to Bay aquatic disposal, and funding additional costs of transporting dredged materials to non-tidal and ocean disposal sites.

**In-Bay Disposal, Ocean Disposal and Beneficial Reuse of Sediment.** In the Bay Area, there are three general options for disposal or placement of dredged sediment. The in-Bay sites are dispersive sites and so are located in areas where fast moving currents quickly move the sediment away from the site. The ocean disposal site is a depositional site and material that is placed there, stays there. In-Bay disposal historically has been the primary option for most dredgers. Currently there are four in-Bay disposal sites: Alcatraz Island (SF-11), which due to its proximity to most dredging projects in Central Bay is the most heavily used; San Pablo Bay (SF-10); Carquinez Strait (SF-9); and Suisun Bay, which is reserved specifically for use by the USACE when dredging the Suisun Channel. Because these sites require simply transporting the sediment to the site and bottom dumping from the scow, they can be used by all dredging projects with “clean” dredged sediment.

Ocean disposal is similar to in-Bay disposal in that sediment is transported in a scow and bottom dumped once over the disposal site. The San Francisco Deep Ocean Disposal site is approximately 55 miles out to sea, takes about 24 hours round trip for a tug and barge, requires larger, ocean going vessels, and must transit through the marine sanctuary. This site is subject to weather delays, especially late in the dredging season, but delays can occur at any time when windy or stormy conditions create rough seas. Due to the distance traveled, larger equipment, additional fuel cost, and time to complete the round trip, ocean disposal is more expensive than in-Bay disposal. For safety reasons, small dredging equipment cannot transit to the ocean disposal site.

In recent years, with the observed decrease in suspended sediment supply from the Delta, increased restoration activity in subsided baylands, and increasing sea level, concerns have been raised by both the environmental community and wetland restoration advocates regarding ocean disposal. The community recognizes that this practice, when involving clean sediment, is wasting a valuable resource that is in short supply. The Commission does not have authority over use of the ocean site, so it cannot deny its use for disposal of clean sediment. The EPA has the ability to deny ocean disposal if the feasibility analysis shows other alternatives are feasible under the Clean Water Act 404(b)(1) guidelines.

Beneficial reuse of sediment has many forms. The most common in the Bay Area is the placement of dredged sediment at a wetland restoration project to raise site elevations appropriate for habitat development. This may be the most beneficial of the options as it provides habitat sooner, supports endangered and other species, and the wetlands created provide storm surge and flood protection. For projects with more than eighty percent sand (3-4 projects within the Bay), placement at a nearby San Francisco Bar disposal site (SF-8) feeds the littoral cell and potentially local beaches. Dredged sediment can also be reused as levee material, daily landfill cover and general construction fill where appropriate. Beneficial reuse sites are often at a greater distance from the dredging project than in-Bay disposal, taking additional time to transit. Also, in general, it takes more time to offload sediment than bottom dumping from a scow, although as projects in the Bay Area have become more efficient with offloading sediments, this time has been greatly reduced. However, in relation to ocean disposal, beneficial reuse sites located around the Bay shoreline rarely engender weather delays and can be a closer distance than the ocean disposal site.

With the exception of the currently available and operating Montezuma site, difficulties in directing the sediment to restoration sites include the “federal standard,” lack of funds to support the incremental cost above aquatic disposal, and lack of dedicated offloading equipment at Cullinan Ranch. In 2016 and 2017, Curtain Marine contracted with the USACE for the Richmond Inner Harbor and brought its own offloading equipment to Cullinan and offloaded over 470,000 cy at this site. However, the offloader is provided by the contractor, not the placement site, so it is only available via Curtain Marine when dredging a project.

**Proposed Project.** As described above, in order to maintain safe navigation in the Bay, the USACE proposes to dredge and dispose or place 5.350 mcy of sediment from five deep water federal channels and two shallow water federal channels over two years. During this period, the majority of the dredged sediment is proposed for in-Bay or ocean disposal with a limited volume (11% over two years) proposed for beneficial reuse at an approved wetland restoration project.

**Table 1.** 2018 Proposed Dredging and Disposal/Placement

Channel	Maximum Volume (cy)	Disposal/Placement Site
Oakland Harbor	950,000	350,000 to Ocean/ 600,000 to Beneficial Reuse
Richmond Inner Harbor	350,000	Ocean
Richmond Outer Harbor	500,000	In Bay (SF-11 or SF-10)
Suisun Bay	275,000	In Bay (SF-16/ SF-9)
Redwood City Harbor	300,000	In Bay/Ocean (SF-11)
Total	2,375,000	

2018 Program	In-Bay	Beneficial Reuse	Ocean
Proposed Volume	1,075,000 cy	600,000 cy	700,000 cy
LTMS Goals	20% (minimize)	40% (maximize)	40% (stop-gap)
Proposed Program	45%	25%	30%

**Table 2.** 2019 Proposed Dredging and Disposal/Placement

Channel	Maximum Volume (cy)	Federal Standard Plan
Oakland Harbor	950,000	Ocean
Richmond Inner Harbor	350,000	Ocean
Pinole Shoal	500,000	In Bay (SF-11/SF-10)
Suisun Bay	275,000	In Bay (SF-16/SF-9)
Redwood City Harbor	300,000	In Bay/Ocean (SF-11)
Petaluma River	350,000	Upland (Schollenberger Park)
Petaluma Across the Flats	250,000	In Bay (SF-10)
Total	2,975,000	

2019 Program	In-Bay	Beneficial Reuse	Ocean/Upland
Proposed Volume	1,325,000 cy	0 cy	1,650,000 cy
LTMS Goals	20% (minimize)	40% (maximize)	40% (stop-gap)
Proposed Program	45%	0%	55%

The LTMS program and the Bay Plan policies direct the dredging project sponsors to minimize in-Bay disposal and maximize beneficial reuse of dredged sediment unless it is infeasible to do so. In the request for concurrence, the USACE describes the evaluation factors it uses for dredging projects involving the discharge of dredged material as follows:

“Navigation and [f]ederal standard. The maintenance of a reliable Federal navigation system is essential to the economic well-being and national defense of the country. The district engineer will give full consideration to the impact of the failure to maintain navigation channels on the national and, as appropriate, regional economy. The USACE regulates the discharge of dredged material from its projects to assure that dredged material placement occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project. The environmental assessment or environmental impact statement, in conjunction with the section 404(b)(1) guidelines and public notice coordination process, can be used as a guide in formulating environmentally

acceptable alternatives. The least costly alternative, consistent with sound engineering practices and selected through the section 404(b)(1) guidelines or ocean disposal criteria, will be designated the [f]ederal standard for the proposed project.” (33 C.F.R. § 336.1(c))

This position is in direct conflict with the CZMA, which, requires the USACE’s projects to be consistent to the maximum extent practicable with the Commission’s Coastal Management Plan for San Francisco Bay. The term “consistent to the maximum extent practicable” means “fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency.”<sup>5</sup> The CZMA regulations further provide that federal agencies shall not use a lack of funding as a basis for being consistent to the maximum extent practicable with an enforceable policy of a management program. In cases where the cost of being consistent with the management program was not included in the Federal agency's budget and planning processes, it should seek additional federal funds necessary to be consistent with the management plan. Federal agencies should include the cost of being fully consistent with the management programs in their budget and planning processes.<sup>6</sup>

In 2015, the Commission included in its 2015 Letter of Agreement, by which it conditionally concurred with the USACE 2015 through 2017 consistency determination concurrence request, that the USACE request additional funding sufficient to meet the Bay Plan policies to maximize the use of dredged sediment, by beneficially reuse at least forty percent of the USACE’s dredging program. Subsequently, Commission staff was informed that the San Francisco District would not request additional funding and would only beneficially reuse dredged sediment consistent with the “federal standard.” It appears from the statement above that the USACE maintains this position for the currently proposed program

In addition, to the conflict with the CZMA provisions, the USACE’s proposed two-year dredging program does not comport with Dredging Policy 1 and the LTMS goals of reducing in-Bay disposal to twenty percent and maximizing beneficial reuse. Regarding this policy issue, the USACE stated “The proposed action would remove shoaled sediment from federal navigation channels and place sediment at the respective project’s federal standard placement site, or other approved site. Disposal would be in compliance with federal policy and law, including the federal standard.” It further states that “The 2015 water quality certification allows for USACE to place a total of 3.5 million cubic yards at in-bay sites [over five years]. The USACE continues to comply with this requirement.” The USACE points out that to date, the San Francisco Bay dredging community as a whole has not exceeded annual in-bay placement limits, and the USACE does not expect an exceedance to occur over the course of this CD.

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<sup>5</sup> 15 CFR 930.32(a)(1)

<sup>6</sup> 15 CFR 930.32(a)(3)

The Bay Plan in-Bay disposal target is 1 mcy per year, and as averaged over consecutive three-year periods to allow for inter-annual variability in shoaling and dredging activities. The USACE has proposed to dispose up to 1.075 mcy in 2018 and 1.325 mcy in 2019. If this were to occur, the ports, refineries and recreational marinas would share the remaining 175,000 cy in 2018 and have no volume available in 2019, without using the contingency volume. In the LTMS Program, 250,000 cy of disposal volume is dedicated to small dredgers who are exempt from requirements to dispose of sediment outside the Bay or beneficially reuse it due to feasibility and safety issues. Ports, refineries, and other medium and large dredging projects have been diligently working to meet the LTMS goals and have been taking approximately eighty percent of their sediment to beneficial use or ocean disposal each year. This collective action greatly reduces the in-Bay disposal needs. The USACE's proposal challenges the ability of the region to meet the LTMS goals. The LTMS agencies have included a 250,000 cy contingency volume in the LTMS Plan for high dredging years. If the in-Bay disposal targets are exceeded, the LTMS agencies may need to use the contingency volume for the first time since the implementation of the program.

