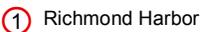
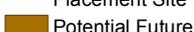
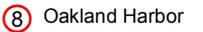
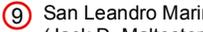
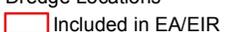
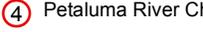
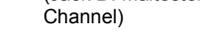
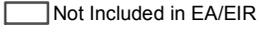
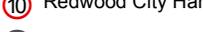
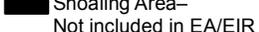
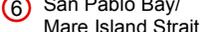


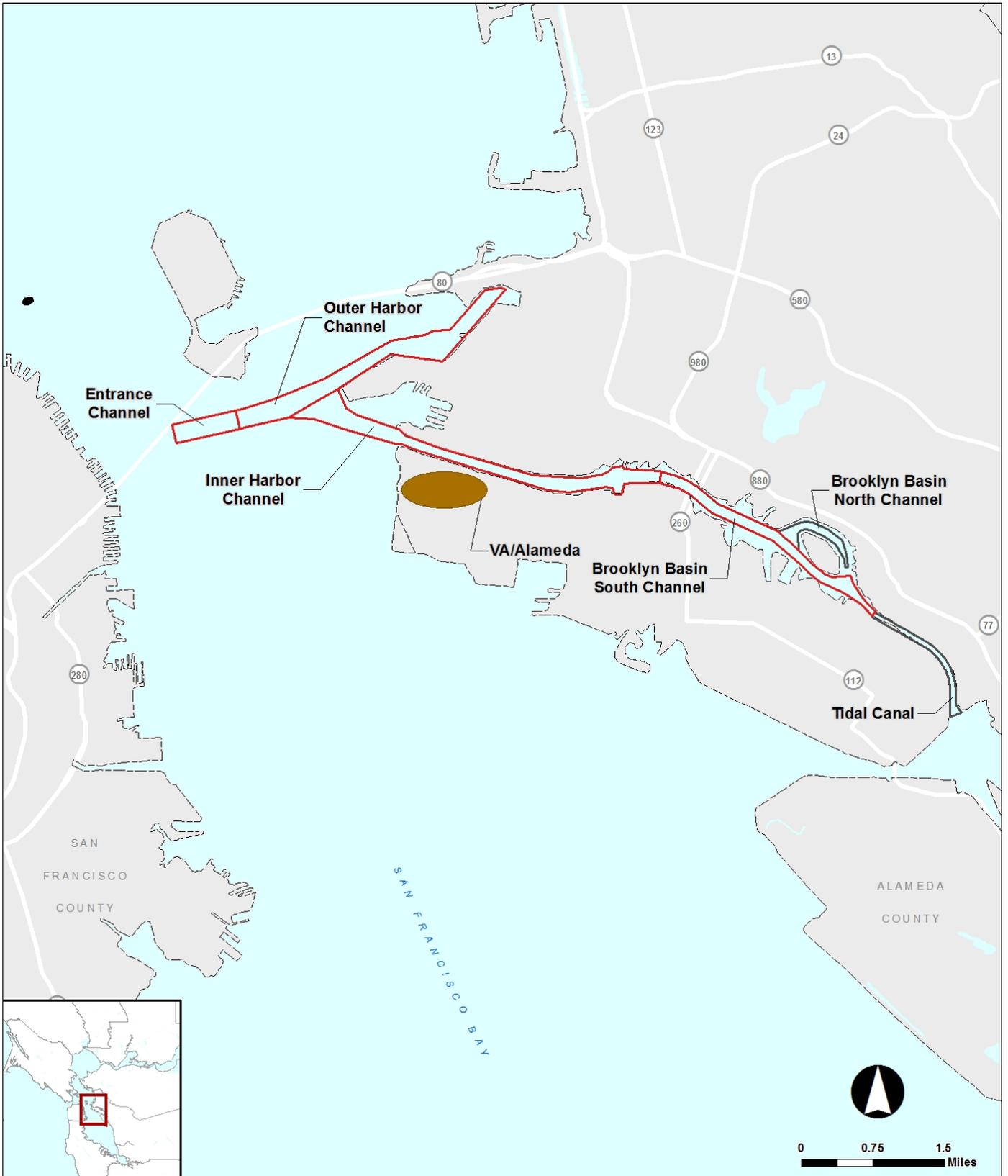
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Source: URS, 2013.

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|--|--|--|
|  Existing Placement Site              |  1 Richmond Harbor                  |  7 Suisun Bay Channel                             |
|  Potential Future Placement Site      |  2 San Francisco Harbor             |  8 Oakland Harbor                                 |
| <b>Dredge Locations</b>  |  3 Napa River Channel               |  9 San Leandro Marina (Jack D. Maltester Channel) |
|  Included in EA/EIR                   |  4 Petaluma River Channel           |  10 Redwood City Harbor                           |
|  Not Included in EA/EIR               |  5 San Rafael Creek Channel         |  11 Suisun Slough Channel                         |
|  Shoaling Area—Not included in EA/EIR |  6 San Pablo Bay/Mare Island Strait |  |

