

San Francisco Bay Conservation and Development Commission

375 Beale Street, Suite 510, San Francisco, California 94105 tel 415 352 3600 fax 888 348 5190

State of California | Gavin Newsom – Governor | info@bcdc.ca.gov | www.bcdc.ca.gov

November 27, 2019

Staff Recommendation

Operations and Maintenance Dredging of San Francisco Bay Federal Navigation Channels

(For Commission consideration on December 5, 2019)

Consistency Determination No.	C2019.004.00
Federal Agency:	US Army Corps of Engineers (USACE)
Project Description:	San Francisco Bay Federal Navigation Channels Maintenance and Operations Dredging Program 2020 – 2024.
Location:	In the Bay, at ten federal navigation channels in San Francisco, Marin, Sonoma, Napa, Contra Costa, Alameda, and San Mateo Counties, and at one federal navigation channel in the Suisun Marsh Primary Management Area in Solano County.
Application Filed Complete:	September 17, 2019
Deadline for Commission Action:	December 13, 2019, per the USACE agreed to time extension.
Staff Contact:	Brenda Goeden (415/352-3623; brenda.goeden@bcdc.ca.gov)
Staff Recommendation:	CONDITIONAL CONCURRENCE

Basis for Recommendation

The staff recommends conditional concurrence with the US Army Corps of Engineers that the proposed San Francisco Bay Federal Navigation Channels Maintenance and Operations Dredging Program 2020 – 2024, as conditioned and described below, is consistent to the maximum extent practicable with the San Francisco Bay Coastal Zone Management Plan, and will minimize impacts to Bay resources to the extent practicable.

The USACE's program is described as follows: in San Francisco Bay, during the calendar years 2020 through 2024, dredge seven deep and seven shallow draft federal navigation channels in San Francisco Bay, and the main ship channel outside the Commission's jurisdiction, and disposing the dredged sediment at four in-Bay disposals sites and the San Francisco Bay Deep Ocean disposal site (SFDODS). The total volume proposed for dredging is 14.395 million cubic yards (Mcy), 12.145 Mcy of which are from within the Bay. Beneficial reuse of dredged sediment may occur if the USACE determines a beneficial reuse site meets its "federal standard" for two of the proposed channels.



Each year the USACE proposes to dredge Oakland Harbor, Richmond Inner Harbor, Richmond Outer Harbor, Pinole Shoal, and Suisun Bay deep water federal navigation channels, and in alternating years, dredge Redwood City Harbor federal navigation channel. San Bruno Shoal deep water channel would be dredged once during the five-year period. The proposed depths of the deep water channels are between minus 35 and minus 50 Mean Lower Low Water (MLLW), which provides safe navigation for most ocean going commerce in the region. In addition, the USACE proposes to dredge San Rafael Creek and Across the Flats, Petaluma River and Across the Flats, and Napa Upper and Lower River shallow draft federal navigation channels, to depths of minus 6 to 15 feet MLLW. The shallow draft channels provide recreation boat passage and for some smaller commercial vessels.

The proposal also includes knockdown events to reduce hazards, “sea trial” events to calibrate vessels that have undergone repairs in dry dock, and advanced maintenance dredging at Suisun and Pinole Shoal channels in limited areas on an as needed basis.

Dredging, disposal and beneficial reuse sites are located in Sonoma, Solano, Contra Costa, Marin, Alameda and San Francisco counties.

Recommended Resolution and Findings

The staff recommends the Commission adopt the following resolution:

I. Agreement

- A. The San Francisco Bay Conservation and Development Commission concurs with the determination of the US Army Corps of Engineers, San Francisco District (USACE) that, as further conditioned by the Commission herein, the USACE’s 2020 through 2024 Maintenance and Operations Program (Program)¹ is consistent to the maximum extent practicable with federal Coastal Zone Management Act and the San Francisco Bay Coastal Zone Management Program as follows:

In the Bay and the Suisun Marsh Primary Management Area (Exhibit A):

1. Dredge a maximum of 950,000 cy of sediment from Oakland Inner and Outer Harbor channels to a depth of -50 feet MLLW, plus two feet over-dredge depth allowance annually for five years and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment at the federally authorized San Francisco deep ocean disposal site (SF-DODS)(Exhibit B);

¹ Program means all dredging and disposal activities proposed by the USACE for the 2018 and 2019 operations and maintenance activities. Project means individual dredging episode at a federal navigation channel and its associated disposal or beneficial use of dredged sediment.



2. Dredge a maximum of 350,000 cy of sediment from Richmond Inner Harbor channel to a depth of -38 feet MLLW, plus two feet over-dredge depth allowance annually for five years and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment at the federally authorized San Francisco deep ocean disposal site (SF-DODS) (Exhibit C);
3. Dredge a maximum of 350,000 cy of sediment from Richmond Outer Harbor channel to a depth of -45 feet MLLW, plus two feet over-dredge depth allowance annually for five years and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, 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 (Exhibit C);
4. Dredge a maximum of 300,000 cy of sediment from Pinole Shoal channel to a depth of -35 feet MLLW, plus two feet over-dredge depth allowance, including advanced maintenance dredging to a depth of -37 MLLW plus two feet of over dredge depth between station 200+00 and 290+00 and between stations 309+00 and 421+00, annually for five years and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment in the Bay at the state and federally authorized or San Pablo Bay (SF-10) and/or Alcatraz (SF-11) disposal site (Exhibit D);
5. Dredge a maximum of 200,000 cy of sediment from Suisun Bay channel to a depth of -35 feet MLLW, plus two feet over-dredge depth allowance, including advanced maintenance dredging to a depth of -37 MLLW plus two feet of over dredge depth in the Bulls Head Reach area (between station 62+00 and 88+00), annually for five years and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment in the Bay at the state and federally authorized Suisun Bay (SF-16) and/or Carquinez Strait (SF-9) (Exhibit E);
6. Dredge a maximum of 300,000 cy of sediment from Redwood City Harbor to a depth of -30 feet MLLW, plus two feet over-dredge depth allowance biannually, beginning in 2021, and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment at SFDODS, or in the Bay at the state and federally authorized Alcatraz Island (SF-11) disposal site (Exhibit F);
7. Dredge a maximum of 16,000 cy of sediment from San Bruno Shoal to a depth of -30 feet MLLW, and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment in the Bay at the state and federally authorized Alcatraz Island (SF-11) disposal sites (Exhibit F);
8. Dredge a maximum of 350,000 cy of sediment from the Petaluma River channel to a depth of -8 feet MLLW, plus two feet over-dredge depth allowance and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment at Schollenberger Park disposal site in the City of Petaluma, Sonoma County (Exhibit G);



9. Dredge a maximum of 250,000 cy of sediment from the Petaluma River Across the Flats channel to a depth: -8 feet MLLW, plus two feet over-dredge depth allowance and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment in the Bay at the state and federally authorized San Pablo Bay (SF-10) disposal site (Exhibit G);
 10. Dredge a maximum of 55,000 cy of sediment from the upper Napa River channel to a depth of -15 feet MLLW, plus two feet of over dredge depth allowance and a maximum of 13,000 cy of sediment from the lower Napa River channel to a depth of -9 feet MLLW, plus one foot over-dredge depth allowance, and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged at the Imola or Napa Plant site in the City and County of Napa (Exhibit H);
 11. Dredge a maximum of 87,000 cy of sediment from the San Rafael Creek channel to a depth of -6 feet MLLW, plus two feet over-dredge depth allowance and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment at the state and federally authorized San Pablo Bay Disposal Site (SF-10)(Exhibit I);
 12. Dredge a maximum of 113,000 cy of sediment from the San Rafael Creek Across the Flats channel to a depth: -8 feet MLLW, plus two feet over-dredge depth allowance and beneficially reuse the dredged sediment at an approved site, or if beneficial reuse is infeasible, dispose of the dredged sediment in the Bay at the state and federally authorized San Pablo Bay (SF-10) disposal site(Exhibit I);
 13. Conduct up to five “sea trials” for the federal hopper dredges, *Essayons* and *Yaquina*, after dry dock repairs or maintenance activities. Sea trials for the *Essayons* includes intake of 600,000 gallons of water for ship displacement calibration and dredging 3-5 loads (up to 12,000 cy of sediment) for load calibration, and 1,500 gallons of water and 3-5 loads (up to 4,000 cy of sediment) for the *Yaquina* per trial episode. The sea trial for either project would occur in Pinole Shoal federal navigation channel in January through March. Place the dredged sediment at the state and federally authorized San Francisco Bar (SF-8) disposal site, unless the sea state is prohibitive. If the sea state is unsafe, place the dredged sediment at the Alcatraz disposal site (SF-11); and
 14. Conduct annual “knockdown events” of up to five percent of that channel’s proposed volume, with individual shoals being no greater than 3,000 cy, unless the USACE agrees to monitor the knockdown event to determine the increase in suspended sediment and turbidity levels from the knockdown event.
- B. This agreement is given based on the information submitted by or on behalf of the USACE in its consistency determination dated June 18, 2019 and the addendum submitted on August 1, 2019, including all accompanying and subsequent correspondence and exhibits. As described, this agreement expires on December 31, 2024.