**Table 4.** In-Bay disposal site limits from Commission Regulations.

Designated Disposal Site	Monthly Target Volume	Annual Target Volume
Alcatraz Island (SF-11) October – April May – September	400,000 cy 300,000 cy	4 mcy
Carquinez Strait (SF-9) (any month)	1 mcy	2 mcy/3 mcy (wet year)
San Pablo Bay (SF-10)		500,000 cy
Suisun Bay (SF-16) USACE Only		200,000 cy
Three Year Average Total (In-Bay)		1.25* mcy

\*This volume does not include an allowable contingency volume of 250,000 cy per year, but does include the 250,000 small dredger allowance.

In 2015 through 2017, the USACE had also proposed high volumes of dredging and disposal, particularly in 2017 due to significant winter rains, however the actual volume dredged was significantly less than proposed in 2016. It is possible that the USACE would dredge and dispose of less sediment than currently proposed. However, if the three-year average of in-Bay volumes is exceeded beyond the contingency volume, the LTMS must consider in-Bay disposal allocations to each dredger. If allocations become necessary, a staff report with analysis of the issues would be prepared with a recommendation for the Commission. The Commission would need to vote affirmatively for the allocations in order to implement this portion of the LTMS program.

Regarding Dredging Policy 2, and the requirements that dredging projects serve a water-oriented use, in this case, it is clear that maintenance dredging of navigational

channels is necessary and a water-oriented use. As described by the USACE “maintenance dredging of the federal deep-draft navigation channels is vital to ensuring safe and efficient movement of good to and from Bay Area ports and harbors.” Discussion regarding whether the proposed program meets water quality standards, complies with seasonal work windows, and the requirements of the resource agencies and be found in the Water Quality and Natural Resources section below.

Dredging Policy 2 also directs the Commission to consider whether the siting and design of the project results in the minimum amount of dredging necessary for the project. The federal navigation channels are sited along the deep spine of the Bay, and thereby minimize dredging in shallower areas by taking advantage of naturally deep water. The Petaluma River Channel and the Across the Flats channel are not situated in deep water, but follow the center of the Petaluma River, which ensures a direct route for vessels in and out of the river.

The volume proposed for dredging is generally that required to maintain the channel depth necessary for safe navigation. As a planning function, the USACE has proposed the maximum volume likely to be dredged rather than the actual volume due to uncertainties associated with shoaling and funding. Prior to dredging, the proposed dredge volume for each channel is calculated from a pre-dredge survey the volume of sediment that needs to be removed to reach design depth of the channel, and an additional one to two feet of “over depth” volume. This “over depth” volume is included to allow for the inaccuracies of using large equipment in deep water with limited control over environmental factors such as currents and tides. If funding is sufficient, the project is dredged to its proposed depth, and if not, the project may be dredged to a shallower depth. Therefore, the proposed volumes provided in the episode approvals are the minimum amount necessary for the project.

In addition to normal maintenance dredging activities, Suisun Bay channel, at Bull’s Head Reach (just east of the Benicia Bridge), has a persistent shoaling problem and requires advanced maintenance dredging. Advanced maintenance dredging can take many forms, but in this instance, the problematic area is dredged deeper (minus 37 rather than minus 35 feet MLLW) in the shoaled area. This allows for more sediment to accumulate below design depth before the next annual maintenance episode is undertaken.

The Bay Plan Dredging Policies 3, 4 and 5 together provide guidance on when in-Bay disposal is appropriate and the analysis that should be undertaken and promotes beneficial reuse of dredged sediments. Policy 3 states, in part, that “[d]redged materials should, if feasible, be reused or disposed outside the Commission’s Bay and certain waterways jurisdictions.” It further states that, dredged material should not be disposed of in the Commission’s Bay and certain waterways jurisdiction unless disposal outside these areas is infeasible and the Commission finds: disposal would be at a site designated by the Commission; the sediment quality is suitable for the proposed disposal/placement site per the Water Board and DMMO’s advice; and the

disposal period is consistent with the advice of the resource agencies (The last two items are discussed in the water quality section). Dredging Policy 4 further describes the Commission's considerations when a project proponent proposes to conduct in-Bay disposal when the disposal would exceed disposal site volume limits. When this is proposed, the project proponent must demonstrate that the potential for adverse environmental impact is insignificant and that non-tidal and ocean disposal is infeasible because no sites are available, or because the cost of disposal at alternate sites is prohibitive. Lastly, Policy 5 states in part, that to ensure capacity for other Bay dredging projects and to protect natural resources, non-tidal disposal sites and the deep ocean disposal site should be secured and maintained, respectively. It further states that dredging projects should maximize beneficial use of dredged sediment as a resource (e.g. in wetland restoration, maintaining levees, etc.) consistent with protecting and enhancing Bay natural resources.

In response to Policy 3, the USACE states:

"Policy 3 states that dredged material *should, if feasible*, be reused or disposed of outside the Bay and certain waterways and that dredging should not be disposed of in the Bay or certain waterways unless other disposal is *infeasible*. The only requirement in this policy is that the Commission finds that the conditions of (a), (b), (c), and (d) are met prior to disposing of material in the Bay. Although Policy 3 does not express a preference as between beneficial use and disposal "outside the Bay", USACE is committed to beneficially using dredging material to the maximum extent feasible; consistent with the statute and regulations governing the beneficial use of dredged material."

This interpretation can be reached by reading Policy 3 independently of other Bay Plan policies, particularly Dredging Policy 1. As the Commission is aware, all applicable Bay Plan policies are applied to proposed projects, and in reading these policies together, there is a clear preference for maximizing beneficial reuse, and at minimum providing forty percent of the overall program.

The USACE quotes the provisions of the federal standard as a basis for infeasibility of beneficial reuse, stating that the least cost disposal location is typically the Deep Ocean Disposal Site and/or in-Bay disposal. They further explain that a non-federal sponsor has not provided funds to support the incremental cost of going to beneficial reuse, as provided for under 333 C.F.R. Section 335.7.

In addressing other parts of Policy 3, it states that the projects will comply with sediment testing requirements, the disposal site determination of the DMMO, and dredge and dispose within the LTMS environmental work windows. It further states that if circumstances require dredging outside of the work windows, the USACE would consult with the appropriate federal resource agency and take into consideration CDFW recommendations. Lastly the determination concludes that if a beneficial use site meets the federal standard criteria (least cost), the USACE may choose to use that site. This has occurred twice in the recent past when the

Richmond Inner Harbor was contracted to take dredged sediment to Cullinan Ranch, resulting in over 470,000 cy of beneficial reuse in 2016 and 2017, partially to satisfy a NOAA National Marine Fisheries Service (NMFS) mitigation requirement.

In 2015, the Commission staff discussed the proposed dredging volumes, lack of beneficial reuse and large quantities proposed for in-Bay disposal with the USACE, raising four main concerns: (1) notwithstanding the USACE's assertion, the proposed in-Bay disposal volumes do not appear to provide for adequate disposal volume for the remaining dredging projects; (2) the percentage of in-Bay disposal is more than double the twenty percent targeted by the LTMS goals; (3) the high volume of dredged sediment proposed for disposal at the ocean disposal site, and the low volume of sediment proposed for beneficial reuse; and (4) the USACE's interpretation of the federal standard appears to arbitrarily limit its ability to consider use of alternate sites—an issue of long and protracted contention between the agencies, and that does not appear to be consistent with the Coastal Zone Management Act. These same concerns exist with the proposed consistency determination.

The USACE's proposed in-Bay disposal volume represents 45 of its total proposed dredging for each year. In regard to maintaining adequate capacity at the in-Bay disposals sites for other important dredging projects, the USACE has not provided an explanation of how the dredging community would be accommodated if the USACE disposed of its sediment as currently proposed. From their proposal, a very limited volume would be available in 2018 and none in 2019. This untenable situation would require the LTMS agencies to invoke the contingency volume and could potentially require the agencies to begin the allocation process described earlier.

The USACE does describe its commitment to the LTMS Program as follows, yet fails to address the needs of other dredging projects:

“To the extent allowed by the federal standard, the USACE is committed to beneficially using dredging material to the maximum extent feasible. Over the period of analysis discussed above (2006 through 2017), USACE has beneficially used approximately 6.85 million cubic yards of maintenance material not including the 6.4 million cubic yards of dredged material beneficially used from Oakland Harbor's 50-foot deepening project or material from the Main Ship Channel. This represents approximately 32 percent of all beneficial use during this timeframe. However, as discussed, USACE is also constrained by the federal standard when placing dredged material. To make using a beneficial use site feasible, its cost must be comparable to the cost of the federal standard or a sponsor must fund the incremental cost above the

federal standard. Finally, over the next 2 years, USACE will dredge in accordance with the 5-year WQC, which specifically developed limitations for USACE in-bay disposal limitations to both comply with the LTMS goal of reduced in-bay disposal and allow for adequate placement for other dredgers.”

