APPENDIX H

DRAFT SECTION 404(B)(1) EVALUATION

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Section 404(b) (1) Clean Water Act Compliance Evaluation
Delta Islands and Levees Feasibility Study

I. Introduction

This appendix evaluates compliance of the tentatively selected plan, Alternative SB-8, with the Guidelines established under the Federal Pollution Control Act (Clean Water Act) Amendments of 1972 (Public Law 92-500), as amended by the Clean Water Act of 1977 (Public Law 95-217), legislation collectively referred to as the Clean Water Act. The Clean Water Act sets national goals and policies to eliminate the discharge of water pollutants into navigable waters. Any discharge of dredged or fill material into waters of the U.S. by the Corps requires a written evaluation that demonstrates that a proposed action complies with the guidelines published at 40 CFR Part 230. These guidelines, referred to as the Section 404(b) (1) Guidelines or "Guidelines," are the substantive criteria used in evaluating discharges of dredged or fill material under Section 404 of the Clean Water Act.

Fundamental to the Guidelines is the precept that "dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern."

The procedures for documenting compliance with the Guidelines include the following:

- Examining practicable alternatives to the proposed discharge that might have fewer adverse environmental impacts, including not discharging into a water of the U.S. or discharging into an alternative aquatic site
- Evaluating the potential short- and long-term effects, including cumulative effects, of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment.
- Identifying appropriate and practicable measures to mitigate the unavoidable adverse environmental impacts of the proposed discharge
- Making and documenting the Findings of Compliance required by §230.12 of the Guidelines.

This Clean Water Act, Section 404(b)(1) evaluation of compliance with the Guidelines is not intended to be a "stand alone" document; it relies heavily on information provided in the integrated feasibility and EIS to which it is attached.

II. Project Description

A. Project Purpose

The Corps of Engineers, Sacramento District (Corps), and the State of California, Department of Water Resources (DWR) propose to restore 89.5 acres of emergent marsh habitat using dredged material in the west central portion of the Sacramento-San Joaquin Delta (Delta).

The remaining ecosystems in the Delta no longer maintain the functions and richness that historically defined the pre-channelized system. The measures of ecological health continue to decline without preventive or restorative actions. The Delta Islands and Levees Feasibility Study analyzes the feasibility of restoring intertidal habitat by subsidence reversal in the flooded areas of Big Break, Frank's Tract, and Little Frank's Tract.

B. Location

The project area is located approximately 2 miles west of the city of Antioch in the west central portion of the Delta (Figure 1) The area's approximate boundaries are the San Joaquin River and Threemile Slough on the north, Sacramento River and Sherman Lake on the west, south edge of Big Break and Dutch Slough on the south, and east edge of Frank's Tract and Fisherman's Cut on the east. The restoration sites include three submerged islands: Big Break (1,600 acres) and Little Frank's Tract (330 acres). The restoration work sites include parts of Big Break, Little Frank's Tract, dredged material disposal sites; and linear corridors of agricultural land between the disposal sites and the two flooded islands (see Figure 2 and 3). The borrow sites include McCormack Pit and Scour Pit located on Sherman Island, Decker Island Pit located on Decker Island, and Bradford Pit located on Bradford Island (Refer to Figure 4). The project area encompasses approximately 600 of land and open waters.

C. General Description

An initial array of 12 alternatives (including the No-Action Alternative) was developed by USACE and the local sponsor (DWR) during the alternatives formulation process. The alternatives represented varying combinations of measures. Alternatives were initially developed based on the USACE federal planning objectives for water resource projects, specific planning objectives developed for the feasibility study, and opportunities and constraints for implementing flood risk management activities. After formulation and refinement of the project alternatives, alternatives were ranked and screened based on NER benefits and implementation costs. Chapter 3 of the integrated report addresses in greater detail the alternative formulation process.

The Delta Islands and Levees Feasibility Study plan formulation process resulted in two action alternatives in the final array:

- Alternative 2. This alternative includes only increment 1 at Big Break (see Figure 3). The work would involve placing 500,000 cubic yards (cy) of material dredged from the Stockton Deep Water Ship Channel directly into open water habitat to restore 42 acres of intertidal marsh habitat. The restoration would be conducted over 5 years as part of the yearly Operations and Maintenance (O&M) dredging of the ship channel. The environmental effects of the O&M dredging and placement of material at the existing McCormick, Bradford, and Scour storage sites are evaluated in the Corps' San Francisco to Stockton Deepwater Ship Channel, Supplemental EIS, scheduled for final release in early 2015. Pumping of the wet dredged material from the O&M dredging ship to the proposed restoration site at Big Break is evaluated as part of the Delta Islands and Levees Feasibility Study

- Alternative 6 (Tentatively Selected Plan). This plan is the NER plan and includes increments 1, 2, 3, and 5 at Big Break and increment 1 at Little Frank's Tract (see Figure 3). The work would involve placing a total of 1,112,000 cy of dredged material into open water habitat to restore a total of 89.5 acres of intertidal marsh habitat. The restoration would be conducted over 5 years as part of the yearly O&M dredging of the ship channel. However, previously stockpiled dredged material obtained from the McCormick Pit, Bradford Island, Scour Pit, and Decker Island storage sites would also be placed in conjunction with the O&M placement to increase the area of restored habitat. The environmental effects of the O&M dredging and placement of material at the existing McCormick, Bradford, and Scour storage sites are evaluated in the Corps' San Francisco to Stockton Deepwater Ship Channel, Supplemental EIS. Removal and use of the stockpiled material are evaluated as part of the Delta Islands and Levees Feasibility Study EIS.

D. Background

The Delta was named an Ecosystem of National Significance through the EPBC Act in 2011. It is a critical link in the Pacific Flyway, a major north-south route of travel for migratory birds in America, and is protected through the Migratory Bird Treaty Act of 1918. Natural resource specialists agree that the remaining ecosystems in the Delta no longer maintain the functions and richness that defined the pre-channelized system, and that the measures of ecological health will continue to decline without preventive action. Not only is it certain that these natural systems will not recover their defining attributes under current conditions, it is unlikely that even the current, degraded ecological conditions can be sustained into the future. For example, delta smelt, key indicators of ecosystem health continue to decline in number throughout the watershed. Another example is the decline in populations of salmonids; commercially, recreationally, and culturally important fish species in the Delta.