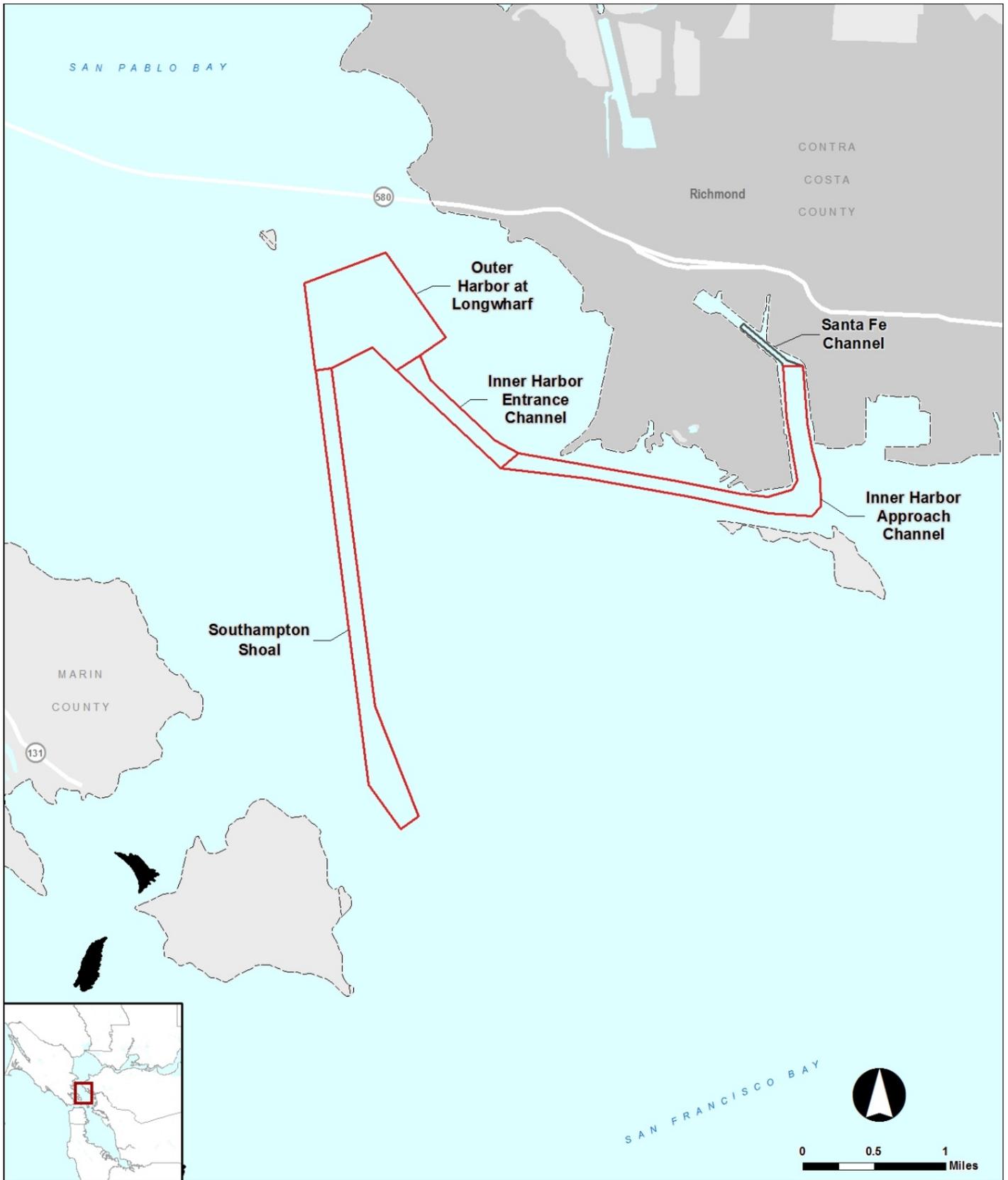
# EXHIBIT A

## BCDC Permit Application No. C2015.002.00



**EXHIBIT B**  
**BCDC Permit Application**  
**No. C2015.002.00**

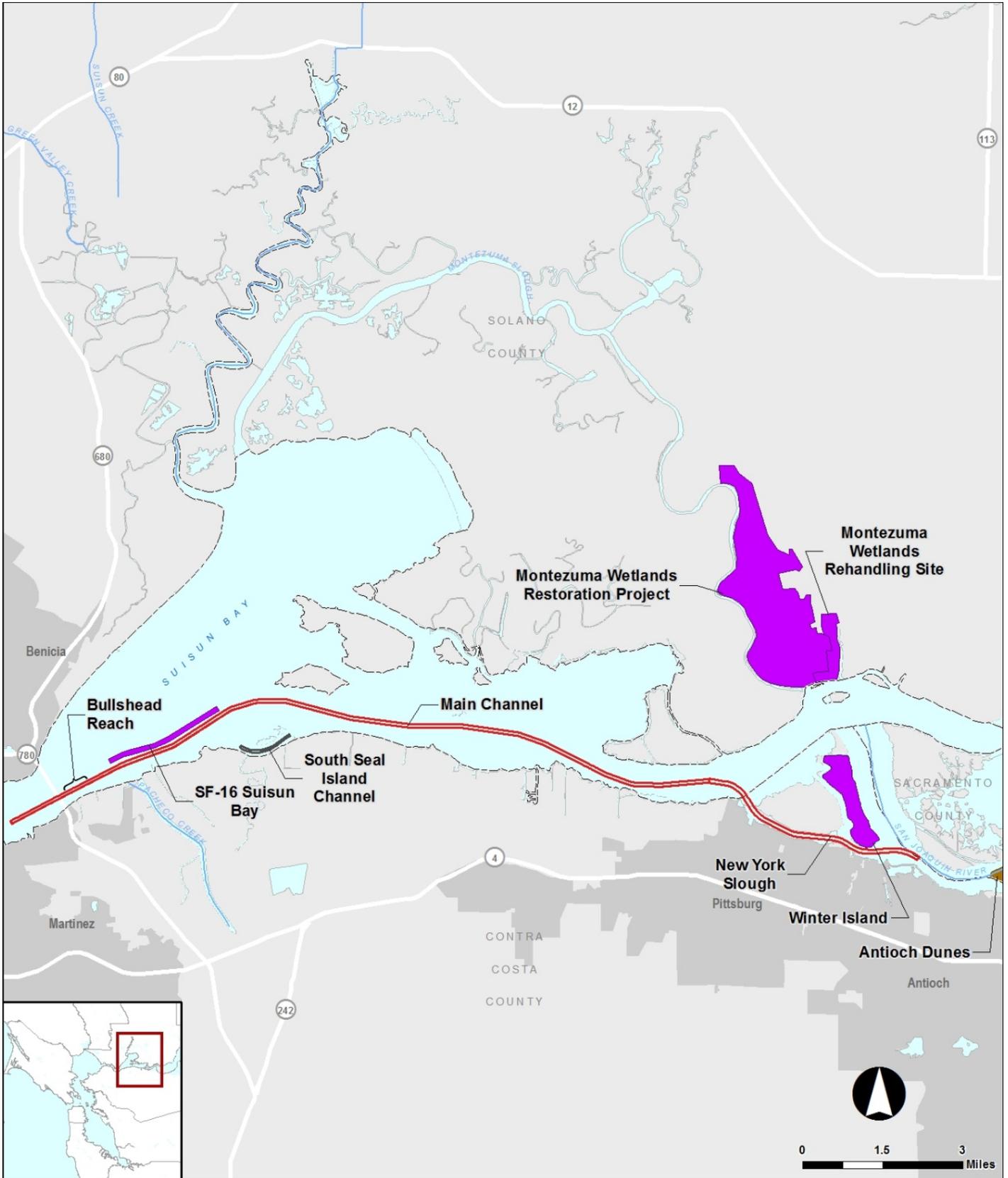
**Oakland Harbor**



**EXHIBIT C**

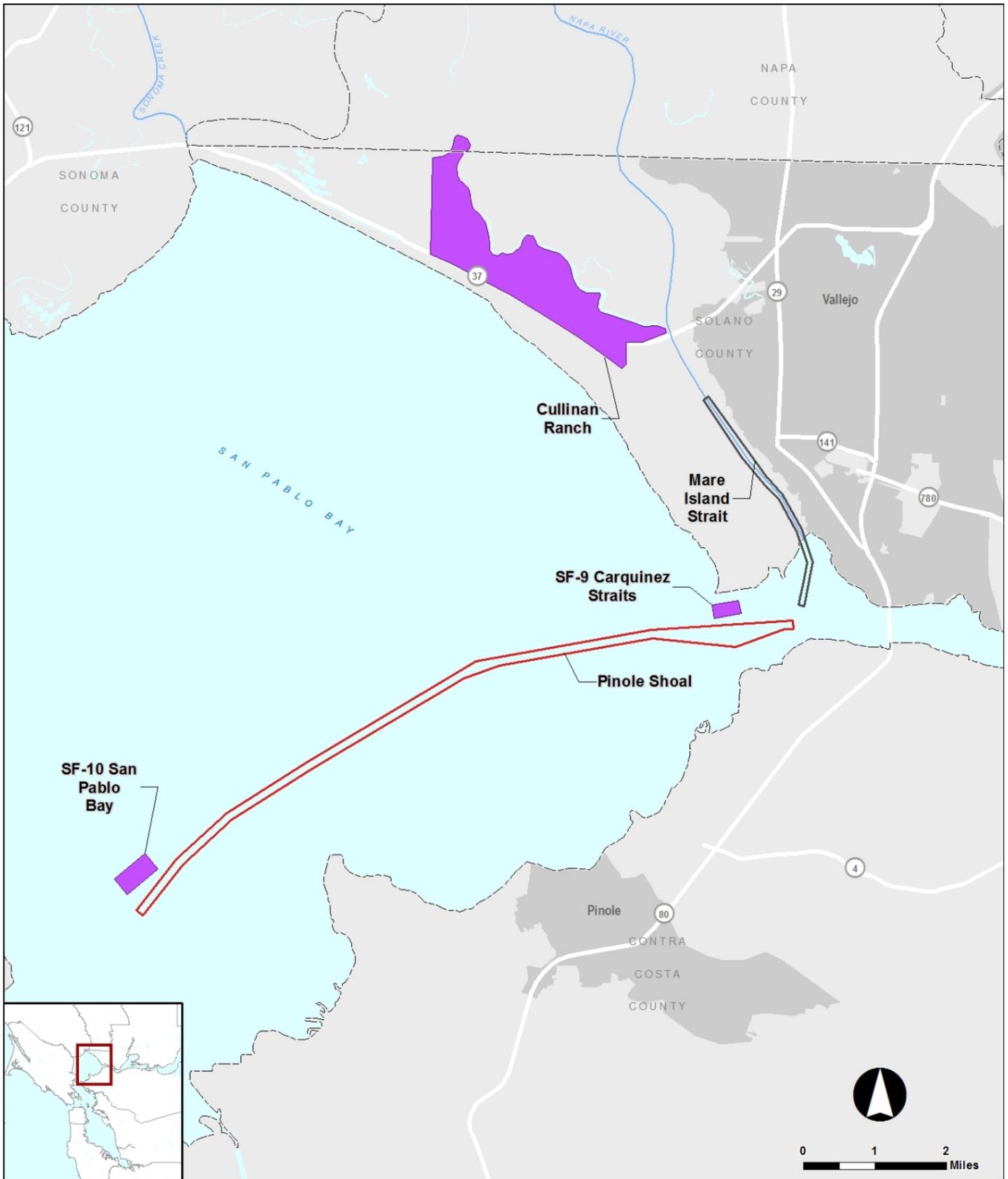
**BCDC Permit Application  
No. C2015.002.00**