**Management of In-Bay Disposal Sites.** Dredging Policy 6 states that the in-Bay disposal sites should be carefully managed to guard against natural resource, sediment and water quality degradation; creation of hazards to navigation; and foreclosure of sites to projects critical to the region’s economy. The USACE states that it uses these sites in furthering its navigation mission. In cooperation with the LTMS agencies, it manages these sites through the Dredged Material Management Office (DMMO). The DMMO ensures that the quality, amount, and timing of sediment disposal does not create navigational hazards and that the individual site volume limits are not exceeded on a monthly or annual basis. When the volume limits at the in-Bay sites are reaching capacity, the DMMO directs dredging projects to alternate sites, or if necessary delays the start of dredging projects to avoid exceeding monthly disposal volume limits, taking into consideration navigational safety. The USACE routinely surveys each in-bay placement site to ensure that no site creates a hazard to navigation.

Regarding its own projects, prior to implementation of each USACE dredging project, it would provide project specifics, including a pre-dredge survey, proposed dredged volumes, and sediment test results to the DMMO for review and a determination of the suitability of the sediment for disposal.

Along with careful management of in-Bay disposal sites, Dredging Policy 12 includes a directive for continued Commission support of the LTMS Program’s implementation and furthering the knowledge of impacts of dredging to the Bay’s physical and biological resources. While the USACE acknowledges that the policy is not specifically directed at the USACE, it states “[the] USACE is also committed to continuing its participation in the LTMS and is willing to partner with other agencies to fund the cost of placing dredged material at SF-DODS or beneficial use sites, as long as it is within congressional authority granted to USACE.”

In 2017, the USACE funded the investigation of additional methods for beneficially reusing sediment entitled “Strategy Placement Framework”. In this effort the USACE and its consultants evaluated whether placing sediment in the nearshore adjacent to marshes or piping it to areas near tidal channels would effectively augment the supply of sediment to marshes. The investigation included conceptual models, and a proposed pilot study and demonstration project. The initial draft of this document is complete, though additional funding is needed to finalize the document and conduct monitoring, modeling, pilot study and a demonstration project. Additional studies undertaken with funds provided by the USACE LTMS budget from previous years can be found on the USACE LTMS website.

The Commission should determine if the USACE' proposed dredging, disposal and placement of dredged sediment is consistent to the maximum extent practicable with Commission's dredging policies and the LTMS Management Plan.

2. **Natural Resources.** The San Francisco Bay Plan has several policies regarding the natural resources of the Bay, including Fish, Other Aquatic Organisms and Wildlife; Subtidal Areas, and Mitigation policies that respond to impacts to natural resources.

Fish, Other Aquatic Organisms and Wildlife Policy 1 states: "To assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased."

Fish, Other Aquatic Organisms and Wildlife Policy 2 states: "Specific habitats that are needed to conserve, increase or prevent the extinction of any native species, species threatened or endangered, ... or any species that provides substantial public benefits, should be protected, whether in the Bay or behind dikes."

Fish, Other Aquatic Organisms and Wildlife Policy 4 directs the Commission to "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 plant, fish, other aquatic organism or wildlife species; and not authorize projects that would result in the "taking" of any plant, fish, other aquatic organism or wildlife species listed as endangered or threatened pursuant to the state or federal endangered species acts, or the federal Marine Mammal Protection Act, or species that are candidates for listing under the California Endangered Species Act, unless the project applicant has obtained the appropriate "take" authorization from the U.S. Fish and Wildlife Service, National Marine Fisheries Service or the California Department of Fish and Game; and give appropriate consideration to the recommendations of the California Department of Fish and Game, the National Marine Fisheries Service or the United States Fish and Wildlife Service in order to avoid possible adverse effects of a proposed project on fish, other aquatic organisms and wildlife habitat."

The Commission's Subtidal Areas policies have similar protective language to the Fish, Other Aquatic Organisms and Wildlife policies in Subtidal Area Policy 2 states that "areas that are scarce in the Bay or have an abundance and diversity of fish, other aquatic organisms and wildlife (e.g., eelgrass beds, sandy deep water or underwater pinnacles) should be conserved. Filling, changes in use; and dredging projects in these areas should therefore be allowed only if: (a) there is no feasible alternative; and (b) the project provides substantial public benefits."

Further, Subtidal Area Policy 1, requires the Commission to fully examine the local and Bay-wide effects of dredging projects on: (a) the possible introduction or spread of invasive species; (b) tidal hydrology and sediment movement; (c) fish, other aquatic organisms and wildlife; (d) aquatic plants; and (e) the Bay's bathymetry. Projects in subtidal areas should be designed to minimize and, if feasible, avoid any

harmful effects. Subtidal Areas Policy 5 directs the Commission to support and encourage expansion of scientific information on the Bay's subtidal areas, including: "... (b) the relationship between the Bay's physical regime and biological populations; (c) sediment dynamics, including sand transport, and wind and wave effects on sediment movement; (d) areas of the Bay used for spawning, birthing, nesting, resting, feeding, migration, among others, by fish, other aquatic organisms and wildlife...."

In summary, the Commission's applicable Mitigation Policies, state that projects should be "designed to avoid adverse environmental impacts to Bay natural resources such as...to plants, fish, other aquatic organisms and wildlife habitat, subtidal areas, or tidal marshes or tidal flats." Whenever adverse impacts cannot be avoided, they should be minimized to the greatest extent practicable and then unavoidable adverse impacts to the natural resources of the Bay should be mitigated. "Mitigation should, to the extent practicable, be provided prior to, or concurrently with those parts of the project causing adverse impacts." Further any mitigation should be coordinated with all affected agencies that have jurisdiction or mitigation expertise to ensure, to the maximum practicable extent, the mitigation program satisfies the policies of all the affected agencies. The policies allow for the use of mitigation banks when the bank is acceptable to the Commission and resource agencies and is shown to be ecologically acceptable and there is a scientifically defensible method for determining the timing and amount of credit required. Lastly, the policies state, "mitigation banking should only be considered when no mitigation is practicable on or proximate to the project site."

Due to the nature of dredging, removing sediment in an aquatic setting, and either disposing of it aquatically in the Bay or the ocean, has potential to impact the organisms living and feeding in that environment, and water quality. Sediment placement at beneficial reuse sites likely has less potential impacts because these sites are normally in active construction phases during the placement period. The extent of the dredging activity and its location determine in part the type and severity of the potential impacts. In addition, the type of equipment can also influence the potential impacts and the duration of the project.

**Equipment.** In San Francisco Bay, there are generally three types of equipment used in various sizes: clamshell or excavator dredges classified as mechanical dredges; and two types of hydraulic dredges, hopper and cutterhead dredges. There are other types of dredging equipment but these are the types that are generally used in San Francisco Bay. As part of the USACE's consistency determination request, it describes using clamshell equipment and hopper dredges.

Clamshell dredges are normally large cranes mounted on a floating platform with a clamshell bucket lowered over the side with the bucket. When the clamshell reaches the bottom, it scoops up the mud or sand in the channel, closes and is drawn up through the water column. Once above the water, the crane moves the clamshell over an adjacent dredge scow where the operator opens the buckets and empties the

sediment into the scow. Water that is entrained in the bucket is also released into the scow. Once the scow is full, a tug boat pushes or pulls the scow to the designated disposal site where it is bottom dumped into the aquatic environment or to a beneficial reuse site where the sediment is either pumped off a scow and piped to its final destination or is offloaded using another crane and mechanical bucket to offload the sediment to the site. Once one scow is loaded and begins transiting to the disposal site, another scow is often delivered so that dredging can continue while disposal is taking place. For longer distance disposal or beneficial reuse, clamshell dredges can be more efficient than hopper dredges. They also entrain less fish during dredging due to the lack of pumping activity. However, clamshell dredging creates more turbidity than hopper dredges.

Hydraulic hopper dredges use suction pumps that draw sediment and water into a draghead that is slowly drawn over the bottom. Once in the draghead, the sediment is drawn into the hopper, or basin, within the vessel via a long pipe. Once in the hopper, the sediment remains until the hopper reaches capacity, and then the draghead is turned off and raised out of the water. The entire vessel travels to the disposal site where it opens the hopper and bottom dumps the sediment into the aquatic placement site. While in transit to the disposal site, there is no dredging activity. These dredges tend to be more efficient at dredging to project depth than clamshell dredges and generally create less turbidity in the water. However, hopper dredges entrain more fish than mechanical dredges due to the suction pumps. The hopper dredges that are commonly used in San Francisco Bay are the Essayons and the Jaquina, two government dredges owned by the USACE, that service the federal navigation channels along the west coast, Alaska and Hawaii.

The Bay Plan policies on natural resources direct the Commission to examine the impacts of the project on Bay resources, including the potential to introduce or spread invasive species, tidal hydrology and sediment movement, aquatic plants, fish and wildlife, the Bay's bathymetry, and habitat. With the proposed project impacts could occur in the dredged channels, adjacent to the dredged channels, in the water column, to wildlife living in, or passing through the dredging footprint, and at aquatic placement sites.