There are numerous contributors to the ecological decline of Delta species and habitats, each of which has the capability to produce adverse impacts independently and/or in combination with other stressors. For example, pesticides, channelization, exotic and non-native invasive species, water supply diversions, agricultural and urban runoff, and wastewater discharges have all been identified as contributors of adverse impacts to the ecological health of the Delta ecosystem. Specifically, channelization of rivers and streams through the construction of levees has resulted in the widespread loss of tidal marsh, shaded riverine aquatic habitat, and the disconnection of floodplains from waterways. If this loss of Delta habitats and disconnection from floodplains continues, the current substantial declines in the Delta's fisheries could result in the extinction of culturally and economically critical species. Many of the defining characteristics of the pre-channelized ecosystem (spatial extent, habitat heterogeneity, and dynamic storage) have either been lost or substantially altered as a result of land use and water management practices during the past 100 years in California. Nearly 95 percent of the historic wetland habitat in the Delta has been converted to agricultural and urban uses.

E. Authority and Purpose

The Corps ensure that the project complies with the CWA, including Sections 404, 401, and 402. Placement of fill within jurisdictional wetlands and waters of the United States is required for the project. A Section 401 State Water Quality Certification for activities associated with implementation of the proposed project is required as a condition of Section 404, and the sponsor will submit a 401 certification application to the CRWQCB for each contract. The project would also require an NPDES permit, through the development of a SWPPP because the project would disturb more than 1 acre of project area.

The purpose of the Feasibility Study is to determine if there is a Federal interest in providing Flood Risk Management (FRM) and Ecosystem Restoration (ER) improvements in the Sacramento – San Joaquin Rivers Delta (Delta), California. Since each multipurpose measure has a FRM negative net benefit, which indicates FRM specific benefits are less than the FRM separable costs, these multipurpose measures cannot be economically justified as ecosystem restoration benefits and costs are added. For this reason, FRM measures will not be pursued.

A recommendation for plan selection was made by identifying the plan that reasonably maximizes environmental outputs relative to costs while meeting planning objectives and avoiding planning constraints. As all alternatives are cost effective, every alternative achieves the greatest number of outputs for a given cost; therefore, incremental costs per output were used to identify the NER Plan.

The O and M dredging actions are analyzed in the 'Sacramento River - San Francisco Bay to Stockton, California (John F. Baldwin And Stockton Ship Channels), Deep Water Ship Channel Maintenance Dredging And Bank Protection Project, California 10-Year Draft Programmatic Biological Assessment'. The process of transporting the dredge materials from the ship to the project sites is analyzed in the Delta Islands and Levees Feasibility Study EIS.

III. Final Array of Alternatives

A. Guidelines

Section 230.10 of the Guidelines dictates that, except as provided under §404(b)(2), "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have significant adverse environmental considerations." While the NEPA process, through the EIS, extensively examines alternatives and discloses all of their environmental impacts, the 404(b) (1) Evaluation focuses on the impacts of alternatives to the aquatic ecosystem. The Guidelines require choosing for implementation the practicable alternative that has the least damage to the aquatic ecosystem, assuming that this alternative has no significant adverse environmental impacts to other components of the environment, such as endangered species that occupy upland habitat. A "practicable alternative" is defined as "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."

The Guidelines also require that "where the activity associated with a discharge which is proposed for a special aquatic site does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise." The basic purpose of this project—to reduce flood risk to the Sutter basin study area—is water dependent, since the project purpose cannot be fulfilled outside the river.

B. Practical Alternative

The Guidelines further specify that where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge that do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless otherwise clearly demonstrated. The placement of dredge material at Big Break and Little Frank's Tract are the special aquatic site type in the project area. Section III, parts E and F describe the proposed activities for each reach.

For the purpose of a 404(b) (1) alternatives analysis, practicable alternatives include:

- Offsite alternatives—i.e., discharges of dredged or fill material at other locations in waters of the United States.
- On-site alternatives—these include project designs that do not involve a discharge of dredged or fill material into waters of the United States as well as project designs that have different impacts to waters of the U.S.

C. Off-Site Alternatives

The locations of this project were selected based upon the need to restore emergent marsh habitat using dredged material within sunken Delta Islands. Off-site alternatives therefore are not practicable at this time.

D. On-Site Alternatives

The two construction alternatives analyzed in detail through the NEPA process would each accomplish the identified project purpose. However, they would accomplish the project purpose to varying extents, with varying levels of benefits and varying adverse impacts to the aquatic ecosystem.

The following is a summary of project elements for each alternative. In general, Alternative 6 entails the greatest amount of emergent marsh habitat restoration (89.5 acres) and Alternative 2 a lesser amount (42 acres). These alternatives are described in greater detail in Chapter 3 of the integrated report EIS.

Alternative 2. The combined size of the potential placement sites would be 42 acres. The total work area including dredging, placement, and staging areas is approximately 100 acres.

The dredge materials will be placed within the functional floodplain inside the river channel complex. The potential placement areas are sunken islands comprised of peat soils. The proposed placement sites are devoid of terrestrial vegetationNative floating aquatic species include duckweed (Lemna spp.), water-meal (Wolffia spp.), and algae. Large expanses of the open-water habitat within the study area are dominated by the invasive nonnative species water hyacinth (Eichhornia crassipes). Submerged aquatic vegetation within the open water habitat in the study area is dominated by the nonnative species egeria (Egeria densa). The proposed work would be conducted three months from August 1st through October 31st pursuant to coordination with NMFS and FWS.

Alternative 6. The project area encompasses approximately 600 acres of both land and water including borrow and placement sites. The dredge materials will be placed within the functional floodplain inside the river channel complex. The potential placement areas are sunken islands comprised of peat soils. The proposed placement sites are devoid of terrestrial vegetation. Native floating aquatic species include duckweed (Lemna spp.), water-meal (Wolffia spp.), and algae. Large expanses of the open-water habitat within the study area are dominated by the invasive nonnative species water hyacinth (Eichhornia crassipes). Submerged aquatic vegetation within the open water habitat in the study area is dominated by the nonnative species egeria (Egeria densa). The proposed work would be conducted three months from August 1st through October 31st pursuant to coordination with NMFS and FWS.

E. General Description and Quantity of Dredged or Fill Material

The wet dredge materials from O and M activities are comprised of organics, silts, sands, and gravel which have accumulated within the deep water ship channels on the Sacramento and San Joaquin rivers. Maintenance operations remove the materials to maintain deep draft commercial ship passage. Existing stockpiled dry dredged materials from the O and M activities are comprised of the same channel wet excavation materials, organics, silts, sands, and gravel.

Table 1-1 and 1-2 provides a general description of the quantity and fill materials for each site within the project. Permanent and temporary impacts are a result of Sacramento District Corps Environmental Planning Section.

F. Description of the Proposed Discharge Site(s)

Alternative 2

The work would involve permanently placing a total of 500,000 cy of dredged material into open water habitat to restore a total of 42 acres of intertidal marsh habitat. A total of 500,00 cy of wet dredge material would be directly placed into Big Break from O&M dredging actions within the Stockton Deep Water Ship Channel.

