APPENDIX A

Clean Water Act Section 404(B)(1) Evaluation

TABLE OF CONTENTS

LIST OF TABLES

ABBREVIATIONS

BUDM	Beneficial Use of Dredged Material
CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	Environmental Assessment
EIR	Environmental Impact Report
LTMS	Long-Term Management Strategy for Dredged Material
SF-8	San Francisco Bar Channel Placement Site
SF-DODS	San Francisco Deep Ocean Disposal Site
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service

1.0 Introduction

This appendix evaluates compliance of the proposed action, with Clean Water Act (CWA) Section 404(b)(1) Guidelines published at 40 Code of Federal Regulations (CFR) part 230 which requires the US Army Corps of Engineers (USACE) to provide a written evaluation that demonstrates compliance with the substantive criteria used to evaluate discharges of dredged or fill material.

San Francisco Bay, along with its tributary rivers, streams, adjacent wetlands, and the Pacific Ocean out to the 3-mile limit, are waters of the United States pursuant to Section 404 of the CWA. Section 404(b)(1) of the CWA provides procedures for the evaluation of permits for discharge of dredged or fill material into waters of the United States. USACE implements Section 404 of the CWA, and although it does not issue itself permits, USACE must demonstrate compliance with Section 404 of the CWA. The following evaluation is provided in accordance with Section 404(b)(1) of the CWA Guidelines (40 CFR 230).

2.0 Proposed Action and Alternatives

USACE proposes to continue maintenance dredging of federal navigation channels in San Francisco Bay and the associated placement of dredged material for a roughly ten-year period beginning in dredging year 2025 and continuing until 2034, with the potential for projects to extend into early 2035 (through February) due to uncertainties in contracting awards, funding, regulatory constraints, and equipment availability.[1]

The federal navigation channels that are anticipated to be dredged by USACE during the planning horizon for this Final EA/EIR include: Oakland Harbor, Redwood City Harbor, Richmond Harbor, San Francisco Harbor (Main Ship Channel only) San Pablo Bay/Mare Island Strait, Suisun Bay Channel Napa River Channel, Petaluma River Channel, and San Rafael Creek Channel. Oakland Harbor, Richmond Harbor, San Francisco Harbor (Main Ship Channel), San Pablo Bay/Mare Island Strait, Suisun Bay Channel, and Redwood City Harbor are dredged annually or semi-annually. The remaining sites of Napa River Channel, Petaluma River Channel, and San Rafael Creek Channel are dredged on cycles between 4 to 7 years, as necessary. Suisun Slough Channel is dredged much less frequently.

The study area spans the shoreline and marine areas of the following 11 counties: Marin, Sonoma, Napa, Solano, Sacramento, San Joaquin, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco. The geographic scope of the study area comprises the estuarine waters of the San Francisco Bay region, portions of the Sacramento-San Joaquin Delta west of Sherman Island. Outside the Golden Gate, the study area includes the San Francisco Deep Ocean Disposal Site (SF-DODS), the San Francisco Bar Channel Placement Site (SF-8), and the nearshore zone off Ocean Beach, as well as the waters used by vessels enroute to these sites.

Maintenance dredging typically involves the following steps: 1) Surveying a site to identify sediment accumulated (shoaled) above authorized project depth, then sampling and testing for sediment quality; 2) excavating shoaled sediment from the dredging site; 3) transporting dredged sediment via scows, hopper dredges, or pipeline to the designated placement site(s); and 4) placing the sediment at either disposal or beneficial use of dredge material (BUDM) site(s). “Disposal” is defined as the placement of material in an area where the material is anticipated to remain in place and have no measurable benefit. In open-water placement sites, nondispersive sites are considered disposal; in confined placement sites, disposal applies if the material is not intended to be offloaded for another beneficial use. The reuse of dredged sediment for construction, levees, tidal wetland restoration or other projects is described as beneficial use. Transitional placement is defined as keeping sediment in the riverine or coastal system as a part of a management process or in a period of transition. The use of placement and disposal sites is described under the description of the alternatives in Chapter 2 of the *San Francisco Bay Federal Channels Operation and Maintenance Dredging and Sediment Placement Activities, Dredging Years 2025-2034, Final Environmental Assessment/Environmental Impact Report (EA/EIR) (USACE 2025).*

[1] Dredging year refers to the calendar year in which dredging is planned to begin. In some cases, dredging episodes associated with a dredging year can extend past the end of the calendar year.