- a. **Invasive Species.** Regarding the introduction or spread of invasive species, the EA/EIR found that because the dredge equipment would comply with United States Coast Guard (USCG) regulations for vessels intended to minimize the spread of invasive nonnative species, the potential for this impact would be minimized. The USACE concurs with this conclusion. While dredging equipment is used in other locations, the USCG, along with the State Lands Commission have implement safeguards to lessen the import of invasive species in the Bay. That said, the equipment is often moved from one embayment to another, which could spread invasive species within the Bay, but it is likely that the salinity differences would limit this type of spread of species. Therefore, project would not be expected to substantially increase the spread of invasive nonnative species.

- b. **Tidal Hydrology, Sediment Movement and Bathymetry.** Because the proposed project is dredging and dredged sediment disposal/placement, it affects tidal hydrology, sediment movement and Bay bathymetry. Because the deep draft channels are dredged on an annual basis to a standard depth, the tidal hydrology associated with these channels likely shows little change from year to year. Dredging in the Petaluma River Channel and Across the Flats may increase tidal flows due to the deeper depths after dredging until the channel silts back in, but this has not been studied.

Sediment movement throughout the Bay is affected as is the sediment transport to the outer coast. Sediment in the Bay is in constant movement, and once dredged, the channels begin to fill in again seeking natural equilibrium. In addition, the deep water channels are the sediment pathways connecting the embayments and the coast. Of the eight channels proposed for dredging within the Bay, two channels have sandy sediment: Suisun Bay Channel and Pinole Shoal and the others have primarily mud and silt. The sediment in Suisun Bay channel is fine grain sand with little variation from year to year. Pinole Shoal channel has portions that are sand and portions that are mud, and the amount of either varies from year to year, but in recent years has trended more towards fine sand. Sand in both of these channels is likely moving into Central Bay over time, as shown in Dr. Barnard's (USGS) work on sediment transport.<sup>7</sup> Sand in Suisun Bay is dredged and disposed of adjacent to the channel on the western end of Suisun Bay (Exhibit E), in a disposal site to the west and north of the channel, allowing sand to stay within the system, it is unknown whether this placement impedes or increases sand movement in this area.

The Pinole Shoal channel is more variable, with the grain size and volume of sand changes from year to year. The sediment from this project has been historically disposed of at the San Pablo disposal site, but in recent years when portions of the channel have been greater than 80% sand the LTMS agencies have urged the USACE to direct the project to SF-8, a disposal site within the coastal littoral cell and considered a beneficial reuse site for sand because it is thought to contribute to coastal beaches. The USACE has responded to this request by taking 1-2 loads (approximately 10,000 cy) to the Bar disposal site as the Essayons completes its dredging of Pinole. It is unknown whether sand from the Pinole Shoal channel would feed Bay beaches, but would likely contribute to the sands at Pinole Regional Park and potentially the Central Bay sand shoals over time.

Richmond, Oakland, Redwood City and Petaluma's sediment are comprised of Bay mud with greater or lesser silts and clays depending on the channel. This sediment is of the same type found in marshes and mudflats around the Bay, and

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<sup>7</sup> Special Issue of Marine Geology 2014, multiple papers by Dr. Patrick Barnard.

therefore the potential for reuse of this sediment is high and would support necessary habitat restoration projects. The LTMS agencies consider placement at beneficial reuse sites as keeping the sediment within the Bay system albeit, not in sediment transport.

As designed, the in-Bay disposal of sediments at the dispersive disposal sites likely hastens the sediment transport out of the Bay system as shown by model exercises completed in 1998 and again in 2011. Once out of the Bay, the muds join the deeper water fine grain sediment pool just off the outer shelf of the coast. Some have suggested that in-Bay disposal increases the amount of sediment in the system, but in fact, it only redistributes it, and does not provide a net gain in Bay sediment. Deep ocean disposal of dredged sediments takes Bay sediments and places them at a depositional site, 55-miles from the Bay, where they no longer are contributing to the coastal system. LTMS studies of the site have shown that sediment placed at this location remains there, as designed.

Regarding the USACE's proposed dredging program, it states that "Dredging would occur in deep-draft navigation channels for all but the Petaluma project, with depths greater than 30 feet MLLW. The proposed dredging would remove shoaled sediment from channels that are deeper than 30 feet MLLW each year to maintain safe and efficient navigation of the respective channel. Some of the sediments would be placed back in the Bay system by placing sediment at the in-bay sites, some sediment would be removed from the Bay by placing material at SF-DODS, and some sediment may be beneficially used at upland sites." According to the USACE, effects are limited to temporary and localized increases of suspended sediment and turbidity around dredging operations and disposal sites over varying periods of time based on sediment type being dredged.

The USACE further states that "Dredging could affect sediment movement by dredging it from channels to the respective channel's authorized depth and moving it to placement sites. However, they hypothesize that this would not result in significant changes to sediment movement or bathymetry, other than actual dredging sediment and transporting it to in-bay and ocean sites for placement. Once completed, the USACE believes that sediment transport is likely to be the same as before maintenance dredging occurred.

Regarding the Petaluma River channel and Across the Flats, both shallow draft channels, the dredging would occur in or adjacent to tidal marshes or tidal flats. The USACE states that dredging the river channel or the tidal flats would not affect sediment transport outside the channel. While this may be correct, there are no studies to verify that deepening this area during maintenance dredging would not influence sediment deposition or erosion in the adjacent marsh, mudflats or subtidal shoals that would likely receive sediment that would normally move down stream to the Bay.

- c. **Aquatic Plants.** Aquatic plants cannot grow in the deep water channels due to lack of sufficient sunlight at depth. However, eelgrass beds exist adjacent to the Richmond Outer channel and Oakland Inner Harbor channels. Dredging has the potential to increase turbidity, which can in turn limit the amount light transmission through the water. As part of the 2011 LTMS Programmatic Essential Fish Habitat consultation with NMFS, dredging projects within two hundred and fifty meters of eel grass (a buffer zone) are required to use silt curtains to reduce the potential of sediment suspended by dredging activity to deposit on the eelgrass beds, reducing their ability to photosynthesize, and projects within 50 meters must survey the dredging footprint to ensure that there would be no direct impacts to eelgrass beds. The USACE has performed pre- and post-dredge eelgrass surveys, and eelgrass mapping at Richmond Inner Harbor and Oakland Inner Harbor since 2010 to determine if maintenance dredging was affecting eelgrass beds. The surveys and mapping have shown no significant changes in eelgrass beds that can be associated with dredging. In addition, according to the USACE's light monitoring in and adjacent to eelgrass beds during dredging of Richmond Harbor and Oakland Inner Harbor, the required light saturation point of a minimum of 5 hours for eelgrass metabolic demands was met.
- d. **Habitat.** Dredging and aquatic disposal degrades habitat over time by regularly disturbing the bottom of channels and disposal sites through sediment removal or disposal; temporary increases in turbidity and suspended sediments; and entrainment of water and organisms. Potential impacts from these actions include: removal of bottom habitat; removal of bottom dwelling organisms; burial of organisms; increased respiratory issues; entrainment of individuals and prey organisms. In evaluating these impacts, the USACE, in accordance with Subtidal Areas Policy 1, has provided minimization measures where it believes they are feasible and warranted.

Regarding these potential impacts, the USACE stated that several fish, other aquatic organisms, and birds that live in the Bay can be impacted by dredging. Changes in ambient conditions, including turbidity and noise generated from dredging could affect fish and other aquatic organisms at the dredge site.

Clamshell dredging would increase suspended sediment concentrations in the vicinity of dredging and the aquatic placement sites. Suspended sediment concentrations are expected to be higher when dredging areas of finer-grained sediment. For example, a 2004 clamshell dredge study (MEC Analytical Systems, 2004) characterized the extent of the suspended sediment plume generated by clamshell dredging in Oakland Harbor. It found that the plumes had increased sediment concentrations above background levels for up to 400 meters from the dredging. Typical ambient concentrations were less than 50 milligrams per liter (mg/l) and the concentrations from dredging exceeded 275 mg/l in the immediate vicinity of dredging activities. Concentrations above 100 mg/l were also distributed in above the bottom of the channel. The study also found that the plume tended to decay with increasing distance from the dredge.

To reduce turbidity effects when using hydraulic dredges, the USACE installed “anti-turbidity valves” on the hopper dredge *Essayons*, reducing the amount of air in the overflow water returning to the Bay, thus reducing potential effects of turbidity on aquatic organisms and habitat.

Fish and invertebrates can be directly injured by a clamshell dredge, dredge spuds, dump scows, or tugs used to maneuver the dredge equipment and scows. Additionally, benthic organisms and potentially fish are removed from their habitat during dredging activities. A detailed analysis of the effects of the removal of benthic species during dredging operations is provided in Impact 3.6-2 of the Environmental Impact Report and Environmental Assessment (EIR/EA) conducted by the Water Board and the USACE in 2014. The EA/EIR found that dredging would have localized, direct impacts on benthic communities through physical disruption and direct removal of benthic organisms. It found that effects are expected to be temporary because benthic habitat is quickly recolonized. While there are many studies in other areas regarding the recovery of benthic species that show recovery in anywhere from 3 months to 3 years, very limited information exists for San Francisco Bay recovery periods. The USACE is contributing to a local study being conducted by the US Geological Survey that will provide a further understanding of effects of dredging on the benthic community and its forage value to fish.

