Initial Study & Mitigated Negative Declaration

Suisun Marina October and November Maintenance Dredging Project

June 10, 2019

Lead Agency:

City of Suisun City
701 Civic Center Blvd.
Suisun City, CA, 94585

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIST OF ACRONYMS AND ABREVIATIONS

ARB	Air Resources Board
BAAQMD	Bay Area Air Quality Management District
BMPs	Best Management Practices
CAP	Climate Action Plan
CARB	California Air Resources Board
CBR	California Black Rail
CCR	California Code of Regulations
CDC	California Department of Conservation
CESA	California Endangered Species Act
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CH	Critical Habitat
City	City of Suisun City
CNDDB	California Natural Diversity Database
CNEL	Community Noise Exposure Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CRPB	California Rare Plant Bank
CWA	Clean Water Act
CY	Cubic Yards
dB	Decibel
DMMO	Dredged Material Management Office
DPM	Diesel Particulate Matter
DPS	Distinct Population Segment
EIR	Environmental Impact Report
EPA	U.S Environmental Protection Agency
ESA	Endangered Species Act
FGC	Fish and Game Code
GHG	Greenhouse Gas
HCP	Habitat Conservation Plan
HDPE	High-Density Polyethylene
hp	Horsepower
IS	Initial Study
IS/MND	Initial Study / Mitigated Negative Declaration
ITP	Incidental Take Permit
lb	Pound
LUST	Leaking Underground Storage Tank

MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendant
MLLW	Mean Lower Low Water
MLRA	Major Land Resource Area
MSHCP	Multiple Species Habitat Conservation Plan
MND	Mitigated Negative Declaration
MRZ	Mineral Resource Zone
mty	Metric Tons Per Year
NAHC	Native American Heritage Commission
ND	Negative Declaration
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NOI	Notice of Intent
PCE	Primary Constituent Element
PM	Particulate Matter
PM_{10}	Particulates 10 microns or less in diameter
$PM_{2.5}$	Particulates 2.5 microns or less in diameter
PRC	Public Resources Code
the "Project"	Suisun Marina October and November Maintenance Dredging Project
RCCR	Ridgway's (California Clapper) Rail
ROG	Reactive Organic Gas
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SFBAAB	San Francisco Bay Area Air Basin
SMHM	Salt Marsh Harvest Mouse
SO_2	Sulfur Dioxide
SSC	Species of Special Concern
TAC	Toxic Air Contaminants
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound

1.0 INTRODUCTION

1.1 Summary

The City of Suisun City (City) has determined that the proposed Suisun Marina October and November Maintenance Dredging Project (Project), and the required discretionary actions of the City for the Project, require compliance with the guidelines and regulations of the California Environmental Quality Act (CEQA). This Initial Study and Mitigated Negative Declaration (IS/MND) addresses the direct, indirect, and cumulative environmental effects associated with the proposed Project.

This IS/MND has been prepared in conformance with the California Environmental Quality Act of 1970, as amended (Public Resources Code Section 21000 *et seq.*); Section 15070 of the State Guidelines for Implementation of the California Environmental Quality Act of 1970 ("CEQA Guidelines"), as amended (CCR, Title 14, Chapter 3, Section 15000 et seq.); and applicable requirements of the Lead Agency, the City of Suisun City.

This IS/MND has determined that the proposed Project would result in potentially significant environmental impacts; however, mitigation measures are proposed that would reduce any potentially significant impact to less than significance levels. As such, an IS/MND is deemed as the appropriate document to provide the necessary environmental evaluations and clearance.

1.2 Statutory Authority and Requirements

In accordance with California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000-21177) and pursuant to Section 15063 of the CEQA Guidelines set forth at Title 14 of the California Code of Regulations (CCR), the City of Suisun City (City) is the Lead Agency for the "Project" undergoing environmental review in this document. Acting in the capacity of CEQA Lead Agency, the City is required to undertake the preparation of an Initial Study (IS) to provide the City with information to use as the basis for determining whether an Environmental Impact Report (EIR), Negative Declaration (ND), or Mitigated Negative Declaration (MND) would be appropriate for providing the necessary environmental documentation for the proposed Project.

The purpose of an IS is to: (1) identify potential environmental impacts; (2) provide the Lead Agency with information to use as the basis for deciding whether to prepare an EIR or ND; (3) enable the project sponsor/applicant or Lead Agency to modify a project, mitigating adverse impacts before an EIR is prepared; (4) facilitate environmental assessment early in the design of a project; (5) provide documentation of the factual basis for the finding in a ND that a project would not have a significant environmental effect; (6) eliminate needless EIRs; (7) determine whether a previously prepared EIR could be used for a project; and (8) assist in the preparation of an EIR, if required, by focusing the EIR on the effects determined to be significant, identifying the effects determined not to be significant, and explaining the reasons for determining that potentially significant effects would not be significant.

Section 15063 of the CEQA Guidelines identifies global disclosure requirements for inclusion in an IS. Pursuant to those requirements, an IS must include: (1) a description of the project, including the location

of the project; (2) an identification of the environmental setting; (3) an identification of environmental effects by use of a checklist, matrix or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries; (4) a discussion of ways to mitigate significant effects identified, if any; (5) an examination of whether the project is compatible with existing zoning, plans, and other applicable land use controls; and (6) the name of the person or persons who prepared or participated in the preparation of the IS.

According to Section 15065(a) of the CEQA Guidelines, an EIR must be prepared for a particular project if any of the following conditions occur:

- The project has the potential to: substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species; or eliminate important examples of the major periods of California history or prehistory;

- The project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals;

- The project has possible environmental effects that are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects;

- The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.

According to Section 15070(a) of the CEQA Guidelines, a ND is deemed appropriate if the IS shows that there is no substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment.

According to Section 15070(b), a MND is deemed appropriate if it identifies potentially significant effects, but:

- Revisions in the project plans or proposals made by or agreed to by the sponsor/applicant before a proposed IS/MND is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and

- There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

1.3 Intended Uses of this Initial Study and Mitigated Negative Declaration

This IS/MND is intended to be an informational document for the City as Lead Agency, the general-public, and for responsible agencies to review and use when approving subsequent discretionary actions

for the Suisun Marina October and November Maintenance Dredging Project (herein referred to as the "Project"). The resulting documentation is not a policy document, and its approval and/or certification neither presupposes nor mandates any actions on the part of those agencies from whom permits and other discretionary approvals would be required.

The Notice of Intent (NOI) to Adopt a MND and supporting analysis is subject to a **30-day public and agency review period (June 10, 2019 to July 11, 2019)**. During this review, comments on the document should be addressed to the City. Following review of any comments received, the City will consider these comments as a part of this Project's environmental review and include them with the IS/MND documentation for consideration by the Suisun Planning Commission and City Council if needed.

1.4 Supportive Documentation

1.4.1 Tiered Documents

As permitted in Section 15152(a) of the CEQA Guidelines, information and discussions from other documents can be included into this document. Tiering is defined as follows:

> "Tiering refers to using the analysis of general matters contained in a broader EIR (such as the one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project."

For this document, the City of Suisun City 2035 General Plan (Suisun City 2015), referred to as the General Plan, serves as the broader document, since it analyzes the entire City that contains the Project site. However, as discussed, site-specific impacts, which this broader document could not adequately address, are provided in this IS/MND for certain issue areas. This IS/MND evaluates each of those site-specific environmental issue areas and will rely upon analysis contained within the General Plan and General Plan EIR with respect to remaining issue areas where appropriate.

Tiering also allows this document to comply with Section 15152(b) of the CEQA Guidelines, which discourages redundant analyses, as follows:

> "Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including the general plans, zoning changes, and development projects. This approach can eliminate repetitive discussion of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration."

Section 15152(d) of the CEQA Guidelines further states:

"Where an EIR has been prepared and certified for a program, plan, policy, or ordinance consistent with the requirements of this section, any lead agency for a later project pursuant to or consistent with the program, plan, policy, or ordinance should limit the EIR or negative declaration on the later project to effects which:

1. Were not examined as significant effects on the environment in the prior EIR; or

2. Are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means."

1.4.2 Incorporation by Reference

Incorporation by reference is a procedure for reducing the size of environmental documents and is most appropriate for including long, descriptive, or technical materials that provide general background information, but do not contribute directly to the specific analysis of the project itself. This procedure is particularly useful when an EIR or ND relies on a broadly-drafted EIR for its evaluation of cumulative impacts of related projects. (*Las Virgenes Homeowners Federation v. County of Los Angeles* (1986) 177 Cal.App.3d 300.) If an EIR or ND relies on information from a supporting study that is available to the public, the EIR or ND cannot be deemed unsupported by evidence or analysis. (*San Francisco Ecology Center v. City and County of San Francisco* (1975) 48 Cal.App.3d 584, 595.) This document incorporates by reference the document from which it is tiered, the City of Suisun City 2035 General Plan and General Plan EIR (Suisun City 2015).

When an EIR or ND incorporates a document by reference, the incorporation must comply with Section 15150 of the CEQA Guidelines as follows:

The incorporated document must be available to the public or be a matter of public record (CEQA Guidelines Section 15150(a)). The General Plan is available, along with this document, at the City of Suisun City Development Services Department, 701 Civic Center Blvd, Suisun City, CA 94585.

- This document must be available for inspection by the public at an office of the lead agency (CEQA Guidelines Section 15150(b)). This document is available at the City of Suisun City Development Services Department, 701 Civic Center Blvd, Suisun City, CA 94585.

- This document must summarize the portion of the document being incorporated by reference or briefly describe information that cannot be summarized. Furthermore, this document must describe the relationship between the incorporated information and the analysis in the General Plan (CEQA Guidelines Section 15150(c)). As discussed above, the General Plan addresses the entire City of Suisun City and provides background and inventory information and data which apply to the Project site. Incorporated information and/or data will be cited in the appropriate sections.

- This document must include the State identification number of the incorporated document (CEQA Guidelines Section 15150(d)). The State Clearinghouse Number for the General Plan EIR is 2011102046.

- The material to be incorporated in this document will include general background information (CEQA Guidelines Section 15150(f)).

1.4.3 Technical Studies

This IS/MND also utilizes information provided in the Pierce Island Biological Assessment for Pierce Island prepared by Marty Ecological Consulting and dated October 2016 (Appendix A).

2.0 INITIAL STUDY / ENVIRONMENTAL CHECKLIST

2.1 Project Title

Suisun Marina October and November Maintenance Dredging Project

2.2 Lead Agency

City of Suisun City
701 Civic Center Blvd.
Suisun City, CA 94585

2.3 Project Contact

John Kearns, Senior Planner
City of Suisun City
701 Civic Center Blvd.
Suisun City, CA 94585

2.4 Project Sponsor

City of Suisun City
701 Civic Center Blvd.
Suisun City, CA 94585

2.5 Project Location

The Project site is in the City of Suisun City, County of Solano, California, located within Suisun City Marina (Figure 1, Project Regional Vicinity Map and Figure 2, Project Location Map).

2.6 General Plan / Zoning Designations

Land Use Designation: Stream Project

General Plan Zoning: Downtown Waterfront Specific Plan, Marina zoning

2.7 Environmental Setting and Surrounding Land Uses

The City of Suisun City is located within the northeast reaches of San Francisco Bay, just south of the City of Fairfield. The City is approximately 4.1 square miles (City of Suisun 2015). Suisun Slough runs through the City north to south, beginning in the downtown area. Suisun City Marina encompasses the northern end of Suisun Slough and includes the Suisun Slough Main Channel. Suisun Slough meanders southward before eventually draining into Grizzly and Suisun Bay. Adjacent connecting channels include Whispering Bay Channel and the Marina Village Residential District Area. Whispering Bay Channel, veers to the east from the Suisun Slough Main Channel. The Marina Village Residential District area is located northward of Whispering Bay Channel. Dredging is proposed for the main Suisun Slough Channel, Whispering Bay Channel, and Marina Village Residential District area, as shown in Figure 3.

Pierce Island is located approximately 0.5 mile south of the head of the Suisun Slough in downtown Suisun City. The main channel boarders Pierce Island to the east and Whispering Bay Channel boarders the island to the north. Two ponds (East and West Pond) are located on Pierce Island, which were initially constructed as oxidation ponds for sewage treatment. These ponds are now used for disposal of hydraulically dredged sediment from the Suisun City Marina, and its associated navigation channels. The City owns and operates the East and West Pond sites.

Adjacent parcels to the Project are characterized in the City's Downtown Waterfront Specific Plan (City of Suisan 2016), which covers approximately 376 acres including the Suisun City Marina. Adjacent land uses include commercial, public facilities/open space, and residential areas with private docks that provide access to the Marina waterways (City of Suisun 2015). Pierce Island is characterized as public facilities/open space. Just south of the Project site, adjacent land uses to Suisun Channel are designated as marsh land. Areas east of the Marina Village Residential District area are also characterized as marsh lands.

2.8 Project Background

The City conducts routine maintenance dredging of the Suisun Marina (Marina) and the associated Whispering Bay and Marina Village Residential District Area access channels. Maintenance dredging is required approximately every eight to nine years to maintain safe and navigable depths. Suisun City Marina was last dredged in 2008. August 1 to September 30 is the "typical dredging window" based on partially overlapping regulatory agency "Environmental Work Windows" that are described below in further detail.

Environmental review and permitting for the next cycle of maintenance dredging and affiliated dredge material placement has been completed for the "typical dredging window." State and federal permits have been obtained. As the CEQA Lead Agency, the City has determined that such routine maintenance dredging is Categorically Exempt under CEQA pursuant to Title 14 of the California Code of Regulations, Section 15304(g) (see Appendix B, Notice of Exemption).

The regulatory agencies' maintenance dredging "Environmental Work Windows" adhere to two different overlapping work windows for the delta and longfin smelt (listed as threatened under the California Endangered Species Act in 2009). The California Department of Fish and Wildlife (CDFW) specifies a dredging window from July 1 to September 30 (three months), while the Dredged Material Management Office (DMMO), which includes CDFW as a participating member, specifies a dredging window of August 1 to November 30 (four months). Due to the different agency "Environmental Work Windows," this allows for only a two-month dredging window to be conducted in any given year between August 1 and September 30. The City recently determined that a minimum of three to four months is required to complete all necessary maintenance dredging of three defined Dredging Areas (Figure 3) within a single year and minimize potential temporal impacts by having to complete the maintenance dredging the following year.

According to a bathymetric condition survey performed by Gahagan & Bryant Associates, Inc. in February 2017, it is estimated that the total volume of material requiring dredging is 158,800 cubic yards (CY). A minimum three to four-month window is required to dredge this quantity of material. This would extend beyond the agencies' coinciding two-month dredging window. As a result, the City is now requesting an Incidental Take Permit (ITP) from CDFW to allow for an additional one to two months of dredging past September 30, coinciding with the DMMO's dredging window that ends on November 30. The additional dredge time requested is from October 1 to November 30. This would allow the contractor enough time to dredge the necessary quantities without the need for additional equipment or remobilization during a second year and assure the safe and continued use of the Marina and its access channels. The proposed additional dredging window would extend past the CDFW work window for longfin smelt, but still remain in compliance with the DMMO work window for this species.

Based on previous discussions between the City and CDFW, CDFW has indicated an ITP for maintenance dredging between October 1 and November 30 cannot be covered under the current CEQA Categorical Exemption because Fish and Game Code Section 2081(b)(2) states that "impacts of the authorized take shall be minimized and fully mitigated." Therefore, the purpose of this IS/MND is to evaluate for potential adverse environmental impacts associated with maintenance dredging of approximately 53,000 CY (rounded) of material between October 1 and November 30, and then minimize and/or mitigate if deemed necessary. Maintenance dredging between August 1 and September 30 has existing approvals and CEQA clearance; and is therefore, not a part of the "Project" analyzed in this IS/MND.

2.9 Project Description

The Project proposes maintenance dredging from October 1 through November 30 in the Marina and the associated Whispering Bay and Marina Village Residential District Area access channels, City of Suisun, California. The total volume of material to be removed during this dredge window is estimated to be about 53,000 CY. At an average production rate of 1,745 CY/day it would take approximately 30 to 60 days to complete the necessary dredging and maintain compliance with permit requirements including allowable turbidity levels. The Project proposes to dredge the Main Channel to -8 feet mean lower low water (MLLW), Whispering Bay Channel to -6 feet MLLW and the Marina Village Residential District area to -6 feet MLLW. Dredging to these depths would assure safe navigable depths for existing vessels that use this facility. Figure 1 shows the Project's regional location and vicinity, Figure 2 shows the Project's location and Figure 3 shows an aerial of the Project site.

The Marina is comprised of four Dredging Areas. This Project proposes dredging in Area 3, Area 4, and Area 5 as shown on Figure 3. The Project Site is comprised of the 3 dredging Areas and the Pierce Island upland disposal site as shown on Figure 3, as well as general use of the channels for temporary equipment access. The Project Vicinity is generally described as the area within 2 miles of the Project site. The Project's dredging schedule would coincide with the seasonal timing conditions of a CDFW-issued ITP, which the City is requesting to allow for dredging to occur between October 1 and November 30. The Project's dredging schedule for Area 3, Area 4 and Area 5 would be determined based on field conditions, dredging needs and conditions of the ITP.

The dredging equipment performing the work would likely include a 12 to 14-inch hydraulic cutterhead suction dredge and two workboats, similar to the equipment used for past maintenance dredging projects in this area, using a high-density polyethylene (HDPE) pipe to pump the material to the Pierce Island upland disposal sites (Disposal Sites) and a CAT D6 dozer to periodically move/position the pipe. Dredged material will be pumped directly to Pierce Island through the pipeline. The pipeline will be occasionally moved to assure that material spreads evenly throughout the site. Pierce Island has been permitted as a long-term dredged material disposal site since 1990 (USACE Permit # 16329E58; BCDC Permit # M85-87, and RWQCB Order No. 90-071). Dredged sediments will be initially placed in the West Pond with the decant water flowing through the weir in the center levee into the East Pond. Once the West Pond is full, the weir boards will be placed to cut off water flow between the ponds and the remainder of the material will be placed in the East Pond. All discharge of decant water will be out of the new weir in the East Pond (along the north levee).

The Project's dredging operation would occur Monday through Saturday from 7 am to 10 pm. Sunday work and other work hours will be allowed by the City as long as the additional workload during those hours is in compliance with regulatory requirements. This is consistent with the City's permitted work hours (Municipal Code Section 15.04.075, Suisun City). Once the dredging is complete, the Marina channels would continue to operate the same as under existing conditions. The Project's purpose is for maintenance only. No new operational changes within the Marina are proposed. Therefore, operational impacts are not anticipated. Temporary dredging and placement related impacts from the proposed 2-month long dredging event are assessed within this IS.