Table 1-1 Big Break Fill Material Schedule

Increment	Year Constructed (Fiscal Calender)	Material Source	Placement Method	Fill Volume (cubic yards)	Permanent Impacts (acres)	Temporary Impacts (acres)
1	2018-2023	O&M Dredging	Wet Direct Placement Pumping	500,000	41.9	41.9
2	2019	McCormack Stockpile	Dry to Wet Slurry Pumping	124,000	10.4	10.4
3	2020	Scour Pond Stockpile	Dry to Wet Slurry Pumping	210,000	17.6	17.6
5	2021	Decker Island Stockpile	Dry to Wet Slurry Pumping	125,000	10.4	10.4
Totals	-	-	-	**959,000**	**80.3**	**80.3**

Table 1-2 Little Frank's Fill Material Schedule

Increment	Year Constructed	Material Source	Placement Method	Fill Volume (cubic yards)	Permanent Impacts (acres)	Temporary Impacts (acres)
1	2022	Bradford Stockpile	Dry to Wet Slurry Pumping	153,000	9.2	9.2
Totals	-	-	-	**153,000**	**9.2**	**9.2**

Alternative 6

The work would involve permanently placing a total of 1,112,000 cy of dredged material into open water habitat to restore a total of 89.5 acres of intertidal marsh habitat. At total of 500,00 cy of wet dredge material would be directly placed into Big Break from O&M dredging actions within the Stockton Deep Water Ship Channel. An additional 459,000 cy of dry stock piled dredge material. A total of153,000 cy of dry stock piled dredge material would be placed in Little Frank's Tract.

The borrow sites for Alternative 6 do not involve filling of waters of the United States. The sites are previously disturbed for the purpose of stockpiling dredge materials. The USFWS has designated specific areas at Scour Pit as protected wetlands. Therefore proper conservation measures ensure that existing wetlands are not disturbed. Drainage ditches exist at the perimeters of the borrow pit sites. The drainage ditches allow for wet dredge materials to leach out residual water. The drainage systems return to the adjacent river systems. The drainage ditches would not be affected by the removal existing dry stockpiled dredge materials.

G. Timing and Duration of Discharge

The construction activities that would affect the waters of the U.S. would be conducted over five years (2018-2023). The work window is August 1 through October 31. Both wet and dry dredge material placement would occur in the same word window previously listed.

H. Description of Disposal Method

Wet Dredge Material Placement. Wet material would be pumped from the dredging ship directly to the placement sites at Big Break. Materials would be pumped to the proposed project areas through a submerged weighted 18" double wall high density plastic extrusion (HDPE) pipe. The piping system would be placed along the shoreline of the Stockton Deepwater Ship Channel in the San Joaquin River The pipeline would be submerged and weighted to the bottom when necessary to avoid navigation hazards. A floating repeater pump station would be positioned every 3 miles to aid slurry flow. Work boats would install and maintain the floating pipeline to Big Break placement sites from the dredging ship. An additional work boat and crew would tender the position of the outfall slurry pipe during pumping operations to ensure correct placement of materials.

Dry Stockpile Dredge Material Placment. Existing dredged materials from the stockpile sites would be pumped to the proposed project areas through 18" double wall high density plastic extrusion (HDPE) pipe. A hydraulic slurry hopper at the stockpile site would create the fluidization process necessary to transport the dredged stockpile materials. Water necessary for the process would be siphoned from the adjacent rivers by a hydraulic pump and transferred to the slurry hopper. The hopper mixes dredge materials with water creating a 90 percent water based slurry solution which is pumped through the HDPE piping network. In-water piping which is not anchored to the bottom would float at the surface by means of floatation devices. A work boat and crew would tender the position of the floating pipe and outfall pipe during pumping operations to ensure safe and correct alignment and placement of materials.

The stockpiled dredge materials would be pumped August through November over four years. During the first year of construction dredge materials from the McCormack Pit site would pumped to the Big Break restoration areas. The McCormack Pit site would then serve as a permanent repeater pump site for the subsequent years. In year 2, additional pump would be positioned at Sherman Island Scour Pond Decker Island, and then moved the following year to Decker Island. The Bradford Island site would be pumped to Little Frank's Tract in year one. Refer to Table 3 for pump station position by year and material destination. Figure E shows the proposed piping layout schematic.

Pipe crossings at the Sacramento and San Joaquin navigable channels would require temporary submerged piping for the life of the project. Pipe segments would be weighted to the bottom in order to avoid impacts to shipping and recreation. A specialized marine craft with a crane and would be required for the pipe weighting process. Temporary weighting would occur at the Decker Island to Sherman Island (Sacramento River) and Sherman Island to Jersey Island (San Joaquin River) crossings. Additional in-water piping would be temporarily weighted to the

channel bottom. The pipes would be moved as necessary by tender boat crews for safety, vessel passage, and pumping logistic purposes. Pipes crossing the deep water shipping lanes would be placed in locations which provide adequate clearance from top of pipe to deep draft shipping vessel hulls. The contractor would be required to work with Port and Corps representatives to determine proper channel bottom locations of temporary pipe crossing based on recent sounding reports. In-water piping that is not weighted to the bottom would float at the surface by means of floatation devices. The floatation devices and marker buoys would be required to meet U.S Coast Guard requirements.

IV. Factual Determinations (Section 230.11)

A. Physical Substrate Determinations (consider items in Section 230.11 and 230.20 Substrate)

(1) Substrate Elevation and Slope. The current bottom of channel elevations average -2.44 ft for Big Break and -5.42 ft for Little Frank's Tract. Alternative 2 and 3 finish grade elevations for the marsh restoration islands was calculated at an elevation between -2.0ft to 0.5ft relative to mean water level.

(2) Sediment Type. Soils and sediment type for both Alternatives 2 and 3 are composed of river deposits which include organics, silts, sands, and gravel.

(3) Dredged/ Fill Material Movement:

a) Fill: Alternatives 2 and 3 require permanent filling of open channel water habitat. Placement of new fill materials would be below or at the ordinary high water mark and may have an effect on hydraulic movement of sediments resulting in recruitment at newly filled areas. Migration of fill material may be possible since construction methods used to create the marsh habitat areas require the use of high turbidity slurry materials.

(4) Physical Effects on Benthos (burial, changes in sediment type, etc.).

a) Fill: Alternatives 2 and 3 require permanent filling of open channel water habitat. Placement of new fill materials would be below or at the ordinary high water mark would have a short term effect on benthic organisms.

Alternative 2: Alternative 2 would have short term effects on 42 acres of the existing benthic zone. The existing habitat and benthic zone is considered poor quality due to invasive sub-aquatic plants. The project would result in a long term increase of primary productivity (benthos) in the area and habitat quality while potentially eradicating 42 acres of invasive sub-aquatic plant species. Alternative 6 would result in 48 more acres of long term benthos production than Alternative 2.