Alternatives evaluated in the Final EA/EIR include two categories of dredging methods performed by USACE for maintenance dredging in San Francisco Bay: hydraulic dredging and mechanical dredging. In hydraulic dredging, hopper or cutterhead dredges are typically used to remove sediment via suction through hydraulic pipelines. Hopper dredges store suctioned sediment on board for later placement; cutterhead-pipeline dredges use a pipeline to deposit suctioned sediment directly at placement sites. USACE mechanical dredging in San Francisco Bay is typically done with clamshell dredgers. These dredgers use buckets that are opened, dropped vertically to the dredging locations, and closed around sediment, which is then lifted and deposited on a scow or barge. Placement can occur via bottom-dumping from split-hull scows or hopper dredges, via a slurry (i.e., mixed water and sediment for mobilization) that is pumped off by means of a pipe offloader from scows or hopper dredges, or via direct delivery from cutterhead dredges to pipelines and transported by booster pumps, if necessary, to the placement site.

The Final EA/EIR evaluates in detail the potential environmental impacts of the following alternatives: the No Action Alternative, Diversion from Deep Ocean Disposal (Alternative 1), Regional Optimization, Leverage Hopper Dredging (Alternative 2), Cost-Share Opportunity (Alternative 3), Maximized (Alternative 4), and the Proposed Project/Proposed Action.

2.1.1 No Action (NEPA)/No Project Alternative (CEQA)

The No Action Alternative would continue to execute the navigation dredging program in the same way as it has been done in the past, as authorized. This alternative would place approximately 0 percent of dredged sediment at upland beneficial use sites, approximately 45 to 55 percent at deep ocean disposal sites, approximately 30 to 40 percent at in-Bay sites, approximately 5 to 15 percent at ocean beneficial use sites, approximately 0 to 10 percent at ocean sites, and approximately 0 to 10 percent at upland (sponsor-provided) sites. This baseline condition was constructed based on the current navigation program, replicating how each channel would be dredged, how frequently each would be dredged, and where the sediment would be placed from each channel.

The No Action Alternative and No Project Alternative differ in that the No Action Alternative represents the current authorized dredging program, which calls for annual dredging of Richmond Outer Harbor and Pinole Shoals with a hopper dredge. The No Project Alternative, in contrast, represents the current, ongoing dredging operation as implemented over the last permit period per California Environmental Quality Act (CEQA) Guidelines section 15126.6(e)(3)(A), where hopper dredging was restricted pursuant to the CWA 401 Certification resulting in biannual dredging of Richmond Outer Harbor and Pinole Shoals. The No Action Alternative is used as the baseline alternative for NEPA. The No Project Alternative is the baseline under CEQA because it is the same as the existing physical setting (CEQA Guidelines section 15126.6(e) (1)).

2.1.2 Diversion from Deep Ocean Disposal (Alternative 1)

This alternative would implement the No Action Alternative, except that a federal project otherwise slated for ocean disposal at SF-DODS may be split between placement in-Bay and at an upland beneficial use site to achieve additional BUDM while maintaining the same cost. In taking this approach, at the Bay-wide programmatic level, this alternative would increase placement of dredged sediment at upland beneficial

use sites from approximately 0 percent (No Action Alternative) to 5 to 20 percent; to decrease deep ocean disposal from approximately 45 to 55 percent (No Action Alternative) to 10 to 40 percent; and to increase in-Bay placement from approximately 30 to 40 percent to 35 to 55 percent at in-Bay sites annually. The remaining placement category percentage ranges would remain the same as for the No Action Alternative.