While removal of bottom habitat and organisms is unavoidable during dredging using any equipment, entrainment of organisms from the water column can be reduced. The EIR/EA found that use of a clamshell dredge rather than a hydraulic dredge clamshell dredging would entrain less fish and other wildlife. Recognizing this impact, the USACE proposed a number of measures to further reduce the level of fish entrainment from hydraulic dredging as discussed in the species section below.

The disposal sites, particularly the Alcatraz Island site, receive large volumes of sediment with each dispose event. Organisms that live at that site must be able to avoid the falling dredged sediment or are buried by it. If buried, it is unlikely that many would survive, but it is assumed that new benthic organisms would emigrate from adjacent sediments or settle out of the water column during the next spawning period, which could be seasonally or annually depending on the species. As with the dredged deep water channels, the disposal sites are considered disturbed habitat and likely offer less value than similar adjacent habitats.

Given these likely impacts, the Bay Plan seeks to protect subtidal habitat via Policy 2, which states, “areas that are scarce in the Bay or have an abundance and diversity of fish, other aquatic organisms and wildlife (e.g., eelgrass beds, sandy deep water or underwater pinnacles) should be conserved. Filling, changes in use; and dredging projects in these areas should therefore be allowed only if: (a) there is no feasible alternative; and (b) the project provides substantial public benefits.” The USACE has stated, “dredging would occur in existing, authorized, deep-draft navigation channels, and there is no feasible alternative to dredging in these areas.” Further, as previously discussed, “the federal deep-draft navigation channels not only provide a substantial public benefit to the region, but also to California and the nation.”

- e. **Species.** The Bay Plan policies on Fish, Other Aquatic Organisms, and Wildlife seek to protect habitats necessary to support native species, and to preserve these species for future generations. Subtidal Area Policy 1 states that dredging projects that occur in a subtidal area should be designed to minimize and, if feasible, avoid harmful effects. It should be noted that the discussion of measures to protect species described herein are in response to these enforceable policies of the Bay Plan and the Commission’s independent authority as required under CZMA, not solely in response to the listing of species by the California Department of Fish and Wildlife (CDFW), US Fish and Wildlife Service (USFWS) and NMFS, although the Commission concurs with these agencies. The Commission staff has sought the advice of these agencies in accordance with Fish, Other Aquatic Organisms and Wildlife Policy 4(a) and (c).

All forms of dredging have the potential to incidentally remove organisms from the environment with the dredged sediment, a process referred to as entrainment. In general, smaller organisms with limited or no swimming capabilities are more susceptible to entrainment than larger organisms with stronger swimming capabilities. It is generally accepted that mechanical dredging entrains far fewer fish from the water column than hydraulic dredging because of the greater the sphere of influence associated with the hydraulic pumps and because much less water is removed along with the sediment when using a mechanical dredge. However, like hydraulic dredging, mechanical dredging removes bottom dwelling fish and crustaceans that live in or on the sediment. Fish entrained by a hydraulic dredge are likely to suffer mechanical injury or suffocation during dredging, resulting in mortality.

Species of special concern in the Bay and are susceptible to impacts from dredging and disposal, include those listed as candidate, threatened or endangered species by the federal and state resource agencies, and include green sturgeon, salmon, least tern, Delta smelt, longfin smelt, Ridgeway’s rail and salt marsh harvest mouse both found in marshes.

Green sturgeon is a bottom dwelling anadromous fish, meaning it lives a portion of its lifecycle in fresh water and portion in salt water. They spawn in fresh water, spend several years as juveniles and adults with the Bay in areas of turbid water, prior to ocean residence. They are found Bay wide, but in low numbers.

Salmon are also anadromous, and spawn in fresh water streams and then travel downstream, to the Bay, feeding and growing along the way, and then migrate out to sea, return to spawn in the Bay's tributaries. These species are in serious decline due to damming, changes to the Delta and river modification, overfishing and other impacts of development. Dredging and disposal can impact these species as they travel through the deep water channels, by increased turbidity in the water column, and through loss of foraging opportunities. However, these species move through the Bay relatively quickly during their well-documented migration period.

Least terns, a visually foraging, fish eating bird, migrate every year to the Bay Area and other locations for nesting, breeding and rearing its young before returning south for the winter. The Bay Area hosts the largest breeding colony on the West Coast at the former Alameda Naval Station. Dredging impacts this species indirectly by increasing turbidity in shallow water areas where eelgrass grows.

Longfin and Delta smelt are small, forage fish that are important to the Bay food web, spawn in fresh water and move into brackish (Delta smelt) and marine waters (longfin smelt). Both fish are not strong swimmers and susceptible to entrainment in the flow fields created around the intakes of hydraulic suction dredges. The use of a clamshell dredge would likely reduce entrainment. Longfin smelt have the potential to occur in any of the project areas in any season, with different life stages occurring in different embayments in higher numbers at different times of year. Delta smelt have potential to occur in the portions of the Estuary that include the San Pablo Bay/Mare Island Strait, and Suisun Bay Channel dredge areas during certain seasons. Delta smelt occur in San Pablo Bay in lower numbers than in the Napa River or Suisun Bay; however, they may be present in San Pablo Bay in increased numbers during high water outflow years. Delta smelt are not expected to occur in the other federal channels.

Over the past decade, according to CDFW fish survey data, abundance indices for various life stages of Delta smelt have hit record lows, indicating that the species is in danger of extinction. In response, the State elevated its listing status from threatened to endangered. USFWS examined the potential to reclassify the Delta smelt as endangered and found it warranted but precluded its listing by other higher priority listing actions.

The CDFW's annual fall mid-water trawl surveys show that the population of longfin smelt, similar to Delta smelt, has declined 99 percent or more in the last 45 years, with record lows in the past decade. The State Fish and Game Commission listed longfin smelt as threatened under CESA. The USFWS reviewed

the longfin smelt status in which it concluded that the listing of the longfin smelt as a threatened species is warranted but precluded its listing by other higher-priority listing actions. As a result, longfin smelt is currently a candidate species for listing under the federal ESA. Because this is a State-listed species only, the USACE has coordinated with CDFW, but has maintained that it is not required under State law to obtain an incidental take permit.

Other species of concern managed by NMFS under the Magnuson Stephenson Fisheries Conservation Act are commercially important include species that live in the water column (pelagic), bottom dwelling fish (groundfish), and salmonids. Environmental work windows, which limit dredging to the time of year certain species are not present and minimizes in-Bay disposal, is an important conservation measure used by the regulatory and resource agencies to reduce impacts from dredging. The Commission implements these work windows in accordance with the resource agencies to provide protection for these species, and under its own authority under CZMA for the region.

The environmental work windows were developed through programmatic consultations on the LTMS Program with the NMFS, USFWS, and CDFW under the national and California Endangered Species Act, ESA and CESA, respectively. These consultations resulted in programmatic biological opinions from NMFS and USFWS and concurrence from CDFW and included terms and conditions that set forth the period of time each year for dredging and disposal activity that would reduce impacts to listed species. In the Bay, NOAA's National Marine Fisheries Service (NMFS) manages salmon and green sturgeon; the USFWS manages Delta smelt, least tern, snowy plovers, Ridgway's rail, and the salt marsh harvest mouse; and CDFW concurred with NMFS and USFWS for species that have overlapping protections from ESA and CESA (all of those listed here) and longfin smelt (a state listed species) and included an environmental work window for Pacific herring – a state managed fishery). The programmatic biological opinions have been amended by USFWS in 2004 with minor adjustments for clarification, and by NMFS in 2015.

The NMFS amendment was more significant in that it included for the first time a measure that would allow dredging outside of the salmon work window with mitigation for impacts during that period and examine the potential impacts to the more recently listed green sturgeon (2009). The review of impacts to green sturgeon did not result in a new work window as it found the salmonid work window was sufficiently protective of this species life stages.

The new measure regarding the salmon work window allows planned dredging activities outside of the salmonid work so long as the sediment generated is beneficially reused at restoration site that would benefit fish habitat (mitigation) in coordination with the LTMS agencies. It also formally delegates the authority to the LTMS agencies allow minor dredging activities after the close of the salmon work window without additional consultation. This new measure provides

benefits to fish habitat through more rapidly constructing new marsh, provides greater flexibility to the dredging community, and reduces workload for the LTMS agencies and NMFS during critical periods of dredging activity.

In 2016 and 2017, the USACE has complied with NMFS' amended LTMS programmatic biological opinion by taking sediment dredged outside of the work window, or its equivalent to beneficial reuse as mitigation for potential impacts to salmon. In its consistency determination request the USACE states: "...in accordance with the NMFS' 2015 LTMS Biological Opinion, clamshell dredging may be conducted outside of the salmonid working window if material is placed at an upland beneficial use site."

While the environmental work windows provide significant reduction in potential impacts to most listed species, they do not eliminate impacts to species that are present year-round, such as the Delta smelt and longfin smelt. For these two species, hydraulic dredging entrainment is a significant issue during any time of year depending on the channel being dredged. In 2010 and 2011 the USACE conducted limited entrainment monitoring while using the *Essayons*, a hydraulic dredge, in three federal channels. Due to the technical and logistical limitations of sampling on-board the vessel, only a small fraction, less than one percent of the total volume dredged, was actually sampled. In 2011, the *Essayons* entrained both Delta and longfin smelt, confirming the concerns of the regulatory and resource agencies.

