

San Francisco Bay Conservation and Development Commission

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November 22, 2019

Consistency Determination Summary

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.
Request Filed Complete:	September 17, 2019
Deadline for Commission Action:	December 13, 2019, per a time extension granted by USACE
Staff Contact:	Brenda Goeden (415/352-3623; brenda.goeden@bcdc.ca.gov)



Figure 1. The USACE's Hydraulic Hopper Dredge (Photo courtesy of Brian Ross)

Project Overview

Project Description

The US Army Corps of Engineers, San Francisco District (USACE), has requested Commission concurrence on its federal consistency determination for the USACE 2020-2024 Operation and Maintenance Dredging Program. The proposed work includes dredging multiple deep and 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 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. Knockdown events are occasionally used to reduce the height of a shoal that is impeding safe navigation by dragging a beam across the shoal to reduce its height, thereby eliminating the need to mobilize a full dredging episode.

The USACE included five "sea trial" events, that would likely occur in Pinole Shoal Channel and the anchorage south of the Bay Bridge between January and March of any year that either of the federal dredges have repairs or maintenance in dry dock. These sea trial events allow the USACE to calibrate the water intake and load intake of the vessel prior to use in normal maintenance dredging activity.

The proposal also includes conducting advanced maintenance dredging at Bulls Head Reach (a portion of the Suisun Bay channel that often has higher shoaling rates than the rest of the channel), the use of knockdown events, and up to five episodes of federal dredge equipment calibration after repair or maintenance work in drydock. Advanced maintenance entails dredging a portion of a channel deeper or potentially wider than the authorized dimensions during routine maintenance episodes and reduces the need for more frequent dredging within portions of a channel.



The following tables provide more detail on the proposed dredging in years 2020 through 2024, which includes annual dredging of deep draft channels, alternate year dredging at Redwood City channel, and one time dredge episodes for the shallow draft channels and San Bruno Shoal (deep draft).

Table 1. Proposed Deep Water Channel Maintenance Projects.

Channel & Depth in Feet MLLW	Volume CY	Dredge Type	Placement Site	Frequency
Main Ship	450,000	Hydraulic Hopper	Ocean Beach/San Francisco Bar	Annual
Oakland Harbor (-50)	950,000	Clamshell	Ocean/Beneficial Reuse	Annual
Richmond Outer Harbor (-45)	350,000	Hydraulic Hopper	Alcatraz/San Pablo Bay (In-Bay)	Annual
Richmond Inner Harbor (-38)	350,000	Clamshell	Ocean/Beneficial Reuse	Annual
Pinole Shoal (-35)	300,000	Hydraulic Hopper	Alcatraz/San Pablo Bay (In-Bay)	Annual
Suisun Bay/ New York Slough (-30)	200,000	Clamshell	Suisun/Carquinez (In-Bay)	Annual
Redwood City Harbor (-28)	300,000	Clamshell	Alcatraz/Ocean (In-Bay)	Biannual
Total without Redwood City	1.562 million			
Total with Redwood City	1.862 million			

Table 2. Proposed Shallow Water Channel Projects (one episode only).

Channel and Depth in MLLW	Volume CY	Dredge Type	Placement Site
Petaluma River and Across the Flat (-8 feet throughout)	600,000	Hydraulic and Clamshell	Schollenberger and San Pablo (Upland and In-Bay)
Napa Upper and Lower River (-15 and -9 feet, respectively)	68,000	Clamshell and Hydraulic	Imola/Napa Pipe (Upland)
San Rafael Creek and Across the Flats (-6 and -8 feet, respectively)	200,000	Clamshell	San Pablo Bay (In-Bay)
Total Volume	868,000		

Table 3. As Needed Projects.

Channel and Depth MLLW	Volume CY	Dredge Type	Placement Site
San Bruno Shoal (-30)	16,000	Hydraulic Hopper/Clamshell	Alcatraz (In-Bay)
Sea Trials (up to 5)	12,000 per trial	Hydraulic Hopper	Alcatraz/San Francisco Bar (In-Bay/Ocean)
Total if all occurred	76,000		

The shallow draft channel dredging would only occur if funding is appropriated, and likely only one channel per year. The first shallow draft channels to be dredged would likely be Petaluma River and Across the Flats as it has been included in the proposed work plan in 2019, but has been delayed due to funding shortfalls. If funding is provided, Petaluma River and Across the Flats is expected to be dredged first, and then either San Rafael Creek and Across the Flats or Napa Upper and Lower Rivers dependent on USACE priorities and funding availability in future years.