2.10 Other Permits and Approvals

This IS/MND is intended to be an informational document for the City, as Lead Agency, to review and use when approving subsequent discretionary actions for this Project. Table 1 provides a potential, but not exhaustive, list of other responsible agencies, trustee agencies and/or entities that may rely upon this IS/MND to grant subsequent discretionary approvals and/or permits, where applicable, related to Project implementation.

Table 1: Other Permits and Approvals

Agency/Entity	Permit/Approval	Description	Timing
United States Army Corps of Engineers	Nationwide Permit # 35 (Maintenance Dredging of Existing Basins) and #16 (Return Water from Upland Contained Disposal Areas)	Potential impacts to jurisdictional waters from dredging and dredged sediment placement	Prior to impacts to Waters of the United States
Regional Water Quality Control Board	401 Water Quality Certification	Potential impacts to jurisdictional waters from dredging and dredged sediment placement.	Prior to impacts to Waters of the United States/State
Regional Water Quality Control Board	Waste Discharge Requirement	Potential impacts to jurisdictional waters from dredged sediment placement.	Prior to impacts to Waters of the United States/State

Agency/Entity	Permit/Approval	Description	Timing
Bay Conservation & Development Commission	Amendment to Permit No. M85-87	Potential impacts to the Bay from dredging and Dredged sediment placement at Pierce Island.	Prior to impacts to the Bay
California State Lands Commission	State Lands Lease	Dredging lease for use of state lands	Prior to dredging of state lands
California Department of Fish and Wildlife	Incidental take Permit	Potential impacts to delta and longfin smelt from the proposed dredging.	Prior to dredging from October to November

2.11 Consultation with California Native American Tribe(s)

The following California Native American tribes traditionally and culturally affiliated with the Project area have been notified of the Project: United Auburn Indian Community of the Auburn Rancheria, Ione Band of Miwok Indians, Torres Martinez Desert Cahuilla Indians, Cortina Band of Indians, and Yocha Dehe Wintun Nation. The City formally initiated consultation with these tribes on May 14, 2019. To date, no tribes have requested consultation pursuant to Public Resources Code section 21080.3.1. Only one response was received from the Ione Band of Miwok Indians requesting that the City update the contact information for their Chairperson as Sara Dutschke Setschwaelo. No comments on the Project or request for consultation was received. Completion of the AB 52 consultation process will conclude in compliance with Public Resources Code section 21080.3.1 prior to certification of the MND and Project approval. A summary of the notification process is provided in Section 3.5 of this IS.

2.12 Environmental Factors Potentially Affected

All of the potential environmental impacts listed below are addressed in this IS. Those that are checked below have been identified as involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages for which mitigation measures have been identified to reduce the impact to less than significant.

☐	Aesthetics	☐	Mineral Resources
☐	Agriculture and Forestry Resources	☐	Noise
☐	Air Quality	☐	Population/Housing
■	Biological Resources	☐	Public Services
☐	Cultural Resources	☐	Recreation
☐	Energy	☐	Transportation
☐	Geology/Soils	☐	Tribal Cultural Resources
☐	Greenhouse Gas Emissions	☐	Utilities/Service Systems
☐	Hazards & Hazardous Materials	☐	Wildfire
■	Hydrology/Water Quality	■	Mandatory Findings of Significance
☐	Land Use/Planning		

2.13 Determination (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet (Appendix C) have been added to the Project. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed Project could have a significant effect on the environment, there WILL NOT be a significant effect in this case because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Signature:	Date:
Printed Name:	Title:

3.0 ENVIRONMENTAL ANALYSIS

The environmental analysis provided below in Section 3.0 is patterned after the IS Checklist recommended by the CEQA Guidelines, as amended, and used by the City in its environmental review process. For the environmental review undertaken as part of this IS preparation, a determination that there is a potential for significant effects indicates the need to more fully analyze the Project's impacts and to identify mitigation.

For the evaluation of potential impacts, the questions in the IS Checklist are stated and an answer is provided according to the analysis undertaken as part of this IS. The analysis considers the short-term, long-term, direct, indirect, and cumulative impacts of the Project. However, as mentioned above, operational changes to the Marina are not proposed, and therefore, long-term operational impacts are not anticipated. There are four possible responses to each question:

- ***No impact.*** The Project would not have any measurable environmental impact on the environment.

- ***Less than significant impact.*** The Project would have the potential to impact the environment, although this impact would be negligible, would be below established thresholds that are considered to be significant and/or would be reduced to less than significant with the implementation of established plans, policies, procedures and/or regulations.

- ***Less than significant with mitigation.*** The Project would have the potential to generate impacts, which may be considered as a significant effect on the environment, although mitigation measures or changes to the Project's physical or operational characteristics would reduce these impacts to levels that are less than significant.

- ***Potentially significant impact.*** The Project could have impacts that may be considered significant, and therefore, additional analysis is required to identify mitigation measures that could reduce potentially significant impacts to less than significant levels.

The following is a discussion of potential Project impacts as identified in the Initial Study/Environmental Checklist. Explanations are provided for each item.

Aesthetics

Except as provided in Public Resources Code Section 21099, would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

3.1 Aesthetics Discussion

a) Would the Project have a substantial adverse effect on a scenic vista?

Less than significant impact. The City of Suisun City 2035 General Plan states that new developments should frame views of waterways and surrounding hills and mountains, where possible (Suisun City 2015). Additionally, the General Plan characterizes increasing visual access to the Suisun Marsh, Coastal Range, Cement Hill, Potrero Hills, and Vaca Mountains as important. Portions of the proposed dredging would occur adjacent to Suisun Marsh; however, no new development or permanent structures are proposed that could block scenic views. The Project only proposes to maintain the existing Marina and its associated channels. Dredging equipment could temporarily disrupt views of the waterfront and Suisun Marsh during dredging events; however, visual impacts are anticipated to be short-term and minor. Impacts to scenic vistas are anticipated to be temporary and less than significant. Mitigation is not required.

b) Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No impact. The Project site is located in the existing Marina and its associated access channels. The Project is not located within a state scenic highway. There are no designated state scenic highways in Solano County. The nearest eligible state scenic highway is State Route 37, approximately 11 miles southwest of the Project site. No impacts are anticipated, and no mitigation is required.

c) Would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Less than significant impact. The proposed dredging is limited to the Marina and its associated access channels. Dredge equipment could be considered visually unappealing by some and thus temporarily degrade the visual character of the Marina and its associated access channels during the two-month dredging event. However, dredging equipment would be visually similar to existing boat traffic and therefore visual impacts are anticipated to be temporary and minor. Potential impacts to public views are anticipated to be temporary and less than significant. No mitigation is required.

d) Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No impact. The Project proposes maintenance dredging. No temporary or permanent lighting installation is proposed. No nightwork is proposed that would require the use of lighting work areas. No impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources:

California Scenic Highway Mapping System (Caltrans, accessed on April 15, 2019 at http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/_); City of Suisun City 2035 General Plan, (Suisun City, 2015).

Agricultural and Forest Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. – Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing agricultural zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

3.2 Agricultural and Forest Resources Discussion

a) Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No impact. The Project footprint is confined to the existing Marina and its associated access channels. No upland work is proposed. According to the California Department of Conservation (CDC) Farmland Mapping and Monitoring Program's California Important Farmland Finder, adjacent land is classified as Urban Built-up Land and other lands (CDC 2016). The Project site would not be located on or

encroach upon Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. No existing or planned farming operations occur here. Impacts are not anticipated, and no mitigation is required.

b) Would the Project conflict with existing agriculture zoning for agricultural use, or a Williamson Act contract?

No impact. The Project site is not located on land designated or zoned for agricultural use. The land use designation/zoning for the Project site is Stream Project (Suisun City 2015). The Project footprint is confined to the existing Marina and its associated access channels. Adjacent land is characterized by commercial, public facilities/open space, and residential uses. The nearest land designated/zoned for prime agricultural land is located approximately 2.5 miles northwest of Area 3 (CDC 2016). The nearest land designated as non-prime agricultural land is located approximately 0.4 miles south of Area 3. According to the CDC Williamson Act Map for Solano County, adjacent land to the Marina and its associated access channels is mapped as urban built-up land and non-enrolled land (CDC 2014). The Project site and adjacent parcels are not an agricultural preserve subject to a Williamson Act contract. Therefore, the Project would not conflict with zoning for agricultural use or a Williamson Act contract. No impacts are anticipated, and no mitigation is required.

c) Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

No impact. As previously discussed, the land use designation/zoning for the Project site is Stream Project (Suisun City 2015). Adjacent parcels consist of commercial, public facilities/open space, and residential uses. The Project site is located in Suisun City and is not located on or adjacent to land designated for forest land, timberland, or timberland zoned timberland production. No impacts are anticipated, and no mitigation is required.

d) Would the Project result in the loss of forest land or conversion of forest land to non-forest use?

No impact. The Project proposes maintenance dredging of an existing Marina and its associated access channels. The Project site is not located on forest land and does not contain forest or timber resources. The Disposal Sites do not contain forest or timber resources. Please see section 3.4 and Figure 4 for further characterization of Pierce Island vegetation. The Project would not result in the loss of forest land. No impacts are anticipated, and no mitigation is required.

e) Would the Project involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

No impact. As previously discussed, the Project site neither contains forest land nor forest resources. As also discussed above, the Project proposes maintenance dredging of an existing Marina and its associated access channels and would not encroach into CDC designated Farmland. No existing or planned farming

operations occur in or adjacent to the Project site. Therefore, impacts are not anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

Farmland Mapping and Monitoring Program (California Department of Conservation, 2016); City of Suisun City 2035 General Plan (Suisun City, 2015); Solano County Williamson Act Map (California Department of Conservation, 2014).

Air Quality

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. – Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard.	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)?	☐	☐	☒	☐

3.3 Air Quality Discussion

a) Would the Project conflict with or obstruct implementation of the applicable air quality plan?

No impact. Suisun City is located in the San Francisco Bay Area Air Basin (SFBAAB). Due to regional air flow patterns, pollutants are carried from the Bay Area through Solano County. Inversion events can trap pollutants near the ground in Solano County, especially during summer mornings and afternoons. Air quality in the City is regulated under the California Air Resources Board (ARB), the Bay Area Air Quality Management District (BAAQMD), and the U.S Environmental Protection Agency (EPA). The BAAQMD is the primary agency responsible for regulating potential air quality impacts from proposed projects in the Bay Area. Projects in the City are subject to BAAQMD regulations.

The Project only proposes routine maintenance dredging (a short-term activity) of the existing Marina and its associated access channels. Proposed activities would be consistent with the existing land use and zoning designations. Once dredging is complete, use of the Marina and its associated channels would continue to operate the same as under existing conditions. No operational changes are proposed. Additional boat travel or boat travel capacity is not proposed. Therefore, operational impacts are not anticipated.

Dredging would produce emissions of nonattainment pollutants primarily from diesel combustion equipment during the 2-month dredging event proposed under this Project. Dredged materials are proposed to be pumped directly to the Disposal Sites and therefore emissions from barge transport to the Disposal Sites are not considered. Emissions would be produced during pumping of dredged

materials. Emissions from dredging equipment are anticipated to be minor and temporary. The Project is not anticipated to conflict with or disrupt any BAAQMD air quality regulations or otherwise applicable air quality management plans. No impacts are anticipated, and no mitigation is required.

b) Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable federal or state ambient air quality standard?

Less than significant impact. Cumulative impacts may result from individually minor but collectively significant projects. Within the SFBAAB there are multiple air quality monitoring stations, the closest monitoring stations to the City show a general decline in particulate matter and carbon monoxide concentrations with generally steady ozone levels. BAAQMD has developed a policy to address the cumulative impacts of CEQA Projects. The policy holds the cumulative threshold to be the same as the project-level threshold and indicates that project impacts are cumulatively considerable if they exceed the project-specific air quality significance thresholds.

The SFAAB is currently in non-attainment with several Federal and/or State air quality standards, including national ozone standard and national particulate matter ambient air quality standards. Criteria pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) and lead. There is no proposed increase in the operational use of the Marina and its associated access channels, and therefore the Project would not result in the cumulative considerable net increase of any criteria pollutants during operations. Dredging activities are anticipated to produce minimal reactive organic gas (ROG), nitrogen oxides (NO_x), PM_{10}, $PM_{2.5}$, CO, and carbon dioxide (CO_2) emissions through the burning of diesel fuel. Diesel fuel would be required for the hydraulic cutterhead, two workboats, and dozer. Diesel fuel would be burnt during equipment mobilization, dredging, pumping, and demobilization. Dredged materials are proposed to be pumped directly to the Pierce Island disposal sites. There would be no transport of dredged sediments via a barge.

The BAAQMD has set construction related project-level thresholds of significance for ROG, NO_x, PM_{10}, and $PM_{2.5}$ (Table 2). Anticipated emissions of BAAQMD construction related project-level emissions were calculated using the CARB 2017 off-road model and anticipated equipment use (Appendix D). ROG emissions were calculated using a THC to ROG conversion factor of 1.21 per the California Air Resources Board (CARB), Off-Road Diesel Engine Emissions Factors. Project-level daily emissions were conservatively calculated using 30 working days; however, due to equipment downtime the Project may take up to 2-months and thus the average daily emissions could decrease from those presented in Table 2. According to the calculations presented in Table 2, dredging emission would not be anticipated to exceed regional BAAQMD construction related project-level air quality thresholds. Therefore, the Project is not anticipated to result in a cumulatively considerable contribution to impacts from related projects or to the existing pollution burden in the BAAQMD.

Table 2: Project-Level Emissions

Pollutant	BAAQMD Project-level Threshold (lb/day)	Anticipated Project Level Emissions (lb/day)
ROG	54	3.3*
NO_x	54	41.4
PM_{10}	82	1.5
$PM_{2.5}$	54	1.5
Source: CARB 2017 Off-road model. *ROG= THC (1.21) per the California Air Resources Board, Off-Road Diesel Engine Emissions Factors		

At a local level, toxic air contaminants (TACs) and $PM_{2.5}$ are considered potential community risks and hazards. The Project is anticipated to produce diesel particulate matter (DPM) from the combustion of diesel fuel from the dredging equipment engine. The CARB classifies DPM emissions as a TAC. The burning of diesel fuel can produce both $PM_{2.5}$ and PM_{10} emissions. The maximum daily on-site DPM emissions (as PM_{10} and $PM_{2.5}$ exhaust) is not anticipated to exceed the BAAQMD significance thresholds (Table 2). Therefore, there are no anticipated local air quality emission hazards anticipated to be associated with the Project and no mitigation is required.

c) Would the Project expose sensitive receptors to substantial pollutant concentrations?

Less than significant impacts. The nearest sensitive receptors to the project site by type are as follows:

- Residential receptors are located immediately to the west of Area 3, and east and west of Area 5 bordering the channels;
- There are no hospitals within the City;
- Recreational facilities such as the waterfront promenade, municipal boat launch, Mike day park, and harbor park border the waterfront immediately adjacent to the channels proposed for dredging;
- Crystal Middle School is located approximately 0.05 miles west of Area 5; and
- Crescent Elementary is located approximately 0.85 miles east of Area 5.

Impacts to sensitive receptors are typically evaluated in terms of exposure to TACs. The Project only proposes routine maintenance dredging of the existing Marina and its associated access channels. Once the dredging is complete, the Suisun Marina channels would continue to operate the same as under existing conditions. No new operational changes within the Marina are proposed. Thus, there would be no affiliated operational TAC emissions.

Proposed Project dredging activities would result in short-term emissions of DPM from the combustion of diesel fuel from dredging equipment engines. The CARB classifies DPM emissions as a TAC and uses PM_{10} emissions from diesel exhaust as a surrogate for DPM. The maximum daily on-site DPM emissions (as PM_{10} exhaust) is not anticipated to exceed the 82 pounds per day BAAQMD significance threshold (Table 2). In addition, health effects from carcinogenic TACs are usually described in terms of individual cancer risk, which is based on a 70-year lifetime exposure to TACs. The proposed Project dredging period of 1 to 2 months would be much less than the 70 years used for risk determination. Equipment would also be moved throughout the Project site during dredging and not remain near a particular receptor over the 1 to 2-month period. The proposed Project would not expose sensitive receptors to substantial TAC emissions and no mitigation is required.

d) Would the Project result in other emissions (such as those leading to odors adversely affecting a substantial number of people)?

Less than significant impact. The Project does not propose land uses or facilities that have been identified as likely to be affiliated with the generation of odors (BAAQMD 2017). The Project only proposes routine maintenance dredging with no new operational changes to the Marina and its associated access channels. Once the dredging is complete, the Suisun Marina channels would continue to operate the same as under existing conditions. Therefore, the Project would not result in operational odor emissions.

Project activities would generate air pollutants due to the combustion of diesel fuel during the 2-month dredging event proposed under this Project. Some individuals may sense that diesel combustion emissions are objectionable, although there is no approved method of quantifying the odor impacts of these emissions to the public. Emissions associated with dredging, and placement activities would be dispersed over the Project area, short-term, and transient. Potential impacts from dredging and operational emissions are anticipated to be less than significant and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

California Environmental Quality Act Air Quality Guidelines (Bay Area Air Quality Management District 2017); Final Environmental Assessment/ Environmental Impact Report Maintenance Dredging of the Federal Navigation Channels in San Francisco Bay (USACE & RWQCB 2015).

Biological Resources

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.4 Biological Resources Discussion

The analysis and findings presented in this section are based in part on the Biological Assessment for Pierce Island prepared by Mart Ecological Consulting for the Suisun City Public Works and Building Department (2016), Appendix A of this IS. The Biological Assessment Report included a site survey for species listed under the Endangered Species Act (ESA), species listed under the California Endangered Species Act (CESA), species identified as California Species of Special Concern (SSC), species protected under the California Fish and Game Code, species listed under the California Rare Plant Bank (CRPR) Inventory of Rare and Endangered Plants of California, species found in the California Natural Diversity Database (CNDDB), and species afforded protection under local and regional documents. The habitat and species surveys were conducted on Pierce Island in August 2016. The purpose of the field survey

(2016 Survey) was to assess the existing habitat, assess the presence or absence of on-site sensitive plant communities and jurisdictional waters, and to determine whether special status plant or wildlife species occur or could potentially occur on Pierce Island. Although the 2016 Survey focused on Pierce Island, the broader Biological Assessment addressed adjacent areas to Pierce Island, including the channels proposed for dredging under this Project. This Biological Assessment is incorporated by reference in the following section. Potential biological resource impacts from the proposed October and November dredging event and the associated dredge sediment placement at the Disposal Sites are assessed below using the incorporated reports and additional literature/database review including US Fish and Wildlife (USFWS), California Department of Fish and Game (CDFG), and CDFW literature/database review.

a) Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

Less than significant with mitigation. Dredging would occur along approximately 1.2 linear miles of the Marina and its associated access channels. This area has been routinely dredged every 8 to 9 years since 1992, with the last dredging event occurring in 2008. The channel bottom is characterized by approximately 0 to 10% sand, 40 to 55% silt and 48 to 56% clay (EcoRisk 2017) and generally does not support vegetation. Dredged materials are proposed to be placed at existing and permitted Disposal Sites on Pierce Island. Pierce Island has been permitted as a long-term dredged material Disposal Site since 1990 (USACE Permit # 16329E58; BCDC Permit # M85-87, and RWQCB Order No. 90-071). Pierce Island is a mostly artificial island that is approximately 0.13 square miles. Two ponds (East and West Pond) are located on Pierce Island, which were initially constructed as oxidation ponds for sewage treatment. These ponds are now used for disposal of hydraulically dredged sediment from the Suisun City Marina and its associated navigation channels. The City owns and operates these Disposal Sites. Vegetation bordering Pierce Island is generally comprised of emergent vegetation. Upland vegetation at Pierce Island is variable but mainly consists of Himalayan blackberry (*Rubus armeniacus*), wild radish (*Raphanus sativa*), non-native grasses, and ornamental trees (Mart Ecological Consulting 2016). The interior areas of the island are seasonal wetlands and are generally characterized by pickleweed (*Sarcocornia pacifica*), annual beard grass and other non-native annual grasses. Tidal wetland vegetation on Pierce Island typically consists of California tules (*Schoenoplectus californicus*) and cattails (*Typha latifolia*). None of these species are candidate, sensitive, or special status species.