Alternative 6. Alternative 6 would have short term effects on 89.5 acres of the existing benthic zone. The existing habitat and benthic zone is

considered poor quality due to invasive sub-aquatic plants. The project would result in a long term increase of primary productivity (benthos) in the area and habitat quality while potentially eradicating 89.5 acres of invasive sub-aquatic plant species.

(5) Turbidity

a) Fill: Alternatives 2 and 3 require permanent filling of open channel water habitat Placement of new fill materials would be below or at the ordinary high water mark would have a short term effect on turbidity.

Alternative 2: Alternative 2 would have short term effects on turbidity. Turbidity and silt curtains, sacrificial hay bales, and geotextile containers would be used to contain sediments and reduce turbidity. Effects from turbidity would be short term.

Alternative 6. Alternative 6 would have short term effects on turbidity. Turbidity and silt curtains, sacrificial hay bales, and geotextile containers would be used to contain sediments and reduce turbidity. Alternative 6 would produce a large effect on turbidity since the alternative is 48 acres larger than Alternative 2. The effects from turbidity would be short term.

(6) Actions Taken to Minimize Impacts. Best Management Practices (BMP's) will be employed to avoid and turbidity and entrainment of aquatic species:

Install fish screens, or other appropriate fish exclusion devices, to prevent entrainment of fish into water intakes of the pumps used for any portion of the project. These pumps would be used to transport dredged material to the site from previous disposal sites through pipelines across parts of the Delta and from hydraulic off-loaders.

Incorporate best management practices during construction to prevent excess sedimentation plumes into any of the existing and proposed wetland areas.

B. <u>Water Circulation, Fluctuation, and Salinity Determinations</u>

(1) Consider effects on (for both Alternatives 2 and 3:

a) Salinity. No significant effect.
b) Water Chemistry (pH, etc.). No significant effect.
c) Clarity. No significant effect.
d) Color. No significant effect.
e) Odor. No significant effect.
f) Taste. No significant effect.
g) Dissolved Gas Level. No significant effect.

h) Nutrients. No significant effect.
i) Eutrophication. No significant effect.
j) Others as Appropriate. No significant effect.

(2) Current Patterns and Circulation (for both Alternatives 2 and 3 :). No significant effect.

(3) Normal Water level Fluctuations (for both Alternatives 2 and 3 :): No significant effect.

(4) Salinity Gradients (for both Alternatives 2 and 3): No significant effect.

(5) Actions That Will Be Taken to Minimize Impacts (for both Alternatives 2 and 3). Since disturbance throughout the project is greater than 1 acre, the contractor would be required to file and adhere to a file and adhere to an In Water Work Plan.

C. Suspended Particulate/ Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site (for both Alternatives 2 and 3). No significant effect.

(2) Effects, Degree, and Duration on Chemical and Physical Properties of the Water Column (for both Alternatives 2 and 3):

a) Light Penetration. No significant effect.
b) Dissolved Oxygen. No significant effect.
c) Toxic Metals and Organics. No significant effect. Dredge materials from the deep water ship channels is collected and tested prior to removal. The Corps maintains records of all materials currently held in dry land stockpile sites. A chemical analysis of the existing project site channel bottom would be conducted prior to the filling with existing dredge materials. The project site channel bottom samples would serve as the baseline by which fill materials chemical analysis must be at or below the existing baseline threshold. Existing samples from sites surrounding the project areas indicate that the dry land stockpile dredge materials would meet baseline thresholds. Future dredge materials from O and M activities would be measured against the baseline thresholds. Materials not meeting the baseline would be stockpiled and not used as fill.
d) Pathogens. Not applicable.
e) Esthetics. Not applicable.
f) Others as Appropriate. No significant adverse effects to the chemical and physical properties of the water column are anticipated.

(3) Effects on Biota (for both Alternatives 2 and 3):

Primary Production, Photosynthesis. No significant adverse effects to the primary production and photosynthesis processes are anticipated.

(Suspension/ Filter Feeders. No significant adverse effects to suspension and filter feeders are anticipated.
Sight Feeders. No significant adverse effects to sight feeders are anticipated.

(4) Actions Taken to Minimize Impacts (for both Alternatives 2 and 3). Since disturbance throughout the project is greater than 1 acre, the contractor would be required to file and adhere to an In Water Work Plan.

D. Contaminant Determinations. The proposed project Alternatives 2 and 3 would not add contaminants the river channel system. Best management practices to reduce the potential of accidental spills during gravel injection would follow all regulatory requirements in conjunction with the National Pollution Discharge Elimination System permitting process.

E. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton. The proposed project Alternatives 2 and 3 would have no affect on plankton communities.

(2) Effects on Benthos. The proposed project Alternatives 2 and 3 would have no effect on benthos communities.

(3) Effects on Nekton. The proposed project Alternatives 2 and 3 would have no effect on nekton communities.

(4) Effects on aquatic Food Web. The proposed project Alternatives 23 and 3 would have no effect on the aquatic food web, or the plankton, benthic and nekton communities with the proposed project.

(5) Effects on Special Aquatic Sites.

a) Sanctuaries and Refuges. The proposed project Alternatives 2 and 3 would require work in the Frank's Tract State Recreation Area. Appropriate conservation measures and BMP's would be utilized to reduce impacts to wildlife resources. Any potential impacts would be temporary and less than significant for both alternatives.
b) Wetlands. None exist in project area.
c) Mud Flats. None exist in project area.
d) Vegetated Shallows. None exist in project area.
e) Coral Reefs. None exist in project area.
f) Riffle and Pool Complexes.

(6) Threatened and Endangered Species**.**

a) Alternatives 3 and 2 are not likely to result in adverse water quality or noise effects on migrating adult and juvenile winter or spring run Chinook salmon, steelhead, green sturgeon, and Delta smelt and their critical habitat. Restriction of all work activities to the proposed construction footprints and work calendar (August 1 through October 31). The

adherence to all turbidity, sediment, and chemistry control as dictated in the In Water Work Plan would further minimize the potential for project-related increases in turbidity and suspended sediment in the Big Break and Little Frank's Tract project areas. Implementation of a spill prevention control and countermeasure plan and slurry spill/pipe breach contingency plan is anticipated to minimize the potential for toxic or hazardous spills or discharges into the project area. Based on the location and duration of tender boat activities and other noise-generating activities, potential noise and vibration impacts on fish are expected to be negligible.

b) Alternatives 2 and 3 are not likely to result in adverse modification of the Primary Constituent Elements (PCE) of critical habitat of on winter or spring run Chinook salmon, steelhead, green sturgeon, and Delta smelt. There would be a direct physical modification of sub-aquatic vegetation within the designated critical habitat of these species below the high water mark. Temporary and permanent losses of submerged aquatic vegetation would be limited to approximately 42 acres (Alternative 2) and 90 acres (Alternative 6) of sub-aquatic vegetation within the permanent and temporary footprints of the project below the OHWM. The majority of sub-aquatic plant species within the project area open water habitat is dominated by the nonnative species egeria (Egeria densa). This introduced species is prevalent in the Delta, and it is currently targeted for abatement by the California Department of Boating and Waterways (DBW). The project would eradicate up to 42 acres (Alternative 2) and 90 acres (Alternative 6) of egeria while provide long term primary productivity for aquatic species. Alternative 6 would result in 48 acres of long term primary productivity.