Dredging and Dredge Sediment Disposal

The USACE proposes to dispose of approximately 12.145 Mcy of dredged sediment over five years. As proposed, no beneficial reuse of sediment would occur unless contractors provide bids that demonstrate that beneficial reuse of dredged sediment would be the least costly alternative. The USACE states that it would have to determine any beneficial reuse of dredged sediment to be the “federal standard” for the project. The “federal standard” is defined by USACE regulation (33 C.F.R. § 335.7) to mean:

“the dredged disposal alternative or alternatives identified by the [USACE] which represent the least costly alternative consistent with sound engineering practices and meeting the environmental standards established by the [Clean Water Act section] 404(b)(1) evaluation process or ocean dumping criteria.”

Over five years, the USACE proposes to dispose of the dredged sediment in three general locations - approximately 45% at in-Bay disposal sites, 52% at the San Francisco Deep Ocean Disposal Site (SFDODS) or the San Francisco Bar Site (SF-8), and 3% at upland disposal sites. The proposed placement sites and percentage by year are provided in Table 4 and 5 below.

Table 4. Proposed sediment disposal, by year with disposal of sediment from Redwood City Harbor channel in alternating years.

Year	In-Bay Disposal	Ocean Disposal	Upland Disposal
2020	862,000 cy	1.3 Mcy	
2021	1.52 Mcy*	1.3 Mcy	350,000 cy*
2022	862,000 cy	1.3 Mcy	65,000 cy*
2023	1.47 Mcy*	1.3 Mcy	
2024	878,000 cy**	1.3 Mcy	
Total	5.592 Mcy	6.5 Mcy	415,000 cy

*Includes one shallow draft channel dredge volume per year

**Includes one episode of dredging at San Bruno Shoal



Table 5. Percentage of proposed sediment disposal calculated using volumes in Table 4.

Year	In-Bay Disposal	Ocean Disposal	Upland Disposal
2020	40%	60%	0%
2021	48%	41%	11%
2022	39%	58%	3%
2023	53%	47%	0%
2024	40%	60%	0%
Total	45%	52%	3%

Bay Natural Resources

The project has the potential to directly affect the natural resources of the San Francisco Bay through water quality impacts, sediment removal, wildlife removal and entrainment. The proposed work has the potential to impact native and threatened species, particularly fish and invertebrates that live on the bay bottom, through removal of either the organism itself, or by removing forage species that they depend on for food.

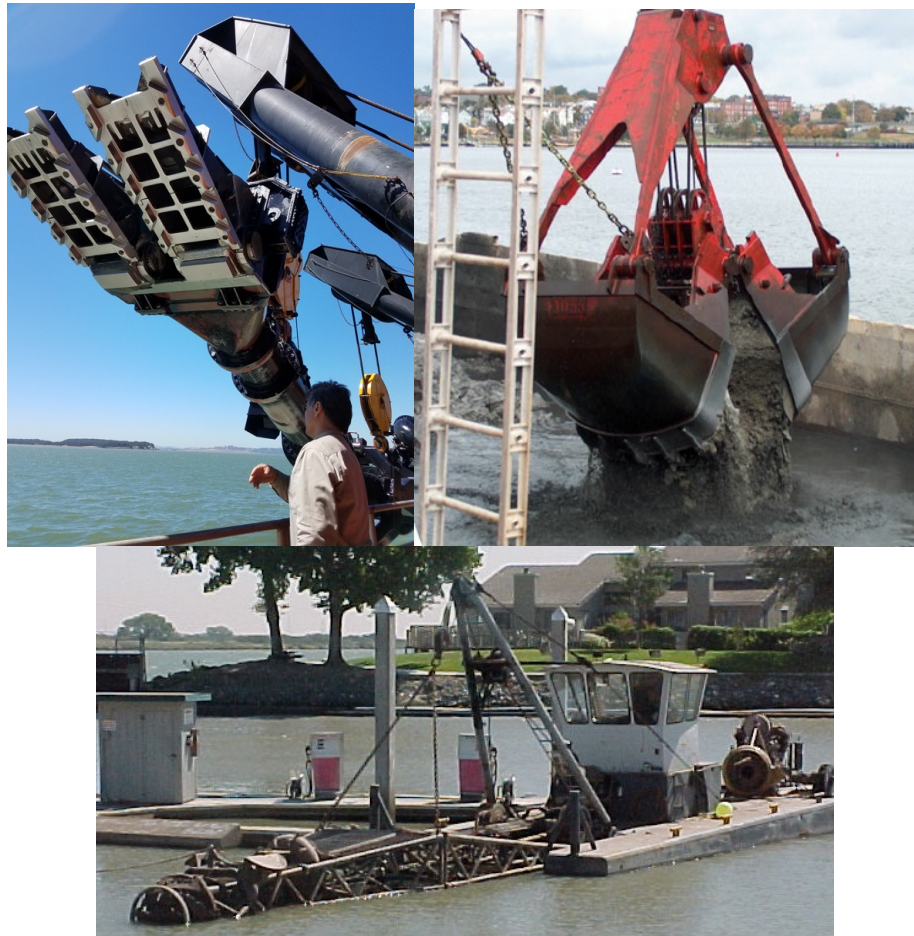
The USACE proposes to use the federal hydraulic hopper dredges (*Essayons* and *Yaquina*), contracted mechanical clamshell dredges, and hydraulic cutterhead dredges. Figure 2 below includes photographs of the dredge heads of each respective equipment type.