Sensitive plant species include federally, or state listed threatened or endangered species, those species listed on the California Native Plant Society (CNPS) rare, species on the endangered plant inventory, and species identified in the Multiple Species Habitat Conservation Plan (MSHCP). The Solano County MSHCP is currently being developed; the final document has not been released. Therefore, our analysis has focused on compliance with adopted federal, state, and local regulations. Based on existing channel depths at proposed dredging locations, Project dredging would have no impact on sensitive plant species. The 2016 Survey observed two sensitive plant species on Pierce Island: Mason's lilaeopsis (*Lilaeopsis masonii*) and Suisun Marsh aster (*Symphyotrichumentum*). Although not observed during the 2016 Survey,

the following sensitive plant species were identified in the Biological Assessment as having a moderate probability of occurring within the Project Vicinity, given suitable habitat presence: Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), Contra Costa goldfields (*Lasthenia conjugens*) and delta tule pea (*Lathyrus jepsonii* var. *jepsonii*). During the literature review, Critical Habitat (CH) for Suisun thistle was identified within the Project Vicinity but not within the Project Site (IPAC 2019, Figure 5). CH occurs approximately 0.15 miles to the west of Area 3. Although potential habitat for Suisun thistle exists on Pierce Island, it was not observed during the 2016 Survey. Figure 6 shows the location of observed sensitive plant species according to the Biological Assessment. Table 3 summarizes the potential occurrence of sensitive plant species. Given the known presence of Mason's lilaeopsis and Suisun Marsh aster as well as the presence of suitable habitat for Contra Costa goldfields, Delta tule pea and Suisun thistle, Avoidance Measure **BIO-1** would require the Project biologist to perform a preconstruction presence/absence survey of the dredge materials placement work area and flag any sensitive plants or plant colonies within 50 ft of the dredge materials placement work area. Implementation of **BIO-1** would ensure potential impacts to sensitive plant species would be less than significant.

Sensitive wildlife species include the following classifications: federally or state listed threatened or endangered species, California SSC, fully protected and protected species (as designated by the CDFW and USFWS species). The Biological Assessment included a sensitive wildlife survey on Pierce Island and assessed adjacent areas according to known observations of sensitive wildlife species. The 2016 Survey of Pierce Island observed the Suisun song sparrow (*Melospiza melodia maxillaris*) foraging on Pierce Island. Therefore, **BIO-2** would require that all work on Pierce Island be conducted according to the USFWS and CDFW approved work window of September 1st – January 31st for the Suisun song bird. The old man tiger beetle (*Cicindela senilis senilis*) was also observed flying within the Project Site. Larval tiger beetles occur in vertical burrows in moist unvegetated soils such as those at the Disposal Sites. However, breeding season occurs from spring to summer while the proposed dredging activities would only occur from October through November. Therefore, impacts to breeding old man tiger beetles would not be anticipated. Additionally, if adult old man tiger beetles are encountered during dredging events it would be anticipated that they would fly away and would not be harmed by the proposed activities. Larval old man tiger beetles can remain buried for up to four years and are typically quite hardy. Although not observed during the 2016 Survey, the following special status species were identified in the Biological Assessment as having a moderate probability of occurring within the Project Site given habitat preferences and or prior sightings: salt-marsh harvest mouse (*Reithrodontomys Raviventris*), Suisun shrew (*Sorex ornatus sinuosus*), Ridgeway's rail (*Rallus obsoletus*), California Black rail (*Laterallus jamaicensis coturniculus*), and Loggerhead shrike (*Lanius ludovicianus*). In addition, delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*) vernal pool fairy shrimp (*Brachinecta Lynchi*) and vernal pool tadpole shrimp (*Lepidurus Packardi*) were identified during database review as having the potential to occur within the Project Vicinity and/or Project Site. To protect the salt marsh harvest mouse and Suisun shrew, **BIO-3** would restrict disposal activities from occurring within 50 ft of suitable tidal marsh habitat for the salt marsh harvest mouse and Suisun shrew within two hours before or after an extreme high tide event unless a salt marsh harvest mouse/Suisun shrew exclusion fence has been installed. This avoidance measure would provide refuge habitat for the salt marsh harvest mouse and Suisun shrew during dredge sediment placement. **BIO-3** would assure potential impacts to these species are less than significant. To

assure potential impacts to the Ridgeways rail and California black rail are less than significant, **BIO-4** would restrict dredge placement activities from occurring within 50 ft of Ridgeways rail or California black rail suitable habitat during extreme high tide events or when the adjacent tidal marsh is flooded. **BIO-2** above would be anticipated to be protective of all nesting bird species including the Suisun song sparrow, California Black rail, Ridgeways rail, and loggerhead shrike. Additionally, a qualified biologist will be required under **BIO-5** to survey and monitor compliance with **BIO-3** through **BIO-4**. Vernal pool shrimp species prefer more freshwater environments (USFWS 2007 & Contra Costa County 2006) than the brackish conditions found at the Project Site. Therefore, potential impacts to shrimp species are not anticipated due to the lack of suitable habitat present. CH for delta smelt was identified within the channels proposed for dredging (IPAC 2019, Figure 7). Delta smelt are listed as threatened under the ESA and under the CESA. Longfin Smelt were identified as potentially occurring within the Project Site during literature and database review (CDFW 2019). Although not currently listed under the federal ESA, the San Francisco Bay-Delta Distinct Population Segment (DPS) of longfin smelt is listed as threatened under the CESA. Figure 8 shows the location of observed species according to the Biological Assessment.

Table 3 summarizes the potential plant and wildlife species with potential to occur within the Project Vicinity and/or Project Site. The implementation of **BIO 1-7** would assure that potential impacts to plant and wildlife species identified in the Biological Assessment would be less than significant. Potential impacts to delta smelt and longfin smelt are further considered below.

Table 3: Special Status Plant and Wildlife Species Summary

Species	Status	Potential to Occur	Proposed Mitigation
Sensitive Plant Species			
Mason's Lilaeopsis	CNPS List 1B	High - Observed on Pierce Island during 2016 Survey of Pierce Island. Locally abundant.	BIO-1
Suisun Marsh Aster	CNPS List 1B	High - Observed on Pierce Island during 2016 Survey. Locally abundant.	BIO-1
Suisun Thistle	Endangered	Moderate - Not observed. Potential habitat on Pierce Island.	BIO-1
Contra Costa Goldfields	Endangered	Moderate - Not observed. Potential habitat on Pierce Island.	BIO-1
Delta Tule Pea	CNPS List 1B	Moderate - Not observed. Potential habitat around the perimeter of Pierce Island.	BIO-1
Sensitive Animal Species			
Suisun Song Sparrow	Federally endangered, state endangered, fully protected.	High - Observed foraging during 2016 Survey.	BIO-2
Old Man Tiger Beetle	Species of regional conservation significance	High - Observed flying around saline wetlands on Pierce Island during the 2016 Survey.	Impacts are not anticipated

Species	Status	Potential to Occur	Proposed Mitigation
Salt Marsh Harvest Mouse	Federally endangered, state endangered, fully protected.	Moderate - Not observed, but suitable habitat on Pierce Island observed.	BIO-3 & BIO-4
Suisun Shrew	State species of concern	Moderate - Not observed, but suitable habitat is present on Pierce Island observed	BIO-3 & BIO-4
Ridgeways Rail	Federally endangered, state endangered, fully protected.	Moderate - Not observed, but suitable habitat is present on Pierce Island observed.	BIO-2 & BIO-5
California Black Rail	Federally endangered, state endangered, fully protected.	Moderate - Not observed, but suitable habitat is present on Pierce Island observed	BIO-2 & BIO-5
Loggerhead Shrike	State species of concern.	Moderate - Not observed but suitable habitat is present on Pierce Island observed.	BIO-2
Delta Smelt	Federally threatened, state threatened, critical habitat.	Moderate - Not observed but could occur within channels.	BIO-6 &BIO-7
Longfin smelt	State threatened.	Moderate - Not observed but could occur within channels.	BIO-6 & BIO-7
Vernal Pool Fairy Shrimp	Federally threatened.	Low - Not observed during 2016 Survey. Identified during database review. Suitable habitat unlikely.	None - Impacts not anticipated
Vernal Pool Tadpole Shrimp	Federally endangered.	Low - Not observed during 2016 Survey. Identified during database review. Suitable habitat unlikely.	None - Impacts not anticipated

Delta Smelt

Delta smelt only occur within the San Francisco Estuary. They exhibit a four-season life cycle that includes: spawning in spring, migration in the low salinity zone during summer, maturation in the fall, and upstream migration in the winter. The proposed 2-month dredging event from October through November would overlap with the fall maturation cycle. CDFW has conducted fall midwater trawls surveys since 1967 to estimate the abundance of delta smelt. The fall midwater trawl surveys sample over 122 stations every month from September to December. These surveys have indicated a general decline in delta smelt, populations with zero individuals being found in 2018. Table 4 summarizes recent fall midwater trawl delta smelt stock indices.

Table 4: Delta Smelt Fall Midwater Trawl Index

Year	Delta Smelt Fall Midwater Trawl Index
2018	0
2017	2
2016	8
2015	7
2014	9
2013	18
2012	42
2011	343
2010	29
Source: CDFW delta smelt fall midwater trawl surveys	

Primary Constituent Elements (PCEs) essential to delta smelt conservation include:

- PCE #1 Physical habitat for spawning
- PCE #2 Suitable water quality for all life stages
- PCE #3 River flow
- PCE #4 Salinity for rearing

The proposed Project is not anticipated to overlap with the spring spawning season. Delta smelt prefer shallow water spawning habitat (USFWS 2008). Shallow water habitat is defined as habitat no deeper than -10 ft MLLW. The Project design depth in the deepest portions of the dredge area is -8 ft MLLS with a maximum 2 ft over dredge and would therefore not convert shallow water habitat to open water habitat. Therefore, the proposed Project would not be anticipated to impact PCE #1. Additionally, the Project is not anticipated to impact PCE #3 or #4 because there is no proposed operational change in the Marina, only maintenance of the existing channels. Potential threats to delta smelt during the 2-month dredging event proposed could include potential impacts to PCE #2 due to temporarily increased turbidity. Increased turbidity could occur from the creation of sediment plumes during dredging events. However, sediment plumes from the proposed dredging are anticipated to dissipate within a day. To minimize and avoid any potential water quality impacts to delta smelt the following BMPs anticipated as a condition of the regulatory permits have been incorporated as mitigation measure **BIO-6** will be implemented:

- Construction debris will not be allowed to enter the water.
- The cutterhead shall remain at or below the sediment surface during dredging.

- Any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into the stream or its tributaries shall be contained in water tight containers or removed from the Project Site.

Additionally, **BIO-7** would require that Prior to start of October through November dredging, The City shall obtain a CDFW-issued ITP for potential impacts to delta smelt and longfin smelt resulting from dredging activities conducted outside of the CDFW Environmental Work Window. The City shall implement the permit conditions according to permit timing and requirements, which may include purchase of mitigation credits, removal of creosote pilings, or other form of mitigation acceptable to CDFW.

Dredging operations would not extend beyond the DMMO delta smelt work window. With implementation of standard BMPs as required by regulatory permit conditions and included as **BIO-6** and **BIO-7**, potential impacts to Delta Smelt are anticipated to be less than significant.

Longfin smelt

Longfin smelt range extends from the San Francisco Bay-Delta in California to the Cook Inlet in Alaska, however it is the Bay-Delta distinct population segment that is proposed for protection under the ESA and protected under CESA. According to the CDFG fact sheet for longfin smelt, their habitat includes Suisun Marsh. The Project does not propose to dredge areas designated as marsh lands and would be confined to the existing navigation channels. These channels are along the fringes of the Suisun Marsh. Longfin smelt have a short life span and typically only live 2 years (CDFG 2009). Adult longfin smelt spend the majority of their time in bays, estuaries, and nearshore coastal areas before migrating into low salinity areas to spawn between January and March. Peak spawning occurs between February and April (University of California 2019). Eggs then hatch within 40 days, at which time larvae are quickly swept downstream into the estuary. Longfin smelt typically die after spawning. The Project would not occur during spawning events or when eggs would likely be found in bottom sediments. Similar to delta smelt populations, longfin populations have also been generally declining. Table 5 summarizes the recent CDFW fall midwater trawl longfin smelt stock indices.

Table 5: Longfin Smelt Fall Midwater Trawl Index

Year	Longfin Smelt Fall Midwater Trawl Index
2018	52
2017	141
2016	7
2015	4
2014	16
2013	164
2012	61
2011	477
2010	191
Source: CDFW longfin smelt fall midwater trawl surveys	

Implementation of the Best Management Practices (BMPs) described above to avoid and minimize potential impacts to delta smelt are anticipated to be protective of longfin smelt as well. PCEs have not

been determined for longfin smelt, but according to the USFWS 12-month Finding on a Petition to List the San Francisco Bay-Delta Population of the Longfin Smelt as Endangered or Threatened (USFWS 2012), threats to longfin smelt include the following factors:

- Factor 1: The present or threatened destruction, modification, or curtailment of its habitat or range.
- Factor 2: Overutilization for commercial, recreational, scientific, or educational purposes.
- Factor 3: Disease or predation.

The Project is not anticipated to have an impact on Factor 2 or Factor 3. There are no operational changes that could cause the overutilization of the Marina and its associated access channels. The Project only proposes to preserve current uses. Therefore, impacts to Factor 2 are not anticipated. The Project does not propose to introduce predatory species, nor would it involve elements that could increase risk of disease. Additionally, any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into the stream or its tributaries shall be contained in water tight containers or removed from the Project Site. Therefore, impacts to Factor 3 are not anticipated. However, dredging could impact Factor 1. Factor 1 is composed of three different categories: reduced freshwater flow, climate change and channel disturbances. As stated above, the Project only involves maintenance of existing channels and is not anticipated to divert or otherwise alter flow. As discussed further in Section 3.8, the Project is not anticipated to contribute to climate change. The Project would, however, create a temporary channel disturbance through dredging of bottom sediments. Channel disturbances are listed as potential threats to longfin smelt because of the potential to degrade spawning habitat. However, the proposed dredging event would not occur during spawning and does not propose to alter the channels beyond routine maintenance. Additionally, adult longfin smelt are pelagic, non-bottom dwelling species and are thus less likely to be directly affected by dredging than other bottom dwelling fish. The CDFW has determined that regular maintenance dredging is expected to have minor localized impacts on longfin smelt. Therefore, potential impacts from this proposed dredging event would be anticipated to be minor and localized. The City would also comply with all permit requirements, including mitigation measures as described in **BIO-6** and **BIO-7**.

A single year of dredging is proposed to minimize potential temporal impacts by having to complete the maintenance dredging the following year. The Project does not propose operational changes to the Marina and would, therefore, not cause operational impacts to delta smelt or longfin smelt. As discussed above, the Project does not propose to convert shallow water habitat to open water habitat, as shallow water is defined as water habitat no deeper than -10 ft MLLW. All potential impacts to delta smelt and longfin smelt are anticipated to be confined to the proposed 2-month dredging window during the fall maturation cycle. Impacts to delta smelt and longfin smelt are anticipated to be less than significant with the proposed mitigation, minimization and avoidance measures. Additional mitigation is not required.

The 2016 Survey found existing vegetation on Pierce Island that showed signs of nesting birds. However, the proposed dredging would occur outside of the nesting season, typically February to mid-September.

Therefore, impacts to nesting birds from the placement of dredged sediments are Pierce Island are anticipated to be less than significant.

Impacts to candidate, sensitive, or special status species are anticipated to be less than significant with the proposed mitigation, avoidance, and minimization measures. Additional mitigation is not required.

b) Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

Less than significant with mitigation. As described in Section 3.4.a, CH for Suisun thistle has been identified within the Project Vicinity, but not within the Project Site. Suisun thistle was not observed during the 2016 Survey. Therefore, impacts to Suisun thistle are not anticipated but could occur during placement of dredged materials on Pierce Island. Sensitive plant species Suisun Marsh aster and Mason's lilaeopsis were identified on Pierce Island during the 2016 Survey. Additionally, suitable habitat for delta tule pea was identified on Pierce Island. Suitable habitat for these special status plants does not occur within the channels proposed for dredging given water depth and the routinely dredged nature of the channels. Therefore, impacts from the proposed Marina and associated access channel dredging events are not anticipated. However, these plant species may be impacted by the placement of dredged sediments at the Disposal Sites.

The estimated vegetation communities present on Pierce Island from the 2016 survey results are presented in Table 6. These vegetation communities could be impacted during disposal of dredged materials.

Table 6. Vegetation Communities on Pierce Island

Vegetation Communities	Total Acreage
Annual Grasses and forbs	13.45
Barren	1.74
Coyote brush scrub	7.33
Eucalyptus	0.49
Levee Crest	2.74
Pampas Grass	0.79
Pickleweed	12.16
Pickleweed- beardgrass	5.97
Riparian mixed shrub	14.06
Tule-cattail	27.71
Source: Pierce Island Biological Assessment, October 2016	

Dredged materials are proposed to be placed in the non-tidal interior area of Pierce Island (East and West Pond). No special status plant species were found in these areas. However special status plant species Suisun Marsh aster and Mason's lilaeopsis were found along the island perimeter wetlands and could be impacted during transport of dredged sediments to the disposal ponds. Direct impacts to non-native grassland, and ornamental trees are considered less than significant because these habitats/land covers are common in the surrounding vicinity and do not represent CNDDB or CDFW sensitive plant

communities. Avoidance measure **BIO-1** would require flagging within 50 ft of working areas of the following sensitive plant species that could occur in the area: Delta tule Pea, Suisun marsh Aster, Suisun thistle, and Mason's lilaeopsis.