**Richmond Harbor**



**EXHIBIT D**  
**BCDC Permit Application**  
**No. C2015.002.00**

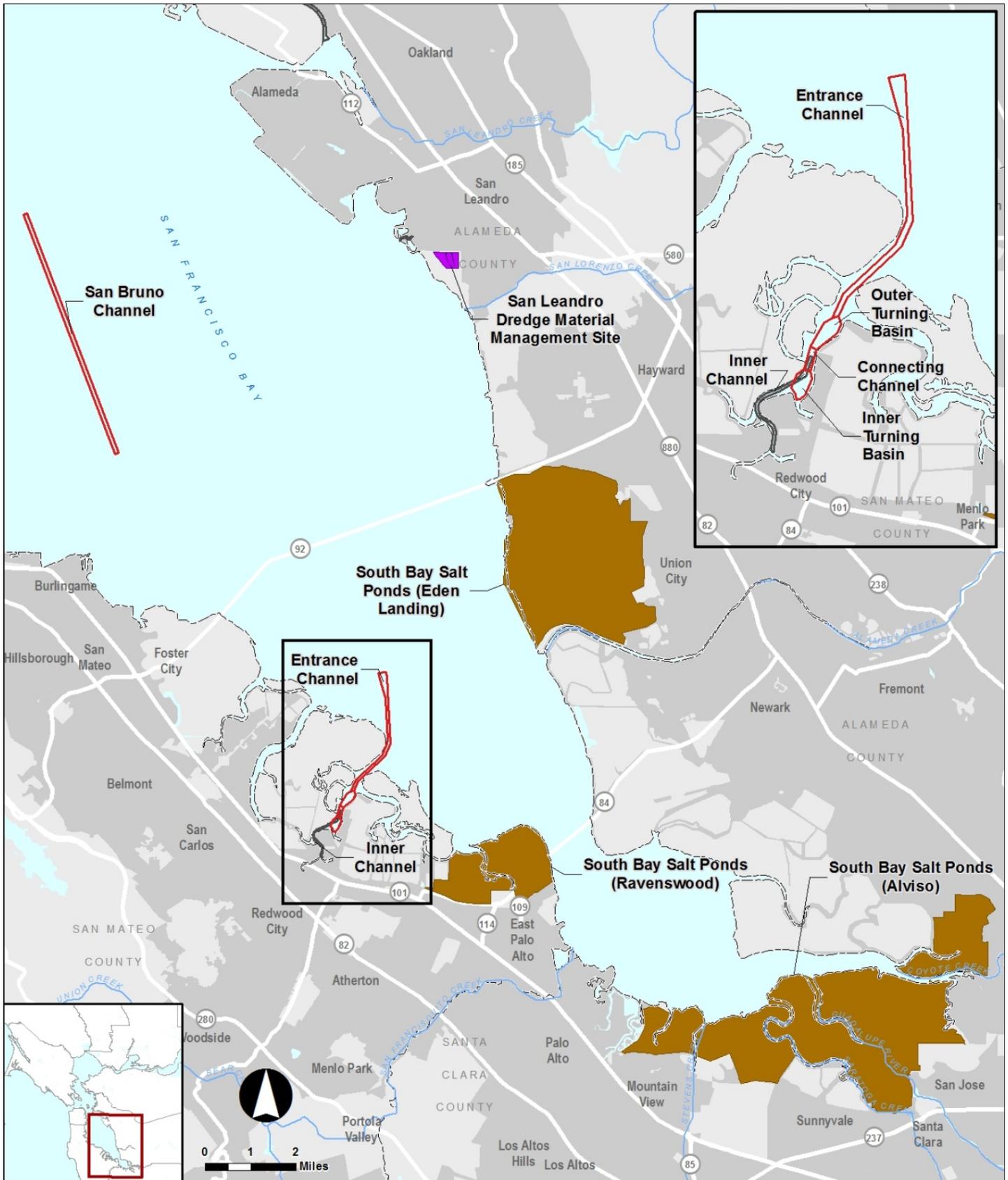
**Suisun Bay and**  
**New York Slough Channels**



# EXHIBIT E

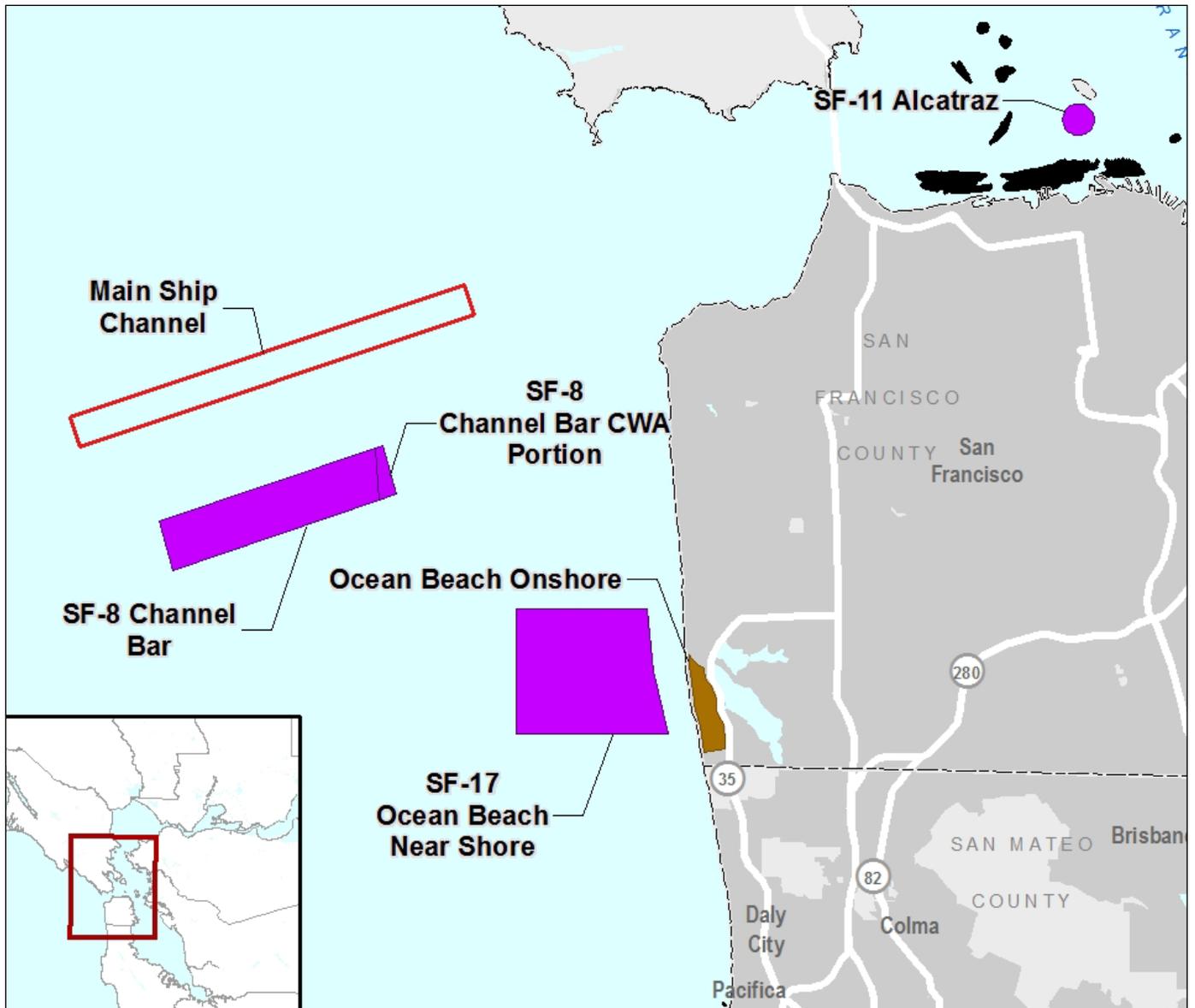
**BCDC Permit Application  
No. C2015.002.00**

# Pinole Shoal Channel



**EXHIBIT F**  
**BCDC Permit Application**  
**No. C2015.002.00**

**Redwood City Harbor**



**EXHIBIT G**  
**BCDC Permit Application**  
**No. C2015.002.00**

**San Francisco**  
**Mainship Channel**

## EXECUTIVE SUMMARY

### INTRODUCTION

The United States Army Corps of Engineers (USACE) proposes to continue maintenance dredging of the federal navigation channels in San Francisco Bay to maintain the navigability of the channels. The San Francisco Bay Regional Water Quality Control Board (Regional Water Board) proposes to issue a Clean Water Act (CWA) Section 401 water quality certification (WQC), and may also issue waste discharge requirements (WDRs) pursuant to the state Porter-Cologne Water Quality Control Act, for USACE's continued maintenance dredging operations in San Francisco Bay. This authorization is referenced throughout as "WQC".