2.1.3 Regional Optimization, Leverage Hopper Dredging (Alternative 2)

This alternative would increase hopper dredging in the Bay to offset the increased cost of beneficial use to achieve more BUDM than Alternative 1 and the No Action Alternative. Hopper dredging can be increased to include Richmond Inner Harbor or Oakland Harbor or a mixture of both projects. Placement with a hopper dredge is usually limited to in-Bay because the government dredge, the *Essayons*, is unable to place material upland. Therefore, beneficial use volume from another project using clamshell or a hydraulic dredge with pumpoff capability would be required. Ultimately, this alternative would increase BUDM placement from approximately 0 percent (No Action Alternative) to 20 to 30 percent; to decrease deep ocean disposal from approximately 45 to 55 percent (No Action Alternative) to 0 to 10 percent; and to increase in-Bay placement from approximately 30 to 40 percent (No Action Alternative) to 50 to 60 percent. The other category percentage ranges remain the same as for the No Action Alternative.

2.1.4 Cost Share Opportunity (Alternative 3)

This alternative would build on Alternative 2 (above) by taking more sediment to upland beneficial use sites within the Water Resources Development Act 2020 Section 125a threshold for easily justifying the cost share of the BUDM incremental cost for Operations and Maintenance budgets. At the Bay-wide programmatic level, this alternative would increase BUDM placement from approximately 0 percent (No Action Alternative) to 35 to 45 percent; decrease deep ocean disposal from approximately 45 to 55 percent (No Action Alternative) to 0 to 10 percent; and increase in-Bay placement from approximately 30 to 40 percent (No Action Alternative) to 35 to 45 percent. The other category percentage ranges remain the same as for the No Action Alternative.

2.1.5 Maximized (Alternative 4)

This alternative would place all suitable material at upland beneficial use sites, including a portion of sediment being placed at nearshore strategic placement beneficial use sites designed to leverage tidal and wave energy to transport sediment from shallow subtidal placement areas to existing intertidal mudflats and marshes. This alternative can also be executed with the volume of sediment placed at the nearshore strategic placement beneficial use sites being placed at upland beneficial use sites instead. At the bay-wide programmatic level, this alternative proposes to increase BUDM placement from approximately 0 percent (No Action Alternative) to 65 to 75 percent; to increase beneficial use nearshore strategic placement from approximately 0 percent (No Action Alternative) to 5 to 15 percent; to decrease deep ocean disposal from approximately 45 to 55 percent (No Action Alternative) to 0 to 10 percent; and to decrease in-Bay placement from approximately 30 to 40 percent (No Action Alternative) to 0 to 10 percent. The other category percentage ranges remain the same as for the No Action/Future Without Project.

2.1.6 Proposed Action

The proposed action would consist of phased implementation of a combination of the USACE Federal Standard Base Plan alternatives (the No Project Alternative, Alternative 1, and Alternative 2) as described in detail in Chapter 2 of the Final EA/EIR.

The proposed phased implementation would be conducted as follows:

- **2025, No Project Alternative:** Continuing the No Project Alternative allows USACE the time necessary to appropriately plan for and implement the changes required for Alternative 1 and eventually Alternative 2.
- **2026 to 2027, Alternative 1:** The earliest USACE would be able to implement Alternative 1 would be 2026.
- **2027 to 2034, Alternative 2:** The earliest USACE would be able to implement Alternative 2 would be 2027. This time is necessary to allow USACE to work to expand the capacity of its hopper dredges, including using the West Coast Hopper Dredging contract (refer to Section 2.3 of the Final EA/EIR).