II. Special Conditions

If the USACE does not agree to comply with the following conditions or fails to incorporate them into its Program, the USACE shall notify the Commission immediately of its refusal to agree or to incorporate any of the conditions into the Program, and this conditional concurrence shall be treated as an objection to the USACE's determination that the Program is consistent to the maximum extent practicable with the enforceable Bay Plan policies applicable to such conditions. The USACE shall also immediately notify the Commission if the USACE determines that it will go forward with any project pursuant to the Program despite the Commission's objection.

- A. **Limits on Dredging.** This consistency determination authorizes maintenance dredging only within areas as shown on Exhibits B through I to the project depths for each channel as listed in the authorization section above with a total dredge volume of 14.395 million cubic yards (Mcy), of which 12.145 Mcy would be dredged from within the Bay. The total volume proposed to be dredged in subsequent years includes: 1.562 Mcy from deep draft channels in 2020, 2022, and 2024; and 1.862 Mcy from deep draft channels in 2021 and 2023; with a total of 884,000 cy of sediment dredged from three shallow draft channels and the San Bruno Shoal, should they be authorized and funded. The three shallow draft channels would likely be dredged in different years. No dredging in other areas or additional volume is authorized.
- B. **Limits on Disposal.** The USACE shall reduce its annual in-Bay disposal volume to a maximum of twenty percent of the total volume of sediment dredged each year in its proposed for its dredging Program. Further, to ensure consistency with the Bay Plan's enforceable policies on Dredging, including but not limited to the policy to maximize the use of dredged sediment as a resource, as discussed further below in Section III – A.1 (Findings and Declarations, Consistency of Dredging Activities with the Amended San Francisco Bay Coastal Zone Management Program, LTMS Management Plan and Dredging Policies, the USACE shall take a minimum of forty percent of the total volume of sediment in its Program's to beneficial reuse sites annually, and to the extent practicable, shall take additional dredged sediment to designated beneficial reuse sites through further reduction of sediment proposed for ocean disposal.

In-Bay disposal of dredged sediments shall not exceed the monthly or annual disposal site targets set forth in the Commission's regulations and the LTMS Management Plan. The USACE shall limit its Program's in-Bay disposal volumes to 20% of the total volume proposed, and in accordance with direction from the Inter-Agency Dredged Material Management Office (DMMO) to ensure there is adequate total in-Bay disposal volume to accommodate other dredgers, particularly the small dredging community. In the event that annual or monthly in-Bay disposal site limits are reached, the USACE shall redirect disposal at the direction of the DMMO, to a site that has not approached its limits. If, in any instance, the USACE determines that the LTMS disposal targets (either individual in-Bay sites or total) would be exceeded, at the next Commission meeting a USACE representative shall present to the Commission the purpose and need of exceeding those limits.



- C. **Annual Schedule.** No later than November 30th of each year, the USACE shall provide the DMMO agencies a schedule of the projects confirmed for dredging in the following calendar year. An updated schedule shall be provided to the Commission staff quarterly if changes are made to the schedule that affects execution of a project(s). If a project receives additional funding after November 30th of any year that would impact the USACE program, the USACE shall provide a project description and schedule to the DMMO agencies within two weeks of receiving funding.
- D. **Water Quality Approval.** By January 31, 2020, and prior to the commencement of any dredging episode authorized herein, the USACE shall submit to the Executive Director a water quality certification, waste discharge requirements, or any other required approvals from the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board). Failure to obtain and comply with such certification prior to the commencement of any dredging episode shall terminate the Commission's concurrence for that episode. The Executive Director may, upon review of the Water Board's approval, either: (1) approve the dredging episode consistent with the Water Board's authorization; or (2) amend this authorization, as necessary, to ensure consistency to the maximum extent practicable with water quality-related policies of the Commission's federally-approved Coastal Zone Management Program. If the Executive Director amends this authorization pursuant to Special Condition II-D, unless the USACE agrees to the authorization in the manner specified by the Executive Director, this consistency determination shall become null and void for that episode.
- E. **Sediment Quality.** Sediment to be dredged and disposed/beneficially reused shall be tested to ensure that the sediment is physically, chemically and biologically suitable for the proposed placement site. The sediment testing program shall be in accordance with the Inland Testing Manual or the Ocean Testing Manual, as modified for the San Francisco Bay Region. The Sampling Analysis Plans shall be consistent with the protocols, advice and decisions of the DMMO, and should be submitted a minimum of one week before the DMMO meeting occurs. Once testing has occurred, the Sampling Analysis Results shall be submitted in report form to the Commission staff and the DMMO for review and decision on the suitability of the sediment for the proposed placement site. The USACE shall abide by the decisions of the DMMO.
- F. **Overflow During Hopper Dredging.** Return water overflow from hopper-type hydraulic dredges shall be limited to no longer than 15 minutes at the dredge site for each hopper load except in channels where the shoaled material contains greater than 80 percent sand. There is no overflow restriction if the dredged material is greater than 80 percent sand.
- G. **Dredging and Disposal Activity**
1. **Episode Approval, Disposal Report and Notice.** At least 30 days before the commencement of any dredging, disposal and/or placement episode authorized herein, the USACE shall submit to the Commission's Executive Director for review and approval:



- a. A bathymetric survey depicting the location of all areas authorized to be dredged, the proposed depth including over-dredge depth based on MLLW, the volume of sediment proposed to be dredged, the results of sediment test analysis, and the proposed placement site, and the approximate date of project commencement. The bathymetric survey data presented shall be collected not more than 60 days prior to proposed start of dredging. At least two (2) weeks prior to any dredging episode, the USACE shall notify the Commission staff of the commencement date by telephone, email or in writing. If the volume of sediment proposed for dredging, placement site, or date of commencement changes, updated information shall be provided as soon as it is available.
 - b. A written statement to the Executive Director that contains: (1) the proposed disposal or placement site and quantity of sediment to be disposed or placed, and dates within which the disposal/placement episode is proposed; (2) if applicable, a discussion as to how the volume proposed for disposal is consistent with in-Bay disposal site limits and/or disposal site allocations; (3) the results of chemical and biological testing of sediment proposed for disposal; and (4) an individual alternatives analysis for that channel or integrated alternative disposal site analysis for the annual program that provides the basis for the feasibility determination of beneficial reuse of dredged sediment, upland placement or ocean disposal at SF-DODS being infeasible.
 - c. If advanced maintenance dredging is necessary, the USACE shall provide: (1) the advanced maintenance footprint; (2) any test results characterizing the sediment; (3) proposed depth; (4) volume; (5) disposal or beneficial reuse location; (6) schedule for the project; and (7) rationale for the purpose of and need for the advance maintenance to the Commission staff for review and approval.
2. **Authorization of In-Bay Disposal.** The authorization for the proposed in-Bay disposal shall become effective only if the Executive Director: (1) informs the USACE in an episode approval letter or email that the episode is consistent with the authorization provided herein, beneficial reuse or alternative disposal options are infeasible, the volume proposed for disposal is consistent with the disposal site limits, and the sediment is suitable for in-Bay disposal, beneficial reuse or ocean disposal; or (2) does not respond to the USACE's episode approval request within 30 days of its receipt. If the Executive Director determines that: (a) ocean disposal, upland disposal, or beneficial reuse of the material is feasible; (b) the sediment proposed for disposal is unsuitable for the Bay; or (c) the proposed disposal is inconsistent with in-Bay disposal site limits, the Commission's concurrence for in-Bay disposal for that episode shall be terminated. The USACE shall adhere to any special conditions contained in the episode approval letter, beyond those contained in this consistency determination concurrence.