In 2013, the United States Army Engineer Research and Development Center (ERDC) conducted a modeling study of entrainment potential of longfin and Delta smelt in San Francisco Bay by hydraulic dredges. In the study, the risk of smelt entrainment was assessed by comparing CDFW monthly trawl fish abundance data in the environment to fish collections in entrainment monitoring samples (screened sub-samples of dredged sediment) collected during the USACE's 2010 and 2011 monitoring efforts.

The modeling study estimated that longfin smelt entrainment during hydraulic dredging in 2011 was likely 3,848 fish for the low entrainment scenario, 6,528 for the medium entrainment scenario, and 10,260 for the high entrainment scenario (up to approximately 8 percent of the median annual population abundance). Modeled estimates of Delta smelt entrainment during hydraulic dredging are 394 for the low entrainment scenario, 1,444 for the medium entrainment scenario, and 3,694 for the high entrainment scenario (up to approximately 29 percent of the median annual population abundance). Many factors are associated with the accuracy of these projections. The small sample size of entrained fish (18 longfin smelt and 4 Delta smelt), combined with the low percentage of dredged material sampled, result in a high degree of uncertainty as to the accuracy of the entrainment estimates. However, this is the best available information on the potential entrainment by the *Essayons* to date.

In its concurrence request the USACE summarizes the entrainment data as follows: “Over the course of the 4-year study, 87 longfin smelt were entrained, 4 delta smelt, and 1 green sturgeon. This includes:

- Seventeen (17) longfin smelt entrained (12 in Richmond Outer Harbor, 3 in Pinole Shoal, and 4 in Suisun Bay) and four (4) delta smelt in Pinole Shoal;
- Twelve (12) longfin smelt entrained in 2016 (all in Richmond Outer Harbor); and
- Fifty-nine (59) longfin smelt in 2017 (all in Pinole shoal—56 during Episode 1 in June and 3 during Episode 2 in November) and one (1) green sturgeon (entrained in June).

In addition, but not noted by the USACE, the monitoring program observed a Chinook salmon entrained in 2016. Further, while these numbers may appear low, it is important to remember that due to technical issues, it is only feasible to monitor a small portion of the dredge operations, so actual entrainment is likely higher.

In its March 14, 2014 letter CDFW indicated its concern based on the entrainment monitoring and the modeling study, that impacts to Delta and longfin smelt would be significant. It noted the ERDC estimates of entrainment and stated that “the Project, as proposed, would substantially reduce the number of an endangered, rare, or threatened species.” To reduce dredging-related impacts to special status fish species to a less-than-significant level, CDFW recommended reducing hopper dredging to a minimum in San Francisco Bay, limiting any hopper dredging during certain periods and implementing the avoidance, minimization, and measures described below. In an additional letter commenting on the EA/EIR, the CDFW further recommended that for Central Bay, hopper dredging should occur “later” in the suggested work window of August 1st to November 30th of any year. CDFW has further refined its opinion that impacts to longfin smelt would be even more in reduced Central Bay (Richmond) may be reduced if dredging was limited to August 1 through November 30 and in San Pablo Bay (Pinole) if dredging was conducted in September through November of any year, because smelt set up for migration upstream spawning in San Pablo Bay.

The USACE has requested annual individual consultation with the USFWS regarding dredging in Suisun Channel and potential impacts to Delta smelt. As a result of these consultations over the past several years, the USACE has agreed to reduce the risk of delta smelt entrainment by using a clamshell dredge in Suisun Bay Channel.

Based on the ERDC entrainment study and guidance from CDFW, the following minimization measures were included in the Final EIR, the Water Board's water quality certification for years 2015 through 2020, and the 2015-2017 Letter of Agreement to protect both Delta and longfin smelt.

- (1) Limit the use of hopper dredges in San Francisco Bay to one federal channel (either Richmond Outer Harbor or Pinole Shoals); and specifically not allow use of a hopper dredge in Suisun Bay Channel.
- (2) No dredging would occur in water ranging from 0 to 5 parts per thousand salinity between December 1 and June 30.
- (3) USACE will coordinate with the appropriate regulatory and resource agencies to perform compensatory mitigation for hydraulic dredging anywhere when water temperature is below 22.0°C.
- (4) Implementation of a worker education program for listed fish species that could be adversely impacted by dredging. The program would include a presentation to all workers on biology, general behavior, distribution and habitat needs, sensitivity to human activities, legal protection status, and project-specific protective measures.
- (5) At the beginning and end of each hopper load, pump priming, drag head clearing, and suction of water would be conducted on the seafloor.
- (6) Hopper drag head suction pumps would be turned off when raising and lowering the drag arms from the seafloor.
- (7) Completion of hydraulic hopper dredging in Central Bay (i.e., Richmond Outer Harbor) between August 1 and November 30 to avoid impacts to young-of-the-year and spawning adult longfin smelt.
- (8) Maintaining contact of drag head, cutterheads, and pipeline intakes with the seafloor during suction dredging.
- (9) Keeping the drag head water intake doors closed to the maximum extent feasible in locations most vulnerable to entraining smelt. In circumstances when the doors need to be opened to alleviate clogging, the doors would be opened incrementally (i.e., the doors would be opened in small increments and tested to see if the clog is removed) to ensure that doors are not fully opened unnecessarily.

The USACE did not implement all of the required measures, specifically item 2, as the Napa River Channel was dredged in 2016 in these conditions, but the USACE purchased additional mitigation credits to offset impacts to listed species from this activity. It also did not comply with item 6 due to logistical and scheduling complications associated with the federal dredge, which is shared nationally.

In 2018, the USACE has stated that its Richmond Outer Harbor dredging cannot comply with item 7 due to similar priority and scheduling conflicts with federal channels elsewhere in the nation. The Commission staff, the Water Board, and CDFW have reiterated to the USACE the importance of dredging later in the season, particularly for Pinole Shoal, as evidenced by the significant increase in entrainment in the early summer compared to dredging in the fall – monitoring results from Pinole Shoal in 2017 validated this concern as 56 longfin smelt were entrained in the June dredge episode 1 as compared to 3 longfin smelt entrained during the November episode.

Minimization measure 1 necessitated an increase in the USACE budget to support the use of a clamshell dredge for an additional channel beyond that required by the USFWS in Suisun. Rather than seeking or providing additional funding, the USACE has chosen to defer dredging in either Richmond Outer Harbor or Pinole Shoal each year. In 2017, the USACE deferred dredging in Richmond Outer Harbor which has resulted in draft restrictions and hazardous conditions for fully loaded oil tankers. This has resulted in “light-loading” of tankers coming into the Chevron refinery. Chevron has reported an economic loss of \$500,000 per vessel. A similar effect is expected in 2018, as the USACE has opted to defer dredging in Pinole. If this deferral results in draft restrictions, it is expected to affect a number of oil terminals and potentially the Ports of Stockton and Sacramento.

In 2018 and 2019, the USACE has committed to the following: “To reduce the risk of entrainment of fishes in the Pinole Shoal and Richmond Outer Harbor, the following avoidance and minimization measures will be implemented when hopper dredging. These measures are discussed below.

- Dredging Pinole Shoal later (from August 1 through November 30) in the San Francisco Bay LTMS environmental work windows, *to the extent feasible* (emphasis added). Dredging later would allow young-of-the-year longfin smelt to grow larger and spawning adults to return upstream;
- Dredging earlier in the LTMS work window in Bulls Head Reach, from August 1 through September 30, to reduce impacts to adult longfin and delta smelt;
- Lowering the draghead to the channel bottom prior to turning on suction pumps;
- Keeping dragheads within 3 feet of the channel bottom should clearing of the pipeline be required; and
- Keeping water intake doors closed to the extent feasible (water intake doors are located on the top of the dragheads).”

The USACE has also committed to continuing entrainment monitoring aboard federal hopper dredges when dredging Pinole Shoal and Richmond Outer Harbor with a hopper dredge and mitigation credits will be purchased to mitigate for entrainment impacts.

Of note is the lack of commitment to dredge in the Petaluma River (a hydraulic dredge is proposed) at times when salinity and temperatures would reduce potential for entrainment, as provided for in the EIR, or monitor entrainment while this activity is ongoing.

Regarding herring, the USACE has agreed, as a matter of comity, to have trained herring monitors observe dredging activities that are conducted outside the work window in areas where spawning is likely to occur in 2018 and 2019. They have further agreed to stop dredging activities within 500 meters of spawning areas for 14 – 21 days to allow the eggs to develop, hatch and larval fish grow sufficiently to avoid high turbidity waters associated with dredging and disposal.

- f. **Mitigation.** The Commission’s Bay Plan policies on mitigation require that when adverse impacts cannot be avoided, they should be minimized to the greatest extent practicable and then unavoidable adverse impacts to the natural resources of the Bay should be mitigated. As described above, there are several minimization measures proposed, many in an effort to reduce entrainment of special status species. Because entrainment cannot be avoided, mitigation is required by the Commission’s mitigation policies.