(7) Other Wildlife. The proposed project action would have no significant adverse effect on wildlife because construction window is limited to specific areas and during non-migratory periods. The duration of adverse effects is temporary. Any displaced wildlife would be expected to return to the area after the action is completed.

(8) Actions to Minimize Impacts.

F. Proposed Disposal Site Determinations

(1) Mixing Zone Determination (for both 2 and 3) The project is not anticipated to increase salinity levels within the Big Break or Little Frank's Tract areas. The project will not anticipated to further advance the current X2 salinity demarcation line.

(2) Determination of Compliance with Applicable Water Quality Standards (for both Alternatives 2 and 3). No water quality or effluent standards would be violated during proposed project action. All project actions would be performed

with strict adherence to the In Water Work Plan developed with Federal and State agency partners.

(3) Potential Effects on Human Use Characteristics (for both Alternatives 2 and 3). The proposed project would not have any significant adverse effects to municipal and private water supply, recreational and commercial fisheries, or water-related recreation. Any displacement of recreational activities would be temporary. The project is anticipated to increase long term recreational experiences and opportunities by increasing the habitat quality.

G. Determination of Cumulative Effects on the Aquatic Ecosystem

The potential cumulative impacts from implementation of the Preferred Alternative (Alternative 6) considered with other relevant actions in the general vicinity of the Delta Islands and Levees Feasibility Study, have been assessed and are discussed in Section 5.11 of the EIS. Nearly all potentially significant impacts from Alternatives 2 and 3 could be reduced to less than significant levels by mitigation measures specified in this EIS. The Alternatives would not have any significant cumulative effects on the aquatic ecosystem. Implementation of the either the TSP/NER (Alternative 6) or the Alternative 2 will provide sub-aquatic primary productivity and terrestrial refugia for migratory species which results in ecosystem restoration benefits to the Delta.

H. Determination of Secondary Effects on the Aquatic Ecosystem

Secondary effects (or impacts) are "effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material" (40 CFR 230.11(h) (1)). Therefore, secondary effects are limited to other actions in the aquatic environment that are indirectly related to implementation of the action, such as erosion or downstream sedimentation, or compensatory mitigation.

Implementation of Alternative 2 or the TSP/NER Alternative 6 could result in the potential secondary impacts such as the unintentional placement of fill material outside of the proposed project area, and an increase in contaminants from construction vehicles and equipment. These actions could result in additional adverse impacts to water quality, accretion patterns, aquatic and other wildlife habitat, recreation, aesthetics and air quality. To help minimize impacts associated with the placement of fill material outside the proposed project area, Corps construction contracts require that the contractor delineate the project boundaries, and install proper BMP's within the project area such as turbidity and silt curtains. Additionally, the contractor will be required to adhere to the details of an In Water Work Plan which prevents or reduces adverse impacts to water quality from turbidity or chemical spills.

V. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

A. Adaptation of the Section 404(b) (1) Guidelines to this Evaluation: No significant adaptations of the guidelines were made relative to this evaluation of the TSP/NER Alternative 6 or Alternative 2.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Impact on the Aquatic Ecosystem:

Alternative 2 creates 42 acres of temporary impacts to wildlife, recreation, water quality, and impacts to the waters of the United States and associated aquatic systems. Alternative 6 creates 90 acres of temporary impacts to wildlife, recreation, water quality, and impacts to the waters of the United States and associated aquatic systems. Alternatives 2 and 3 create permanent impacts to the waters of the United States by conversion of open water habitat to tidal marsh habitat. The restored tidal marsh would have a higher value habitat than the existing open water habitat. The total project area for Alternative 6 is 90 acres compared to Alternative 2 which is 42 acres. Therefore, Alternative 6 creates more impact to the waters of the United States based upon the additional 48 acres of proposed work. No alternative exists which does not involve discharge of fill materials into waters of the U.S.

Alternative 2 does not provide the range and extents of ecosystem benefits and study objectives as Alternative 6. Alternative 2 involves discharge of fill materials into the waters of the U.S. and has less adverse effects on the aquatic ecosystem than Alternative 6. However, Alternative 2 does not meet the study's planning objectives. A recommendation for alternative selection was made by identifying the plan that reasonably maximizes environmental outputs relative to costs while meeting planning objectives and avoiding planning constraints.

The TSP/NER (Alternative 6) meets the Corps 404 (b) (1) permit criteria of the least environmentally damaging practical alternative (LEDPA). The 404 (b)(1) guidelines, § 230.3 Definitions (q) define practicable as 'a means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes'. Alternative 6 is the most reasonably efficient contribution to the California Delta ecosystem, restoring 90 acres of tidal marsh habitat. Millions of Federal dollars have been spent in recent decades to study the Delta; yet very little restoration has occurred. This plan would allow progress to be made toward significant, cost-effective ecosystem restoration, while beneficially using previously dredged material and future dredged material from USACE projects. The project creates several benefits:

- Creates 90 acres of long term high value habitat producing primary productivity benefiting migratory avian and aquatic species, and threatened and endangered species (Delta Smelt and Giant Garter Snake)
- Removes stockpiles dredge material inventory and creates additional storage space for future O and M actions.
- Increase recreation opportunities in an area with evident recreation by creating higher value habitat which attracts avian and aquatic species.

Appropriate conservation measures and BMP's to minimize potential adverse impacts of the discharge on the waters of the United States and associated aquatic systems would be implemented. The proposed disposal sites for the discharge of dredge materials would meet construction and In Water Work Plan specifications and guidelines and comply with the requirements of practicable conditions and measures to minimize pollution or adverse effects to

the aquatic ecosystem. No mitigation should be necessary (other than air quality). The project is designed to avoid affects to other habitat types and therefore no additional mitigation is necessary. Additionally, The Corps would not mitigate for the open water area that is filled because the habitat affected by the project is being converted to higher value habitat.

C. Compliance with Applicable State Water Quality Standards, and; Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act: State water quality standards would not be violated. Alternatives 2 and 3 would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

D. Compliance with Endangered Species Act (ESA) of 1973: The Corps has initiated consultation with USFWS and NOAA Fisheries under Section 7 of the Endangered Species Act (16 U.S.C. 1536[c]) for potential effects to listed species and their critical habitats for both Alternatives 3 and 2. All terms and conditions of a subsequent Biological Opinion from the USFWS will be fully implemented.

E. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972: Not applicable to both Alternatives 2 and 3.

F. Compliance with Rivers and Harbors Act of 1899; 33 U.S.C. 403, *et seq.*. The Rivers and Harbors Act of 1899, Section 10. Alternative 2 or 3 would not result in unauthorized obstruction or alteration of any navigable water of the U.S. Both alternatives would require work In Water Work Plans which require that no project action may interfere with river commerce or alter the navigable shipping lane. Both project sites are not within the Sacramento or San Joaquin deep water shipping lanes.

G. Evaluation of Extent of Degradation of the Waters of the United States: The placement of fill materials would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife would not be adversely affected. No significant adverse or long term effects on aquatic ecosystem diversity, productivity and stability, recreational, aesthetic, and economic values would occur.

(1) Significant Adverse Effects on Human Health and Welfare (Alternatives 2 and 3).

a) *Municipal and Private Water Supplies*. No significant effect.
b) *Recreation and Commercial Fisheries*. No significant effect.
c) *Plankton*. No significant effect.
d) *Fish*. No significant effect.
e) *Shellfish*. No significant effect.
f) *Wildlife*. No significant effect.
g) *Special Aquatic Sites*. No significant effect.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems. Temporary and not significant none for both Alternatives 2 and 3.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity, and Stability. Temporary and not significant none for both Alternatives 2 and 3.

(4) Significant Adverse Effects on Recreational, Esthetic, and Economic Values. Temporary and not significant. None for both Alternatives 2 and 3 .