3. **Post-Dredging Requirements.** For all projects completed in the previous year, the USACE shall submit a bathymetric map showing the actual area(s) and depths dredged including over-dredge depth based on MLLW, any dredging that occurred outside the area or below the depths authorized herein, and a written statement indicating the total volume of sediment dredged and placed/disposed, the placement or disposal locations and the volume of sediment placed at each site of each dredging episode or advanced maintenance event, authorized by this agreement, by January 31st of each year, as well as a summary of work completed by December 31st for incomplete projects. For projects completed after December 31st of any year, the USACE shall provide the same information listed above within 60 days of episode completion.
- H. **Biological Resource Protection.** Dredging, and dredged sediment disposal have impacts to the biological resources of the Bay. Therefore, the USACE shall undertake the following avoidance, minimization and mitigation measures:
1. **Seasonal Limitations.** To reduce impacts to Bay species whose population are in decline, and specifically those that federal and state governments have listed as candidate, threatened or endangered, as well as those that use the Bay as spawning grounds, the USACE shall confine dredging and disposal operations to the work windows consistent with Tables F-1 and F-2 of Appendix F, "In-Bay Disposal and Dredging" and Figures 3.2 and 3.3 of the Long-Term Management Strategy Management Plan (2001) as amended by the U.S. Fish and Wildlife Service (USFWS) on May 28, 2004 and NOAA's National Marine Fisheries Service (NMFS) amended LTMS Programmatic Biological Opinion dated July 2015. No work inconsistent with the time and location limits contained in these tables may be conducted without the written approval of the Executive Director. Such approval may only be issued after the Executive Director has sought the advice of the appropriate resource agencies and determined that dredging and disposal outside of the work window would be consistent with the Commission's Coastal Zone Management Program.

In the event that the USACE dredges outside of the salmon work window anywhere within San Francisco Bay, the USACE shall place the sediment dredged during that time at a designated beneficial reuse site that will benefit fish habitat, consistent with the NMFS 2015 amended LTMS Programmatic Biological Opinion. If it is infeasible to do so during that dredging episode, the USACE shall place an equivalent volume of dredged sediment at a beneficial reuse site from a project conducted during the work window the following dredge season.
 2. **Longfin and Delta Smelt.** Both the longfin smelt and Delta smelt populations are in extreme decline, as noted by the listing of both species. Longfin smelt is listed as threatened by the California Department of Fish and Wildlife (CDFW) and is a candidate species for listing by the USFWS. Delta smelt is listed as endangered by CDFW and threatened by USFWS.

- a. **Reduced Use of Hydraulic Dredge.** To ensure consistency with the Bay Plan's enforceable policies on Fish, Aquatic Organisms and Wildlife, including but not limited to the policies to protect native fish species, as discussed further below in Section III – A.2 (Findings and Declarations, Consistency of Dredging Activities with the Amended San Francisco Bay Coastal Zone Management Program, Natural Resources), the USACE shall reduce impacts from entrainment to these and other fish species by reducing the use of hydraulic hopper dredge to a maximum of one in-Bay federal channel located within San Francisco Bay annually (either Richmond Outer Harbor or Pinole Shoal). Other channels shall be dredged using mechanical equipment.
- b. **Hydraulic Dredge Minimization Measures.** To reduce entrainment of longfin and Delta smelt when a hydraulic dredge is in use, the USACE shall implement the following minimization measures when using a hydraulic dredge:
 - (1) No dredging would occur in water ranging from 0 to 5 parts per thousand salinity between December 1st and June 30th of any year;
 - (2) The USACE shall designate a qualified biologist to provide a worker education and training program regarding special status 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 for all special status species. The training program shall be conducted prior to the use of a hydraulic dredge in San Francisco Bay;
 - (3) At the beginning and end of each hopper load, pump priming, drag head clearing, and suction of water would be conducted within three feet of the seafloor;
 - (4) Hydraulic drag head suction pumps would be turned off when raising and lowering the drag arms from the seafloor;
 - (5) Maintaining contact of drag head, cutterheads, and pipeline intakes with the seafloor during suction dredging;
 - (6) Keeping the drag head water intake doors closed to the maximum extent feasible in locations most vulnerable to entraining longfin and Delta smelt. In circumstances when the doors need to be opened to alleviate clogging, the doors would be opened incrementally;
 - (7) In the event Suisun Channel is dredged using hydraulic equipment, dredge between August 1st and September 30th of any year, to avoid impacts to spawning adult longfin and Delta smelt;
 - (8) Conduct hydraulic dredging in San Pablo Bay (Pinole Shoal) and Central Bay (i.e., Richmond Outer Harbor) between August 1st and November 30th, to the extent feasible, to avoid impacts to young-of-the-year and spawning adult longfin smelt; and

- (9) Notify the Commission staff in writing immediately if it determines that it is not in compliance with any of these measures, including but not limited to any actual or anticipated failure to implement minimization measures.
- c. **Entrainment Monitoring for Hydraulic Dredges.** To increase the accuracy of the existing estimated entrainment rates for longfin and Delta smelt, the USACE shall:
- (1) By March 31, 2020, USACE shall submit a five-year entrainment monitoring plan, acceptable to the Executive Director, for collecting data to increase the accuracy of existing entrainment rate estimates for delta smelt, longfin smelt, and other special status fish species in hydraulic hopper dredges during maintenance dredging in San Francisco Bay. Annual monitoring reports are due by January 31st of the year following dredging activity monitored. At a minimum, the plan shall include the following elements:
- a. On-board monitoring during active dredging;
 - b. Sampling during all phases of the dredging cycle;
 - c. Sampling both drag-arms to capture a greater percentage of the pump volume during active dredging;
 - d. Sampling associated with flood/ebb tides and spring/neaptides;
 - e. Visual monitoring of vessel hold for fish that are not captured by sampling screens during active dredging;
 - f. Presence/absence monitoring in the immediate vicinity of the dredge active to determine effectiveness, if feasible; and
 - g. Procedures for evaluating the effectiveness of the avoidance, minimization, and mitigation measures as described in Special Condition II-1.2.b.

By March 31 of years 2021 through 2024, USACE shall submit an annual update to the plan (or an acceptable rationale justifying that no update is necessary or proposed).

- (2) If hydraulic dredging occurs in the Petaluma River or Napa River Channel between October 1st and June 30th, monitor water temperatures in the morning prior to the start of work at 3 feet above the river bottom and at the river bottom in the dredging footprint, at 541 meters (1,775 feet) upstream and 541 meters downstream from the dredging activity that day. The temperature readings shall be logged and provided to Commission staff via email each Friday by 5 pm PST of any week that work is occurring to assist in assessing mitigation credit requirements.



- (3) Implement the entrainment monitoring plan when using a hydraulic dredge in San Francisco Bay, and provide a report within 6 months of completion of each monitoring event.

In the event that the USACE identifies a proposal that is more beneficial to species of concern, it may propose it to the Water Board and Commission staff for review and approval by February 28th of the year in which its implementation is proposed.

d. Compensatory Mitigation Measures

- (1) **Use of Hydraulic Dredges.** Compensatory mitigation is necessary to offset the impacts of hydraulic dredging. When the USACE uses a hydraulic dredge in Pinole Shoal, Richmond Outer Harbor, or other federal channel, and in the event sea trials occur, the USACE shall purchase at a minimum 0.92 acres mitigation credit at Liberty Island Conservation Bank based on a conservative estimate to mitigate for potential impacts to longfin and Delta smelt. If the volume of sediment actually dredged is beyond the estimated amount used for the migration credit calculations, the USACE shall revise the calculations and purchase the appropriate amount of credit for the volume of sediment actually dredged.

If another CDFW and USFWS-approved conservation bank opens, which provides habitat benefitting listed smelt species, the USACE may purchase credits at that bank if it is located closer to the dredge site than Liberty Island. If Pinole Shoal is dredged with a hydraulic dredge the USACE shall purchase no less than 0.19-acres of mitigation credit per year and if Richmond Outer Harbor is dredged with a hydraulic dredge, the USACE shall purchase no less than 0.34 acres of mitigation credit per year. When sea trials for hopper dredges occur, additional credits shall be calculated and purchased in that same year.

In finalizing the annual compensatory mitigation purchases, the USACE shall coordinate with the Commission staff, the Water Board, USFWS and CDFW, to reach agreement on the additional compensatory mitigation required for purchase, and provide documentation that the purchase has occurred to the Commission staff by March 30th of the year following the dredging activity.

- (2) If Petaluma River Channel, Napa River Channel, or San Rafael Creek, and Across the Flats is hydraulically dredged when conditions are conducive to the presence of longfin or Delta smelt (water temperature less than 22 degrees Celsius), the USACE shall use the temperature measurements from Special Condition II–H.2.c(2) to determine the number of days that dredging occurred when conditions were appropriate for the presence of longfin or Delta smelt. Using the volume of water pumped during dredging, calculate and purchase mitigation credit commensurate with the volume of sediment dredged while those conditions were present as with the hydraulic hopper dredge.



If a mitigation option that would be of greater benefit to smelt becomes available, the USACE shall work with the Commission staff in consultation with the CDFW and USFWS to determine the type and amount of mitigation appropriate to compensate for the potential impacts to smelt from hydraulic dredging in San Bruno Shoal, the Petaluma River Channel, Napa River Channel, or San Rafael Creek, and Across the Flats channels, subject to agreement by the Executive Director.