As in the 2015-2017 program, the USACE has offered to purchase mitigation credits at Liberty Island Conservation Bank or other approved conservation bank, to compensate for entrainment of special status fish. The USACE has proposed using an equation agreed upon by CDFW and USFWS to determine the necessary credits. The equation (shown below) used to calculate the amount of conservation credits required for purchase based on the volume of water estimated to be pumped through the dredge during dredging.

$$\frac{3.0 \text{ million acre-feet}}{800 \text{ acre}} = \frac{X \text{ volume dredged}}{X \text{ acres of habitat}}$$

“Currently, USACE proposes to purchase 0.92 acres of credits per year—0.19 acre for Pinole Shoal, 0.34 acre for Richmond Outer Harbor, and 0.39 acre for Suisun Bay and New York Slough. These estimates are considered conservative because they are based on the largest volume of material dredged over a 12-year period. Each year, mitigation credits would be purchased following completion of hopper dredging. The mitigation discussed herein was agreed upon by USACE and CDFW.” The USACE qualified the applicability of this statement to only those projects using a hopper dredge. Currently, the USACE is only proposing to use the hopper dredge at Richmond Outer Harbor in 2018 and at Pinole Shoal in 2019.

This commitment appears to be the same as proposed for projects dredged between 2015 and 2017 and may not take into account the larger volume of hydraulic dredging resulting from deferring dredging in 2018 and 2019, nor the proposed hydraulic dredging in the Petaluma River channel, and therefore may need to be recalculated to mitigate for potential impacts to listed species from the 2018 and 2019 program. For example, due to heavy shoaling in 2017, 557,000

cy of sediment was dredged at Pinole Shoal in two episodes and required 0.43 acre credits to compensate for impacts to listed smelt rather than the previously proposed 0.19 acre credits. Currently, Richmond Outer Harbor has experienced significant shoaling and dredging was deferred in 2017. As a result, the USACE is estimating that it would need to dredge 500,000 cy at this site, which would likely require more than the 0.34 acre credits proposed based on the 2016 volume estimates. The USACE estimates the mitigation credit prior to dredging and then, based on the volume actually dredged, increases the needed credits as needed.

Also of note, is that in limiting hydraulic dredging of Pinole Shoal and Richmond Outer harbor to alternating years, a greater volume of sediment is dredged at that site in a single year. This increase may have additional effects on listed species due to the potential for more species to be entrained in a single year, potentially reducing the breeding population in that year. This change in practice has not been thoroughly analyzed or addressed by the USACE or resource agencies.

The Bay Plan policies further discuss the need for the required mitigation to be coordinated by all agencies with jurisdiction for the project and to, if possible be located near the location where the impacts occur. In 2014 as part of the CEQA/NEPA review process, discussions occurred between the USACE, USFWS, CDFW, BCDC and the Water Board, and agencies agreed to the mitigation equation, that the type of credit provided by Liberty Island (or Honker Bay mitigation bank when it becomes available) is appropriate to mitigate for impacts to Delta and longfin smelt. While mitigation is not being required for take of salmonids, an individual Chinook salmon was entrained during monitoring. Liberty Island provides credit to compensate for impacts to salmon as well. There is no appropriate mitigation bank available nearer to the project impacts in Central Bay.

The Commission must determine whether the proposed project is consistent with the Commission's policies regarding fish, other aquatic organisms, and wildlife; subtidal areas; and mitigation.

3. **Water Quality.** The Bay Plan Water Quality Policies 1 and 2 state, respectively, that "Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality..." and "Water 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 San Francisco Bay Regional Water Quality Control Board's *Water Quality Control Plan, San Francisco Bay Basin* and should be protected from all harmful or potentially harmful pollutants. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the Regional Board, should be the basis for carrying out the Commission's water quality responsibilities."

Further, Dredging Policy 2 necessitates that “[d]redging should be authorized when the Commission can find:...(b) the materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board...” In addition, the Bay Plan Dredging Policy No. 3(c) requires, in part that “the quality of material disposed is consistent with the advice of the Regional Board and the Dredged Material Management Office” (DMMO).

As part of any dredging and disposal/placement of dredged sediments in San Francisco Bay, the project sponsor is required to show that the sediment proposed for dredging is relatively free of contaminants, and that the dredging and disposal would not have harmful effects to water quality, habitat or the organisms that live in the Bay. This requirement is met through sediment testing and data analysis as describe by the Inland Testing Manual (for in Bay disposal) or the Ocean Testing Manual (for ocean disposal), and as refined, to address known San Francisco Bay contaminates. In addition, the Water Board has instituted Total Maximum Daily Loads (TMDLs) for specific contaminants with the goal of reducing the Bay’s load of these contaminants over time. Also instituted Bay-wide in 2011, are specific testing requirements to protect managed fish species under the Magnuson-Stevens Fish Conservation and Management Act through a programmatic Essential Fish Habitat (EFH) consultation for the LTMS program. This consultation further refined sediment contaminant limits for dredging and in-Bay disposal. The LTMS agencies have incorporated the Water Board’s TMDL requirements and the NMFS’s EFH recommendations in the DMMO sediment testing program.

In its consistency determination concurrence request, the USACE stated that dredging activity would not cause adverse impacts to tidal marshes, subtidal areas or alter fresh water flow into San Francisco Bay. Further, the USACE would conduct the program in compliance with the 2015 5-year WQC issued for the San Francisco Bay federal maintenance dredging program. The USACE would ensure that all required sediment testing and analysis be completed, and the results of the sediment testing and analysis will be provided to the BCDC, Water Board, and USEPA through the Dredged Material Management Office (DMMO) for review, approval and suitability determination for proposed disposal and placement sites. The USACE has provided sampling and analysis plans for some of the projects proposed for dredging in 2018, including Richmond Inner and Outer Harbor, and Redwood City Harbor. The DMMO anticipates the sediment analysis reports will be made available for review shortly for these projects, and prior to receiving requests for dredge episode approvals. Similarly, the DMMO anticipates receiving both sampling and analysis plans and results for the remaining USACE projects prior to issuing episode approvals for 2018 (Oakland Harbor and Suisun Channel) and similar information for 2019 projects.

The USACE has stated that it will place sediment in accordance with the requirements of the respective placement site; if sediment is not suitable to be placed at an in-bay aquatic site, it will be placed at a suitable site, such as SF-DODS or as non-cover material at Montezuma Wetlands. If sediment is not suitable for one of these sites,

additional coordination would be conducted to identify and use a suitable disposal site. As proposed, the sediment dredged from and placed in the Bay or adjacent upland sites would not result in permanent adverse effects to the Bay's water quality.

As discussed in the 2015 consistency determination, Richmond Inner Harbor's Santa Fe Channel (Exhibit C), is contaminated with DDT, PCB and other legacy contaminants due to the historic production of these chemicals. The United Heckathorne site has been designated as EPA superfund clean up site, and while efforts have been made to remediate the contamination, the site continues to contribute DDT into the Bay. The USACE does not currently, nor has it proposed to dredge the Santa Fe Channel during the period of this consistency determination.

Similarly, test results in 2014 and 2015 found portions of Redwood City Harbor Channel had elevated levels of PCB's in the turning basin area of the channel (Exhibit F). Higher resolution testing of this area was conducted, and the sediment dredged from this area was disposed of at the San Francisco Deep Ocean Site because it was determined not to have significant bioaccumulation potential in that environment. This site will be fully tested to ensure the dredged sediment proposed placement is appropriate and would not affect water quality or wildlife.

The Water Board's Order, the LTMS Management Plan as well as the Commission's policies and regulations have set annual and disposal site specific In-Bay disposal volume limits to reduce impacts to water quality, habitat and species. In response to the USACE's request for a WQC, the Water Board adopted Water Quality Certification and Waste Discharge Requirements, issued on May 13, 2015. It included a discussion of the LTMS in-Bay disposal targets and the individual in-Bay disposal site limits. The Water Board Order requires that the USACE continue management and monitoring of the in-Bay disposal site limits for all dredgers, including the USACE. Further it requires the USACE to enforce the limits as shown herein (Table 4), in order to minimize impacts to water quality.

The Water Board's WQC/WDR authorizes the USACE to conduct up to 12.4 million cy of dredging over five years, and a maximum in-Bay disposal of 3.5 million cy over the same period. The total in-Bay disposal limited authorized by the WQC/WDR is based on an average annual in-Bay disposal volume of 700,000 cy per year, although it does not set annual volume limits. The Order discusses the need to provide in-Bay disposal availability for the five ports, seven refineries and multiple small dredging projects such as recreational marinas and homeowners as described in the dredging policies discussion. According to the WQC/WDR, the Water Board will monitor dredging and disposal/placement volume through the episode approval process, in which the USACE provides equipment type, pre-dredge surveys, volumes for dredging and disposal/placement, and the disposal and/or placement sites on a channel by channel basis for review and approval.

Between 2015 and 2017, the according to the USACE, it disposed of 1,991,386 cy of sediment at various in-Bay disposal sites, including 684,300 cy in 2017, 425,086 cy in 2016, and 882,000 cy in 2017. Approximately 1.76 mcy of in-Bay disposal remains in the Water Board's waste discharge authorization for dredging projects in 2018 and 2019. The USACE has proposed a maximum of 1.075 mcy of in-Bay disposal in 2018 and 1.325 mcy of in-Bay disposal in 2019 and does not explain how it plans to address the shortfall of 650,000 cy of in-Bay disposal not authorized in the Water Board's waste discharge authorization. It is likely that the USACE would seek additional in-Bay disposal authorization in late 2018 or early 2019.