Table A-1 shows the maximum volumes dredged for all alternatives for each likely dredging method. Under the No Action Alternative, clamshell dredging is the main dredging method used by volume of material dredged. This information is used as the basis of analysis for impacts to water quality.

Table A-1. Maximum Volume in Cubic Yards of Dredged Material for Each Likely Dredging Method

Dredge Method	No Action	No Project	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Clamshell	3,630,000	3,630,000	3,630,000	2,655,000	3,165,000	4,920,000
Cutterhead	375,000	375,000	375,000	375,000	375,000	375,000
Hopper	1,935,000	1,935,000	1,935,000	2,910,000	2,400,000	645,000

3.0 Alternatives Analysis

Section 404 (b)(1) requires an evaluation of alternatives for projects that include the discharge of dredged or fill material into waters of the United States. Under the guidelines, practicability of alternatives is taken into consideration, and no alternative may be permitted if there is a less environmentally damaging practicable alternative (40 CFR 230.5(c)). The least environmentally damaging practicable alternative must:

- Meet the overall project purpose.
- Be practicable with respect to cost, technology, and logistics.
- Avoid and minimize discharge of dredged or fill material into waters of the United States.
- Not entail significant impacts to other non-aquatic environmental resources.

Alternative 4 has been determined to be the least environmentally damaging alternative but is not practicable at this time due to costs, technology, and logistics. Alternatives 1 and 2 are identified as the least environmentally damaging practicable alternatives, consistent with section 404(b)(1) of the Clean Water Act.

3.1 Overall Project Purpose

USACE is mandated by Congress to maintain the navigability of federal navigation channels. Accumulation of sediment in these channels can present navigation safety hazards. Maintenance dredging removes this sediment and returns the channels to authorized depths. As described in Section 1.1 of the Final EA/EIR, the overall project purpose is to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for the movement of commerce, national security needs, and recreation, which is achieved through continuing to dredge federal navigation channels in San Francisco Bay. This basic project purpose is to provide safe, reliable, and efficient waterborne transportation systems. The basic purpose is water dependent as defined by 40 CFR Part 230 since it cannot be fulfilled outside of an aquatic environment.

3.2 Practicability

The act of dredging is not specifically regulated under Section 404 of the CWA; however, the type of dredge equipment used factors into the placement process (i.e., the discharge of dredged and fill material). The dredge equipment type determines technologically viable placement site options as well as the cost of dredged material placement and therefore is a practicability consideration in this Section 404(b)(1) evaluation.

All alternatives would involve dredging the federal channels with a combination of hydraulic and mechanical dredge equipment and placing the dredged materials at an approved placement site. The choice of dredging method for a particular area is determined by various site-specific factors. These

include the type of substrate, sediment quality, site bathymetry and layout, wave energy, dredging depth, desired production rate, placement method and distance, environmental concerns, and spatial constraints. Additionally, considerations such as equipment costs and availability play a significant role in the decision-making process for selecting the most suitable dredging approach.

Therefore, for the purpose of this evaluation, all alternatives are considered practicable with respect to technology and logistics.

3.3 Impacts to Waters of the United States

USACE, as mandated by Congress, is responsible for maintaining the navigability of federal navigation channels to their authorized depth. The amount of material to be dredged and consequently placed would be dependent on the extent of sediment accumulation in the federal navigation channels. In general, clamshell dredging results in higher levels of resuspended sediments and turbidity than hydraulic dredging. However, while the amount of material dredged via clamshell dredging from the federal navigation channels and discharged into waters of the United States differs (see Table A-1), the potential effects on water quality (e.g., increased suspended particles and turbidity) would be the less than significant under all alternatives, as described in Section 3.7 of the Final EA/EIR.