3. **Herring.** Pacific herring is an important forage and commercial fishery fish that spawns on hard surfaces, aquatic plants, and seaweed in San Francisco Bay. To protect this species' spawning habitat, the USACE shall implement the following measures when dredging between November 30th and March 15st of any year. By November 15th of each year, the USACE shall notify the Commission staff, the Water Board and CDFW if dredging is proposed between November 30th and March 15st of any year within a herring spawning area in San Francisco Bay. If dredging would occur in potential spawning habitat between November 30th and March 15th of any year, the USACE shall implement the following measures:
 - a. A qualified and trained herring observer shall be present during all dredging or in-water work (day and night) and observing shall be his/her sole duty. Training includes, at a minimum, annual attendance at a CDFW administered herring training. The USACE shall provide a copy of observers' qualifications to the Commission, the Water Board and the CDFW not later than November 20th in years that dredging would occur after the herring closure;
 - b. The observer shall monitor for herring spawn from an area that allows a full range of view of the 500-meter buffer zone. Observations may be conducted from the dredge, shore, or by a separate vessel;
 - c. The observer shall conduct a shoreline survey within the 500-meter buffer zone at least one hour prior to the start of dredging when there is a lag time of eight hours or more between dredging activities and/or following dredging at night;
 - d. All in-water work shall stop immediately and Commission staff and CDFW shall be notified if spawning Pacific herring are detected within 500 meters of the dredging site. If spawning occurs within the 500-meter buffer, work may not continue until spawning has ended and herring embryos have hatched (14-21 days). Dredging can restart with approval from CDFW and notification to the Commission staff;
 - e. The observer shall keep a daily log of observations, which shall be submitted to Commission staff and the CDFW on a weekly basis by 5:00 pm on Fridays; and
 - f. To further protect herring during their spawning season, if dredging occurs between December 1st and March 15th of any year, the Oakland Harbor and Richmond Inner Harbor channels shall be dredged beginning in the outer reaches to the inner reaches.

4. **Eelgrass.** Eelgrass is a known productive aquatic plant that provides significant habitat value for certain Bay species. When a dredging footprint is within 45 meters of an eelgrass bed, the USACE shall conduct pre-dredge and post-dredge eelgrass surveys to determine whether the project is impacting eelgrass beds. The USACE shall provide a copy of the pre-dredge eelgrass survey 30 days prior to project commencement of dredging. Once dredging is complete, the USACE shall provide a post-dredge eelgrass survey within 45 days of project completion and provide them to the Commission staff, the Water Board, NMFS, and CDFW for review and consideration. If a dredging project is completed during the eelgrass dormancy period, the USACE shall perform the post-dredge eelgrass survey in the spring, and provide the post-dredge eelgrass survey within 45 days of completion, in compliance with the LTMS Programmatic Essential Fish Habitat Consultation (2011).
5. **Fish Habitat.** In order to reduce impacts to habitat from the dredging and disposal projects, the USACE shall comply with the Conservation Measures set forth in the June 9, 2011, Programmatic Essential Fish Habitat (EFH) Consultation Agreement between USACE, the EPA, and NOAA Fisheries.
6. **Hazardous Materials and Fuels.** The USACE shall immediately stop/repair and clean up any fuel or hazardous waste leaks or spills from dredging or disposal activities at the time of occurrence. The USACE shall properly contain hazardous products and dispose of any unused or leftover hazardous products off-site.
7. **Take of Listed Species.** This consistency determination agreement does not allow for the take, including incidental take, of any special status species. The USACE is required, as prescribed in the State and Federal Endangered Species Acts, to consult with or obtain appropriate take authorization from the appropriate agencies prior to undertaking dredging activities in San Francisco Bay which may affect any federally or state listed species and is not in compliance with the LTMS Programmatic Biological Opinions, or individual biological opinions currently in effect.

If the USACE initiates consultation with one or more resource agencies, it shall provide a copy of the amended or new biological opinion to the Commission staff for consideration and potential amendment to this Letter of Agreement as required by the Commission. The USACE shall use the appropriate protocols, as approved by the CDFW, NMFS, and/or USFWS, to ensure that project activities do not adversely affect rare, candidate, threatened and endangered species, as they are protected natural resources of San Francisco Bay and its tributaries.

- I. **Funding Request.** The USACE shall request funds annually to: (1) use a mechanical dredge in the deferred channel (i.e., Pinole Shoal or Richmond Outer Harbor channel) to maintain safe navigation and protect listed species as described in Special Condition II–H.2.b; (2) to beneficially use a minimum of 40% of the dredged sediment each year or over the five-year period as required in Special Condition II–B; and (3) report the outcome of such request to the Commission at the appropriate time in the federal budget cycle.



- J. **Management and Monitoring of In-Bay Disposal of Dredged Material.** The USACE shall maintain administrative controls on disposal volumes at the in-Bay disposal sites to ensure that the site specific and LTMS target volumes are not exceeded. The USACE shall manage overall disposal volumes and disposal locations within each site to prevent build-up of dredged materials at each of the sites.
1. The USACE shall continue bathymetric monitoring of the in-Bay disposal sites, monthly at SF-11, quarterly at SF-9, SF-10, and SF-16. The USACE shall provide these condition surveys within 60 days of their completion to the Commission staff; and
 2. No later than July 1st of each year, the USACE shall provide to the Commission an annual report acceptable to the Executive Director, analyzing the status of the mounding at the Alcatraz disposal site. This report shall include:
 - a. A description of results of the previous year's bathymetric surveys and a description of the trends in mound shape and size;
 - b. An estimate of the annual net change in volume of the mound overall, and at depths above -60, -50, -40, and -30 feet MLLW;
 - c. An estimate of the annual volume of dredged material disposal at the site;
 - d. An analysis of the relationship between disposal volumes, site management practices, and net change in mound volume;
 - e. Assessment of whether management practices are achieving satisfactory results; and
 - f. Recommendations for future site management practices, as informed by the analysis and assessment of items d and e, above.
- K. **Observation of Dredging and Disposal Operations.** The USACE shall allow the Commission staff and representatives of other state or federal agencies to come aboard the dredge or barge associated with any dredging, knockdown or disposal episode and observe the operation(s) to ensure that these activities are consistent with pre-dredging reports required herein and other terms and conditions of this permit. Further, the Commission reserves the right to have post-dredging reports inspected by a reliable third party familiar with bathymetric mapping in order to verify the contents of these reports.
- L. **Long-Term Management Strategy Program.** If, at any time during the effective life of this agreement, the Commission's laws, Bay Plan policies, or regulations are changed and are in effect regarding dredging, dredged material disposal, and beneficial reuse consistent with the multi-agency Long-Term Management Strategy for Placement of Dredged Material in the Bay Area (LTMS) Program, this agreement shall become null and void unless the USACE agrees to amend its consistency determination, and agrees to new conditions to meet the new laws, policies, or regulations in a manner specified by or on behalf of the Commission, if appropriate.

III. Findings and Declarations

This authorization is given on the basis of the Commission's findings and declarations that the work authorized as conditioned herein, is consistent to the maximum extent practicable with the Commission's federally-approved Amended Coastal Zone Management Program for San Francisco Bay, including the McAteer-Petris Act, the Suisun Marsh Preservation Act, and the *San Francisco Bay Plan*, and *Suisun Marsh Protection Plan*, and the Commission's regulations, for the following reasons:

- A. **Consistency of the Dredging Activities with the Amended San Francisco Bay Coastal Zone Management Program.** Section 66663 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.

The USACE maintains seven federal deep water navigation channels, and seven shallow draft channels in San Francisco Bay, and one deep water channel at the entrance to the Bay to support safe waterborne commerce, transportation, military and recreation activities. Consistency Determination No. C2019.004.00 includes maintenance dredging of thirteen channels over five years within the Commission's Coastal Zone Management Program Area, or projects that have the potential to impact the Coastal Zone, including: the Oakland Harbor, Richmond Inner Harbor, Richmond Outer Harbor, Pinole Shoal, Suisun Bay, Redwood City Harbor, Napa River (upper and lower), Petaluma River, and Petaluma Across the Flats, San Rafael Creek and San Rafael Across the Flats channels, and one channel outside the Commission's jurisdiction, the Main Ship channel. The maximum volume that would be dredged from the in-Bay channels over five years is 12.145 Mcy, with a maximum volume in any year if all channels were dredged of 2.746 Mcy. However, it is unlikely that all proposed channels would be dredged in any one year due to limited funding that the USACE receives each year. The more likely maximum volume is 2.462 Mcy, in the event that all deep water channels were dredged in the same year as the Petaluma River and Across the Flats were dredged. As proposed, the dredged sediment will be disposed of at one of four in-Bay disposal sites, at the San Francisco Deep Ocean Disposal Site (SFDODS), the San Francisco Bar disposal site (SF-8) a nearshore disposal site, or beneficially reused at an approved beneficial site, or placed at an approved upland disposal site. The authorization section describes the projects as going to beneficial reuse sites, unless infeasible and then provides the aquatic disposal site. This, along with Special Condition II-G, requires the USACE to provide additional information regarding the actual volume proposed for dredging and a feasibility analysis in the year the channels would be dredged.