United States Department of Agriculture Natural Resources Conservation Service lists 5 soil types for the Project site. Joice muck Major Land Resource Area (MLRA) 16 makes up the entirety of Pierce Island (National Resources Conservation Service 2019). Bordering Area 3 to the west, soils are mapped as tamba mucky clay MLRA 16. To the north of Area 4 and west of Area 5 soil is mapped as made land. Along the southeast border of Area 5 soil is mapped as joice muck clayey subsoil, 0 to 2 percent slopes, MLRA 16. Along the northeast border of Area 5 soil is mapped as alviso silty clay loam. The Draft MSHCP identifies Pescadero Series soils as known to be associated with hydro-period/playa pool/vernal lake MSHCP covered species. Additionally, the Draft MSHCP identifies hardpan soils as a unique habitat feature. Neither Pescadero Series nor hardpan soils occur onsite.

Based on the vegetation types, soil characteristics, implementation of avoidance measure **BIO-1** and compliance with all permits and permit conditions required by the applicable agencies, Project implementation would not be anticipated to result in significant impacts to riparian habitat or other sensitive natural communities. Impacts would be less than significant.

c) Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than significant impact. Projects with impacts to Waters of the United States are regulated under Sections 401 and 404 of the Clean Water Act through the United States Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB). Pierce Island was assessed for jurisdictional wetland and non-wetland Waters of the United States. The Marina and associated access channels were not included in this assessment but are assumed to be non-wetlands given water depth and channel hydrology. To determine the presence of a wetland, three indicators are required: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Jurisdictional non-wetland Waters of the United States are typically determined through the observation of an Ordinary High Water Mark (OHWM), which is defined as the "line on the shore established by the fluctuation of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." Waters of the United States must also be connected to adjacent watersheds.

The wetlands found on Pierce Island are subject to the jurisdiction of the USACE and RWQCB under Section 404 of the Federal Clean Water Act. Pierce Island has been permitted as a long-term dredged material disposal site since 1990 (USACE Permit # 16329E58; BCDC Permit # M85-87, and RWQCB Order No. 90-071). The wetland habitat of Pierce Island consists of both tidal and non-tidal areas. The tidal areas are generally characterized as freshwater emergent wetlands. The East and West Ponds,

proposed for disposal of dredged sediments, are located in the interior of the island. These are non-tidal wetlands and are seasonally inundated. Both ponds are mapped as saline emergent wetlands.

CDFW and RWQCB have jurisdiction over Waters of the State (California Fish and Game Code [FGC] §§1600 et seq.; CCR, Title 14, §720; Porter-Cologne Water Quality Control Act). Section 1602 of the FGC applies to natural rivers, streams, and lakes. The Marina and its associated access channels are subject to jurisdiction under the CDFW and the RWQCB.

Jurisdictional Waters of the United States under the jurisdiction of the USACE and RWQCB, and Waters of the State under the jurisdiction of CDFW and RWQCB occur within the Project site. Marsh lands border Area 3 to the west and Area 5 to the east. Dredging operations will only occur in pre-disturbed areas, with the last dredging event occurring in 2008. The Marina and its associated access channels are heavily used and developed. The proposed routine dredging only proposes to maintain the current use of the Marina and its associated channels. There is no expansion of use that could impact previously undisturbed channels or marsh lands. Dredge material disposal at the East and West Ponds would comply with all permit requirements. Therefore, impacts are anticipated to be less than significant, and no mitigation is required.

d) Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than significant with mitigation. Wildlife corridors link together areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The Project site is located on Pierce Island and the adjacent navigation channels. This area is heavily developed. The Marina and its associated channels are routinely dredged, with the last dredging event occurring in 2008. The Project does not propose to alter the channel or its associated channels. However native and migratory fish movement could be impeded during the proposed 2-month dredging. In particular, Project dredging may temporarily impact delta smelt and longfin smelt. Please see Section 3.4.a for a discussion on potential impacts to delta smelt and longfin smelt, which require implementation of mitigation measure **BIO-7**. As discussed above, all work would be completed outside of the bird nesting season and would, therefore, not be anticipated to impact migratory birds or violate the Migratory Bird Treaty Act (MBTA). Impacts to the movement of fish or wildlife are anticipated to be less than significant and no additional mitigation is required.

e) Would the Project conflict with any local policies or ordinance protecting biological resources, such as a tree preservation policy or ordinance?

Less than significant with mitigation. Dredging is located within the existing Marina and its associated access channels. These channels are routinely dredged with the last dredging event occurring in 2008. No local policies or ordinances have been identified that protect biological resources. Dredged materials would be placed at the upland Disposal Sites on Pierce Island. The 2016 Pierce Island Biological Assessment surveyed for species afforded protection under local and regional documents. The identified

vegetation communities on Pierce Island are described in Table 6 above and depicted in Figure 4. No special status plant species were found in the non-tidal interior area of Pierce Island; however, Suisun Marsh aster and Mason's lilaeopsis were present in the tidal marsh areas. Placement of dredged pipelines, and disposal of dredged sediments could impact plant species. Therefore, avoidance measure **BIO-1** would require flagging Delta tule pea, Suisun Marsh aster, Suisun thistle and Mason's lilaeopsis colonies within 50 feet of work areas prior to placement of dredge materials. Implementation of **BIO-1** would assure that identified sensitive plant species are protected. Therefore, impacts are anticipated to be less than significant, and no additional mitigation is required.

f) Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No impact. The Solano County MSCHP is currently being developed. The final document has not been released or adopted and the anticipated adoption date is not listed. The Project would comply with all federal, state, and local regulations. Impacts are not anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

The following mitigation measures would be implemented to avoid and/or minimize potential impacts and to ensure impacts are less than significant:

BIO-1 Prior to placement of dredge materials, the Project's biologist shall perform a preconstruction presence/absence survey to flag the location of any sensitive plant species including Suisun Marsh aster and Mason's lilaeopsis plants or plant colonies within 50 ft of dredging placement work areas. Any such identified plant or colony shall be avoided.

BIO-2 All Project work on Pierce Island shall be conducted according to the USFWS and CDFW approved work window of September 1st – January 31st to avoid potential impacts to the Suisun song bird.

BIO-3 No project activities shall occur within 50 ft of suitable tidal marsh habitat for the salt marsh harvest mouse (SMHM) within two (2) hours before and after an extreme high tide event (6.5 ft or higher measured at the Golden Gate Bridge and adjusted to the timing of local high tides) or when adjacent marsh is flooded unless SMHM proof exclusion fencing has been installed around the work area.

BIO-4 No project activities shall occur within 50 ft of suitable Ridgway's (California clapper) rail (RCCR) or California black rail (CBR) habitat during extreme high tide events or when adjacent tidal marsh is flooded. Extreme high tides events are defined as a tide forecast of 6.5 ft or higher measured at the Golden Gate Bridge and adjusted to the timing of local high tides.

BIO-5 The City will retain a qualified biologist to survey, monitor and document compliance with measures AM BIO-3 through AM BIO-5 with the submittal of weekly summary reports/emails or through requirements outlined in the Project's regulatory permit conditions.

BIO-6 The City shall implement the following BMPs:

- Construction debris will not be allowed to enter the water.
- The cutterhead shall remain at or below the sediment surface during dredging.
- Any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into the stream or its tributaries shall be contained in water tight containers or removed from the Project Site.

BIO-7 Prior to start of October through November dredging, The City shall obtain a CDFW-issued ITP for potential impacts to delta smelt and longfin smelt resulting from dredging activities conducted outside of the CDFW Environmental Work Window. The City shall implement the permit conditions according to permit timing and requirements, which may include purchase of mitigation credits, removal of creosote pilings, or other form of mitigation acceptable to CDFW.

Sources

Biological Assessment for Pierce Island (Marty Ecological Consulting 2016); Information for Panning and Consultation (IPAC accessed on May 2, 2019 at https://ecos.fws.gov/ipac/location/RK4AS36JG5BIJH4YNEMVXESDWU/resources); Pierce Island Dredged Materials Waste Water Discharge Requirements (RWQCB 2019); Endangered and Threatened Wildlife and Plants 12-month Finding on a petition to List the San Francisco Bay-Delta Population of the Longfin Smelt as Endangered or Threatened (USFWS 2012); Longfin Smelt Fact Sheet (CDFG 2009); California Fish Species, Longfin Smelt (University of California, 2019); Delta Smelt Biological Opinion (USFWS 2008); Characterization of Sediment from the Suisun City Marina: Results of Sediment Sampling and Analysis (EcoRisk 2017); Vernal Pool Tadpole Shrimp (East Contra Costa County HCP 2006); Vernal Pool Fairy Shrimp 5-Year Review: Summary and Evaluation (USFWS 2007).

Cultural Resources

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

3.5 Cultural Resources Discussion

a) Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

No impact. According to the City of Suisun City 2035 General plan, there are 17 listed historical resources and historical resources eligible for listing in Suisun City (Suisun City 2015). The Suisun City Historic district is also eligible for listing on the National Register of Historic Places. There are no known historical resources within the Marina or its associated access channels, including the Project site. The Project proposes no impacts to structures or buildings. Additionally, it is unlikely that unknown historical resources would be found during routine maintenance dredging as dredging would occur in pre-disturbed areas that were previously dredged in 2008 and before. In addition, placement of dredge material at the Disposal Sites would not result in disturbance of a historical resource. Therefore, no impacts are anticipated, and no mitigation is required.

b) Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

No impact. As discussed above, the Project site is not located in an area of historical significance according to the City of Suisun City 2035 General Plan. Additionally, the Project only proposes routine maintenance dredging in previously dredged areas with the last dredging event occurring in 2008. Dredged sediments would be placed at the Disposal Sites that routinely accept dredged sediments from the Marina and its associated channels. Therefore, it would be unlikely that unidentified archaeological resources would be encountered during routine maintenance dredging. No impacts are anticipated, and no mitigation is required.

c) Would the Project disturb any human remains, including those interred outside of formal cemeteries?

No impact. No human remains are known to exist at the Project site. The Project only proposes routine maintenance dredging, and placement of that dredge material at the permitted Disposal Sites, an area previously disturbed in 2008 and before. Therefore, it would be unlikely that unknown human remains would be found. No impacts are anticipated; however, should human remains be discovered during ground disturbance, the Project Applicant/Developer would be required to follow all standard protocols and regulations required of any project that uncovers human remains. To comply with State Health and Safety Code Section 7050.5, if human remains are encountered, the County Coroner must be notified of the find immediately. No further disturbance would occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code (PRC) Section 5097.98. If the remains are determined to be Native American, the Coroner would notify the Native American Heritage Commission (NAHC), which would determine and notify a Most Likely Descendant (MLD). The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

Avoidance, Minimization and/or Mitigation Measures

No impacts were identified, and no mitigation measures are required.

Sources

City of Suisun City 2035 General Plan (Suisun City 2015); National Register of Historic Places (National Park Service, accessed on April 30, 2019 at https://www.nps.gov/subjects/nationalregister/index.htm) California Register of Historical Resources (Office of Historic Preservation, Accessed on April 20, 2019 at http://ohp.parks.ca.gov/ListedResources/?view=county&criteria=48) AB-52 Consultation (May 14, 2019).

Energy

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☐	☒
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

3.6 Energy Discussion

a) Would the Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

No impact. The City of Suisun City 2035 General Plan identifies a lack of connectivity as an issue that can lead to increased energy usage and travel distances (Suisan City 2015). The maintenance of the Marina and its associated channels would maintain the current connectivity of the Marina and its associated channels, which may provide more direct routes to the City and adjacent areas, thus reducing energy usage. There is no proposed increase in waterway usage that could lead to increased energy consumption. The Project only proposes to maintain current uses. The Project does not propose the construction of any structures that could result in the unnecessary consumption of energy usage during operation. Therefore, long-term Project operation is not anticipated to result in the wasteful, inefficient or unnecessary consumption of energy resources.

Project dredging would create temporary minor elevations in energy usage through the use of dredging and placement equipment. However, use of such equipment is not anticipated to be wasteful, inefficient, or unnecessary and would not result in a potentially significant environmental impact. As mentioned above, dredging is necessary to maintain the current waterways and assure direct and efficient routes to the City and adjacent areas. Energy usage is anticipated to be minor and temporary during dredging and placement activities. In addition, the Project may provide long-term energy usage benefits as discussed above. Therefore, no impacts are anticipated, and no mitigation is required.

b) Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No impact. The Draft Suisun City Zoning Code (Suisun 2016) promotes the installation of solar energy technologies. The Draft Suisun City Zoning Code also promotes the usage of building integrated wind systems and ground mounted wind towers that do not exceed a capacity of 50 kilowatts, are incidental to the primary use of the property, and are intended to provide electricity primarily for on-site usage. The

Project only proposes to maintain the current Marina and its associated channels and would not conflict with or obstruct the installation of solar or wind energy technologies. There are no structural elements associated with the Project that could be outfitted with solar technologies or building integrated wind systems. The Project is confined to the existing Marina and its associated access channels. There are no viable areas within the Project footprint to install ground mounted wind turbines. Impacts are not anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

Draft Title 18, Zoning Code (Suisun City, 2016). City of Suisun City 2035 General Plan (Suisun City 2015).

Geology and Soils

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a Known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994 or most current edition), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

3.7 Geology and Soils Discussion

a) Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

No impact. Two of Solano County's faults are known to be active, the Green Valley fault and the Cordelia fault (Suisun City 2015). These two faults have been delineated under the Alquist-priolo Earthquake Fault zoning map; however, these two active faults do not occur within the City limits and do not occur within the Project footprint (California Department of Conservation EQ Zapp 2019). The nearest fault is 5.5 miles west of the site. Additionally, the Project does not propose the construction of structures that could be damaged or pose risk of injury or death during an earthquake. Therefore, no impacts are anticipated, and no mitigation is required.

ii) Strong seismic ground shaking?

No impact. The possibility of damage due to ground rupture, as a result of faulting, is considered very low since active faults are not known to cross the site (Suisun City 2017, Figure 9). The nearest known active regional fault is the Cordelia fault, located approximately 5.5 miles west of the site. The Project does not propose the development of structures that would be subject to seismic ground shaking. The Project only proposes maintenance dredging of the existing Marina and its associated access channels, and placement of that material within permitted placement sites. With no active faults present on the Project site, no further investigation of the Project site such as geophysical surveys or fault trenching are necessary. No impacts are anticipated, and no mitigation is required.

iii) Seismic-related ground failure, including liquefaction?

No impact. Liquefaction is a ground failure hazard that typically occurs during seismic events in areas where loose sandy soils exist below shallow groundwater. The project area contains soils of high liquefaction potential; however, the Project does not propose the development of structures which would be subject to ground failure. The Project proposes maintenance dredging and upland disposal of dredged sediments at the Pierce Island Disposal Sites. Dredging methods and proposed depths would be consistent with previous dredging operations and would not jeopardize the geological integrity of the Dredge Areas or Disposal Sites. No new structures are proposed to be developed on these dredged sediments and no structures exist within the Project footprint except for levee and weir infrastructure at the Disposal sites specifically designed to accept and manage dredge material. Because the Project does not propose the development of structures that could be at risk for ground failure no impacts are anticipated, and no mitigation is required.

iv) Landslides?

No impact. The project site is located in the existing Marina and its associated access channels. The Project does not propose structures that could be at risk of landslides. There are no onsite or adjacent hills. The project area and greater Project Vicinity is characterized as flat or shallowly sloping (Suisun City 2015); therefore, landslides are unlikely, no impacts are anticipated, and no mitigation is required.

b) Would the Project result in substantial soil erosion or the loss of topsoil?

Less than significant impact. The Project site and surrounding area is relatively flat with characteristics that are not indicative of erosive conditions. The project is confined to the Marina and its associated access channels. No upland work would occur that could result in the loss of topsoil, however bottom sediments from the Marina and its associated access channels would be removed during dredging. This is necessary to maintain safe and navigable depths. Dredging will only occur to depths previously permitted and determined to assure the safe and continued use of the channels. Dredged materials will be placed at the Disposal Sites. Dredged material disposal will comply with all environmental regulations and standard BMPs would be implemented including:

- Care shall be taken during placement or movement of materials on the tidal slough banks to prevent any damage to stable tidal slough banks; and

- Vegetation shall not be removed trimmed or otherwise modified.

Additionally, placement of dredged sediments would be confined within the designated Disposal Sites, where the weirs will control any potential erosion. Potential impacts would be less than significant, and no mitigation is required.

c) Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in, on or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?

Less than significant impact. The Project area and greater Project Vicinity is located in low lying areas. There are no adjacent hills and therefore landslides are not anticipated within the Project Vicinity. Liquefaction potential is typically high for recently deposited sediments that are loose, wet and occur in areas with high groundwater levels. The project area and greater Project vicinity occurs in an area of high liquefaction potential. The project proposes to remove bottom sediments from the Marina and its associated channels and place them at the Disposal Sites. Dredged sediments would be loose and wet and would likely have a high potential for liquefaction. However, the Project does not propose the development of structures that could be impacted by liquefaction. No structures would be built on deposited dredged materials or within the dredged channels. Therefore, although liquefaction potential is high for the site, impacts are anticipated to be less than significant given that no development at risk of liquefaction impacts is proposed or occurs within the project footprint. No mitigation is required.

d) Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks of life or property?

No impact. Expansive soils are characteristically clay soils that are prone to large volume changes (swelling and shrinking) that are directly related to changes in water content. The area along the western edge of Area 3 is characterized as having high shrink-well potential (Suisun City 2017, Figure 10). There are also smaller areas along the eastern edge of Area 5 that are characterized as having moderate or high shrink-swell potential. Expansive soils can cause damage to structures that are built on them due to shrinking and swelling events. The Project does not propose the development of any structures that could be damaged during shrink swell events. The Project only proposes maintenance dredging of the Marina and its associated access channels. Therefore, impacts are not anticipated, and no mitigation is required.

e) Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No impact. The Project does not propose septic tanks or alternative waste water disposal systems. All dredged sediments will be disposed of at the Disposal Sites. This area has been authorized for the disposal of hydraulically dredged sediments from the Marina and its associated access channels. Impacts are not anticipated, and no mitigation is required.

f) Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact. Paleontological resources are remains of prehistoric animals and plants that are at least 11,000 years old. The Project vicinity is located on Holocene Alluvium soils (Suisun City 2015). These soils are no older than 11,000 years old and therefore paleontological resources are not anticipated to occur in these soils. Additionally, dredging has routinely occurred in the Marina and its associated access channels every 8 to 9 years since 1992 with the last dredging episode occurring in 2008. Therefore, it is anticipated that disturbed sediments during the proposed dredging event would be less than 11 years old. Impacts to paleontological resources are not anticipated and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

California Department of Conservation EQ Zapp accessed on April 18, 2019 at https://maps.conservation.ca.gov/cgs/EQZApp/app/; City of Suisun City 2035 General Plan, (City of Suisun, 2015); City of Suisun City Local Hazard Mitigation Plan (Suisun City, 2017).