The USACE and Regional Water Board have prepared this Environmental Assessment (EA)/Environmental Impact Report (EIR) to address the environmental effects of the maintenance dredging of federal navigation channels in San Francisco Bay and the associated placement of dredged materials for a period of 10 years. This EA/EIR is prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. § 4321 et seq.; the Council on Environmental Quality regulations for implementing NEPA, 40 C.F.R. pt. 1500-1508; USACE Procedures for Implementing NEPA (Engineer Regulation 200-2-2); USACE regulations for operation and maintenance of civil works projects (33 C.F.R. pt. 335-338); Section 404 of the CWA (33 U.S.C. § 1344 and 33 C.F.R. pt. 320-330); the California Environmental Quality Act (CEQA) of 1970, California Public Resources Code, Section 21000 et seq., as amended, and the Guidelines for Implementation of CEQA, Title 14, California Code of Regulations, Section 15000 et seq. The USACE is the NEPA lead agency, and the Regional Water Board is the CEQA lead agency.

The dredging process involves the excavation of accumulated sediment from the channel bed, and the subsequent transportation and placement of the sediment at a permitted facility or location in a manner consistent with the permit conditions established by applicable regulatory agencies, after determination of suitability for placement at that site. The environmental impacts of maintenance dredging of the federal navigation channels were initially described in USACE's *Final Composite Environmental Impact Statement for Maintenance Dredging of Existing Navigation Projects, San Francisco Bay Region* in December 1975. The environmental effects of dredged material placement activities associated with dredging the federal navigation channels in San Francisco Bay were analyzed in the *Long-Term Management Strategy for Placement of Dredged Material in the San Francisco Bay Region, Final Policy Environmental Impact Statement/Programmatic Environmental Impact Report* in 1998. Subsequent to the publication of these documents, USACE has conducted NEPA compliance review, and the Regional Water Board has conducted CEQA compliance review, for maintenance dredging activities on an individual channel basis; this NEPA and CEQA<sup>1</sup> compliance has been conducted periodically as warranted by operation and dredging maintenance needs. This document is intended to fulfill USACE's NEPA compliance requirements for maintenance dredging of federal navigation channels it maintains in San Francisco Bay for the federal fiscal years<sup>2</sup> 2015 through 2024. This document is also intended to fulfill the Regional Water Board's CEQA compliance requirements for issuance of a 10-year WQC to USACE. Additionally, for those maintenance dredging projects that involve discharge of dredged or fill material into waters of the United States, this document is intended to serve as the Section 404(b)(1) analysis for maintenance dredging in compliance with the CWA.

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<sup>1</sup> "Maintenance dredging where the spoil is deposited in a spoil area authorized by all applicable state and federal regulatory agencies" is a Class 4 Categorical Exemption under CEQA (CEQA Guidelines, Section 15304). Past WDRs were issued under this Categorical Exemption. The listings of longfin smelt and green sturgeon, noted in the following paragraph, warranted the preparation of an EIR under CEQA.

<sup>2</sup> The federal fiscal year begins October 1 and ends September 30.

Longfin smelt and green sturgeon were not protected under the federal or state Endangered Species Acts at the time the Long-Term Management Strategy (LTMS) Environmental Impact Statement (EIS)/EIR was completed. Longfin smelt is a state-listed threatened species, and the green sturgeon southern distinct population segment is a federally listed threatened species. Delta smelt was addressed in the LTMS Final EIS/EIR as a federally listed and state-listed threatened species; however, the state elevated its listing status from threatened to endangered in 2010. Listed salmonids were addressed in the LTMS EIS/EIR. Subsequent to the completion of the LTMS EIS/EIR and to the listing of longfin smelt, USACE implemented monitoring to determine whether dredging operations were resulting in take of listed fish species. In 2011, there were occurrences of delta smelt and longfin smelt becoming entrained in hopper dredging equipment during USACE maintenance dredging at certain locations. To minimize the potential for future impacts to listed fish species, the proposed project would address aspects of USACE's maintenance dredging and dredged materials placement program that could result in injury or mortality of these species.

The federal navigation channels and associated placement sites are in the San Francisco Bay LTMS Program Area, which spans 11 counties, including Alameda, Contra Costa, Marin, Napa, Sacramento, San Joaquin, Santa Clara, San Francisco, San Mateo, Solano, and Sonoma. However, the geographic scope of potential impacts of the proposed project are limited to 10 federally authorized navigation channels and associated placement sites in San Francisco Bay (Figure ES-1).

## PROJECT PURPOSE, NEED, AND OBJECTIVES

The USACE, as mandated by Congress, is responsible for maintaining navigability of federal navigation channels to authorized depth or lesser regulatory depth.<sup>3</sup> Accumulation of sediment that settles in these channels can impede navigability. Maintenance dredging removes this sediment and returns the channels to regulatory depths to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for the movement of commerce, national security needs, and recreation. Therefore, USACE's purpose of the project is to continue maintenance dredging of the federal navigation channels in San Francisco Bay consistent with the goals and adopted plans of the LTMS, while adequately protecting the environment, including listed species. The Regional Water Board's overall project objective is to ensure USACE's consistency with the water quality objectives and beneficial uses adopted in the Water Quality Control Plan for the San Francisco Bay Basin, as will be addressed through the Section 401 WQC process.

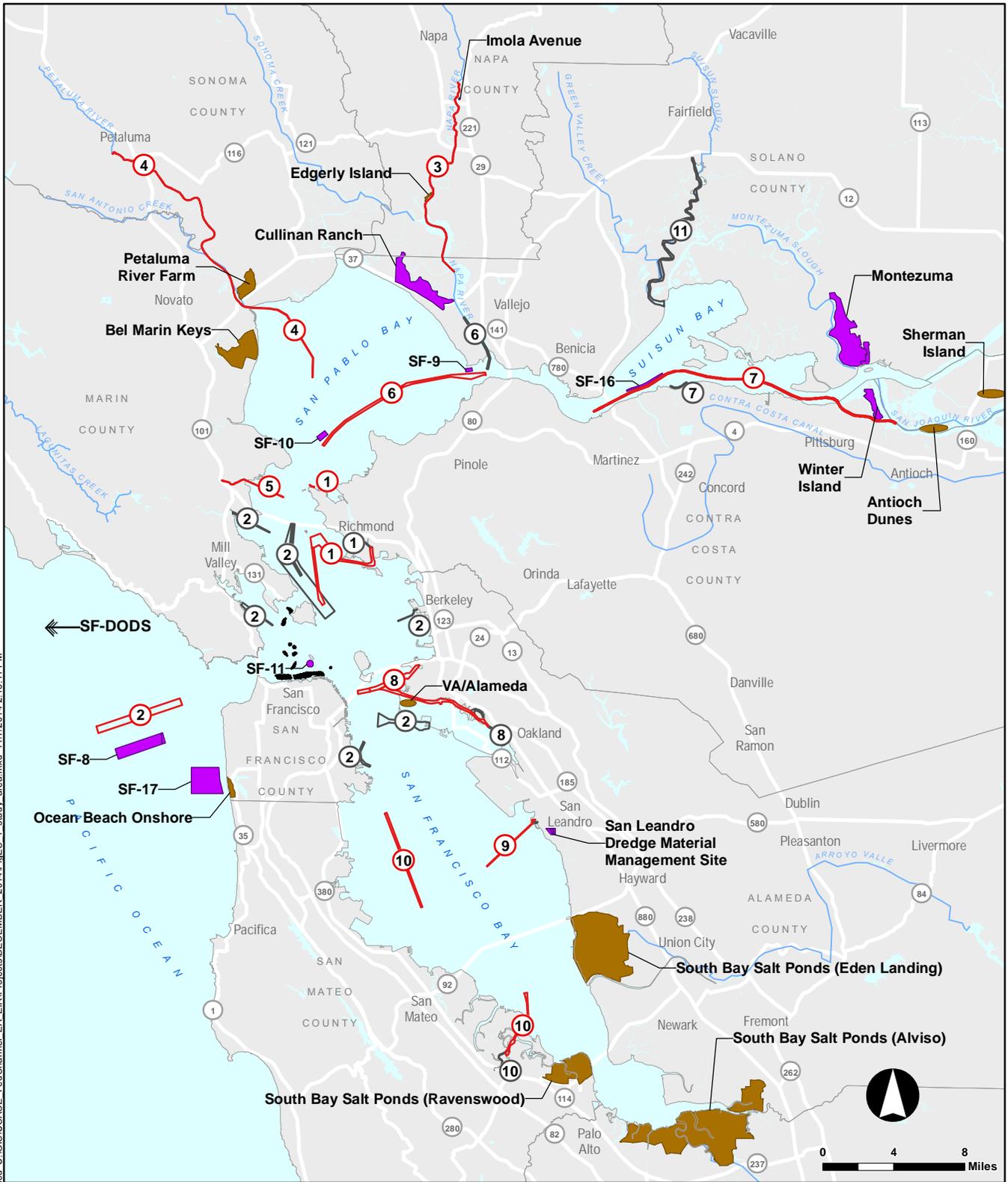
The USACE's specific project objectives are to:

- Provide safe, reliable, and efficient navigation through federal channels in San Francisco Bay in a feasible manner. This objective is considered the underlying fundamental purpose of the proposed project;
- Ensure consistency, to the maximum extent practicable, with the goals of the LTMS program as described in the 1998 LTMS Final EIS/EIR and the 2001 LTMS Management Plan; and
- Conduct dredging in a manner that adequately protects the environment, including listed species.

The Regional Water Board has authority under CWA Section 401 and the Porter-Cologne Act to issue permits governing dredge and fill activities. The Regional Water Board will consider USACE's application for a multi-year WQC for continued maintenance dredging of San Francisco Bay federal channels and associated dredged materials placement. To issue a WQC to USACE, the Regional Water Board, in compliance with CEQA, must analyze and disclose potential water quality and other environmental impacts of the project; consider alternatives that would avoid or substantially reduce

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<sup>3</sup> Regulatory depth is the depth to which federal environmental compliance has been completed.



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Source: URS, 2013.

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|---|--|--|
| <span style="display: inline-block; width: 15px; height: 10px; background-color: purple; border: 1px solid black;"></span> Existing Placement Site        | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span> Richmond Harbor                  | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">7</span> Suisun Bay Channel                             |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: brown; border: 1px solid black;"></span> Potential Future Placement Site | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">2</span> San Francisco Harbor             | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">8</span> Oakland Harbor                                 |
| <b>Dredge Locations</b>   | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">3</span> Napa River Channel               | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">9</span> San Leandro Marina (Jack D. Maltester Channel) |
| <span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px;"></span> Included in EA/EIR   | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">4</span> Petaluma River Channel           | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">10</span> Redwood City Harbor                           |
| <span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Not Included in EA/EIR                                   | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">5</span> San Rafael Creek Channel         | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">11</span> Suisun Slough Channel                         |
| <span style="background-color: black; display: inline-block; width: 15px; height: 10px;"></span> Shoaling Area—Not included in EA/EIR                     | <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">6</span> San Pablo Bay/Mare Island Strait |  |

**STUDY AREA**  
 Federal Navigation Channels EA/EIR  
 U.S. Army Corps of Engineers  
 December 2014  
 Bay Area, California



**FIGURE ES-1**

potentially significant impacts of the project as approved; adopt or make a condition of approval all feasible mitigation for potentially significant impacts; and demonstrate that all applicable state water quality requirements are met.

## **ALTERNATIVES**

Typical methods of maintenance dredging include hydraulic or mechanical dredging. Hydraulic dredging usually involves hopper dredges (a ship with a hopper bin to store and transport material dredged) or suction/cutterheads attached to hydraulic pipelines that convey the dredged material to a scow or directly to a placement site. Mechanical dredging usually involves bucket or clamshell dredges, which scoop material directly into a scow for transport to a placement site. Once the material is dredged, it is transported to, and placed at, a designated dredged material placement site.

This EA/EIR evaluates in detail four alternatives for USACE's maintenance dredging of the federal navigation channels in San Francisco Bay: the No Action/No Project Alternative, the Proposed Action/Project, and two action alternatives involving reduced use of hopper dredge equipment (Reduced Hopper Dredge Use Alternatives 1 and 2).

### **No Action/No Project Alternative**

Under NEPA, in cases where the project involves modification of an existing program or management plan, No Action may be defined as no change from current program implementation, or no change in management direction or intensity. Therefore, the No Action Alternative may be thought of in terms of continuing with the present course of action until that action is changed. Similarly, Section 15126.6 (e)(3)(A) of the CEQA Guidelines states that "when the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the no project alternative will be the continuation of the existing plan, policy or operation into the future." Therefore, under the No Action/No Project Alternative, USACE would continue current maintenance dredging practices for the projects it maintains in San Francisco Bay, and the Regional Water Board would consider issuing a WQC based on USACE's current dredging practices. Current maintenance dredging practices were determined through a review of maintenance dredging activities for fiscal year 2000 through fiscal year 2012 to determine the typical dredge equipment type, frequency of dredging, volumes dredged, and placement site(s) for each specific maintenance dredging project. Table ES-1 describes maintenance dredging and placement activities that would occur under the No Action/No Project Alternative, based on these current practices.

Under the No Action/No Project Alternative, dredging and placement would be conducted in accordance with previously established permit conditions and minimization measures, as detailed in Chapter 2. Dredging and disposal activities would continue to be limited to the LTMS Program work windows (USFWS, 1999; USFWS, 2004a; NMFS, 1998), unless through an additional consultation process, the appropriate agencies provide written authorization to work outside these windows.

The USACE would meet all federal environmental compliance requirements (e.g., CWA Section 404, Endangered Species Act), including those federal requirements implemented by state agencies (e.g., Clean Water Act Section 401, Coastal Zone Management Act). The USACE would undertake mitigation, as appropriate, in meeting its compliance requirements.

### **Proposed Action/Project**

Under USACE's Proposed Action/Project, USACE would perform dredging practices for the projects it maintains in San Francisco Bay. The dredge equipment type, frequency of dredging, and volumes dredged would be the same as under the No Action/No Project Alternative. Table ES-2 identifies the federal standard placement site and proposed alternate placement sites that would be used for each

**Table ES-1  
No Action/No Project Alternative Summary**

<b>Channel</b>	<b>Dredge Type</b>	<b>Typical Dredging Frequency (years)</b>	<b>Range of Volume Dredged per Episode (CY)<sup>1</sup></b>	<b>Median Volume Dredged Per Episode (CY)<sup>2</sup></b>	<b>Placement Site</b>
Richmond – Inner Harbor Outer Harbor	Clamshell-Bucket	1	11,000 – 631,000	390,000	SF-DODS, SF-11
	Hopper	1	78,000 – 318,000	190,000	SF-11
San Francisco Harbor – Main Ship Channel	Hopper	1	78,000 – 613,000	306,000	SF-8, SF-17
Napa River Channel*	Cutterhead-Pipeline	6-10	140,000 <sup>3</sup>	140,000 <sup>3</sup>	Upland (Sponsor Provided)
Petaluma River Channel (and Across the Flats*)	Cutterhead-Pipeline (River Channel) Clamshell-Bucket (Across the Flats)	4-7	150,000 <sup>3</sup>	150,000 <sup>3</sup>	Upland (Sponsor Provided) for the River Channel SF-10 for Across the Flats
San Rafael Creek Channel	Clamshell-Bucket	4-7	78,000 – 87,000 <sup>3</sup>	83,000 <sup>3</sup>	SF-11
Pinole Shoal	Hopper	1	80,000 – 487,000	146,000	SF-10
Suisun Bay Channel and New York Slough	Hopper	1	21,000 – 423,000	159,000	SF-16
Oakland Inner and Outer Harbor	Clamshell-Bucket	1	122,000 – 1,055,000 <sup>4</sup>	330,000	SF-DODS, MWRP
San Leandro Marina (Jack D. Maltester Channel)	Cutterhead-Pipeline	4-6	121,000 – 187,000 <sup>3</sup>	154,000 <sup>3</sup>	Upland (Sponsor Provided)
Redwood City Harbor	Clamshell-Bucket (Harbor Channels) Hopper (San Bruno Channel)	1-2	10,000 – 560,000	179,000	SF-11

## Notes:

\* For areas not dredged since 2000, the last dredging event is reported.