1. **LTMS Management Plan and Dredging Policies.** The Legislature amended the McAteer Petris Act Sections 66663 through 66666 in response to, and Bay Plan policies and Commission regulations incorporate, the LTMS Management Plan's goals and measures. The LTMS program provides for economically and environmentally sound dredging and 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 includes a 250,000 cy “contingency volume” for unforeseen events, and also describes a regulatory disposal volume allocation strategy if the “voluntary targets” are exceeded.

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 [Wildlife], 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 [Wildlife], 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.

- a. **In-Bay Disposal, Ocean Disposal and Beneficial Reuse of Sediment.** In the Bay Area, there are four general options for disposal or placement of dredged sediment: disposal at dispersive in-Bay sites adjacent to deep water channels; disposal at SFDODS; upland disposal; and beneficial reuse. There are four in-Bay sites, which tend to be the least expensive. Ocean disposal, upland disposal, and beneficial reuse are generally more expensive than in-bay but often have comparable costs.

The four in-Bay disposal sites include: Alcatraz Island (SF-11); San Pablo Bay (SF-10); Carquinez Strait (SF-9); and Suisun Bay, can be used by all dredging projects with “clean” dredged sediment except Suisun, which is reserved for the USACE and Suisun Bay Channel sediment disposal. SFDODS is approximately 55 miles out to sea past the Farallones Marine Sanctuary and requires larger, ocean going



vessels. It takes 24 hours (round) trip to use and is subject to weather delays. For these reasons, ocean disposal is more expensive than in-Bay disposal and is infeasible for small dredging equipment to use safely. Upland disposal involves additional equipment to offload sediment from barges, and the sediment is treated as a waste product, as in in-Bay and ocean disposal.

Beneficial reuse of dredged sediment most commonly occurs at wetland restoration in the Bay Area. Placing sediment at restoration sites provides habitat sooner, supports endangered and other species, and provides some wave attenuation and flood water absorption. Projects with eighty percent sand or greater placed at San Francisco Bar disposal site (SF-8) feed the littoral cell and potentially local beaches and therefore are considered beneficial reuse. Dredged sediment can also be reused as levee material, daily landfill cover and general construction fill where appropriate. Beneficial reuse sites are often further from the dredging project than in-Bay disposal sites, require additional transit time, and offloading equipment, and therefore are generally more expensive than in-Bay disposal. Beneficial reuse sites can be comparable in cost to ocean disposal, but rarely engender weather delays and are closer to dredging sites than SFDODS, depending on the project. Upland disposal has costs comparable to beneficial reuse and SFDODS.

With the observed decrease in suspended sediment supply from the Delta, increased restoration of subsided baylands, and increasing sea level, concerns have been raised regarding ocean disposal. The Bay Area community recognizes that this practice, when involving clean sediment, is wasting a valuable resource that is in short supply. The Commission does not have the authority to deny disposal of clean sediment at SFDODS. 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.

Montezuma and Cullinan Ranch Wetland Restoration sites are currently open and operating. Montezuma has a dedicated offloader and Cullinan Ranch requires the contractor to provide the offloading equipment. During the next five years, Bel Marin Keys Restoration Site and Eden Landing are anticipated to be available to receive sediment in 2020 and 2021, respectively.

- b. **Proposed Project.** As described in the authorization section, in order to maintain safe navigation in the Bay, the USACE proposes to dredge and dispose or place 12.145 Mcy of sediment from seven deep water channels and three shallow water channels over five years. During this period, the USACE proposes to dispose of all of the dredged sediment at in-Bay or ocean disposal sites, unless bids produced for Oakland Harbor or Richmond Inner Harbor channel have beneficial reuse as the least expensive option, due to the USACE's interpretation of its "federal standard" regulation, citing ocean disposal as environmentally acceptable.



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 has described the evaluation factors it uses for dredging projects involving the discharge of dredged material as follows:

“The evaluation factors for the discharge of dredged material are contained in 33 C.F.R. § 336.1(c), most notably, the 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 conflict with the CZMA and its implementing regulations, 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.”² The CZMA regulations further provide that federal agencies shall not use a lack of funding as a basis for not 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.³

² 15 CFR 930.32(a)(1)

³ 15 CFR 930.32(a)(3)



In 2015 and in 2018, the Commission included in its Letter of Agreements, that the USACE request additional funding sufficient to meet the conditions requiring the USACE to beneficially reuse a minimum of 40% of the dredged sediment and dispose of a maximum of 20% of dredged materials in the Bay, and that it reduce use of hydraulic dredging to one in Bay channel per year. Subsequently, the USACE informed Commission staff that the San Francisco District would not request additional funding and would not comply with these conditions on account of the USACE’s “federal standard.” The USACE’s position remains the same for the 2020–2024 maintenance dredging program.

In addition to the conflict with the CZMA and its implementing regulations, the USACE’s proposed five-year dredging program does not comport with the Bay Plan’s enforceable Dredging policies and the LTMS goals of reducing in-Bay disposal to a maximum of twenty percent per year as averaged over three years and maximizing beneficial reuse. Regarding this policy issue, the USACE stated “[t]he 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. USACE does not plan to utilize in-Bay disposal in a manner that may trigger allocations.”

The Bay Plan in-Bay disposal target is 1 Mcy per year for medium and large dredger combined, and as averaged over consecutive three-year periods to allow for inter-annual variability in shoaling and dredging activities. This volume limit does not include 250,000 cy of in-Bay disposal volume assigned to small dredgers collectively on an average year.

Table 1. 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.



The USACE has proposed to dispose up to 5.592 Mcy at in-Bay disposal sites, and 6.5 Mcy at SFDODS over five years. As described the maximum proposed in-Bay disposal in one year is 1.52 Mcy, and the minimum 862,000 cy. If this were to occur, the ports, refineries would have no in-Bay disposal volume available in a maximum scenario and 138,000 cy in a minimum scenario. In either case, it is likely that the LTMS agencies would have to use the contingency volume of an additional in-Bay disposal 250,000 cy meant for unforeseen events, not business as usual, as proposed by the USACE. 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 reuse or ocean disposal each year. This collective action reduces the in-Bay disposal needs and allows for some flexibility. The USACE's proposal challenges the ability of the region to meet the LTMS goals.

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 agencies, including the Commission, 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. Special Condition II-A and B limit the volume dredged and require the USACE to reduce in-Bay disposal to 20% of its annual program to address this issue.

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 goods 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 can 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 shallow draft channels are not situated in deep water, but follow the center of the rivers that they are located in, which ensures a direct route for vessels.



The volume proposed for dredging is generally that required to maintain the channel at a depth safe for 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. If shoaling is high and funding is available, the maximum volume proposed could be dredged. If funding is insufficient, 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 (to minus 37 feet MLLW rather than to 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. Similarly, the USACE has conducted advanced maintenance dredging in specific reaches of Pinole Shoal to minus 37 feet MLLW. In both instances, the USACE has stated that the volume proposed for dredging includes the volume needed for advanced maintenance work, or an amendment to the Letter of Agreement would be requested.

Dredging Policy No. 2 is addressed through the authorized volumes and Special Condition II-G. Special Condition II-G requires that the USACE further define its dredging volumes in episode approval requests. These requests will be reviewed for necessary dredging volumes, availability of disposal and placement sites, and sediment suitability prior to being approved for dredging.

The Bay Plan Dredging Policies 3, 4 and 5 together provide guidance on when in-Bay disposal is appropriate, 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.

With regard to whether the siting and design of the project results in the minimum amount of dredging necessary for the project, the USACE states that its mission is to maintain safe and efficient navigation, consistent with the Commission's Navigation safety policies. It notes that approximately 10,000 deep-draft vessel trips, including 2,000 oil tanker trips, are made in the federal navigation channels, and that maintaining navigation channels and minimize dredging times is vital to its mission. It will dredge to the authorized depth to maintain safe navigation. It will also conduct its dredging projects will be conducted in compliance with the anticipated 2020 Water Quality Certification and sediment dredged will meet water quality standards for placement at the respective project's federal standard placement site, or other suitable site.

In maintaining its channels, it will strive to dredge within the LTMS work windows and, when it cannot, consult with the appropriate federal agency. Further, the USACE states that projects will comply with the terms and conditions of the NMFS' 2015 LTMS Biological Opinion, and conservation recommendations set forth in the NMFS's 2011 Programmatic 2011 Essential Fish Habitat consultation, as well as any terms and conditions in biological opinions issued by the USFWS in 2019.