Greenhouse Gas Emissions

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

3.8 Greenhouse Gas Emissions Discussion

a) Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than significant impact. Operational greenhouse gas (GHG) emissions are not anticipated. No permanent structures are proposed that would generate greenhouse gas emissions. Once the dredging is complete, the Suisun Marina channels would continue to operate the same as under existing conditions. The Project's purpose is for maintenance only. No new operational changes within the Marina are proposed.

Project dredging and placement activities within October and November would result in the temporary minor generation of GHG emissions. GHG emissions would occur from direct sources such as the use of dredging equipment. GHG Emission rates were calculated using the CARB 2017 off-road model and anticipated equipment use (Appendix D). A dredge quantity of 53,000 CY of material was used to calculate project-level GHG emissions. Anticipated Project GHG emissions are presented in Table 7.

Table 7: **Annual GHG Emissions**

Source Category	CO2 (mty)	CH4 (mty)	N2O (mty)	CO2e (mty)
Construction				
Dredging of 53,000 CY	99	0	0	99
BAAQMD significance threshold				None
Operation				
Operational Emissions[1]	0	0	0	0
BAAQMD stationary source significance threshold				1,100
BAAQMD non-stationary source significance threshold				10,000
Total GHG Emissions	99	0	0	99
Significant?				No

[1] No change in Marina operations compared to existing baseline conditions. Therefore, operational emissions are not anticipated.
Total annual GHG emissions are the sum of construction emissions.
Source: 2017 CARB off-road model

Table 7 shows that the Project would result in an incremental increase in GHG emissions of 99 metric tons per year (mty). The BAAQMD does not state a significance threshold for construction related GHG emissions however the construction related GHG emissions described above are anticipated to be minor. Additionally, the Project does not propose operational changes and would therefore not cause operational GHG emissions. GHG emission from the Project are anticipated to be temporary and less than significant. Mitigation is not required.

b) Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

No impact. The Governor's Executive Order S-3-05 (EO S-3-05) established GHG emission reduction targets for the state as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. In response to this Executive Order, California adopted Assembly Bill 32 (AB 32), which codified EO S-3-05 goals as statewide targets and instructed CARB to adopt regulations that reduce emissions from significant sources of GHGs and establish a mandatory GHG reporting and verification program. In 2008 CARB developed the AB 32 Scoping Plan, which laid out a suite of measures to reduce GHG emissions to 1990 levels by 2020. In 2014 CARB developed the 1st Update to the AB 32 Scoping Plan, which highlighted California's progress toward meeting the near-term 2020 GHG emission reduction goals, highlighted the latest climate change science and provided direction on how to achieve long-term emission reduction goals described in EO S-3-05.

In 2015, the Governor issued Executive Order B-30-15 (EO B-30-15) establishing a mid-term GHG reduction target for California of 40 percent below 1990 levels by 2030. In response to this Executive Order, California adopted Senate Bill (SB) 32, which codified EO B-30-15 goals as a statewide target and instructed CARB to adopt regulations to meet the target. The CARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target set by EO B-30-15 and codified by SB 32.

AB 32 and SB 32 codified state targets and directed State regulatory agencies to develop rules and regulations to meet the targets; AB 32 and SB 32 do not stipulate project-specific requirements. Specific requirements are codified in rules and regulations developed by regulatory agencies such as CARB and BAAQMD, and local City actions such as the City of Suisun City's draft Climate Action Plan (CAP), which is part of a regional-effort that includes Dixon, Rio Vista and Fairfield City. The Public Review Draft was released in 2012.

AB 32 Scoping Plan and Scoping Plan Update strategies include, but are not limited to the renewables portfolio standard, the low carbon fuel standard, mobiles source measures (vehicle efficiency measures, zero vehicle emission technologies), solar roof programs, carbon sequestration systems, etc. CARB and BAAQMD develop regulations based on these strategies, which are enforced at the state level on utility providers and automobile manufacturers.

The Project only proposes maintenance of an existing Marina and its associated channel. There is no proposed expansion of use. Once the dredging is complete, the Suisun Marina channels would continue to operate the same as under existing conditions. The Project's purpose is for maintenance only. No new

operational changes within the Marina are proposed. Therefore, operational impacts to applicable plans, policies or regulations for reducing GHG emissions are not anticipated.

Minor, temporary GHG emissions would occur during dredging events; however, construction of the proposed Project would comply with CARB and BAAQMD requirements as discussed above in Table 7. The proposed Project would comply with existing regulations and would, by law, comply with future regulatory requirements. The proposed Project would therefore, not preclude the State's implementation of the AB 32 Scoping Plan or Plan Update. In addition, the proposed Project would not be anticipated to conflict with the development of the Suisun City CAP. Therefore, no impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

Public Review Draft City of Suisun City Climate Action Plan (City of Suisun, November 2012); Final Environmental Assessment/ Environmental Impact Report Maintenance Dredging of the Federal Navigation Channels in San Francisco Bay (USACE & RWQCB 2015); California Environmental Quality Act Air Quality Guidelines (Bay Area Air Quality Management District 2017).

Hazards and Hazardous Materials

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site, which is included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a Project located within an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.	☐	☐	☐	☒

3.9 Hazards and Hazardous Materials Discussion

a) Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than significant impact. The Project proposes maintenance dredging of an existing Marina and its associated access channels. Dredged sediments proposed for disposal have been tested and characterized as acceptable for upland disposal at the Disposal Sites (RWQCB 2019). All constituent levels were within the acceptance criteria set by the RWQCB. The RWQCB in coordination with the DMMO has reviewed the report characterizing the sediments proposed for upland disposal. It has been determined that disposal of dredged sediments at the Disposal Sites would not cause degradation to the current

environment. All discharges from the project will comply with the applicable provisions of Clean Water Act (CWA) section 301 Effluent Limitations, 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards), and with other applicable requirements of State law (RWQCB 2019). Therefore, the project is not anticipated to create a significant hazard to the public or the environment through the disposal of hazardous materials.

During dredging and placement activities, some hazardous materials would be used such as petroleum-based fuels, however, the implementation of BMPs stipulating proper storage and handling of equipment refueling would be implemented during dredging and placement activities as a standard requirement. Additionally, any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into the stream or its tributaries shall be contained in water tight containers or removed from the Project Site. With the implementation of BMPs, the Project would not create a significant hazard to the public or the environment through the use of hazardous materials.

The Project does not propose the routine transport of hazardous materials. Boats would continue to utilize the Marina and its associated access channels during and after maintenance dredging. Any transport of hazardous materials in boats using the Marina and its associated access channels would continue to be regulated by federal safety standards under the jurisdiction of the U.S. Department of Transportation. Impacts from the transport, use or disposal of hazardous wastes are anticipated to be less than significant, and no mitigation is required.

b) Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than significant impacts. The Project only proposes routine maintenance dredging. There have been no past issues related to encountering hazardous materials during past dredging events. Little potential exists for encountering hazardous materials or hazardous waste within the Project site. A review of the State Water Resources Control Board's Leaking Underground Storage Tank (LUST) Geotracker database indicated that there is one active listed hazardous material site approximately 0.4 miles northwest of Area 3 (SWRCB 2017). This site was a former Sheldon Oil Company truck washing facility that closed in 1993. Potential contaminants of concern include chlorinated solvents. The potential media of concern includes groundwater, soil and surface water. The proposed Project would be confined to the existing Marina and associated Disposal Sites and does not propose activities that have the potential to disturb contaminants at this site. The EnviroStor database does not list any active cleanup sites with potential contamination in the Project area or in the City (EPA 2019).

During dredging and placement activities some hazardous materials, such as petroleum-based fuels would be used. The Project could create a possible hazard to the public or the environment through the temporary use of hazardous materials during dredging and placement activities if not handled properly. As previously noted, BMPs for proper fueling and equipment maintenance to prevent any dredging related pollutants and products from violating any water quality standards would be implemented as a

standard requirement. The potential risk associated with accidental discharge of hazardous materials during the use of dredging equipment would be low since the handling of such materials would be addressed through the implementation these BMPs. As also noted above the proposed dredged materials have been characterized and determined to comply with applicable environmental regulations and requirements for upland disposal at the Pierce Island site. With the implementation of BMPs and standard regulations, potential impacts would be less than significant, and no mitigation is required.

c) Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No impact. The nearest school, Crystal Middle School, is located approximately 0.05 miles west of Area 5. The Project would be confined to the Marina and its associated access channels. No upland work is proposed near the school. Dredged materials have been determined to not pose risk to the environment and any petroleum emissions from dredging equipment would be minimal. Additionally, dredged material disposal would occur at the Disposal Sites, which are not located within one-quarter mile of an existing or proposed school. No impacts are anticipated, and no mitigation is required.

d) Would the Project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No impact. A review of the Department of Toxic Substances Control's Hazardous Waste and Substances List (Cortese List) indicated that the project site is not located on any identified hazardous material sites (DTSC 2019). The nearest site identified on the Department of Toxic Substances Control's Cortese List is approximately 4.5 miles southwest of the site. A review of the State Water Resources Control Board's LUST Geotracker database and the EPA EnviroStor database indicated that there is one active listed hazardous material site approximately 0.4 miles northwest of Area 3 (SWRCB 2017; EPA 2019). The Project would be completely confined to the Marina and its associated access channels and is not anticipated to impact this hazardous material site. No other active sites were identified within the Project Vicinity. No impacts are anticipated, and no mitigation is required.

e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?

No impact. The closest airport to the project site is the Travis Air Force Base approximately 4 miles east of Area 5 (Google Earth 2018). This is not a public airport. This airport is outside of the City limits and no airport land use plan has been adopted. The closest Public airport is Rio Vista Municipal airport approximately 19 miles east of the project site. The Project does not include any elements that would create safety hazards associated with airports or air travel. Given the distance to the nearest public airport and the Project scope, no impacts are anticipated, and no mitigation is required.

f) Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No impact. The Project would neither physically interfere with nor impair implementation of any existing emergency response plan or emergency evacuation plan. The project only proposes maintenance of an existing Marina and its associated access channels. The project would not block roads that could provide emergency response or evacuation. All major highways would remain fully accessible. Furthermore, the Project would not block entrances to the Marina or its associated access channels but would maintain existing boat access routes. No impacts are anticipated, and no mitigation is required.

g) Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

No Impact. The Project proposes maintenance of the existing Marina and its associated access channels and would not occur in a high fire risk area (Suisun City 2015, Figure 11). The Project does not propose activities that could exacerbate wildfire risks. The Project only proposes maintenance of the existing channels and would not otherwise change topography or wind patterns. No impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

EnviroStor database (EPA 2019); Geotracker database (SWRCB 2019); M&N desktop review (Google Earth, 2018); Pierce Island Dredged Materials Waste Water Discharge Requirements (RWQCB 2019); City of Suisun City 2035 General Plan (Suisun City, 2015); Department of Toxic Substances Control Cortese List (DTSC, accessed at https://dtsc.ca.gov/dtscs-cortese-list/ on April 28, 2019).

Hydrology and Water Quality

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surface, in a manner which would				
i) result in substantial erosion or siltation on or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	☒
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;	☐	☐	☒	☐
or				
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

3.10 Hydrology and Water Quality Discussion

a) Would the project violate or conflict with any adopted water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Less than significant with mitigation. The Project proposes maintenance dredging of an existing Marina and its associated access channels. Dredged sediments will be disposed of in the West Pond. Decant water would flow through the weir in the center levee into the East Pond. Once the West Pond is full, the weir boards will be placed to cut off water flow between the ponds and the remainder of the material

will be placed in the East Pond. All discharge of decant water will be out of the new weir in the East Pond (along the north levee). Dredged sediments proposed for disposal have been tested and characterized as acceptable for upland disposal at the Disposal Sites. All constituent levels were within the acceptance criteria set by the RWQCB. The RWQCB in coordination with the DMMO has reviewed the report characterizing the sediments proposed for upland disposal. It has been determined that disposal of dredged sediments at the Disposal Sites would not cause degradation to the current environment. All discharges from the Project would comply with the applicable provisions of CWA section 301 Effluent Limitations, 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards), and with other applicable requirements of State law (RWQCB 2019). Dredging of the channels may create temporary elevated turbidity levels from localized sediment plumes, however turbidity levels would be maintained through compliance with regulatory permits and through the implementation of BMPs, which includes the following measures incorporated under mitigation measure **HWQ-1**:

- No water or sediment shall be allowed to leak from the pipeline under any circumstances.
- The cutterhead shall remain at or below the sediment surface during dredging.
- Turbidity monitoring shall be conducted downstream as well as at an appropriate reference area upstream. If turbidity is found to threaten aquatic life, CDFW approved control methods will be installed.
- No overflow or decant water shall be discharged at the site from the barge.
- The barge will remain afloat at all times and shall not rest on the bed or bank of the water body.

Therefore, the Project is not anticipated to violate any water quality or discharge requirements. Project activities are not anticipated to impact groundwater quality. Impacts are anticipated to be less than significant, and no additional mitigation is required.

b) Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No impact. No alterations of current channels that could interfere with groundwater recharge are proposed, only maintenance of existing channels. The Project does not propose activities that would increase the amount of impervious surface area. Therefore, the Project is not anticipated to interfere with the amount of potential groundwater recharge at the site. In addition, the Project proposes no pumping or extraction of groundwater. The Project would not deplete groundwater supplies and would not interfere with groundwater recharge by building additional wells. Therefore, impacts are not anticipated, and no mitigation is required.

c) Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i) result in substantial erosion or siltation on- or off-site;

Less than significant impact. The Project would not alter the course of a stream or river. Dredging activities are not anticipated to result in the erosion of channel banks, only the deepening of existing channels to safe and navigable depths. The Project does not propose the addition of impervious surfaces that could resulting in higher runoff rates or volumes and offsite issues downstream. Dredged sediments would be placed in the West Pond where sediments would be allowed to settle. Decant water would flow through the weir in the center levee into the East Pond. Suspended sediments would be allowed to settle during this process and all effluent requirements would be met before decant water is discharged into Whispering Bay Channel. Therefore, substantial impacts due to siltation are not anticipated. Potential impacts are anticipated to be less than significant, and no mitigation is required.

ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

No impact. As discussed above, the Project does neither proposes the alteration of the course of a stream or river nor does it propose an increase in impervious surfaces. The Project does not propose any fill or structures that could reduce flood-carrying capacity. Channels would be deepened to safe and navigable depths, which may provide more capacity for surface runoff from surrounding areas and thus potentially reduce the risk of flooding. Additionally, because the Project does not propose an increase in impervious surfaces there is no anticipated increase in the rate or amount of surface runoff. Impacts are not anticipated, and no mitigation is required.

iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

Less than significant impact. As discussed above, the Project neither proposes the alteration of a stream or river, nor does it propose an increase in impervious surfaces. The City's stormwater drainage systems include creek flows along Laurel Creek, McCory Creek and Union Avenue Creek (Suisun City 2016). The Project would not alter the onsite drainage pattern. The Project does not propose activities that could contribute to runoff water or sources of polluted runoff. Channels would be deepened which could increase capacity of stormwater runoff. As discussed above, disposal of dredged sediments would comply with the applicable provisions of CWA section 301 Effluent Limitations, 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards), and with other applicable requirements of State law (RWQCB 2019) and dredged sediments are not anticipated to provide a source of polluted runoff with compliance with regulatory permits and implementation of standard BMPs such as:

- The Permittee shall decontaminate all tools that will enter the water.
- There shall be no dumping of any litter or construction debris
- No overflow or decant water shall be discharged from the Barge.

Impacts are anticipated to be less than significant, and no mitigation is required.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less than significant impact. The Project is located within the 100-year flood plain. The Base flood elevation is 10 ft (FEMA 2016). The flood season in Solano County typically lasts from November through April (Suisun City 2015). The Project area is confined to the existing Marina and its associated access channels which are subject to tidal ebb and flood. The Project does not propose elements that would pose risk of release of pollutants during inundation. Channels would be deepened to safe and navigable depths, which may increase flood capacity and thus reduce the risk of flood hazard. Disposal of dredged materials would comply with the applicable provisions of CWA section 301 Effluent Limitations, 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards), and with other applicable requirements of State law (RWQCB 2019). Additionally, the Project site is located inland from coastal wave influences and is not located in a tsunami or seiche hazard zone (Suisun City 2015). Impacts are anticipated to be less than significant, and no mitigation is required.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less than significant impact. The existing drainage pattern of the site would be maintained. The Project would not increase the amount of surface runoff or interfere with groundwater replenishment as a result of additional hardscaped surfaces. Dredged materials are not anticipated to conflict with the implementation of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary water quality control plan (RWQCB 2018). Impacts are anticipated to be less than significant, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

The following mitigation measures would be implemented to avoid and/or minimize potential impacts and to ensure impacts are less than significant:

HWQ-1: The City shall implement the following BMPs:

- No water or sediment shall be allowed to leak from the pipeline under any circumstances.
- The cutterhead shall remain at or below the sediment surface during dredging.

- Turbidity monitoring shall be conducted downstream as well as at an appropriate reference area upstream. If turbidity is found to threaten aquatic life, CDFW approved control methods will be installed.

- No overflow or decant water shall be discharged at the site from the barge.

- The barge will remain afloat at all times and shall not rest on the bed or bank of the water body.

Sources

FEMA Flood Map Service Center (FEMA, 2016. accessed at https://msc.fema.gov/portal/search?AddressQuery=Suisun%20City#searchresultsanchor; City of Suisun City Waterfront District Specific Plan (Suisun City 2016); City of Suisun City 2035 General Plan (Suisun City 2015); Pierce Island Dredged Materials Waste Water Discharge Requirements (RWQCB 2019); Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (RWQCB 2018).

Land Use and Planning

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☒	☐
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

3.11 Land Use and Planning Discussion

a) Would the Project physically divide an established community?