Regarding the proposed, maximum dredging and disposal volumes, these volumes will be confirmed and tracked in pre-dredge surveys. To facilitate further refinement of the proposed volumes the USACE has committed to providing a pre-dredge survey for each project to the Commission and requesting approval of both the dredging and disposal proposed. This, in combination with the post dredge surveys will allow for tracking and managing disposal volumes, and thus impacts to water quality. It is also possible that the actual project volumes would be less than proposed and that some would be higher than the estimated volumes. The LTMS agencies can use this information along with volumes proposed by other dredging projects to monitor in-Bay disposal volumes to ensure targets are not exceeded, or if necessary the contingency volume is used.

The Commission must determine whether the proposed project is consistent to the maximum extent practicable with the Bay Plan's policies on Water Quality.

4. **Navigational Safety and Oil Spill Prevention.** The Bay Plan Navigational Safety and Oil Spill Prevention policies 1 and 3 state respectively: “[p]hysical obstructions to safe navigation...should be removed when feasible when their removal would contribute to navigational safety and would not create significant adverse environmental impacts.” and that “[t]o ensure navigational safety and help prevent accidents that could spill hazardous materials, such as oil, the Commission should encourage major marine facility owners and operators, the U. S. Army USACE of Engineers and the National Oceanic and Atmospheric Administration to conduct frequent, up-to-date surveys of major shipping channels, turning basins and berths used by deep draft vessels and oil barges....”

In response to Commission Navigation Safety and Oil Spill Prevention policies, the USACE provided information regarding the region's Harbor Safety Committee's and U.S. Coast Guard's procedures and priorities, and that they collectively consider shoals to be obstructions that should be removed to ensure safe navigation. The noted the Harbor Safety Plan's critical maneuvering areas including those in Redwood Creek, San Mateo-Hayward Bridge, Oakland Bar Channel, Richmond Inner harbor, Richmond-San Rafael Bridge, Union Pacific Bridge, and New York Slough, all areas proposed for maintenance dredging its proposed program. The USACE explained that

a function of the Harbor Safety Committee is to identify shoals can result in serious environmental consequences as a result of groundings. The USACE's 2-year dredging program supports this policy by ensuring that obstructions (i.e., shoals) are removed from the deep-draft navigation channels, thus reducing the risk of navigation safety concerns and oil spills.

The USACE regularly conducts surveys of its navigation channels, including pre-dredge (before dredging) and post-dredge (after dredging) surveys. Even if a channel is not proposed for dredging, USACE maintains up-to-date conditions surveys of each channel to determine if hazardous shoaling has occurred. Lastly, as the federal dredges and its contracted dredges are required to maintain oil and hazardous material containment plans and equipment on board the vessel when operating within San Francisco Bay in compliance with the US Coast Guard and the Oil Spill Response Program (OSPR).

The Commission should decide whether the proposed project is consistent with the Commission's policies regarding navigational safety and oil spill prevention.

5. **Public Trust.** The Commission's policies on public trust state that when it takes an action affecting public trust lands, the Commission should assure that the project is also consistent with the public trust needs of the area. The public trust is a common law doctrine that guarantees the right of the public to use the state's waterways for navigation, commerce, fisheries, boating, recreation, natural habitat protection, and to preserve lands in their natural state for protection of scenic and wildlife habitat values. Public trust uses of public lands are generally limited to water dependent or water related uses. Further, because public trust lands are held in trust for all citizens of the state, they must be used to serve statewide, as opposed to purely local, public purpose.

In completing its independent evaluation of the project, the Commission must determine if the project is consistent with the public trust needs of San Francisco Bay. Public trust needs include the same categories as the uses. Maintaining the federal navigation channels through dredging and disposal/or placement of the dredged sediment is consistent with public trust needs for navigation; facilitates water borne commerce's ability to access local ports; and recreational boating, but may conflict with preservation of natural lands and wildlife habitat. The annual maintenance of the deep water channels allows large, ocean going ships to traverse to Bay and inland ports, refineries and other berthing areas. If the channels were not maintained, commerce would still occur, but at a lower rate, and some companies may choose to avoid the Bay, using other west coast ports. The maintenance dredging of Petaluma River and Across the Flats would facility water-borne commerce, specifically sand, to access a local market, and access to berthing areas and San Francisco Bay for recreational boaters. Annual dredging of deep water channels, as described above, likely reduces the abundance and diversity of organisms living in or on the sediments in deep water channels and causes some habitat degradation, as it would in shallow channels. However, because these channels have been dredged annually for decades,

it is likely that they have formed a steady-state of disturbance and recolonize to the extent possible. Due to the infrequent dredging of the Petaluma channels, the benthic organisms would likely recover and repopulate the area. Sediment removed from the channels may impact adjacent marshes and mudflats, but information regarding this potential impact is not available.

The Commission should determine whether the proposed project is consistent with the Public Trust needs of the Bay.

- B. **Review Boards.** The Engineering Criteria Review Board does not evaluate dredging projects and, as this project does not include any proposed public access, the Design Review Board did not review this project.
- C. **Environmental Review.** In 2014, the USACE and the Water Board completed a joint Environment Impact Assessment and Environment Impact Report (EA/EIR) *Maintenance Dredging of the Federal Navigation Channels in San Francisco Bay Fiscal Years 2015–2024*. The Water Board certified the Final EIR (FEIR) on May 13, 2015. The FEA/FEIR examined four project alternatives, and a number of issues, including: geology, soils and sediment quality; hydrology and water quality; air quality and climate change; biological resources, cultural and paleontological resources; land use; hazards and hazardous materials; and transportation.

The California Environmental Quality Act (CEQA) review identified significant impacts to Delta and longfin smelt in the alternatives that maximized use of hydraulic dredge equipment. The Water Board (lead agency) found that either of the reduced hopper dredge alternatives would reduce impacts to listed smelt and determined that using one hydraulic dredge in the Bay, (Reduced Hopper Dredge Alternative 1) coupled with minimization measures and mitigation for take of listed species was feasible. In certifying the FEIR, the Water Board made a finding of overriding considerations regarding the delay in implementing the reduced project alternative until 2017, to allow time for the USACE to adjust its budget. The USACE did not request additional funds to support the reduction of hydraulic dredging in the Bay. Instead, began deferring dredging of one channel (Richmond Outer Harbor or Pinole Shoal channel) in 2017, and anticipates continuing this process into the future.

In 2015, the USACE, through the National Environmental Quality Act (NEPA) review made a Finding of No Significant Impact (FONSI), and found that, “based on a review of the information incorporated in the FEA [Final Environmental Assessment] and supported by the administrative record, the proposed activity would not significantly affect the quality of the physical, biological, and human environment. In addition, avoidance, minimization, and mitigation measures are proposed to further support this determination.” The FONSI was signed on May 22, 2015, which completed the NEPA process. The USACE did not conduct further environmental review under NEPA prior to adopting its course of action number in 2017, to defer dredging of either Richmond Outer or Pinole Shoal in alternating years.

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

1. Section 66604 (pages I-3)
2. Section 66605 (pages I-3)
3. Section 66632 (pages I-13)
4. Section 66663 (pages I-34)
5. Section 66664 (pages I-38)

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

1. Bay Plan Policies on Fish, Other Aquatic Organisms and Wildlife (page 16)
2. Bay Plan Policies on Water Quality (page 19)
3. Bay Plan Policies on Tidal Marshes and Tidal Flats (page 23)
4. Bay Plan Policies on Subtidal Areas (pages 28)
5. Bay Plan Policies on Dredging (pages 46 to 48)
6. Bay Plan Policies on Mitigation (pages 86-87)
7. Bay Plan Policies on Public Trust (page 88)
8. Bay Plan Policies on Navigational Safety and Oil Spill Prevention (page 88)

**F. Relevant Portions of the Suisun Marsh Preservation Act**

1. Section 29002 (page II-1)
2. Section 29003 (page II-1)
3. Section 29008 (page II-3)
4. Section 29114 (page II-8)
5. Section 29500 (page II-25)

**G. Relevant Portions of the Suisun Marsh Protection Plan**

1. Findings and Policies on the Environment (pages 11-13)
2. Findings and Policies on Water Supply and Quality (pages 14-18)
3. Findings and Policies on Utilities, Facilities, and Transportation (pages 22-27)

**H. Relevant Portions of the Solano County Policies on Regulations Governing the Suisun Marsh (The Local Protection Program)**

1. Policies on Water Quality (page 18)
2. Policies on Utilities, Facilities and Transportation (pages 22 - 29)

**I. Relevant Portions of Federal Laws and Regulations**

1. 16 USC Section 307(c)
2. 15 CFR 930.32(a)
3. 15 CFR 930.34(b)
4. 15 CFR 930.39(a)
5. 33 CFR 304(1)

**Exhibits**

- A. **Vicinity Map, Exhibit A**
- B. **Site and Project Plan(s), Exhibits B-H**
- C. **FEA/FEIR Summary, Exhibit I**