Regarding state listed species, the USACE states that it confers with CDFW, but does not consult with CDFW under the California Endangered Species Act. It has coordinated with the CDFW to minimize impacts to state listed species and species of special concern as a matter of comity. To the extent feasible, USACE has procedures that protect State listed longfin smelt when hydraulic dredging, voluntarily agreeing to the dredge in the Petaluma and Napa Rivers only when waters are greater than 22 degrees Celsius and does not dredge in waters with salinity less than 2 parts per thousand between December 1 and June 30. Finally, USACE proposes compensatory mitigation for hydraulic dredging in San Francisco Bay. These minimization measures are included in the Special Condition II -I and are discussed further in the Natural Resources section below.



Regarding Policy 3, the USACE responded: "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 between beneficial use and disposal "outside the Bay," USACE is committed to beneficially using dredging material to the maximum extent feasible consistent with federal laws and regulations.

As previously described the USACE quotes the federal standard and states, "[f]or the deep-draft navigation projects in San Francisco Bay, the least-cost disposal location prescribed by the federal standard is typically either in-bay sites or SF-DODS. There are various federal laws and regulations that allow others to partner with USACE to fund the incremental placement cost above using the federal standard. Therefore, in the absence of any contribution, USACE is required to use a federal standard site. Put in other terms, to use a beneficial use site, either the cost must be equivalent to the cost to use the federal standard site or a sponsor must fund the incremental price above the federal standard placement cost. As discussed below, for in-bay placement USACE is consistent with (a), (b), (c), and (d).

All dredged material disposal will occur at a site designated by the Commission (i.e., SF-9, SF-10, SF- 11, or SF-16). All sites outside of the Golden Gate are outside of BCDC jurisdiction. Prior to disposal, sediment will be sampled and tested, in accordance with the DMMO-approved master plan for sediment sampling and testing.... The USACE complies with the DMMO's placement site suitability determinations. This practice will continue throughout the 5- year CD."

As discussed, to the extent beneficial use is feasible (i.e., comparable to the federal standard cost or funded by a non-federal partner), USACE may choose to beneficially use dredged material over aquatic disposal. In-bay placement will be at designated sites in accordance with the applicable WQC and individual placement site limitations. It also states that it will comply with requirement of the USFWS, NMFS and CDFW regarding in-Bay disposal.

The USACE's interpretation can be reached only by reading Policy 3 independently of other Bay Plan policies, particularly Dredging Policy 1 and ignoring the first sentence of the policy. However, all applicable Bay Plan policies are applied to proposed projects, and in reading these policies together, there is a clear preference for minimizing in Bay disposal and maximizing beneficial reuse, and beneficially reusing a minimum of forty percent of the total materials dredged on an annual basis, consistent with the LTMS.



The USACE quotes the provisions of its federal standard regulations as a basis for infeasibility of beneficial reuse, stating that the least cost disposal location is typically the SFDODS 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 and therefore, it cannot comply with the dredging policies. In addressing other parts of Policy 3, the USACE 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. The USACE 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 three in the recent past when the Richmond Inner Harbor was contracted to take dredged sediment to Cullinan Ranch, resulting in beneficial reuse of the sediment from this channel in 2017, and 2019. In addition, the USACE was unable to complete dredging for the Oakland and Redwood City Channels, and therefore beneficially reused the volume of sediment dredged outside of the work windows to satisfy a NMFS 2015 Amended LTMS Programmatic Biological Opinion's mitigation requirement.

The Commission staff has 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 proposed by the USACE 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 does not comply with Bay Plan Dredging policies; 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 is inconsistent with the Coastal Zone Management Act and its implementing regulations. These same concerns continue to exist with the proposed consistency determination.

The USACE's proposed in-Bay disposal volume represents 45% of its total proposed dredging the five-year program, with 52% targeted to SFDODS, and 3% to upland disposal. 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 2020 through 2024. 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 address Dredging Policy 2, 3 and 5, Special Condition II- B requires the USACE to beneficially reuse at least 40% of sediment dredged at a beneficial reuse site and reduce in-Bay disposal to 20% of the overall program each year. Further, Special Condition II-E requires sediment testing and DMMO approval for disposal or placement options prior to dredging each episode, and Special Condition II-H.1 and H.2.d(2) requires the USACE to dredge within environmental work windows, and consistent with the NOAA 2015 Amended Programmatic Biological Opinion, mitigate for work outside the work windows with beneficial use of the dredged sediment at a restoration site that will benefit fish.

- c. **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 to ensure that use of these site is not foreclosed for projects critical to the region's economy. The USACE states that it uses the in-Bay disposal sites in furthering its navigation mission. In cooperation with the LTMS agencies, the USACE manages these sites through the 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. 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. Special Condition II-J codifies the USACE's agreement to continue monitoring and managing the in-Bay disposal sites.

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.”

Accordingly, based on the foregoing information, and the conditions herein that require compliance with the Commission’s laws and policies, including the Commission’s Amended San Francisco Bay Coastal Zone Management Program, the Commission has determined that as conditioned herein, operations and maintenance dredging program proposed by the USACE is consistent to the maximum extent practicable with Bay Plan’s enforceable 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: “[t]o 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: “[s]pecific 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 [Wildlife] 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 [Wildlife], 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. Subtidal Area Policy 2 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."

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 plants, fish, other aquatic organisms and wildlife habitat, subtidal areas, or tidal marshes or tidal flats. Whenever adverse impacts cannot be avoided, impacts should be minimized to the greatest extent practicable and then unavoidable adverse impacts to the natural resources of the Bay should be mitigated. The policies further state that mitigation should, to the extent practicable, be provided prior to, or concurrently with those parts of the project causing adverse impacts. Also, 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 that 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 fewer 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.

- a. **Equipment.** In San Francisco Bay, there are generally three types of equipment used in various sizes: mechanical clamshell or excavator dredges; and two types of hydraulic dredges, hopper and cutterhead dredges. As part of the USACE's consistency determination request, it describes using clamshell equipment, a hydraulic hopper dredge (the *Essayons*), and a hydraulic cutterhead dredge. The analysis and conditions herein are limited to these three dredge types, if additional dredge types are proposed further analysis or an amendment to the consistency determination could be required.

For longer distance disposal or beneficial reuse, clamshell dredges can be more efficient than hopper dredges. They also entrain fewer fish during dredging due to the lack of pumping activity. However, clamshell dredging creates more turbidity than hydraulic dredges. Hydraulic hopper dredges use suction pumps that draw sediment and water into a draghead as dredging occurs, as do cutterhead dredges. These dredges tend to be more efficient at dredging to project depth than clamshell dredges when disposal sites are in close proximity, and generally create less turbidity in the water. However, hydraulic dredges entrain more fish than mechanical dredges due to the suction pumps and entraining large volumes of water. The cutterhead dredge is a hydraulic dredge that has a rotating dredge head placed in the sediment, which pumped via pipeline to an adjacent disposal site.

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, impact tidal hydrology and sediment movement, aquatic plants, fish and wildlife, the Bay's bathymetry, and habitat. The proposed project's 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.

- b. **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, safeguards have been implemented to reduce 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, but it is likely that salinity differences would limit spread of species between embayments. Therefore, the dredging program is not expected to substantially increase the spread of invasive nonnative species.



- c. **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 shallow draft channels may increase tidal flows due to the deeper depths after dredging, until the channel silts back in, but this has not been studied.

Suisun Bay Channel and Pinole Shoal Channel are primarily sandy in character. The LTMS agencies have requested that sandy sediment from the Pinole Shoal Channel, when feasible be placed at the San Francisco Bar (SF-8) disposal site to augment the sand supply in the coastal littoral cell. 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.

Richmond, Oakland, Redwood City and the shallow draft channels, except portions of Napa River, sediments 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 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 modeling exercises completed in 1998 and again in 2011. Proponents of increased in-Bay disposal have suggested that in-Bay disposal increases the amount of sediment in the Bay system, but in fact, at best it only redistributes it, and does not provide a net gain in Bay sediment. Deep ocean disposal of dredged sediments results loss of sediment contribution to the coastal system. LTMS studies of the site have shown that sediment placed at this location remains there, as designed.

The proposed dredging would remove shoaled sediment from channels 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 “[d]redging could affect sediment movement by dredging it from channels to the respective channel’s authorized depth and moving it to placement sites.” The USACE asserts 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. However, this is not a logical or valid assertion as sediment is being removed from transport, and therefore cannot be the same as prior to dredging.

Regarding the dredging in shallow draft channels, it would occur in or adjacent to tidal marshes or tidal flats. The USACE states that dredging these channels or the tidal flats would not affect sediment transport outside the channel. While this may be correct, there are no studies to verify that maintenance dredging would not influence sediment deposition or erosion in the adjacent marsh, mudflats or subtidal shoals or impact sediment transport downstream to the Bay.