End of Evaluation

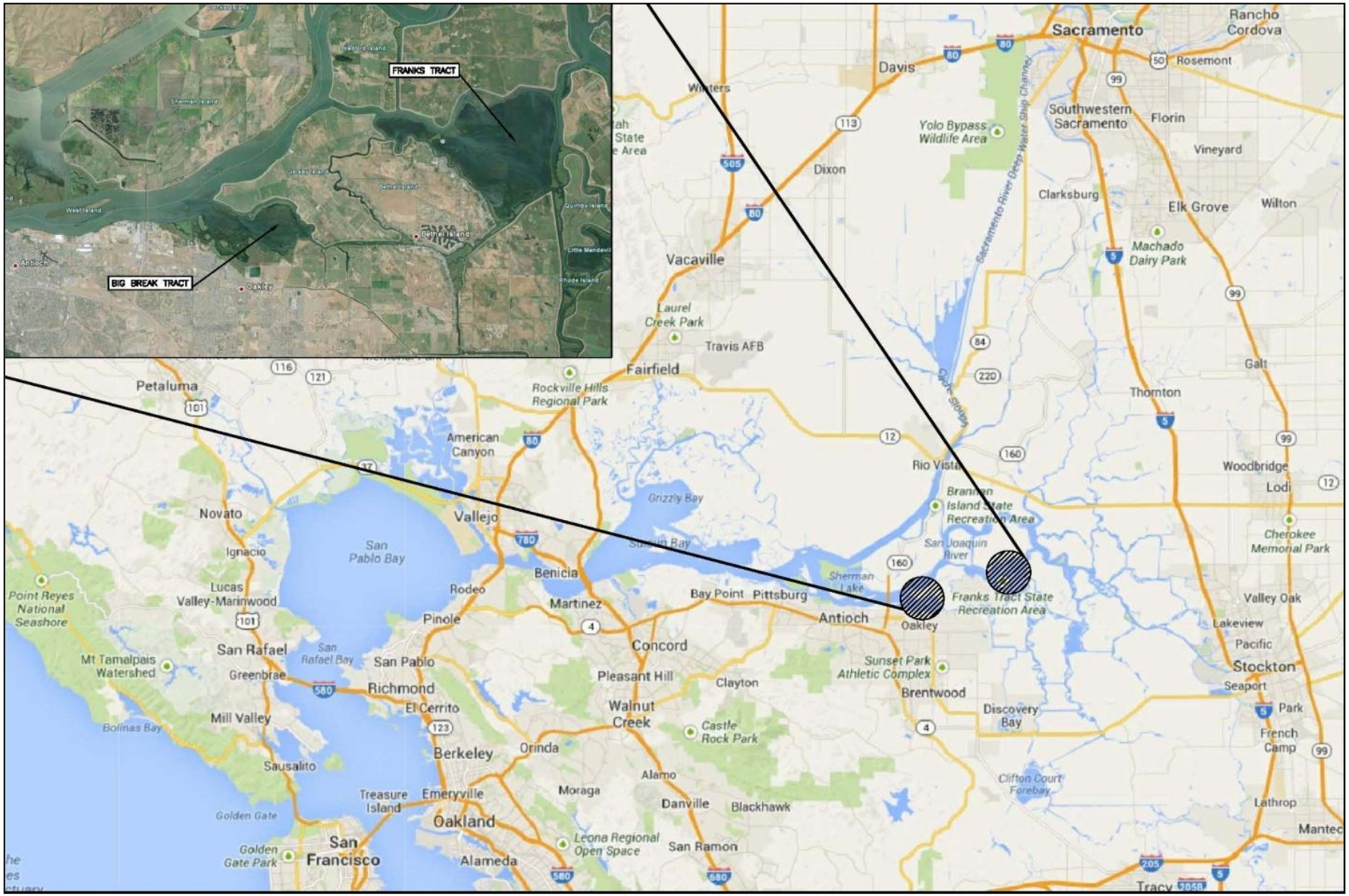


Figure 1. Project Area Locations

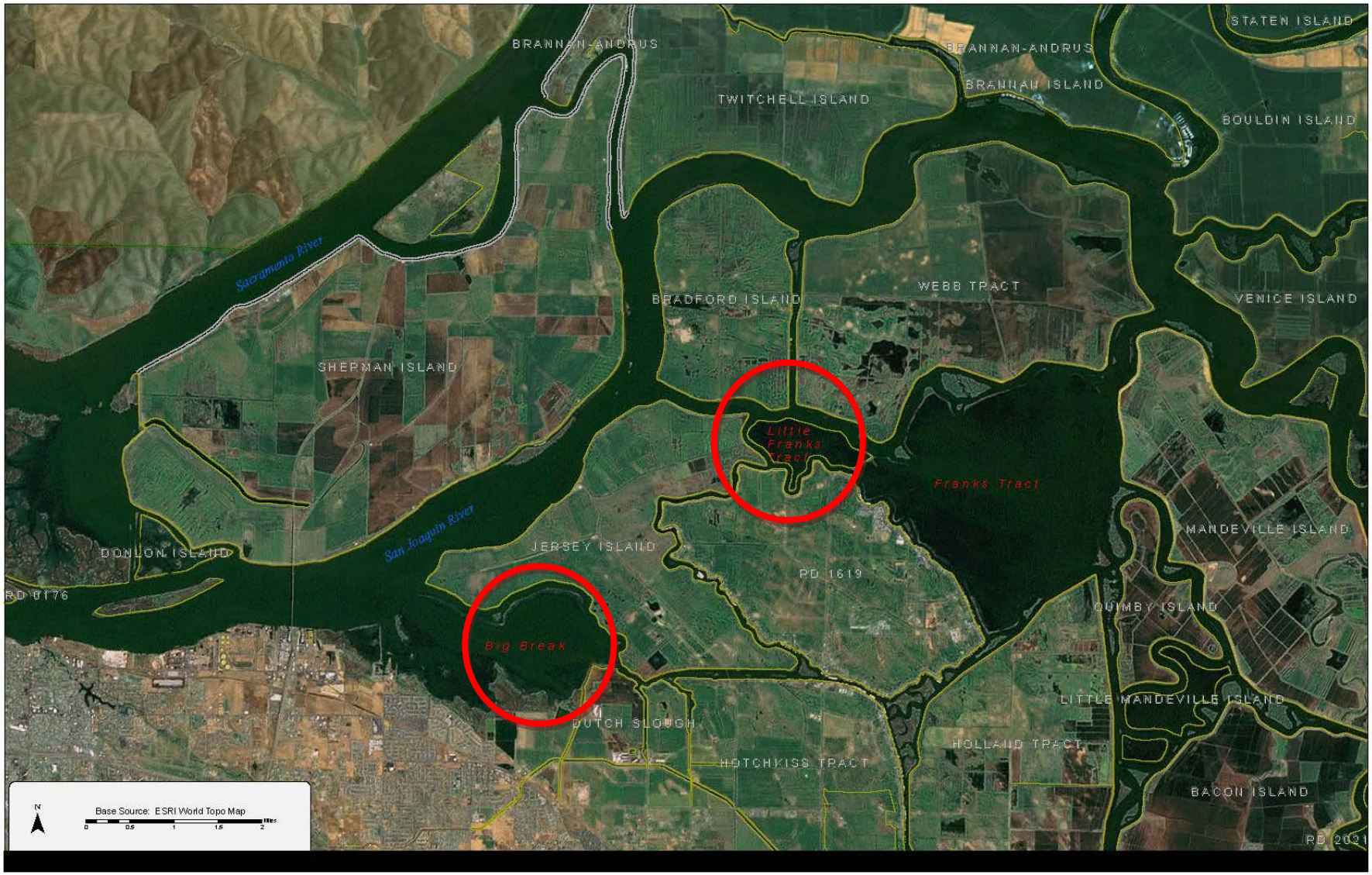
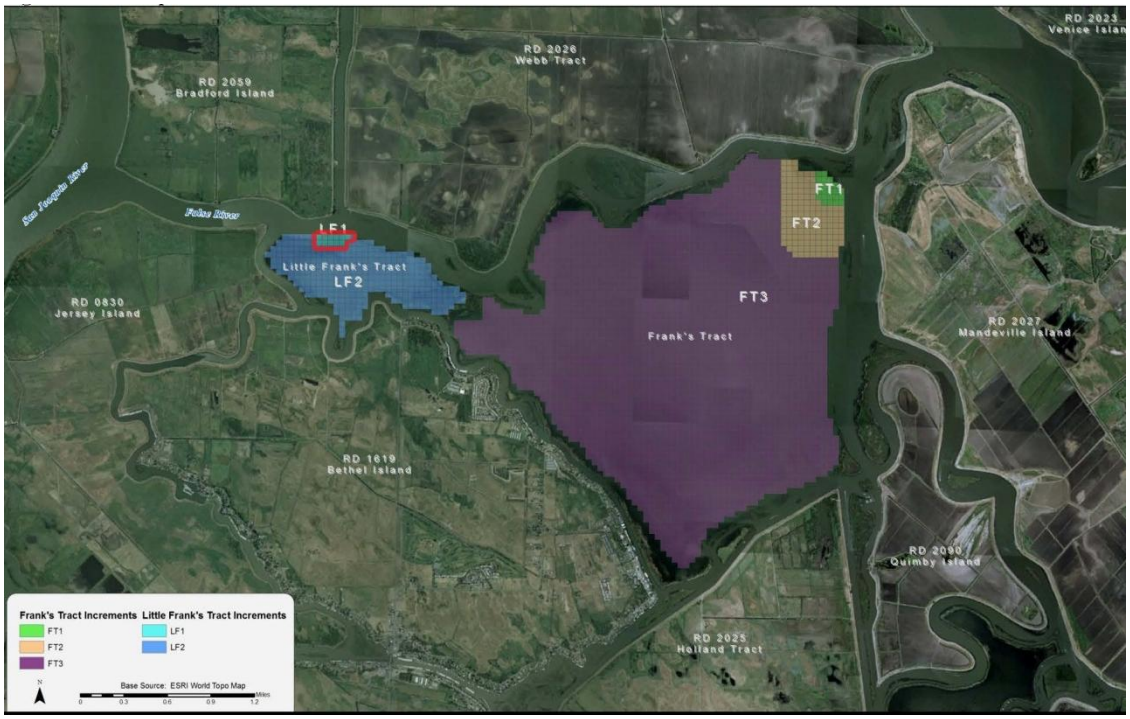


Figure 2. Project Area Locations



Little Frank's Tract (one square equals one acre). Red outline indicates project area.

Big Break (one square equals one acre). Red outline indicates project area.