Hydraulic dredges are considered to have a greater potential to entrain fish and invertebrates from the water column at various life stages including eggs, larval, juvenile and adult, than other types of dredges due to the intake of large volumes of water along with the dredged sediment. Generally speaking, the larger the hydraulic dredge head and pumping capability, the greater the capacity for entrainment. Species that may be entrained include listed salmonids, longfin and Delta smelt, and commercially important herring and Dungeness crab, among others. Conversely, clamshell dredges do not entrain large volumes of water, but do have the ability to capture fish and other organisms that cannot move out of the way of the dredge head. Cutterhead dredges are different from draghead hydraulic dredges (*Essayon* and *Yaquina*) as they have a rotating dredge head that is inserted into the sediment and pump water and sediment while dredging.

In-Bay disposal impacts fish and invertebrates living on or near the bottom of the disposal site through burial. The water quality in the water column above the site is temporarily impacted by increased suspended sediment (turbidity) and can cause fish to leave the area and/or exhibit some respiratory effects. Upland or beneficial use site placement has minimal impact to species as these sites are generally in construction zones or holding areas for sediment that are lacking habitat for fish species. However, decant water is sometimes discharged from these sites to the Bay, but impacts to water quality are usually further reduced when the activity occurs in

accordance with water quality requirements. Ocean disposal has similar effects to in-Bay disposal, but disposal occurs at a much deeper and larger site. Monitoring of the deep ocean disposal site has shown that although there may be temporary turbidity and burial impacts, recolonization of the site by invertebrates does occur.

Figure 2. Hydraulic Dredge Drag Head (left), Clamshell Dredge (right), and Hydraulic Cutterhead Dredge(bottom).



Schedule and Cost

The USACE states that proposed dredging and dredged sediment placement is anticipated to begin in June 2020 and end by November 30, 2024. The total project cost is estimated at \$215 million.

Issues Raised

The staff believes the primary issues raised by the proposed project are whether the proposed dredging and subsequent disposal of sediment is consistent with minimizing in-Bay disposal and maximizing beneficial reuse of the dredged sediment in accord with *San Francisco Bay Plan* Dredging policies 1, 3, and 5; and whether the dredges methods are protective of Bay natural resources, specifically native and listed fish species in accord with Fish, Other Aquatic

Organisms and Wildlife policies 1 and 2; and whether the proposed dredging program is consistent to the maximum extent practicable the *San Francisco Bay Plan*, the *Suisun Marsh Protection Plan*, the McAteer-Petris Act, the Suisun Marsh Preservation Act, and the San Francisco Bay Coastal Zone Management Program.

Staff Notes

The staff notes the following considerations for the Commission:

The *Long Term Management Strategy for Placement of Dredged Material in the Bay Area* (LTMS) Management Plan, to which the Commission is an implementing partner agency, seeks to maximize beneficial reuse of dredged sediment and minimize in-Bay disposal. The LTMS Management Plan establishes an in-Bay disposal volume limit of 1.25 million cubic yards per year for all dredging projects combined, with 250,000 cy reserved for the small dredging community (projects that have a draft of less than 12 feet MLLW, and dredge 50,000 cy yards on average). Large and medium size dredging projects, including the USACE's project, share the remaining 1 Mcy of available in-Bay disposal capacity. This limit is incorporated into the *San Francisco Bay Plan*, Dredging Policy 1. Should this limited be exceed in the three-year averaging period, the LTMS Management Plan provides a process that the State agencies would undertake to determine if disposal site allocations for all dredgers should be triggered.