<sup>1</sup> Range of volume dredged per fiscal year since 2000 (USACE, 2014). For areas not dredged since 2000, the last dredging event is reported.

<sup>2</sup> Median volume dredged per fiscal year since 2000. For areas not dredged since 2000, the last dredging event is reported.

<sup>3</sup> Due to the lower frequency at which these channels are dredged, future dredge volumes could be greater.

<sup>4</sup> Due to the deepening of Oakland Harbor completed in 2010, future dredge volumes could be greater.

CY = cubic yards

MWRP = Montezuma Wetlands Restoration Project (in Solano County)

SF-8 = San Francisco Bar Channel Disposal Site (ocean site)

SF-10 = San Pablo Bay placement site (in-Bay site)

SF-11 = Alcatraz Island placement site (in-Bay site)

SF-16 = Suisun Bay placement site (in-Bay site)

SF-17 = Ocean Beach placement site (nearshore site, includes the Ocean Beach demonstration site)

SF-DODS = San Francisco Deep Ocean Disposal Site (55 miles west of Golden Gate)

**Table ES-2  
Proposed Action/Project Summary**

Channel	Dredge Type	Typical Dredging Frequency (years)	Range of Volume Dredged per Episode (CY) <sup>1</sup>	Median Volume Dredged Per Episode (CY) <sup>2</sup>	Federal Standard Placement Site <sup>3</sup>	Placement Site Alternate 1 <sup>4</sup>	Placement Site Alternate 2 <sup>4</sup>	Placement Site Alternate 3 <sup>4</sup>
Richmond Inner Harbor	Clamshell-Bucket	1	11,000 – 631,000	390,000	SF-DODS	Upland Beneficial Reuse	Other In-Bay Site	N/A
Outer Harbor	Hopper	1	78,000 – 318,000	190,000	SF-11	Other In-Bay Site	Upland Beneficial Reuse	N/A
San Francisco Harbor – Main Ship Channel	Hopper	1	78,000 – 613,000	306,000	SF-8	SF-17	Ocean Beach Onshore	SF-11
Napa River Channel*	Cutterhead-Pipeline	6-10	140,000 <sup>5</sup>	140,000 <sup>5</sup>	Upland (Sponsor Provided)	Other Upland Site	SF-9 for downstream reach only	N/A
Petaluma River Channel (and Across the Flats*)	Cutterhead-Pipeline (River Channel) Clamshell-Bucket (Across the Flats)	4-7	150,000 <sup>5</sup>	150,000 <sup>5</sup>	Upland (Sponsor Provided) for the River Channel; SF-10 for Across the Flats	Upland Beneficial Reuse	Other In-Bay Site	N/A
San Rafael Creek Channel	Clamshell-Bucket	4-7	87,000 – 150,000 <sup>5</sup>	83,000 <sup>5</sup>	SF-11	Other In-Bay Site	Upland Beneficial Reuse	N/A
Pinole Shoal	Hopper	1	80,000 – 487,000	146,000	SF-10	Other In-Bay Site	Upland Beneficial Reuse	Ocean Beach Onshore
Suisun Bay Channel and New York Slough <sup>6</sup>	Hopper	1	41,000 – 423,000	159,000	SF-16	Other In-Bay Site	Upland Beneficial Reuse	Ocean Beach Onshore for New York Slough only
Oakland Inner and Outer Harbor	Clamshell-Bucket	1	122,000 – 1,055,000 <sup>7</sup>	330,000	SF-DODS	Upland Beneficial Reuse	In-Bay Site	N/A
San Leandro Marina (Jack D. Maltester Channel)	Cutterhead-Pipeline	4-6	85,000 – 121,000 <sup>5</sup>	153,000 <sup>5</sup>	Upland (Sponsor Provided such as San Leandro DMMS)	In-Bay Site	Upland Beneficial Reuse	N/A

**Table ES-2  
Proposed Action/Project Summary (Continued)**

Channel	Dredge Type	Typical Frequency (years)	Range of Volume Dredged per Episode (CY) <sup>1</sup>	Median Volume Dredged Per Episode (CY) <sup>2</sup>	Federal Standard Placement Site <sup>3</sup>	Placement Site Alternate 1 <sup>4</sup>	Placement Site Alternate 2 <sup>4</sup>	Placement Site Alternate 3 <sup>4</sup>
Redwood City Harbor	Clamshell-Bucket (Harbor Channels) Hopper (San Bruno Channel)	1-2	10,000 – 560,000	179,000	SF-11	Other In-Bay Site	Upland Beneficial Reuse except for San Bruno Channel; SF-DODS for San Bruno Channel	Upland Beneficial Reuse for San Bruno Channel only

Notes:

\* For areas not dredged since 2000, the last dredging event is reported.

<sup>1</sup> Range of volume dredged per fiscal year since 2000. For areas not dredged since 2000, the last dredging event is reported.

<sup>2</sup> Median volume dredged per fiscal year since 2000. For areas not dredged since 2000, the last dredging event is reported.

<sup>3</sup> The federal standard is defined as the least-costly dredged material disposal or placement alternative consistent with sound engineering practices, and meeting the environmental standards established by the 404(b)(1) evaluation process or ocean dumping criteria (33 C.F.R. § 335.7).

<sup>4</sup> The USACE would not use the future placement sites identified in Section 1.5.4 until supplemental environmental review under NEPA and/or CEQA and acquisition of required environmental approvals from resource and regulatory agencies is completed.

<sup>5</sup> Due to the lower frequency at which these channels are dredged, future dredge volumes could be greater.

<sup>6</sup> Aside from regularly scheduled maintenance of this navigation project, USACE would take urgent action outside the work window, as needed, to remove the hazardous shoaling at Bulls Head Reach, as described in Section 2.3.3.

<sup>7</sup> Due to the deepening of Oakland Harbor completed in 2010, future dredge volumes could be greater.

CEQA = California Environmental Quality Act

CY = cubic yards

NEPA = National Environmental Policy Act

Ocean Beach Onshore = Onshore Ocean Beach placement site

San Leandro DMMS = Upland San Leandro Dredged Material Management Site

SF-8 = San Francisco Bar Channel Disposal Site (ocean site)

SF-9 = Carquinez Strait placement site (in-Bay site)

SF-10 = San Pablo Bay placement site (in-Bay site)

SF-11 = Alcatraz Island placement site (in-Bay site)

SF-16 = Suisun Bay placement site (in-Bay site)

SF-17 = Ocean Beach placement site (nearshore site, includes the Ocean Beach demonstration site)

SF-DODS = San Francisco Deep Ocean Disposal Site (55 miles west of Golden Gate)

USACE = United States Army Corps of Engineers

location as well as expected dredge volumes. The USACE would make every effort to use the federal standard<sup>4</sup> disposal locations, but may be forced by logistical constraints<sup>5</sup> to use the alternate locations.

Dredging and placement would be conducted in accordance with the conditions described under the No Action/Project Alternative. In addition, USACE would implement the following best management practices (BMPs) to minimize impacts to longfin smelt and delta smelt:

- Completing hydraulic dredging in the Central Bay later in the year (from August 1 to November 30) during the June-to-November environmental dredging window, to the extent feasible,<sup>6</sup> to allow young-of-the-year longfin smelt to grow large, and spawning adults to return upstream;
- Completing hydraulic dredging in Suisun Bay between August 1 and September 30, to the extent feasible, to avoid impacts to spawning adult longfin and delta smelt;
- Monitoring drag head, cutterheads, and pipeline intakes so that they maintain contact with the seafloor during suction dredging;<sup>7</sup> and
- Closing the drag head water intake doors in locations most vulnerable to entraining or entrapping 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. It may take multiple iterations to fine tune the exact intake door opening necessary to prevent clogging. For each project, the intake door opening will be different because the sediment in each location is different and the sediment physical characteristics (e.g., sand versus mud) determine how much water is needed to slurry the sediment adequately. Typically, the drag arms do not clog when dredging areas composed mostly of sand.