4.0 Technical Evaluation/Potential Impacts of the Proposed Action

USACE's maintenance dredging and dredged material placement must comply with the regulations set forth in 33 CFR Part 335-338, which define the "Federal Standard." The Federal Standard, also known as the Base Plan, is defined by USACE regulations as the least costly dredging and dredged material disposal or placement alternative (or alternatives) identified by USACE that is consistent with sound engineering practices and meets all federal environmental requirements including those established under Section 404 of the CWA; the Marine, Protection, Research and Sanctuaries Act; and the Coastal Zone Management Act.

The proposed action would consist of phased implementation of a combination of the USACE Federal Standard Base Plan alternatives: the No Project Alternative, Alternative 1, and Alternative 2. The potential impacts of the maintenance of the federal navigation channels in San Francisco Bay by USACE were analyzed in the Final EA/EIR, which incorporates analysis from previous environmental review documents.

This section evaluates the significance of potential adverse impacts resulting from the continuation of historically authorized maintenance dredging of the federal navigation channels and the placement of dredged materials at the placement sites under the proposed action pursuant to Subpart C though Subpart F of the Section 404(b)(1) Guidelines (Table A-2). References are included to the section(s) of the Final EA/EIR where the analysis relevant to each applicable evaluation factor is presented.

Table A-2. Technical Evaluation of Proposed Action Implementation

Technical Evaluation Factors for the Proposed Action	Evaluation	Impact Level
Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)		
Substrate Sections 3.5 and 3.7 of the Final EA/EIR	Effects would be localized and short-term. Possible beneficial effects due to augmenting the local supply of sediment available to support accretion in mudflats and tidal wetlands.	Not significant
Suspended particles/turbidity Section 3.7 of the Final EA/ EIR	Effects from dredging would be minor, localized, and temporary. Sediment at placement sites may create short-term increases in turbidity during placement for wetland restoration but have potential to create long-term beneficial increases in sediment retention and stabilization, and pollutant filtration.	Not significant

Technical Evaluation Factors for the Proposed Action	Evaluation	Impact Level
Water Quality Sections 3.7 of the Final EA/ EIR	Based on studies by USACE, hopper, cutterhead, and clamshell dredging activities and placement of dredged material do not cause substantial changes to salinity, temperature, or pH (USACE 1976a, 1976b, 1977, 1990), and any associated minor changes would be localized and short-lived.	Not significant
Current patterns and water circulation Section 3.5 of the Final EA/EIR	The amount of dredging to be conducted is negligible in relationship to the volume of water and the tidal forces present in San Francisco Bay. The amount of material placed at aquatic or upland sites is likewise negligible in relationship to the volume of water and tidal forces present in San Francisco Bay.	Not significant
Normal water fluctuations Section 3.5 of the Final EA/EIR	The amount of dredging to be conducted is negligible in relationship to the volume of water and the tidal forces present in San Francisco Bay. The amount of material placed at aquatic or upland sites is likewise negligible in relationship to the volume of water and tidal forces present in San Francisco Bay.	Not significant
Salinity gradients Section 3.7 of the Final EA/ EIR	Based on studies by USACE, hopper, cutterhead, and clamshell dredging activities and placement of dredged material do not cause substantial changes to salinity, temperature, or pH (USACE 1976a, 1976b, 1977, 1990), and any associated minor changes would be localized and short-lived.	Not significant
Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D) (Section 230.30-230.32)		
Threatened and endangered species Sections 3.3 of the Final EA/ EIR	Impacts on most fish caused by entrainment would be considered less than significant through the implementation of the long-term management strategy for dredged material windows and other standard practices intended to reduce the potential for entrainment. Beneficial use of the dredged material for wetland restoration would provide habitat for longfin smelt and other species. No negative effects are expected on the leatherback turtle from the project. In the unlikely event that a leatherback turtle is sighted near the dredging or disposal area, all dredging and disposal activities would be suspended until the animal leaves the area. The work windows for portions of San Francisco Bay are intended to minimize potential impacts from turbidity effects on foraging success during the California least tern nesting season when prey species are at critical life states.	Not significant