Less than significant impact. The Project site is situated in the City. Suisun Slough runs through the City north to south. The Project only proposes maintenance of the current channel and would not alter the path of Suisun Slough. The Project would enhance the connectivity of the City by assuring safe and navigable depths of Suisun Marina and its associated access channels. Vessel traffic may be limited in the immediate vicinity of the hydraulic dredger during dredging events; however, vessel use of the Marina and its associated access channels would never be fully restricted. Vessel traffic would be diverted around the hydraulic dredger. Potential temporary impacts from the associated dredging would be less than significant and would result in long-term benefits to the connectivity of the City. No mitigation is required.

b) Would the Project Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No impact. The Project site land use is designated as Stream Project (Suisun City 2015). The Project does not propose any changes to land use. The project proposes dredging that would assure the safe and continued use of the Marina. Dredging and disposal would be consistent with all zoning requirements as stated in the City of Suisun City Waterfront District Specific Plan (Suisun City 2016). No impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

City of Suisun City General Plan (Suisun City, 2015). City of Suisun City Waterfront District Specific Plan (Suisun City, 2016).

Mineral Resources

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

3.12 Mineral Resources Discussion

a) Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No impact. According to the City of Suisun City 2035 General Plan, there are no mineral resource zones within the project footprint. The nearest mineral resource zone is Mineral Resource Zone Category 3 (MRZ-3). This zone is categorized as "areas containing mineral deposits the significance of which cannot be evaluated from available data." This MRZ-3 zone is located 1 mile southeast of Area 3. The nearest identified mineral resources are sand and gravel resources approximately 4.5 miles southwest of Area 3 (USGS 2019). The USGS Minerals Resource Data System did not identify any critical or major mineral deposits in the Project area, the nearest major mineral deposit is gold and is located over 55 miles northwest from the project site. The nearest mine is the Peterson Pit (Suisun City 2015), located approximately 6 miles east of Area 5. Given the nature of this Project, neither impacts to mineral resources nor the loss of availability of mineral resources are anticipated. No impacts are anticipated, and no mitigation is required.

b) Would the Project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No impact. Mineral resource zones have been designated to assure consideration of statewide or regionally significant mineral deposits for the City of Suisun. As discussed above, there are no mineral resource zones within the Project footprint or the greater City sphere of influence. Therefore, the Project is not anticipated to result in the loss of availability of a locally-important mineral resource recovery site. No impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No impacts were identified, and no mitigation measures are required.

Sources

Mineral Resources Data System (USGS, accessed on April 17, 2019 at https://mrdata.usgs.gov/mrds/); City of Suisun City 2035 General Plan (Suisun City 2015).

Noise

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive ground-borne vibration or ground-borne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒

3.13 Noise Discussion

a) Would the Project result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than significant impact. The City of Suisun City 2035 General Plan in its Chapter 9, Noise and Vibration section, acknowledges the potential negative effects of noise on humans including auditory and non-auditory impacts. The General Plan lists State and Federal guidelines and regulations pertaining to control of noise that are at the City's disposal. The City's General Plan also establishes land use compatibility criteria in terms of the Community Noise Equivalent Level (CNEL) for various developments, including residential uses. These standards, shown in Table 8, are typically applicable to long-term, operational effects of developments within the City.

Table 8: Suisun City Noise and Land Use Compatibility Standards (Ambient Exterior Noise Exposure)

Land Use	Normally acceptable	Normally unacceptable
Residential- low density	<60 dBA	70-75 dBA
Multiple-Family Residential	<65 dBA	70-75 dBA
Transient lodging	<65 dBA	70-80 dBA
Public Facilities (Schools, libraries, churches, hospitals, nursing homes)	<70 dBA	70-80 dBA
Industrial, manufacturing utilities, agriculture	<75 dBA	75+ DBA
Source: City of Suisun City 2035 General Plan		

The City has not adopted noise regulations as part of their municipal code; however, the General Plan recommends that sensitive land uses such as educational and residential land uses not be located in areas with noise levels that exceed 65 dB CNEL. The Noise Element policy aims to protect residential land uses from outside noise sources by designating appropriate locations for industrial and commercial uses. Section 15.04.075 of the Suisun City Municipal Code states that construction is not allowed within 500 ft of a residence, except between the hours of 7:00 am to 10:00 pm Monday through Saturday and between 8:00 am and 10:00 pm on Sunday. Dredging operations would comply with the City's permitted construction work hours. Impacts are anticipated to be less than significant, and no mitigation is required. The nearest sensitive structures to the project site are single-family residences located immediately to the west of Area 3 and east and west of Area 5. Additionally, Crystal Middle School is located approximately 0.05 miles west of Area 5 and Crescent Elementary is located approximately 0.85 miles east of Area 5.

Construction noise associated with the Project would be temporary. Noise generated would primarily be associated with the operation of dredging equipment. Sound from dredging operations can be variable depending on the type of sediment, and phase of operation. Noise from hydraulic dredgers include noises from the rotating cutterhead in contact with the sediment floor, noise from pumps during the suction of materials, transport sounds during the movement of sediment in pipes, and general ship machinery sounds. Hydraulic dredges typically generate airborne noise levels ranging from 60 to 80 decibels at about 50 ft from the source (Columbia Association 2013). Dredge equipment would not remain near a particular receptor for the duration of the Project. Dredging equipment would move throughout the Marina and its associated access channels throughout the duration of the Project. Therefore, any potential noise impacts would be temporary.

Construction noise attenuates at a rate based on physical conditions between the source and receiver. Generally, sound levels for a point source decreases by 6 dBA for each doubling of distance (FHWA 2017). The nearest sensitive receptors are residential areas that boarder the channels along the waterfront. The nearest residential property line is within approximately 50 ft of the channel with the nearest residential structure approximately 70 to 80 ft from the proposed dredge limits. Therefore, residential properties would occasionally be within 50 ft of the dredge equipment. However, dredge equipment would not remain near a particular receptor for the duration of the Project. Dredge equipment would continuously move throughout the Project Site, making any potential noise impacts temporary. Additionally, normal noise attenuation within residential structures with open windows is about 17 dBA,

while the noise attenuation with closed windows is about 25 dBA (NCHRP 1971). This would reduce noise levels to approximately 55 dB given a conservative distance between equipment and properties and if residential property owners chose to shut their windows. Therefore, the proposed Project would comply with the suggested noise levels for sensitive land uses.

In addition, construction activities would be conducted during the City's construction noise exempted hours between 7:00 a.m. and 10:00 pm Monday through Saturday. Sunday work and other work hours would be allowed by the City as long as the additional workload during those hours is in compliance with regulatory requirements. Impacts are anticipated to be less than significant, and no mitigation is required.

Once the dredging is complete, Suisun Marina and its associated access channels would continue to operate the same as under existing conditions. No new operational changes within the Marina are proposed. Therefore, there would be no long-term noise impacts associated with the Project and no mitigation is required.

b) Would the Project result in generation of excessive ground-borne vibration or ground-borne noise levels?

Less than significant impacts. Project dredging could have the potential to result in minor varying degrees of temporary ground borne vibration, depending on the phase of work and sediment characteristics. The Project proposes to use hydraulic dredging and would likely not produce noticeable ground borne vibrations. Dredging is proposed for soft, recently deposited sediments and no blasting, rock crushing or mechanical dredging is proposed. Therefore, impacts are anticipated to be less than significant, and no mitigation is required.

c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

No impact. The Project site is not located within an airport land use plan. The closest airport to the project site is the Travis Air Force Base approximately 4 miles east of Area 5 (Google Earth 2018). This is not a public airport. This airport is outside of the City limits and no airport land use plan has been adopted. The closest Public airport is Rio Vista Municipal airport approximately 19 miles east of the project site. The Project would not expose people residing or working in the area to excessive noise levels associated with airports or airstrips. Given the distance to the nearest public airport and airstrip, no impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

City of Suisun Municipal Code; City of Suisun City 2035 General Plan (Suisun City, 2015); Highway Noise: A Design Guide for Highway Engineers (National Cooperative Highway Research Program Report 117, 1971); Highway Traffic Noise Analysis and Abatement Policy and Guidance (FHWA 2017); Noise Impacts Related to Lake Restoration Activities at Lake Kittamaqundi and Lake Elkhorn (Columbia Association 2013).

Population and Housing

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial upland population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.14 Population and Housing Discussion:

a) Would the Project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No impact. The Project proposes maintenance dredging of an existing Marina and its associated access channels. The Project does not propose the construction of new housing or commercial businesses that would directly induce population growth in the area. The Project would only assure the safe and continued current uses of the channels and would not extend the Marina or its associated access channels. The Project would not extend roadways or other infrastructure into new areas that could lead to indirect growth. No impacts are anticipated, and no mitigation is required.

b) Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No impact. There are no housing units located within the project site. The Project footprint is fully confined to the existing Marina and its associated access channels. Therefore, the Project would not displace housing. The Project does not propose the removal of housing or businesses. Therefore, the Project would not displace people. No impact would occur, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No impacts were identified, and no mitigation measures are required.

Sources

Based on the nature of proposed Project activities.

Public Services

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☒	☐

3.15 Public Services Discussion:

a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services?

i) Fire protection

No Impact. The City is serviced by a volunteer fire department. The fire department is run by a paid fire chief and two paid captains. There are 15 firefighters total and six recruits (Suisun City 2017). The fire station is located at 621 Pintail Drive, Suisun City, CA 94585, approximately 1.2 miles northeast of Area 5. The station would be adequate for servicing the Project site, similar to existing conditions, without the need for alterations to existing facilities or construction of new facilities.

Dredging and placement activities would not result in lane closures that could impact firefighter response time. The proposed dredging would occur in the Marina and its associated access channels. The proposed Project would not create a new public safety or fire hazard. The Project is not anticipated to induce population growth that would create additional demand for public services or facilities. The Project would not result in the need for new or physically altered government facilities and would not affect response times or performance objectives. No impacts are anticipated, and no mitigation is required.

ii) Police protection

No impact. The Suisun City Police Department would provide service to the project site in the event of a service call. The nearest station is located at 701 Civic Center Blvd, approximately 0.15 miles north of Area 3. As previously discussed, the Project would not induce population growth that could lead to any incremental or cumulative increase in demand for service, impact public facilities, or impact emergency response times. The proposed dredging would not impact police response times or performance objectives. Impacts to police services are not anticipated and no mitigation is required.

iii) Schools

No impact. The nearest schools to the project site are Crystal Middle School at 400 Whispering Bay Lane and Crescent Elementary at 1001 Anderson Drive. Crystal Middle School is located approximately 0.05 miles west of Area 5. Crescent Elementary is located approximately 0.85 miles east of Area 5. The Project proposes maintenance dredging of the existing Marina and its associated channels. The Project does not include residential uses that would increase the use of existing school facilities identified above or require the construction of new school facilities. Therefore, no impacts are anticipated, and no mitigation is required.

iv) Parks

No impact. The Project proposes no direct change to existing park facilities. The Project also does not include residential uses that would indirectly increase the use of existing park facilities or increase the demand for construction of new park facilities. No impacts are anticipated, and no mitigation is required.

v) Other public facilities

Less than significant impact. The proposed dredging would improve public use of the existing channel by assuring safe and navigable depths. Use of the Marina and its associated access channels may be temporarily limited in the immediate vicinity of the hydraulic dredger during dredging events; however, use of the Marina and its associated access channels would never be fully restricted. Other boats would be diverted around the hydraulic dredger. Potential temporary impacts from the proposed dredging would be less than significant and would result in long-term benefits to public services. No mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

Google Earth Investigation (M&N, August 2019); City of Suisun City Local Hazard Mitigation Plan (Suisun City 2017).

Recreation

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

3.16 Recreation Discussion:

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No impact. The Project only proposes maintenance dredging to maintain the current use of the Marina and its associated access channels. There is no proposed expansion of use. The Project proposes no increase in residential development that would increase the demand for parks or other recreational facilities. The Project is also not expected to cause a significant increase in employment, only temporary dredging jobs to complete the necessary maintenance dredging. Therefore, no direct or indirect increase in demand or use of existing parks or recreational facilities would result from Project implementation. Impacts are not anticipated, and no mitigation is required.

b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Less than significant impact. The Suisun Marina and its associated access channels are used in-part for recreation activities such as fishing, jet skiing, and recreational boating. The proposed maintenance dredging would assure the safe and continued use of the Marina and its associated channels for such recreational activities. There is no proposed construction or expansion of recreational facilities, only maintenance of the existing Marina. Once the dredging is complete, Suisun Marina and its associated access channels would continue to operate the same as under existing conditions. No potential impacts to the physical environmental are anticipated other than those analyzed and disclosed in this IS/MND. No additional impacts are anticipated, and no additional mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

Based on the nature of proposed Project activities.

Transportation

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

3.17 Transportation Discussion

a) Would the Project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit roadway, bicycle and pedestrian facilities?

Less than significant impact. The Project would not impact transit roadways, bicycle or pedestrian facilities. The Project proposes maintenance dredging of the existing Marina and its associated access channels. The Marina and its associated access channels provide water access to the City and receive measurable levels of boat traffic (Suisun City 2015). The Project would assure long-term safe and navigable depths of the waterways and allow for continued boat use. Use of the Marina and its associated access channels may be temporarily limited in the immediate vicinity of the hydraulic dredger during dredging events; however, use of the Marina and its associated access channels would never be fully restricted. Boats and other watercraft would be diverted around the hydraulic dredger. Potential impacts are anticipated to be temporary and less than significant. No mitigation is required.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Less than significant impact. Project dredging would require use of a hydraulic dredger for one to two months. The dredger would work along the existing Marina and its associated access channels making occasional trips to the Disposal Sites to unload dredged sediments. The project could temporarily generate the need for vessels to divert around the immediate vicinity of the hydraulic dredger, but distances traveled by boats to avoid dredging equipment would be minimal. The Project would not result in a change in automobile use or vehicle miles traveled (VMT) because it is not related to roadway transportation or land-use changes.

The Project would provide long term benefits to transportation by assuring safe and navigable depths of the Marina and its associated channels, therefore allowing for continued water access to Suisun City and adjacent areas; therefore, potential impacts from Project dredging and operation are anticipated to be less than significant. No mitigation is proposed.

c) Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves of dangerous intersections) or incompatible uses (e.g., farm equipment)?

No impact. The Project proposes maintenance dredging of the existing Marina and its associated access channels. Construction of structures is not proposed. Dredge depths have been determined that provide safe and navigable depths and would be compatible with the current uses of the Marina and its associated access channels. Impacts are not anticipated from the proposed dredging. No mitigation is proposed.

e) Would the Project result in inadequate emergency access?

No impact. The Project would not block or impact roadways used for emergency access. Additionally, the Project would not block access to the Marina and its associated channels. Boat traffic would be temporarily diverted around dredging equipment; however, this is not anticipated to impede emergency access. No impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

City of Suisun City 2035 General Plan (Suisun City 2015).

Tribal Cultural Resources				
Would the Project cause a substantial adverse change in the significance of a Tribal Cultural Resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

3.18 Tribal Cultural Resources Discussion

The information and findings provided in this section are based on the Cultural resources Background Report for the City of Suisun City 2035 General Plan. Only one response was received from the Ione Band of Miwok Indians requesting that the City should update the contact information for their Chairperson as Sara Dutschke Setschwaelo. No comments on the Project or request for consultation was received. Completion of the AB 52 consultation process will conclude in compliance with Public Resources Code section 21080.3.1 prior to certification of the MND and Project approval. Any additional mitigation measures will be added to the final mitigation monitoring reporting program should additional input on the presence of resources be provided by the tribes and should the City determine such measures would reduce, minimize or avoid impacts to a resource.

The Project site is located within Solano County, which has long been part of the traditional homeland of the Patwin who occupies the area west of the Sacramento River and north of Suisun Bay. The Patwin speakers of the Wintuan language. Their settlements were generally large, and their villages were usually located along river or stream banks. Their diet typically varied with the season, but generally consisted of foraged foods such as acorns, nuts, seeds and berries and hunted animals such as tule elk, deer, antelope, bear, duck, geese, quail, turtle and fish. By the mid nineteenth century many Patwin had been relocated. During this time Euro-American diseases decimated much of the Patwin populations. Although populations have severely declined, the Patwin still reside in Solano County.

Would the Project cause a substantial adverse change in the significance of a Tribal Cultural Resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

No Impact. Based on the nature of proposed activities, which includes dredging in previously dredged locations and the placement of material at a currently permitted disposal site; and dredged material having recently been deposited over the last 10 years in the Marina and associated channels since 2009, no impacts are anticipated resulting from the proposed maintenance Project and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

Based on the nature of proposed Project activities.

Utilities and Service Systems

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

3.19 Utilities and Service Systems Discussion:

a) Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

No impact. The Project entails maintenance dredging of the existing Marina and its associated access channels. No wastewater treatment facilities are associated with the Project or required to serve the Project. No impact would occur, and no mitigation is required.

b) Would the Project have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?

No impact. The Project proposes maintenance dredging to the existing Marina and its associated access channels. Water supply would not be required for the project. No impact would occur, and no mitigation is required.

c) Would the Project result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

No impact. Please refer to the discussion under Section 3.19(a). No impacts are anticipated, and no mitigation is required.

d) Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less than significant impact. The Projects dredging wastes would consist of dredged materials. Hydraulically dredged sediment would be approximately 15 percent solids and 85 percent water (RWQCB 2019). Dredged sediments would be placed at the East and West Pond upland disposal sites on Pierce Island. In 2018 the City raised the East Pond and Center Levee Crests to accommodate the proposed dredging episode. Total current capacity for dredged materials at the two ponds is 176,000 CY, sufficient for the proposed disposal (RWQCB 2019). No new businesses or residences are proposed that are typically associated with more substantial amounts of construction and operational waste streams. Therefore, permitted capacity is available, the Project's contribution to solid waste is considered less than significant and no mitigation is required.

e) Would the Project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No impact. The Project's dredging waste would consist of dredged materials. Dredged materials would be placed at the Disposal Sites on Pierce Island, owned and operated by the City. Pierce Island has been permitted as a long-term dredged material disposal site since 1990 (USACE Permit # 16329E58; BCDC Permit # M85-87, and RWQCB Order No. 90-071). Once suspended sediments have settled and effluent limitations have been met, decant water would be discharged into Whispering Bay Connecting Channel. All stages of dredge disposal would comply with required federal, state, and local management regulations, including but not limited to, dredge material acceptance criteria, effluent limits, monitoring and reporting, and applicable mitigation. Impacts are not anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

Pierce Island Dredged Materials Waste Water Discharge Requirements (RWQCB 2019).

Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

3.20 Wildfire Discussion

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

The Project footprint is confined to the existing Marina and its associated access channels and the affiliated Disposal Sites. Adjacent areas to Area 5 are characterized as moderate fire risk (Suisun City 2015). There are two high fire risk areas near the Project site. One high fire risk area is located approximately 0.5 miles northwest of Area 3 and one is located approximately 0.5 miles east of Area 5.

a) Would the project Substantially impair an adopted emergency response plan or emergency evacuation plan?