- d. **Aquatic Plants.** Eelgrass beds exist adjacent to the Richmond Inner channel and Oakland Inner Harbor channels, but not in the deep water channels of the Bay. Dredging has the potential to increase turbidity, which can in turn, limit the amount light transmission through the water, and thus productivity. In accordance with the NMFS 2011 LTMS Programmatic Essential Fish Habitat consultation, 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 the required light saturation point of a minimum of 5 hours for eelgrass metabolic demands was met. Special Condition II–H.4 and H.5 requires that the USACE continue the monitoring of eelgrass in these areas as recommended in the Essential Fish Habitat Programmatic Consultation and that the results of these surveys are provided on an annual basis to the Commission staff and the resource agencies.
- e. **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 increases 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 as shown in the MEC Analytical System's study of Oakland Dredging Plumes in 2004. The study also found that the plume tended to decay with increasing distance from the dredge. The *Essayons* had also been found to increase turbidity when overflowing water from the hopper. 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 removed or directly injured by a clamshell dredge, dredge spuds, dump scows, or tugs used to maneuver the dredge equipment and scows. 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 fewer 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 (SF-11), receive large volumes of sediment with each disposal episode. 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 policies 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 ... 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.”

- f. **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 under CZMA, not solely in response to the listing of species by the CDFW, USFWS and NMFS or the Water Board’s determination that such measures are necessary to ensure compliance with state water quality standards, 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).

Dredging incidentally removes 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 the large volume of water entrained. Both remove 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, resulting in mortality. Bay species of special concern 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, steelhead, least tern, Delta smelt, longfin smelt, Ridgeway’s rail and salt marsh harvest mouse.

Green sturgeon is a bottom dwelling anadromous fish that spends several years as juveniles and adults within the Bay in areas of turbid water, prior to ocean residence. They are found Baywide, but in low numbers. Salmon are also anadromous, spawning in fresh water streams and then traveling downstream to the Bay where they feed and grow prior to migrating out to sea and returning to spawn in the Bay's tributaries. Dredging and disposal can impact these species through increased turbidity in the water column, and 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. 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 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 and 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, are important conservation measure used by the regulatory and resource agencies to reduce impacts from dredging. The Commission implements these work windows in consultation with the resource agencies to provide protection for these species, and pursuant to own authority under the CZMA.

The environmental work windows were developed through programmatic consultations on the LTMS Program with the NMFS, USFWS, and CDFW under the federal and California Endangered Species Act, ESA and CESA, respectively. These programmatic biological opinions 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. The programmatic biological opinions were amended by USFWS in 2004 with minor adjustments for clarification, and by NMFS in 2015.

The NMFS amendment included a measure that allows planned dredging activities outside of the salmonid work window 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 to 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. The amended biological opinion also examined 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.

In 2016, 2017, 2018, and 2019 the USACE 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 sediment 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 different



times of year depending on the channel being dredged. The USACE has 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. The monitoring has shown conclusively that the *Essayons* entrains 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. The USACE has summarized the entrainment data stating that over the course of the 4-year study, 87 longfin smelt were entrained, 4 delta smelt, 1 green sturgeon, and 1 salmon.

In addition, but not noted by the USACE, the monitoring program observed a Chinook salmon entrained in 2016. While the number of entrained listed fish may appear low, it is important to note that it is only feasible to monitor a small portion of the dredge operations, so actual entrainment is likely higher than reported, and that the total populations of delta smelt and longfin smelt are currently extremely low.

In its March 14, 2014 letter CDFW indicated its concern, that based on the entrainment monitoring and the modeling study, 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 (Richmond Harbor), 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 reduced in Central Bay if dredging was limited to August 1st through November 30th and in San Pablo Bay (Pinole Shoal) and 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 consulted with the USFWS regarding dredging in Suisun Channel and its potential impacts on Delta smelt for years 2019 through 2023. In its Biological Assessment, the USACE committed to using a clamshell dredge in Suisun Channel to minimize impact to Delta smelt. The USFWS provided terms and conditions, as well as conservation measures in its February 28, 2019 biological opinion. The conservation measures are intended to enhance the environmental protectiveness of the LTMS program for EFH, which the Magnuson-Stevens Fishery Conservation and Management Act defines as “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity,” for all managed fish species. The terms and conditions and conservation measures are incorporated in the Special Conditions herein.

- g. **Environmental Impact Report Measures.** Based on the ERDC entrainment study and guidance from CDFW, the following minimization and mitigation measures were included in the Final EIR, the Water Board’s water quality certification for years 2015 through 2020, its current Tentative Order, the 2015-2017, and 2018-2019 Letter of Agreements to protect both Delta and longfin smelt during dredging operations:
- (1) Limit the use of hopper dredges in San Francisco Bay to one federal channel (either Richmond Outer Harbor or Pinole Shoal), 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) Implement 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; and
- (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.

In January 2017, the USACE adopted what it has referred to as “Course of Action # 2,” under which it determined that, in order to comply with measure (1), above (and the implementing provision of the Water Board’s water quality certification for years 2015 through 2020 and condition of the 2015-2017 Letter of Agreement), the USACE would dredge only Richmond Outer Harbor or Pinole Shoal Channel with a hydraulic dredge in alternating years, while deferring dredging at 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. However, this measure (and the implementing provision of the Water Board’s water quality certification and condition of the Letter of Agreement) envisions that the USACE would comply with that measure (and the implementing provision and condition) by dredging both Richmond Outer Harbor and Pinole Shoal Channel every year, one with a hydraulic dredge and the other using a mechanical dredge.

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 chose to defer dredging in either Richmond Outer Harbor or Pinole Shoal in 2017, 2018 and 2019. According to affected companies, deferring dredging 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.

In its 2020-2024 consistency determination, the USACE proposes to implement only measures 5,6, and 9, stating that it is choosing “to not self-impose restrictions” in dredging. In 2018, the USACE 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.

In order to minimize harmful effects, Special Condition II–H includes conditions listed in the Final Environmental Impact Report, though some have been updated in accordance with the Commission’s enforceable policies on Fish, Other Aquatic Organisms and Wildlife and Subtidal Areas and are protective of native and listed species and their habitat. The USACE has 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. Special Condition II–H.2.c requires the USACE to continue entrainment monitoring when using a hydraulic dredge in the federal navigation channels. Special Condition II–H.2.c.2 requires water temperature monitoring prior to and while dredging to assist in impact assessment and mitigation needs determination.

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. They have further agreed to stop dredging activities with 500 meters of spawning areas for 14 to 21 days to allow the eggs to develop, hatch and larval fish grow sufficiently to avoid high turbidity waters associated with dredging and disposal. Special Condition II–H.3.a requires the USACE to conduct herring spawn monitoring after November 30th and through March 15th of any year, and stop dredging to allow herring eggs to hatch and larval fish to develop sufficient swimming abilities necessary to avoid high turbidity prior to recommencing dredging, to protect this commercial fishery and native species consistent with the Fish, Other Aquatic Organisms and Wildlife policies.

- h. **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 and 2018- 2019 programs, 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, including listed smelt and salmon. The USACE has proposed using an



equation agreed upon by CDFW and USFWS to determine the necessary credits. The equation used to calculate the amount of conservation credits required for purchase is based on the volume of water estimated to be pumped through the dredge during dredging:

3.0 million acre-feet divided by 800 acres = volume dredged divided by X acres of mitigation habitat.

Using estimated volume of sediment dredged from historic records, the USACE calculated anticipated mitigation credit for dredging in 2020-2024. Given that the proposed dredging volumes are higher than historically dredged, it is likely that purchase of additional credits would be necessary once the dredging is complete for each channel. The USACE states, “[c]urrently, USACE proposes to purchase 0.53 acres of credits per year—0.19 acre for Pinole Shoal, 0.34 acre for Richmond Outer Harbor. These estimates are considered conservative because they are based on the largest volume of material dredged over a 13-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 hydraulic hopper dredge at Richmond Outer Harbor, Pinole Shoal, and potentially San Bruno Shoal, should it be needed. The USACE is also proposing to use a hydraulic cutterhead dredge in some of the shallow draft channels, so additional mitigation may be required.

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, should it occur, and therefore may need to be recalculated to mitigate for additional potential entrainment. For example, in 2017, 557,000 cy of sediment was dredged at Pinole Shoal due to heavy shoaling and required 0.43 acre credits to compensate for impacts rather than the previously proposed 0.19 acre credits.

The USACE estimates the mitigation credit prior to dredging and then, based on the volume actually dredged, increases the needed credits as needed. Special Condition II-H.2.d(1) and 2.d(2) require the purchase of mitigation credit at a species appropriate mitigation bank when hydraulic dredging is proposed. 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 be located near the location where the impacts occur, if possible. The USACE, USFWS, CDFW, BCDC and the Water Board agreed to the mitigation equation, and 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.

Accordingly, based on the information herein, the USACE's proposed minimization and mitigation measures, and those required herein, the Commission concurs that as conditioned herein, the 2018 and 2019 program is consistent to the maximum extent practicable with the Bay Plan's enforceable 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).