Technical Evaluation Factors for the Proposed Action	Evaluation	Impact Level
	The project is not expected to directly affect the western snowy plover due to avoidance and minimization measures. The project not expected to directly affect the salt marsh harvest mouse because placement of dredged material in its habitat area is closely monitored and will not be allowed if the animals are present. Restoration of tidal salt marsh habitat will also create additional habitat for salt marsh harvest mouse and Ridgway's rail.	
Fish, crustaceans, mollusks, and other aquatic organisms in the food web Sections 3.3 of the Final EA/ EIR	None of the commercially or recreationally important fish would be significantly affected by the proposed maintenance dredging. Temporary affects to food supply and foraging success would be minor, and there would be no significant long-term effects to pelagic-based food resources because of the rapid recovery predicted in these communities, the small area affected, and the brief time in which they would be affected.	Not significant
Other wildlife Sections 3.3 of the Final EA/EIR	Impacts on avian roosting, nesting, and foraging caused by dredging activities would be less than significant. Temporary increases in noise levels from dredging could constitute harassment of marine mammals. However, levels would be similar to ambient noise associated with commercial shipping and recreational boating within the study area, and there would be no adverse impacts on wildlife.	Not significant
Potential Impacts on Special Aquatic Sites (Subpart E) (Section 230.40-230.45)		
Sanctuaries and refuges	The resource is not present or there would be no adverse impact.	Not applicable
Wetlands Section 3.5 and 3.7 of the Final EA/EIR	BUDM placement could directly result in beneficial effects to water quality by augmenting the local supply of sediment available to support accretion in mudflats and tidal wetlands, which in turn may provide water quality benefits.	Not significant
Mud flats Section 3.3 of the Final EA/EIR	Activities related to placement and dredging for maintenance would not result in the loss of mudflat land. Past surveys indicate that the size and health of special aquatic sites, including eelgrass beds and mudflats, are not negatively impacted by ongoing maintenance dredging. Activities related to placement and dredging for maintenance would not result in the loss of mudflat land.	No impact
Vegetated shallows Section 3.3 of the Final EA/EIR	There would be no disturbance to sensitive ecosystems (such marshes and mud flats) that are close to federal navigation channels.	No impact

Technical Evaluation Factors for the Proposed Action	Evaluation	Impact Level
Coral reefs	The resource is not present or there would be no adverse impact.	Not applicable
Riffle and pool complexes	The resource is not present or there would be no adverse impact.	Not applicable
Potential Effects on Human Use Characteristics (Subpart F) (Section 230.50-230.55)		
Municipal and private water supplies	The resource is not present or there would be no adverse impact.	Not applicable
Recreational and commercial fisheries Section 3.3 of the Final EA/ EIR	Impacts on most fish caused by entrainment would be considered less than significant through the implementation of the long-term management strategy for dredged material windows and other standard practices intended to reduce the potential for entrainment.	Not significant
Water-related recreation Section 3.4 and 3.6 of the Final EA/EIR	The project alternatives may occasionally delay or temporarily impede recreational watercraft during dredging and placement activities. In most locations, there would be sufficient room for recreational vessels to maneuver around dredge equipment, and therefore, impacts are expected to be negligible.	Not significant
Aesthetics	The resource is not present or there would be no adverse impact.	Not applicable
Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves	The resource is not present or there would be no adverse impact.	Not applicable
Cultural Resources Section 3.4 of the Final EA/EIR	Although historical dredging has occurred in the navigation channels, there is the potential that cultural resources could be inadvertently uncovered by project activities. Such inadvertently discovered resources could represent historical resources or unique archaeological resources, and their disturbance could adversely change their condition. Through implementation of mitigation measures CT1-1, CT1-2, and CT2-1, project activities would not result in impacts on known historical resources or Native American sacred sites.	Not significant

Notes:
EA/EIR = Environmental Assessment/Environmental Impact Report
USACE = US Army Corps of Engineers

4.1 Evaluation and Testing

This section evaluates the potential biological availability of possible contaminants in dredged material pursuant to Subpart G of the Section 404(b)(1) Guidelines. This analysis is based on past sediment

testing results for the federal navigation channels and known sources of contamination in or near the channels. Section 1.2. of the Final EA/EIR provides a description of the sediment testing requirements.