No impact. The Project proposes maintenance of an existing Marina and its associated access channels and would not occur in a high fire risk area (Suisun City 2015). The nearest high fire risk zones occur 0.5 miles northwest of Area 3 and 0.5 miles east of Area 5. The project would not block roads that could provide emergency response or evacuation from wildfires. Furthermore, the Project would not block entrances to the Marina or its associated access channels and all major highways would remain open. The Project would also maintain existing boat access routes. No impacts are anticipated, and no mitigation is required.

b) Due to slope, prevailing winds, and other factors, would the Project exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

No Impact. The Project does not propose the addition of habitable buildings or structures or activities that could exacerbate wildfire risks. The Project only proposes maintenance of the existing channels and would not otherwise change topography or wind patterns. No impacts are anticipated, and no mitigation is required.

c) Would the Project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

No impact. The project proposes maintenance of an existing Marina and its associated access channels and would not occur in an area of high fire risk. The channels would be dredged to navigable depths, thus increasing water depths of the channels. City water is provided through the Suisun-Solano Water Authority (Suisun City 2015). The main water supply is from Lake Berryessa, 20 miles north of the project site. Suisun Slough is not used as a water source for the City and therefore the proposed dredging is not anticipated to impact emergency water sources. The Project does not propose any installation of infrastructure that could exacerbate fire risk. No impacts are anticipated, and no mitigation is required.

d) Would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No impact. The Project does not propose changes to topography such as slope or drainage changes, only maintenance of the existing channels. No habitable buildings or structures are proposed or located within the Project footprint. All work would be confined to the footprint of the Marina and its associated access channels, upland work is not proposed except for placement of dredged material at the upland Disposal Sites. No impacts are anticipated, and no mitigation is required.

Avoidance, Minimization and/or Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

Sources

City of Suisun City 2035 General Plan (Suisun City 2015).

Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects.)	☐	☐	☐	☒
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

3.22 Mandatory Findings of Significance Discussion:

a) Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less than significant with mitigation. As discussed in Section 3.4, Several sensitive vegetation communities either occurred on the Pierce Island during the 2016 Survey or have the potential to occur on Pierce Island. Sensitive vegetation occurrence on Pierce Island could include: Suisun Marsh aster, Mason's lilaeopsis, Suisun thistle, Contra Costa goldfields and delta tule plea. **BIO-1** would require flagging within 50 ft of these sensitive vegetation communities to avoid placement of dredge materials in any such sensitive location. **BIO-1** would assure that impacts to sensitive vegetation communities would be less than significant.

Several sensitive wildlife species were also either observed during the 2016 Survey or noted to have the potential to occur within the Project Site given suitable habitat. The Suisun song sparrow and old man tiger beetle were observed during the 2016 Survey. In addition, the salt marsh harvest mouse, Suisun shrew, Ridgeway's rail, California black rail, Loggerhead shrike, delta smelt, longfin smelt, vernal fairy pool shrimp and vernal tadpole shrimp could occur within the Project Site given suitable habitat. As

described above, avoidance and mitigation measures **BIO-2** through **BIO-7** are anticipated to assure that impacts to these sensitive wildlife species would be less than significant.

The Project would also protect water quality through the implementation of water quality BMPs required under mitigation measure **HWQ-1.** As described above in Section 3.10, implementation of **HWQ-1** would ensure potential impacts to water quality would be less than significant.

Finally, as discussed in Section 3.5 and 3.7, potential impacts to historical and/or prehistorical resources are not anticipated. It is unlikely that unknown historical resources would be found during routine maintenance dredging as dredging would occur in pre-disturbed areas that were previously dredged in 2008 and before. In addition, placement of dredge materials at the Disposal Site would not result in the disturbance of a historical resource. Paleontological resources are remains of prehistoric animals and plants that are at least 11,000 years old. The Project Vicinity is located on Holocene Alluvium soils (Suisun City 2015). These soils are not older than 11,000 years old. Therefore, the Project is not anticipated to eliminate part of California's history or prehistory.

b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects)?

No impact. The Project would not result in potentially significant Project-level or cumulative impacts with regard to air quality or GHG emissions as described above in Sections 3.3 and 3.8, respectively. No cumulative impacts are anticipated resulting from this maintenance dredging project. Therefore, impacts are not anticipated, and no mitigation is required.

c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than significant. Previous sections of this IS/MND reviewed the Project's potential impacts related to air quality and noise among other environmental issue areas. As concluded in these previous discussions, the Project would result in less than significant environmental impacts and would not require mitigation measures. Therefore, the Project would cause less than significant adverse effects on human beings.

4.0 LIST OF PREPARERS

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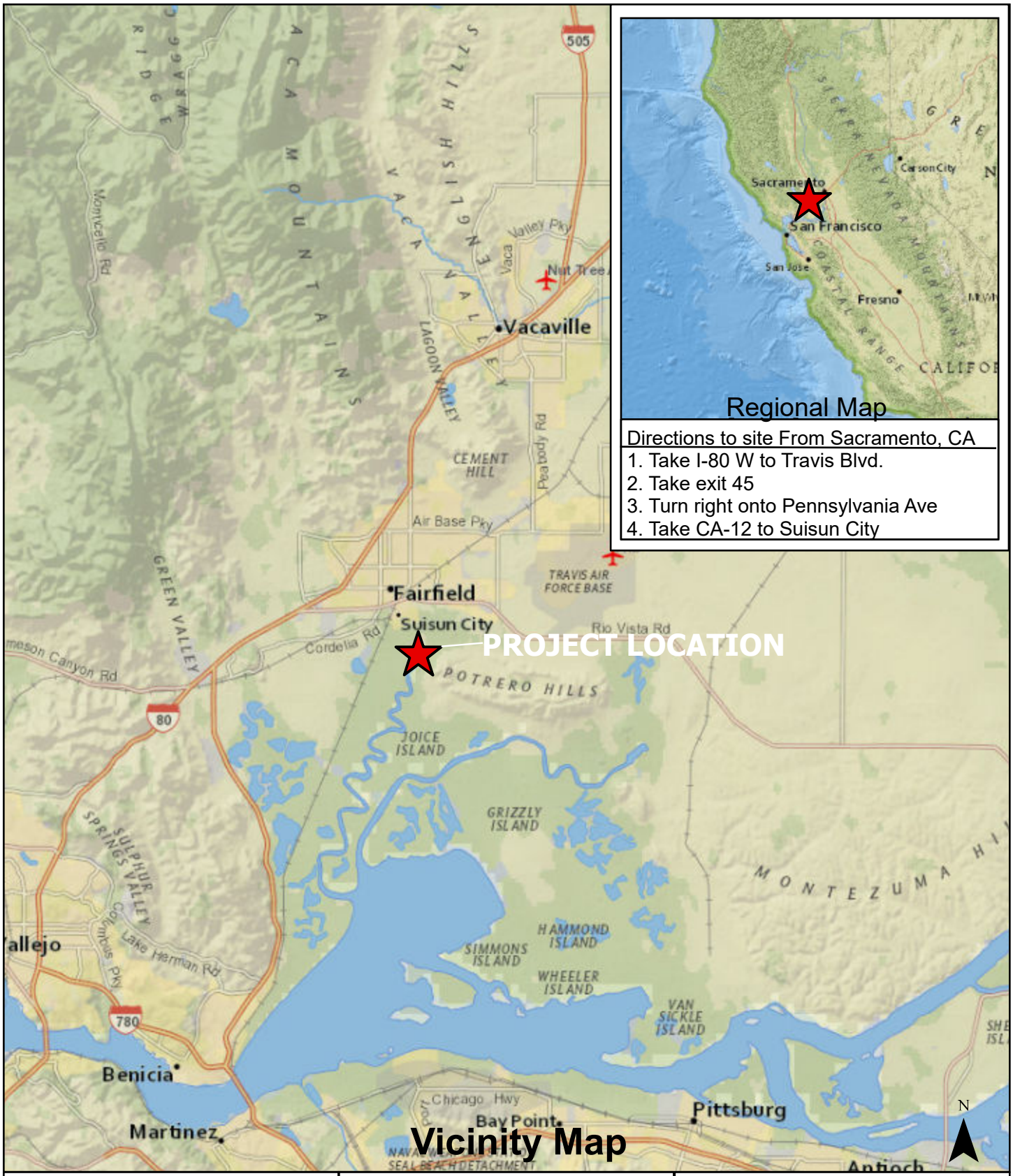
6.0 FIGURES



APPLICANT: City of Suisun City

PROPOSED PROJECT: Suisun Marina October and November Maintenance Dredging

moffatt & nichol

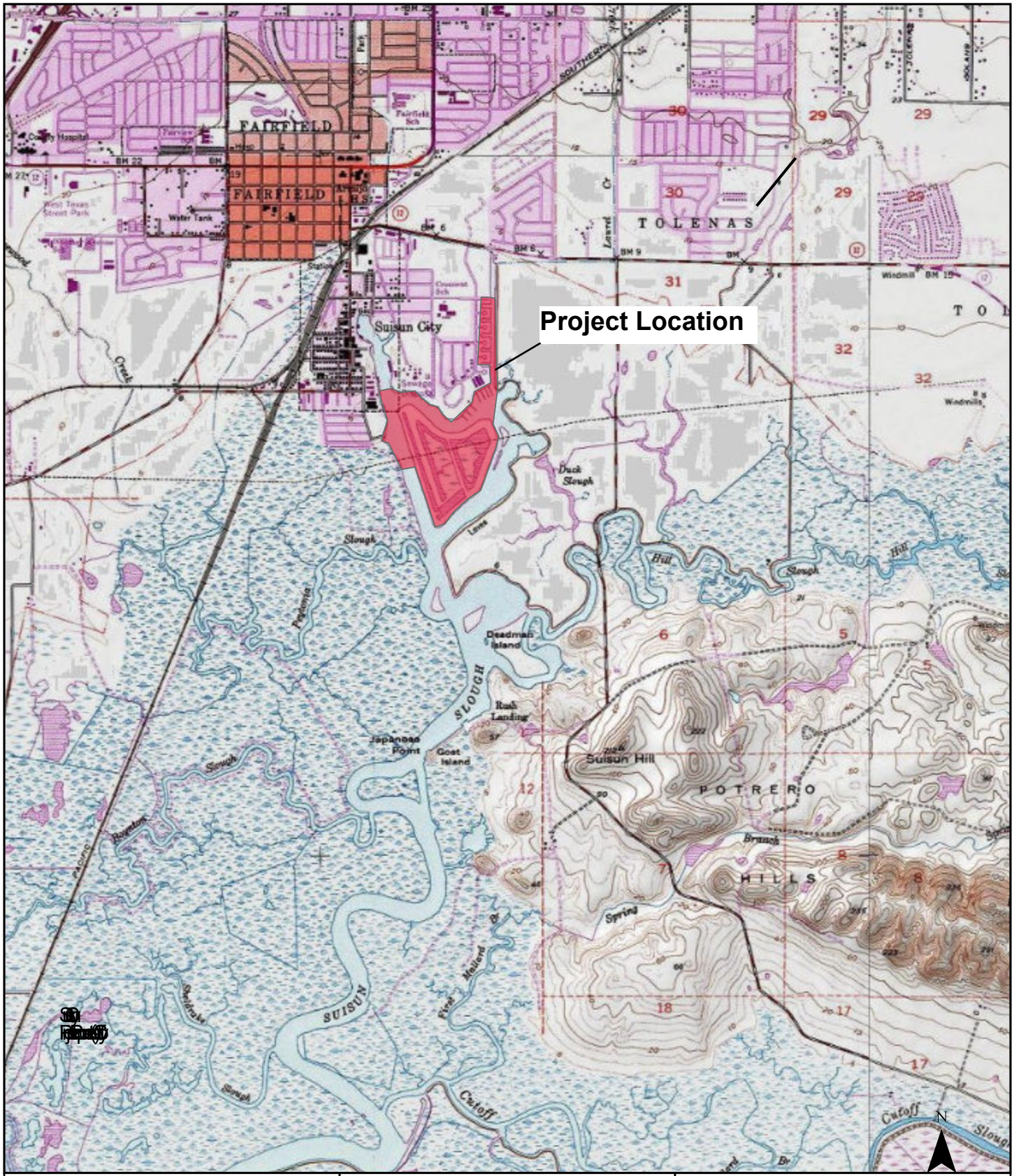
LOCATION ADDRESS: Suisun City Marina and associated access channels

COUNTY: Solano
STATE: CA

FIGURE 1: Regional and Vicinity Map

0 1.75 3.5 7 Miles

Source: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



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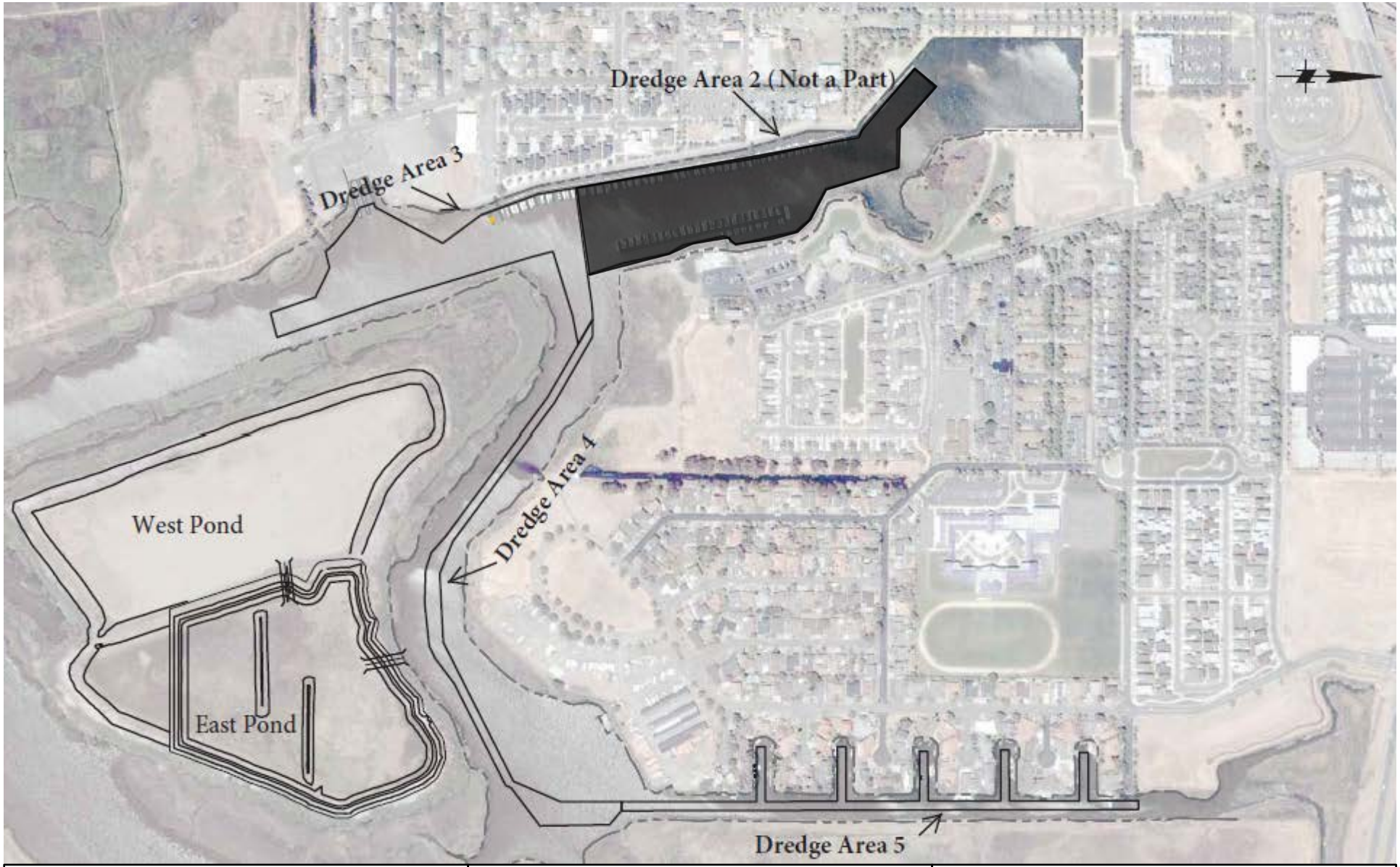
STATE: CA

FIGURE 2: Project Location

0 50 100 200 Miles

Source: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Copyright:© 2013 National Geographic Society, i-cubed



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moffatt & nichol

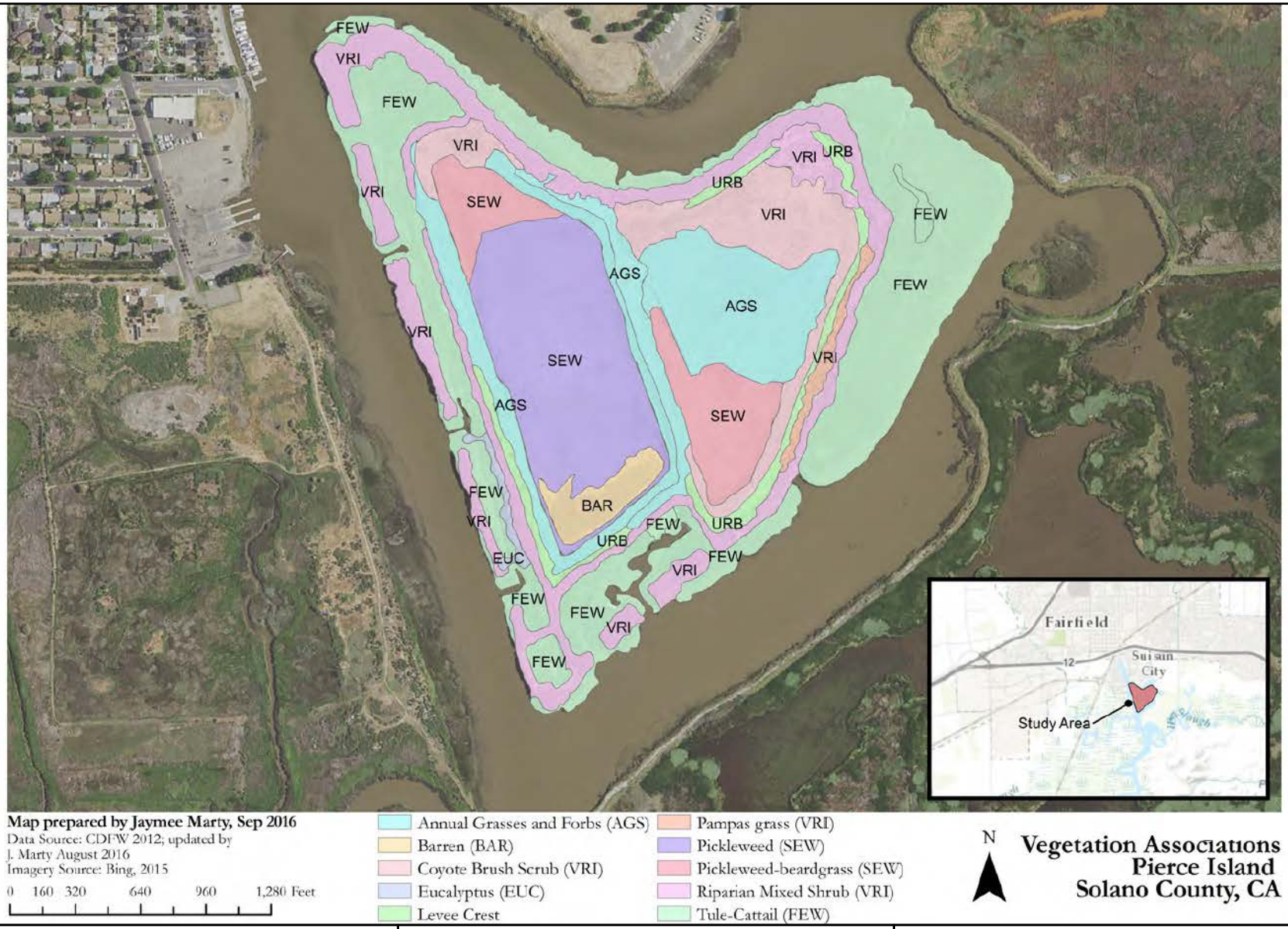
LOCATION ADDRESS: Suisun City Marina and associated access channels