The USACE would purchase 0.92 acre mitigation credit at the Liberty Island Conservation Bank, or other approved site, annually for potential impacts to listed species. The 0.92 acre mitigation credit was calculated from an equation (3.0 million acre-feet/800 acres = volume dredged/X acres of mitigation habitat) that was developed by resource agencies to determine mitigation requirements for other projects with entrainment impacts as a result of pumping water, including the State Water Project. For volume dredged, available government-hopper-dredge-pumped total sediment and water volumes for 2006 through 2012 were reviewed. The highest volume for each of the in-Bay channels (Pinole Shoal, Richmond Outer Harbor, and Suisun Bay Channel/New York Slough) from this period was used in the calculation. Of the 0.92 acre mitigation credit, 0.19 acre mitigation credit would be for Pinole Shoal, 0.34 acre mitigation credit would be for Richmond Outer Harbor, and 0.39 acre mitigation credit would be for Suisun Bay Channel and New York Slough.

In addition, an approximate ½-mile portion of Bulls Head Reach, just east of the Benicia-Martinez Bridge in Suisun Bay Channel, shoals rapidly and becomes a navigation hazard that requires urgent action by USACE to maintain navigational safety in a critical maneuvering area. In the past, USACE has been

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<sup>4</sup> The federal standard is defined as the least-costly dredged material disposal or placement alternative consistent with sound engineering practices, and meeting the environmental standards established by the Section 404(b)(1) evaluation process or ocean dumping criteria (33 C.F.R. § 335.7).

<sup>5</sup> Examples of logistical constraints include: 1) unsafe conditions at the placement site (e.g., weather/wave conditions); 2) an event blocking access to a placement site (this occurred during America's Cup 34); and 3) the federal standard site reaching its monthly disposal limit (as established by the Bay Plan and Basin Plan).

<sup>6</sup> Feasibility is contingent upon the availability of federal funds (e.g., timing of Congressional appropriations) to execute the dredging work, as well as the availability of dredging equipment to perform the dredging work at the referenced time and locations.

<sup>7</sup> The seafloor surface is not uniform and is undulating, which could cause the drag head to lose contact with the seafloor. The hopper dredge also has to contend with sea state (i.e., swells and wave action) in the bay which also affects the drag head's contact with the channel bottom.

requested by the United States Coast Guard to make an emergency<sup>8</sup> declaration to conduct maintenance dredging of this area outside of the LTMS work window, and completed NEPA and other environmental compliance requirements pursuant to the CWA, federal Endangered Species Act, and the Coastal Zone Management Act after the maintenance dredging occurred. Under the Proposed Action, USACE would take urgent<sup>9</sup> action outside the LTMS work window, as needed, to remove the hazardous shoal. Removal of the shoal would likely involve 1 to 5 days of dredging to clear the hazard area. Past critical dredging episodes<sup>10</sup> have not occurred at a regular or predictable frequency; therefore, USACE estimates urgent removal of this shoal may be required in any given year within the 10-year planning horizon. Analysis of impacts related to the removal of this shoal in this EA/EIR is intended to fulfill USACE's NEPA requirements related to these episodes, and preclude emergency declaration. Because the extent and frequency of critical dredging episodes cannot be predicted, appropriate mitigation for these episodes—if warranted based on expected impacts—would be determined in coordination with regulatory agencies at the times they occur.

### Reduced Hopper Dredge Use Alternatives

Two alternatives were considered under which USACE's use of a hopper dredge for maintenance dredging of the federal channels would be reduced, compared to the Proposed Action/Project and No Action/No Project Alternative. The costs for implementing these alternatives are beyond the currently programmed operation and maintenance budget for San Francisco Bay (estimated at an additional \$3 to \$10 million per year). Therefore, before USACE could accomplish the preferred alternatives, should they be adopted by the Regional Water Board, three things typically should occur: first, higher executive branch authority must agree that the increased cost is consistent with the federal standard; second, the additional costs must be included in the annual budget submitted to Congress; and third, Congress must appropriate or reprogram the additional funds. NEPA and CEQA do not restrict consideration of alternatives that are outside the jurisdiction or capability of the lead agency to implement if the alternatives are otherwise reasonable. For the purpose of this EA/EIR, it is assumed that either reduced hopper dredge use alternative would be implemented by fiscal year 2017, as required by a condition of the WQC issued by the Regional Water Board. For both reduced hopper dredge use alternatives, implementation of dredging in fiscal years 2015 and 2016, including purchase of mitigation credit, would be as described under the Proposed Action/Project.

Although it is assumed for the purpose of analysis that the reduced hopper dredge use alternatives could be implemented, it should be noted that if USACE is unable to obtain both the necessary authorization and funding to implement these alternatives, USACE would follow the regulations at 33 C.F.R. pt. 335-338. The process described in these regulations could potentially result in deferred dredging at certain channels (i.e., Richmond Outer, Pinole Shoal, and Suisun Bay Channel and New York Slough). Deferred dredging means that these channels may not be fully maintained by USACE. Funding historically appropriated for dredging the deferred channels may be diverted to other navigation and maintenance projects nationwide, and the USACE San Francisco District may be unable to recover the funding for dredging these channels at future date. In addition, because of scheduling constraints with the government-owned hopper dredges, limiting hopper dredge use to the San Francisco Bay Main Ship Channel (MSC) under Reduced Hopper Dredge Use Alternative 2 could increase the risk that full

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<sup>8</sup> As defined in USACE's Raise the Flag Procedure (Headquarters, Civil Works Construction, Operations and Readiness Division [CECW-OD], Revised January 22, 2002), an emergency is a situation that would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action is not undertaken in a time period less than the normal contract procurement process.

<sup>9</sup> As defined in USACE's Raise the Flag Procedure (CECW-OD, Revised January 22, 2002), an urgent dredging requirement is a situation that may be time-sensitive for providing a safe navigation channel that requires prompt action, but does not meet the definition of an emergency.

<sup>10</sup> Critical dredging episodes occur outside the regular annual maintenance dredging of Suisun Bay Channel to remove a hazard to navigation when the channel is less than 35 feet mean lower low water in the area of the shoal.

dredging of the MSC would not be completed within the scheduled availability of the hopper dredge when inclement weather precludes dredging of the MSC.

In the interest of disclosing the potential environmental impacts of deferred or incomplete dredging, such impacts are noted in this EA/EIR. Because it is unknown whether, to what extent, or for how long dredging could be deferred, the impacts of deferred dredging would be speculative and variable. Therefore, discussion of the potential impacts associated with deferred dredging is presented as a brief qualitative assessment in Chapter 3 of this EA/EIR.

### **Reduced Hopper Dredge Use Alternative 1**

Under Reduced Hopper Dredge Use Alternative 1, the government hopper dredge *Essayons*, or similarly sized hopper dredge, would only be used to dredge the MSC, and either the Richmond Outer Harbor or the Pinole Shoal Channel, annually. Because of the strong currents and waves at the MSC, a hopper dredge is the only method that can safely dredge the channel. At times, inclement weather and strong currents at this location create conditions that may preclude safe dredging with a hopper dredge. During such times, dredging at an in-Bay channel would allow for efficient use of the hopper dredge, whereby the dredge would move into San Francisco Bay and work on the identified channel, then return to the MSC as soon as conditions allow. If dredging of the MSC is able to be completed without interruption by inclement weather, then the in-Bay channel (i.e., Richmond Outer Harbor or Pinole Shoal) would be dredged subsequent to the completion of dredging at the MSC. Dredging of the in-Bay channel would occur within the LTMS work window, or after an individual consultation is conducted with the appropriate regulatory agencies to allow dredging to be performed outside the work window.

Selection of the in-Bay channel to be dredged by a hopper, in any given year, would depend on: (a) the amount of shoaled material present at the respective channel; (b) timing and impact to sensitive resources (e.g., compliance with LTMS work windows); and (c) project-specific availability of funds. The additional channel would be identified by USACE in its initial annual maintenance dredging plan, which is prepared at the beginning of each fiscal year, and would be subject to change based on the actual available funds prior to maintenance dredging. Therefore, this alternative would reduce hopper dredge use for maintenance dredging compared to the Proposed Action/Project and No Action/No Project Alternative, but it would not change the total amount of dredging in the channels, placement sites used, or standard operating procedures.