Sediment quality analysis is performed prior to dredging as described 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 contaminants. In addition, the Water Board has instituted Total Maximum Daily Loads (TMDLs) to reduce specific contaminants loads in the Bay over time. Also instituted Bay-wide in 2011, are testing requirements protective of managed fisheries under the

Magnuson-Stevens Fish Conservation and Management Act through a programmatic Essential Fish Habitat (EFH) consultation for the LTMS program. The LTMS agencies have incorporated the Water Board's TMDL requirements and the NMFS's EFH recommendations in the DMMO sediment testing program and review sediment analysis results consistent with these efforts.

In its consistency determination concurrence request, the USACE stated that dredging activity would not cause adverse impacts to tidal marshes, or subtidal areas, or alter fresh water flow into San Francisco Bay. Further, the USACE would conduct the program in compliance with the 2020 five-year WQC that would likely be issued by the San Francisco Bay Regional Water Quality Control Board (Water Board). The Water Board has issued a tentative order and has scheduled the proposed program for its Board meeting on December 11, 2019. The tentative order include provisions to protect the beneficial use of San Francisco Bay's waters of the state. Special Conditions II-A requires that the USACE obtain Water Quality Certification prior to conducting the dredging program, and special conditions similar to proposed provisions where appropriate have been included herein.

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 DMMO for review, approval and suitability determination for proposed disposal and placement sites. 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.

Known chemicals of concern are found at the Richmond Inner Harbor's Santa Fe Channel (Exhibit C), and Redwood City Harbor channel (Exhibit F). Santa Fe Channel is contaminated with DDT, PCB and other legacy contaminants due to the historic production of these chemicals at United Heckathorn, and sediment in Redwood City Harbor channel had elevated levels of PCBs in recently. The USACE has not proposed to dredge the Santa Fe Channel during the period of this consistency determination.. Per Special Condition II -E, and consistent with the Bay Plan Dredging and Water Quality policies, these sites 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 Tentative 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. The Water Board Tentative Order includes provisions that require the USACE continue to manage and monitor 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 2), 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 it authorized a maximum in-Bay disposal of 3.5 million cy over the same period. The total in-Bay disposal limit 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.

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, a special condition is included that requires the USACE to provide an episode approval request that includes a pre-dredge survey, proposed volume of sediment to be dredged and disposed, and the disposal or placement site 60 days prior to start of dredging. This information, in combination with the post dredge surveys, will allow for tracking and managing disposal volumes, and thus allow management of 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 information along with volumes proposed by other dredging projects to monitor in-Bay disposal volumes to ensure the targets are not exceeded, or if necessary authorize the use of the contingency volume. Special Condition II-K requires the USACE to continue to monitor the in-Bay disposal sites and disposal volumes in coordination with the LTMS agencies in compliance with the Dredging Policies.

Based on the foregoing, the Commission concurs, that as conditioned, the USACE's dredging Program is protective of Bay water quality and is consistent to the maximum extent practicable with the Bay Plan's enforceable 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, specifying that they collectively consider shoals to be obstructions that should be removed to ensure safe navigation. They 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 that can result in serious environmental consequences as a result of groundings. The USACE’s five-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. The USACE maintains up-to-date conditions surveys of each channel to determine if hazardous shoaling has occurred. Lastly, 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).

Based on the foregoing, the Commission concurs that the USACE’s dredging Program is consistent with the Bay Plan’s enforceable 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 the shallow draft channels would facilitate water-borne commerce to communities located along these tributaries, 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 the channels and causes some habitat degradation. However, because the deep water 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 shallow draft channels, the benthic organisms would likely recover and repopulate the area over time. Sediment removed from the channels may impact adjacent marshes and mudflats, but information regarding this potential impact is not available.

Based on the foregoing, the Commission concurs that as conditioned herein, the 2020-2024 dredging program is fully consistent with Bay Plan's enforceable policies regarding the public trust.

- B. **Coastal Zone Management Act.** The Commission, pursuant to the Coastal Zone Management Act of 1972, as amended (16 USC Sections 1451 *et. seq*), and the implementing CZMA regulations in Title 15 Code of Federal Regulations Part 930, is required to review Federal projects within San Francisco Bay and concur or conditionally concur with or object to the Federal agency's determination that the project is consistent to the maximum extent practicable with the Commission's amended coastal zone management program for San Francisco Bay. This letter constitutes such review and comment.

The Commission finds and certifies that the USACE's, 2020-2024 maintenance and operations dredging program for the federal navigation channels in San Francisco Bay, as described and conditioned herein, and the information submitted, is either within the coastal zone or affects the coastal zone and is consistent to the maximum extent



practicable with the Commission's Amended Coastal Zone Management Program for San Francisco Bay, as approved by the National Oceanic and Atmospheric Administration, Office of Coastal Management, so long as the USACE complies with the conditions contained herein.

- C. **Environmental Review.** The 2015 California Environmental Quality Act (CEQA) review conducted by the lead agency, the Water Board, identified significant impacts to Delta and longfin smelt in the alternatives that maximized use of hydraulic dredge equipment. The Water Board 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, it began deferring dredging of one channel (Richmond Outer Harbor or Pinole Shoal channel) in 2017 and continued this practice through 2019. The USACE was the lead agency for the National Environmental Quality Act (NEPA) review. It 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 # 2 in January 2017, to defer dredging of either Richmond Outer or Pinole Shoal in alternating years.
- D. **Conclusion.** For all the above reasons, the Commission finds that as conditioned, the USACE's Program will sufficiently protect fish and wildlife resources, will mitigate for those impacts that are unavoidable, maintain water quality in the Bay, assist in implementing beneficial reuse of dredged sediment and the LTMS Management Plan, and provide for safe navigation within the Bay. Therefore, as conditioned, the USACE's maintenance and operations dredging program 2020-2024 is consistent to the maximum extent practicable with the Commission's federally-approved Amended Coastal Zone Management Program for San Francisco Bay.

IV. Standard Conditions

- A. **Letter of Agreement Execution.** This Letter of Agreement shall not take effect unless the federal agency executes the original of this Letter of Agreement and returns it to the Commission within ten days after the date of the issuance of the Letter of Agreement. No work shall be done until the acknowledgment is duly executed and returned to the Commission.



- B. **Notice of Completion.** The attached Notice of Completion and Declaration of Compliance form shall be returned to the Commission within 30 days following completion of the work.
- C. **Other Government Approvals.** All required permissions from governmental bodies must be obtained before the commencement of work; these bodies include, but are not limited to, the Regional Water Quality Control Board, NOAA National Marine Fisheries Service, US Fish and Wildlife, whenever any of these may be required. This Letter of Agreement does not relieve the federal agency of any obligations imposed by State or Federal law, either statutory or otherwise.
- D. **Built Project must be Consistent with Consistency Determination.** Work must be performed in the precise manner and at the precise locations indicated in your consistency determination, as such may have been modified by the terms of the Letter of Agreement and any plans approved in writing by or on behalf of the Commission.
- E. **Life of Authorization.** Unless otherwise provided in this Letter of Agreement, all the terms and conditions of this Letter of Agreement shall remain effective for so long as the Letter of Agreement remains in effect or for so long as any use or construction authorized by this Letter of Agreement exists, whichever is longer.
- F. **Commission Jurisdiction.** Any area subject to the San Francisco Bay Conservation and Development Commission Coastal Management Program Area under the Coastal Zone Management Act, as amended at the time the Letter of Agreement is granted or thereafter shall remain subject to that jurisdiction notwithstanding the placement of any fill or the implementation of any substantial change in use authorized by this Letter of Agreement. Any area not subject to the jurisdiction of the San Francisco Bay Conservation and Development Commission that becomes, as a result of any work or project authorized in this Letter of Agreement, subject to tidal action shall become subject to the Commission's "Bay" jurisdiction.
- G. **Should the Letter of Agreement Conditions Be Found to be Illegal or Unenforceable.** If any term, standard condition, or special condition of this Letter of Agreement is held by a court of competent jurisdiction to be legally invalid, void as a matter of law, or otherwise unenforceable, all other terms, conditions, and standard conditions of this Letter of Agreement shall continue in full force and effect. If this Letter of Agreement is held by a court of competent jurisdiction to be invalid or null and void in its entirety, any fill or structures placed in reliance on this Letter of Agreement shall be subject to removal by the federal agency to the extent that the Commission determines that such removal is appropriate, and any uses authorized shall be terminated to the extent that the Commission determines that such uses should be terminated.
- H. **Permission to Conduct Site Visit.** The federal agency shall grant permission to any member of the Commission's staff to conduct a site visit at the subject property during and after construction to verify that the project is being and has been constructed in compliance with the authorization and conditions contained herein. Site visits may occur during business hours without prior notice and after business hours with 48-hour notice.