The Final EA/EIR (Section 3.5) concluded that potential impacts and benefits of placing sediment at the alternative beneficial use sites (listed in Section 2.3 of the Final EA/EIR) would be similar to those at the current beneficial use sites.

This evaluation addresses maintenance dredging of the federal channels for a period of 10 years. Therefore, sediment testing will be conducted in this period, pursuant to the Section 404(b)(1) sediment testing guidelines (Subpart G), per approved sediment sampling and analysis plans.

4.2 Actions Taken to Minimize Potential Impacts

Proposed measures to minimize potential impacts include the coordination of dredging windows, standard dredging practices designed to reduce the risk of entrainment, increased hopper dredging and placing materiel at beneficial use sites to minimize potential impacts from higher in-bay placement, compensatory mitigation which could take the form of either increased upland beneficial use and/or contribution to an approved mitigation bank (see also Section 2.3 and 3.4 in the Final EA/EIR). Other measures to avoid or reduce potential entrainment impacts include set up of a pilot study to assess the potential for directing fish away from the hopper dredge during operations to reduce entrainment, and application of eDNA sampling and use of an echosounder in conjunction with hopper dredging activities to prioritize the order of dredging based on fish community conditions. Additionally, USACE will comply with the terms and conditions of the 2015 biological opinion for the Long Term Management Strategy for Dredged Material (LTMS) Program for federally listed species under the National Marine Fisheries Service's jurisdiction (NMFS 2015), the programmatic biological opinion for the LTMS program for federally listed species under the US Fish and Wildlife Service's (USFWS) jurisdiction (USFWS 2025), and the biological opinion for effects on California least tern from USACE maintenance dredging activities in Oakland Harbor (USFWS 2023).

The Proposed Action includes BUDM as a minimization measure to reduce the impacts to longfin smelt from hopper dredging. Additionally, to compensate for potential entrainment impacts to longfin smelt associated with hopper dredging at any in-Bay location, USACE shall annually purchase mitigation credits from an approved mitigation bank or in-lieu fee program or place sediment, calculated by the volume BUDM equation (Sections 2.3 and 3.4 Final EA/EIR), at a permitted upland tidal wetland beneficial use site that would provide habitat for longfin smelt within San Francisco Bay.

4.2.1 Compliance with Applicable Water Quality Standards

The Proposed Action or its alternative would be implemented in accordance with all applicable federal and California water quality standards. The following measures are part of the Proposed Action and would help ensure compliance with these standards:

- Implementation of the Spill Prevention, Containment, and Cleanup Plan for USACE.
- Implementation of compensatory mitigation measures including increased BUDM and/or purchase of mitigation bank credits for alternatives that include increased reliance on hopper dredging.

- Adherence to dredging work windows and other standard dredging mitigation practices to reduce impacts as detailed in Chapter 2 of the Final EA/EIR.
- Monitoring to ensure compliance with water quality certification/waste discharge requirement permit conditions, with adaptive management to address any in-water conditions that approach permit conditions.
- USACE continued participation in San Francisco Estuary Institute monitoring programs for tracking maintenance dredging impacts.
- USACE participation in a pilot study to assess deterrent methods such as light, sound, and air jets for hopper dredging.

4.3 Determination of Cumulative Effects on the Aquatic Environment

For a detailed discussion of the potential cumulative effects of the Proposed Action on aquatic habitat and aquatic species, please refer to the cumulative effects discussions that are included in each of the resource impacts and mitigation measures discussions contained in Section 3 and summarized in section 3.10 the Final EA/EIR. None of the project alternatives including the No Action Alternative are expected to result in significant cumulative effects on any aquatic ecosystem or aquatic species.