The MSC is typically dredged in the months of May and June; however, depending on the condition of the channel, equipment availability, and availability of funds, dredging has occurred as late as September. Maintenance dredging of the MSC using a hopper dredge (i.e., the *Essayons*, or similarly sized dredge) typically requires 10 to 14 days. If Pinole Shoal was selected as the additional channel, 5 to 15 days of additional hopper dredge use would occur, for a total of 15 to 29 days of hopper dredge use under this alternative, depending on the duration of dredging at each channel. If Richmond Outer Harbor was selected as the additional channel, 5 to 8 days of additional hopper dredge use would occur, for a total of 15 to 22 days of hopper dredge use under this alternative, depending on the duration of dredging at each channel.

The channel not selected as the additional hopper dredge channel (i.e., either Pinole Shoal or Richmond Outer Harbor) would be dredged with a mechanical dredge. Additionally, Suisun Bay Channel and New York Slough Channel and San Bruno Channel in Redwood City Harbor would be dredged with a mechanical dredge under this alternative, instead of a hopper dredge. The USACE would purchase 0.19 acre mitigation credit at the Liberty Island Conservation Bank annually for potential impacts to listed species if Pinole Shoal is dredged with a hopper. If Richmond Outer Harbor is dredged with a hopper, USACE would purchase 0.34 acre mitigation credit at the Liberty Island Conservation Bank annually for potential impacts to listed species.

All other dredging, placement activities, and BMPs would be as described for the Proposed Action/Project, including urgent action to remove the hazardous shoal at Bulls Head Reach as needed. If feasible, this activity would be completed with a mechanical dredge; however, because of the urgent nature of this activity, a hopper dredge may be used. Regular maintenance dredging of this area would be completed with a mechanical dredge.

## Reduced Hopper Dredge Use Alternative 2

Under Reduced Hopper Dredge Use Alternative 2, the government hopper dredge *Essayons*, or similarly sized hopper dredge, would be used to dredge the MSC. The MSC is typically dredged in the months of May and June; however, as stated above, depending on the condition of the channel, equipment availability, and availability of funds, dredging has occurred as late as September. Maintenance dredging of the MSC using a hopper dredge (i.e., the *Essayons*, or similar-sized dredge) typically requires 10 to 14 days; this would be the only hopper dredge use under this alternative, except potential use at Bulls Head Reach as noted below.

Pinole Shoal, Richmond Outer Harbor, Suisun Bay Channel and New York Slough Channel, and San Bruno Channel in Redwood City Harbor would be dredged with a mechanical dredge under this alternative, instead of a hopper dredge. All other dredging, placement activities, and applicable BMPs would be as described for the Proposed Action/Project, including urgent action to remove the hazardous shoal at Bulls Head Reach. If feasible, this activity would be completed with a mechanical dredge; however, because of the urgent nature of this activity, a hopper dredge may be used. Regular maintenance dredging of this area would be completed with a mechanical dredge.

## ENVIRONMENTAL CONSEQUENCES

Table ES-3 (at the end of this Executive Summary) presents a summary of impacts for the action alternatives, mitigation measures, and the NEPA and CEQA impact levels for each alternative after mitigation. Impacts of the No Action/No Project Alternative are presented in Chapter 3.0 for comparison to those of the action alternatives. As noted under the reduced hopper dredge use alternatives, the analysis of impacts is based on the assumption that USACE has obtained the authorization and funding to implement these alternatives by 2017.

## EVALUATION OF ALTERNATIVES

Because the No Action/No Project Alternative represents a continuation of USACE's current maintenance dredging practices, adverse impacts of the No Action/No Project Alternative would be similar to those of the Proposed Action/Project, because both alternatives involve use of the same dredge equipment type. However, adverse impacts to longfin smelt and delta smelt would be greater under the No Action/No Project Alternative, because there would be fewer measures implemented to minimize entrainment impacts to these species; these impacts would be significant under CEQA.

Under the action alternatives, no impacts are expected related to land use plans and hazards and hazardous materials.

Under the Proposed Action/Project and both reduced hopper dredge use alternatives, dredging and placement activities would have equivalent minor adverse impacts on sediments. Although not expected, inadvertent discovery of archaeological or paleontological resources could result in adverse cultural resource impacts under all alternatives; with implementation of the identified mitigation measures, these impacts would not be significant.

All action alternatives would have impacts on water quality, primarily from increased turbidity. Impacts would be greater under the reduced hopper dredge use alternatives compared to the Proposed Action/

Project, because mechanical dredging, which would be conducted in place of hopper dredging at certain locations, generates more turbidity than hopper dredging over a longer period of time. Nonetheless, under all alternatives, impacts would be short-term and minor.

Under the reduced hopper dredge use alternatives, there would be a minor increase of emissions compared to the Proposed Action/Project from increased mechanical dredge equipment use; however, the increase would not exceed the Bay Area Air Quality Management District significance thresholds.

All action alternatives would have minor adverse impacts on biological resources including: temporary, localized turbidity impacts on aquatic species and habitat, including eelgrass; temporary, localized disturbance of benthic habitat; temporary adverse effects on fish and marine mammals from underwater noise; temporary, localized interference with the movement or migration of fish and wildlife species (with the exception of entrainment risks discussed below); temporary, and localized impacts on avian foraging and roosting. Under all action alternatives the potential for project activities to result in biotoxicity impacts to aquatic organisms or increase the spread of invasive nonnative species would be minimal. Turbidity impacts on aquatic species from dredging would be longer in duration under the reduced hopper dredge use alternatives than under the Proposed Action/Project, but they would still be less than significant under NEPA and CEQA.

Entrainment of delta smelt and longfin smelt could occur during hopper dredging. Under the Proposed Action/Project, a hopper dredge would be used to dredge three in-bay channels and the Main Ship Channel annually; therefore, of the action alternatives, the Proposed Action/Project would have the greatest potential to result in entrainment impacts. The potential for entrainment impacts would be less under Reduced Hopper Dredge Use Alternative 1 because only one in-Bay channel and the Main Ship Channel would be maintained with a hopper dredge. The potential for entrainment impacts would be largely eliminated under Reduced Hopper Use Dredge Alternative 2 because hopper dredges would not be used for maintaining in-Bay channels after 2016. Under NEPA, project and cumulative impacts to delta smelt and longfin smelt from entrainment would be less than significant under all action alternatives. Under CEQA, project and cumulative impacts to delta smelt and longfin smelt from entrainment would be significant under the Proposed Action/Project, significant but reduced to less than significant with reduced hopper dredging and minimization and mitigation measures under Reduced Hopper Dredge Use Alternative 1, and less than significant under Reduced Hopper Dredge Use Alternative 2.

Entrainment of other special-status or commercially and recreationally important marine species also could occur during hopper dredging. Under NEPA, these impacts would be less than significant under all alternatives. Under CEQA, these impacts would be significant under all alternatives, but reduced to less than significant with implementation of the LTMS work windows and other standard practices intended to reduce the potential for entrainment.

Under all action alternatives, dredging activities may occasionally delay or temporarily impede some vessels using the federal navigation channels, resulting in short-term minor impacts on navigation. Mechanical dredges have a greater potential to impact navigation compared to hopper dredges, because they are stationary while operating and involve use of multiple vessels. Therefore, potential navigation impacts would be greatest under Reduced Hopper Dredge Use Alternative 2, because it maximizes use of mechanical dredges, and least under the Proposed Action/Project, but less than significant under any alternative.

As noted above, under CEQA, the Proposed Action/Project would have significant cumulative impacts to delta smelt and longfin smelt from entrainment. Under NEPA, the Proposed Action/Project would have less than significant cumulative impacts to delta smelt and longfin smelt from entrainment. Under NEPA and CEQA, the reduced hopper dredge use alternatives would have less than significant cumulative impacts to delta smelt and longfin smelt from entrainment. For all other resource areas under all action alternatives, the project, in combination with other past, present, and reasonably foreseeable future

projects, would not contribute to adverse cumulative impacts, or the project's contribution to cumulative impact would not be cumulatively considerable or significant.

### **COORDINATION AND CONSULTATION**

Since early 2013, public and agency participation has occurred as a part of the environmental review process, pursuant to the requirements of the NEPA and CEQA. Stakeholders and public agencies, including those with permitting authority for the project, have been engaged and involved in scoping and alternatives development as detailed in Chapter 4.