Figure 3. Big Break and Little Frank's Tract Alternative Increments

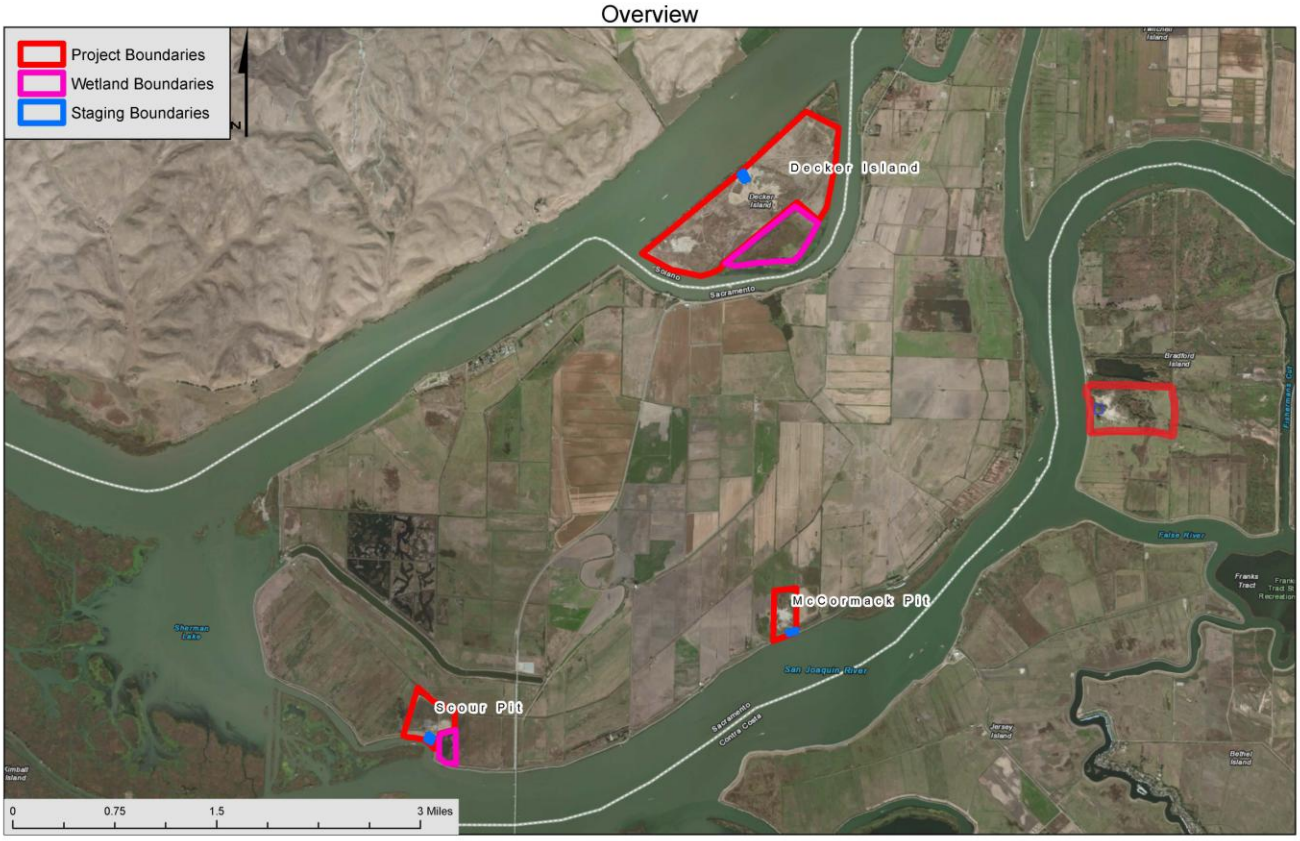
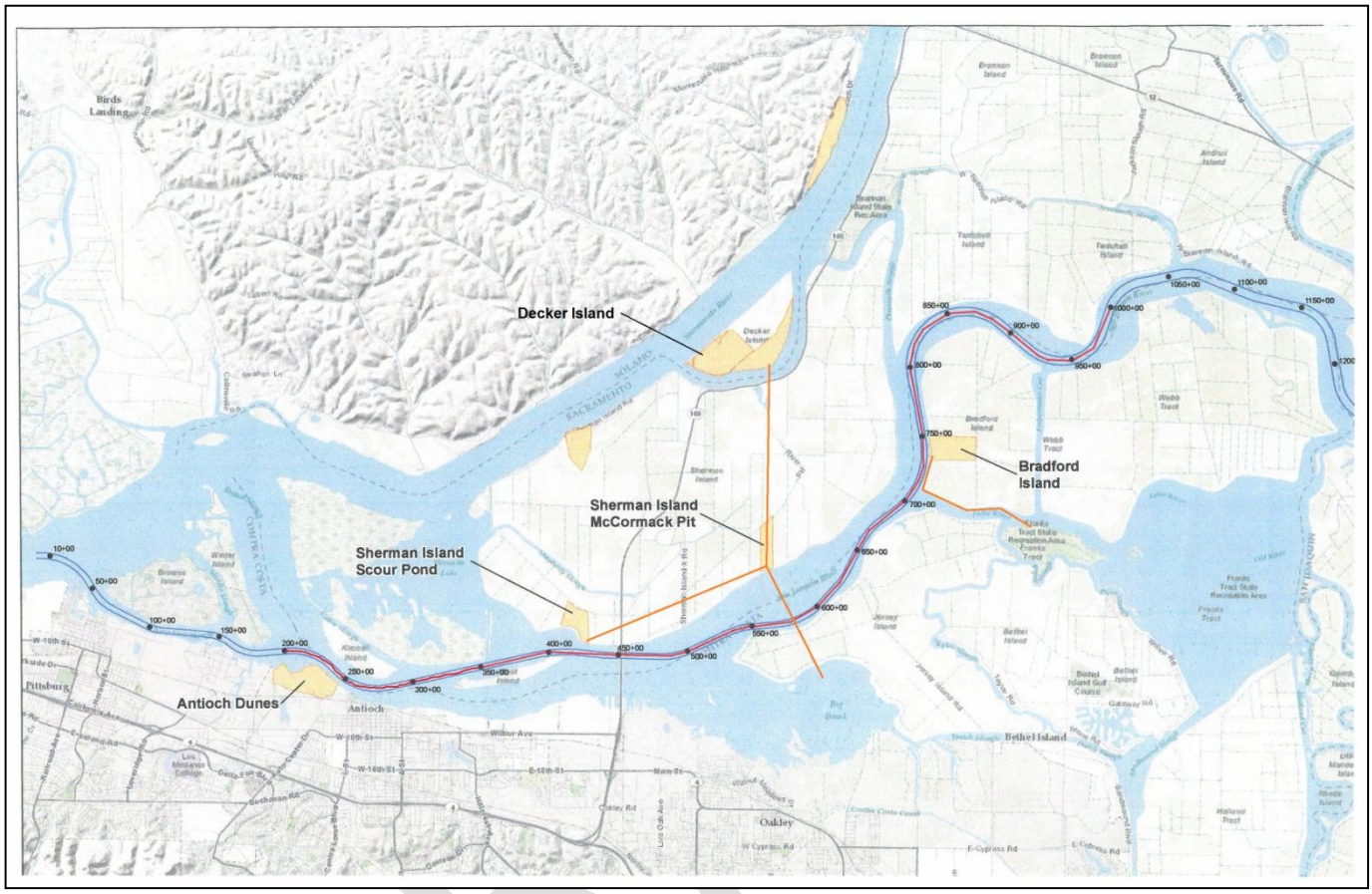


Figure 4. Borrow Site Overview Map



Legend

Proposed 2015-2020 Channel Dredging: Station Points 200+00 to 1000+00

Proposed Slurry Piping Layout

Figure 5. Proposed Channel Dredging & Existing Material Placement Site Location Map