5.0 Findings

The following evaluation is undertaken to demonstrate compliance with the Section 404(b)(1) guidelines (restrictions on discharge, 40 CFR 230.10). No adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation. USACE has determined that there are no other available practicable alternatives that would have less adverse impact on the aquatic ecosystem that do not involve discharges into waters of the United States or at other locations within these waters.

Based on the technical evaluation as provided in Section 4.0 above, under the proposed action there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:

Physical substrate	YES
Water circulation, fluctuation, and salinity	YES
Suspended particulates/turbidity	YES
Contaminant availability	YES
Aquatic ecosystem structure, function, and organisms	YES
Proposed placement site	YES
Cumulative effects on the aquatic ecosystem	YES
Secondary effects on the aquatic ecosystem	YES

5.1 Special Restrictions

The proposed action will not violate state water quality or toxic effluent standards, jeopardize endangered or threatened species or critical habitat, or violate standards set by the Department of Commerce to protect marine sanctuaries. There are no known contaminated areas within the action area.

5.1.1 Water Quality Standards

Will the discharge:

Violate state water quality standards?	NO
Violate toxic effluent standards (under Section 307 of the CWA)?	NO
Jeopardize endangered or threatened species or their critical habitat?	NO
Violate standards set by the Department of Commerce to protect marine sanctuaries?	NO

5.1.2 Contamination and Sediment Testing

Evaluation of the information in Section 4.1 above indicates that the proposed discharge material meets testing exclusions criteria for the following reasons:

- (X) Based on the above information, the material is not a carrier of contaminants.

- (X) The levels of contamination are substantially similar at the extraction and disposal sites.
- (X) The discharge is not likely to result in degradation of the disposal site and pollutants will not be transported to less contaminated areas.
- (X) Acceptable constraints are available and will be implemented to reduce contamination to acceptable levels within the disposal site and to prevent contaminants from being transported beyond the boundaries of upland BUDM sites (i.e., sediment testing).

5.1.3 Other Restrictions

Will the discharge contribute to significant degradation of waters of the United States through adverse impacts to:

Human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife and special aquatic sites?	NO
Life states of aquatic life and other wildlife?	NO
Diversity, productivity and stability of the aquatic ecosystem, such as the loss of fish or wildlife habitat, or loss of capacity of wetland to assimilate nutrients, purify water, or reduce wave energy?	NO
Recreational, aesthetic or economic values?	NO

5.2 Findings of Compliance or Non-Compliance

The proposed maintenance dredging of federal navigation channels in San Francisco Bay and the associated placement of dredged material for a roughly 10-year period complies with the Section 404(b)(1) guidelines.	YES

DATE

DISTRICT COMMANDER

6.0 References

NMFS (National Marine Fisheries Service). 2015. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region Revised Incidental Take Statement. NMFS Consultation Number: WCR-2014-1599.

Regional Water Board (San Francisco Bay Regional Water Quality Control Board). 2020. Reissued Waste Discharge Requirements and Water Quality Certifications for U.S. Army Corps of Engineers, San Francisco District, San Francisco Bay Federal Channel Maintenance Dredging Program, 2020 through 2024. Order No. R2-2020-0011. Available at: https://www.waterboards.ca.gov/rwqcb2/board_info/agendas/2020/February/7_final_to.pdf

USACE (US Army Corps of Engineers). 1976a. Dredge Disposal Study, San Francisco Bay and Estuary, Appendix C, Water Column.

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USACE. 1990. Assessment of Dredged Material Toxicity in San Francisco Bay. Army Corps of Engineers. 1977. Dredge Disposal Study, San Francisco Bay. Environmental Laboratory, Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi. Prepared by Thomas M. Dillon and David W. Moore. November 1990.

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