As described by the USACE, the proposed in-Bay disposal exceeds the in-Bay disposal volume limit in two years, depending on which small dredging projects are implemented. In other years, the USACE proposes to use more than 80% of the volume available for other large and medium size dredgers. If the program is executed as proposed, other large and medium sized dredging projects may be limited in their ability to use in Bay disposal sites, or risk initiating the LTMS required process for implementing disposal site allocations in accordance with the Commission's regulations.

Further, the LTMS Management Plan and Dredging policy 5 seeks to maximize beneficial reuse of the dredged sediment, with 40% of the overall volume of sediment targeted for beneficial reuse. The USACE proposes no beneficial reuse of dredged sediment from the proposed dredging activities, unless contract bids for either Oakland or Richmond Inner Harbor channels include beneficial reuse as the least cost alternative. Numerous other efforts in the region, including the Baylands Ecosystem Habitat Goals Update have identified a significant and urgent need to move sediment into wetland restoration projects to allow shorelines and habitats to adapt to climate change. The maintenance dredging proposed by the USACE is the single largest and most available source of sediment in the region.

In 2014, the USACE and the San Francisco Bay Regional Water Quality Control Board (Water Board) completed the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) review. The Water Board review found that, in order to reduce impacts to listed species to less than significant, the USACE should limit the use of the hydraulic dredge

equipment to one or none of the federal channels in the Bay. In addition, several minimization measures were identified that would further reduce impacts to native species at the recommendation of the California Department of Fish and Wildlife.

The USACE proposes to use hydraulic hopper dredges, known to entrain native fish, including listed salmon, Delta and longfin smelt, and important commercial species, in three federal channels, contrary to the findings of the CEQA review and previous conditions in the Commission's Letter of Agreement in 2015 and 2018. Further, the USACE has not included in its 2020-2024 dredging program any minimization measures to protect native and listed species, even though the it has previously agreed to such minimization measures.

Since 2016, the USACE has dredged only one federal channel with a hydraulic hopper dredge by not dredging either Richmond Outer Harbor or Pinole Shoals channel in alternating years, which has caused economic hardship and light loading of vessels to avoid shallower than normal navigation channels resulting in more hazardous navigation conditions.

Applicable Laws and Policies

The following laws and policies are applicable in the Commission's review of the proposed project:

- Coastal Zone Management Act Section 307(c)
- Code of Federal Regulations Sections: 16 USC Section 307(c), 15 CFR 930.32(a), 15 CFR 930.34(b), 15 CFR 930.39(a), 33 CFR 304(1)
- McAteer-Petris Act Sections: 66604 (page I-3), 66605 (page I-3), 66632 (page I-13), 66663 (page I-34), and 66664 (page I-38)
- *San Francisco Bay Plan* policies on: Fish, Other Aquatic Organisms and Wildlife (page 16), Water Quality (page 19), Tidal Marshes and Tidal Flats (page 23), Subtidal Areas (pages 28), Dredging (pages 46 to 48), Mitigation (pages 860-87), Public Trust (page 88), and Navigational Safety and Oil Spill Prevention (page 88)
- Suisun Marsh Preservation Act Sections: 29002 (page II-1), 29003 (page II-1), Section 29008 (page II-3), 29114 (page II-8), 29500 (page II-25)
- *Suisun Marsh Protection Plan* policies on: the Environment (pages 11-13), Water Supply and Quality (pages 14-18), and Utilities, Facilities, and Transportation (pages 22-27)

Exhibits

- A. Overview of Federal navigation channels, disposal sites, and beneficial reuse sites.
- B. Oakland Federal navigation channel.
- C. Richmond Outer and Inner Harbor federal navigation channel.
- D. Pinole Shoal federal navigation channel, Carquinez Strait (SF-9) and San Pablo Bay disposal sites, and Cullinan Ranch Wetland Restoration Project.
- E. Suisun Bay federal navigation channel, Suisun Bay (SF-16) disposal site, and Montezuma Wetland Restoration Project.
- F. Redwood City and San Bruno Shoal federal navigation channel, and Eden Landing and South Bay Salt Pond Restoration Project (future beneficial reuse at Eden Landing).



- G. Petaluma River and Across the Flats federal navigation channel, and Bel Marin Keys Wetlands Restoration Project (future beneficial reuse site).
- H. Napa Upper and Lower River federal navigation channel, and Cullinan Ranch Wetland Restoration Project.
- I. San Rafael Across the Flats, and San Pablo Bay disposal site (SF-10).
- J. San Francisco Main Ship federal navigation channel, San Francisco Bar (SF-8) and Alcatraz (SF-11) disposal sites, Ocean Beach Demonstration Project (SF-17).