COUNTY: Solano
STATE: CA

Figure 3: Project Aerial

0 0.08 0.15 0.31 Miles

Source: Google Earth Imagery. Accessed on April 28, 2019



APPLICANT: City of Suisun City
PROPOSED PROJECT: Suisun Marina October and November Maintenance Dredging

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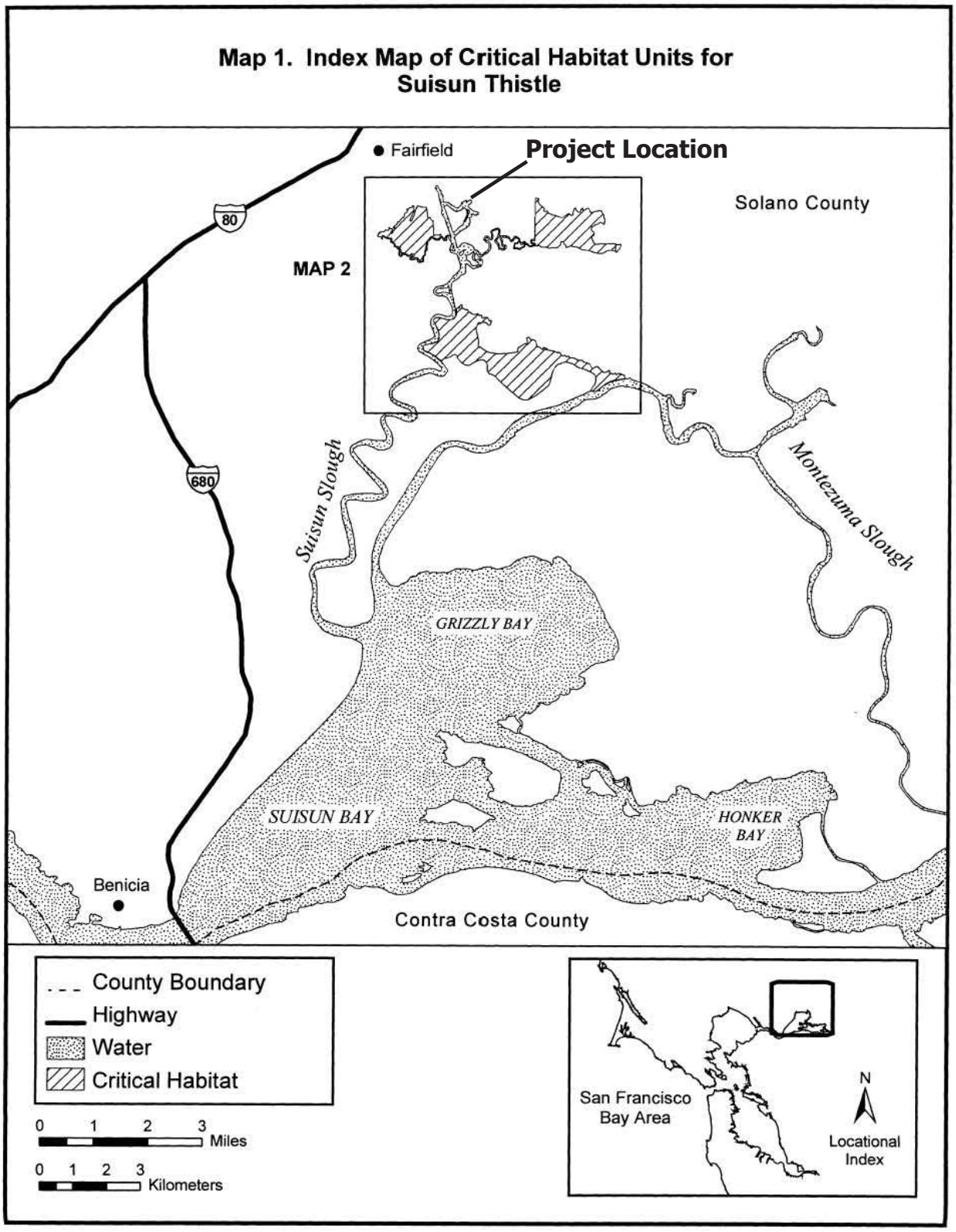
LOCATION ADDRESS: Suisun City Marina and associated access channels

COUNTY: Solano
STATE: CA

Figure 4: Pierce Island Vegetation

Source: CDFW 2012; updated by J.Marty August 2016



Applicant: City of Suisun City PROPOSED PROJECT: Suisun Marina October and November Maintenance Dredging	LOCATION ADDRESS: Suisun City Marina and associated access channels COUNTY: Solano STATE: CA	FIGURE 5: Suisun Thistle Critical Habitat Source: Federal Register Vol. 72, No. 70

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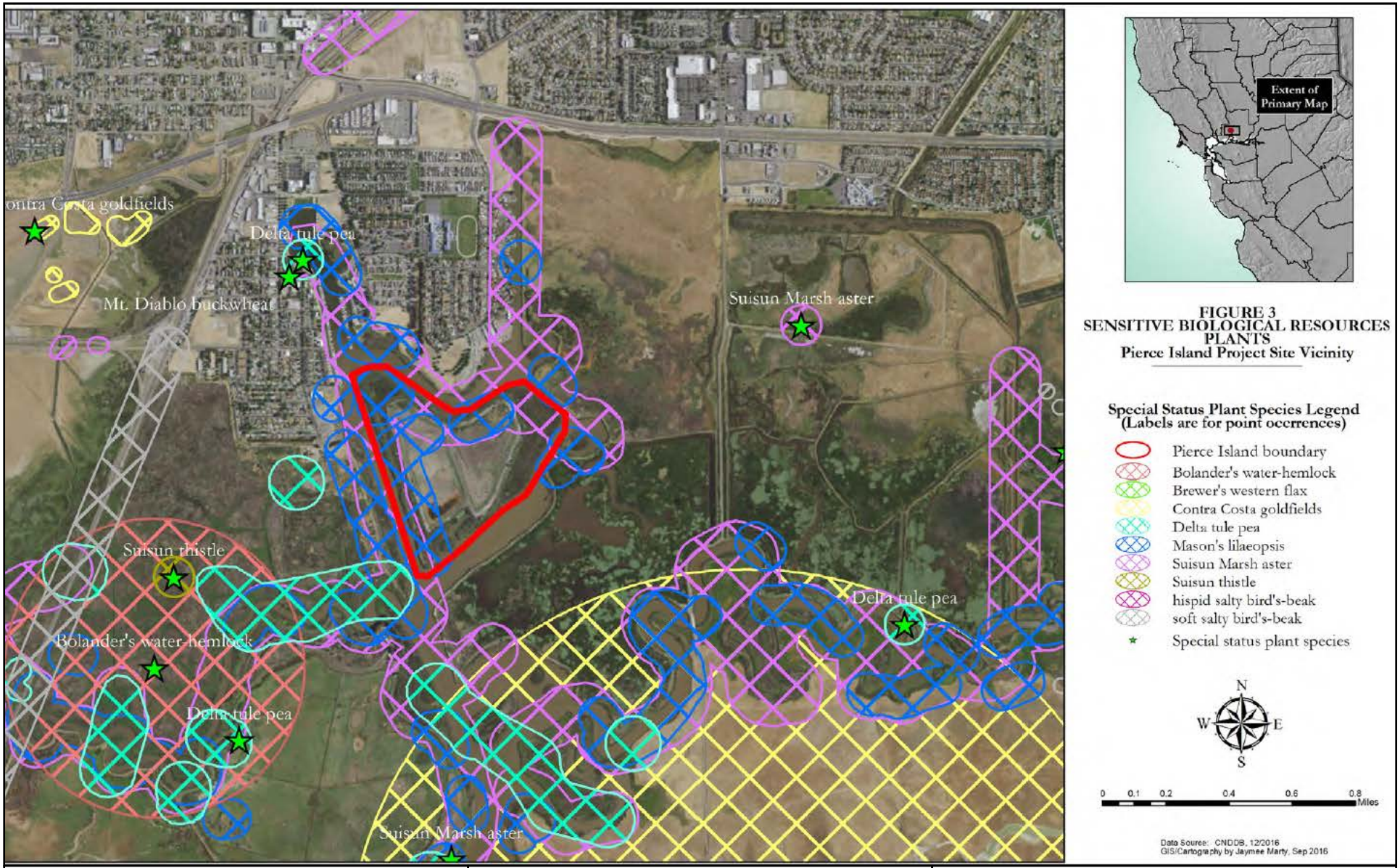

APPLICANT: City of Suisun City
PROPOSED PROJECT: Suisun Marina October and November Maintenance Dredging

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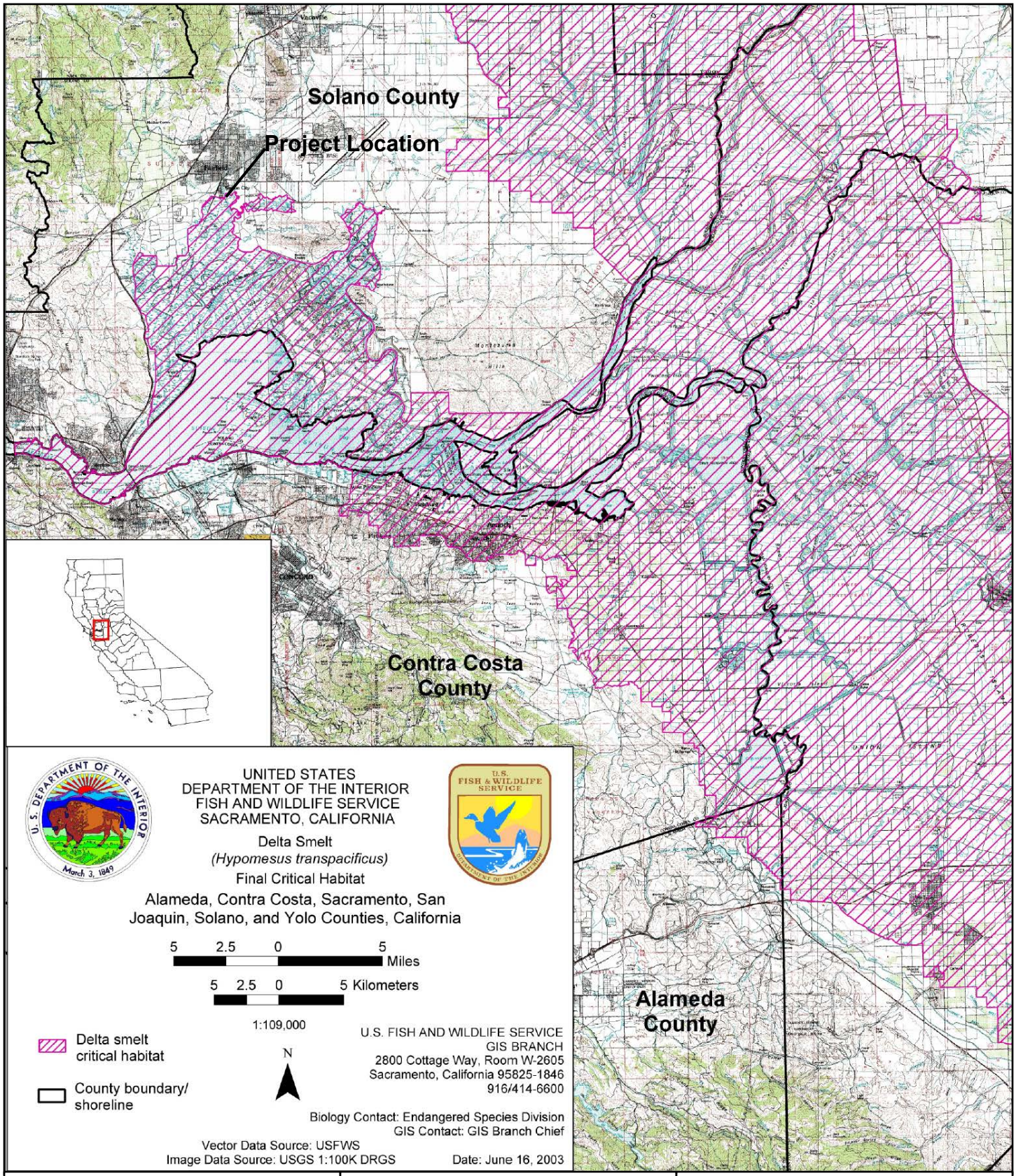
LOCATION ADDRESS: Suisun City Marina and associated access channels

COUNTY: Solano
STATE: CA

Figure 6: Historical Sensitive Plant Species Recordings

Source: CNDDB, 1/2/2016



APPLICANT: City of Suisun City

PROPOSED PROJECT: Suisun Marina October and November Maintenance Dredging

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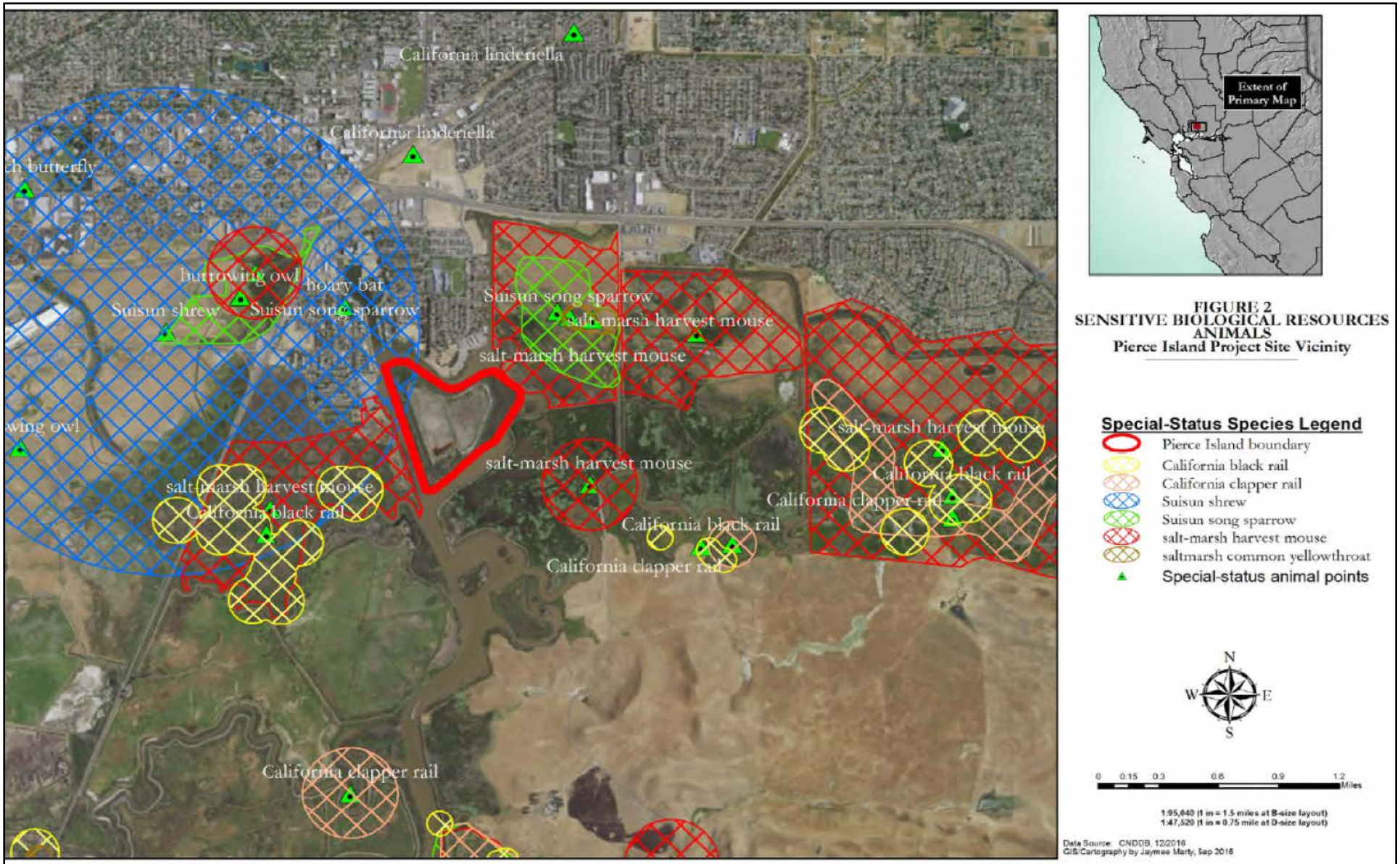
LOCATION ADDRESS: Suisun City Marina and associated access channels

COUNTY: Solano
STATE: CA

FIGURE 7: Delta Smelt Critical Habitat

Source: USGS 1:100K DRGS



APPLICANT: City of Suisun City
PROPOSED PROJECT: Suisun Marina October and November Maintenance Dredging

moffatt & nichol

LOCATION ADDRESS: Suisun City Marina and associated access channels

COUNTY: Solano
STATE: CA

Figure 8: Historical Sensitive Wildlife Species Recordings

Source: CNDDB, 12/2018

7.0 APPENDICES

Appendix A

Pierce Island Biological Assessment

Final Preliminary Biological Assessment for Pierce Island

Solano County, CA

Prepared By:

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Suisun City, CA 94585

Table of Contents

Tables

Figures

Appendices

1 Introduction

This report summarizes the results of a preliminary biological resources assessment for Pierce Island, an approximate 68-acre Island in Suisun Slough owned and managed by the City of Suisun City (City). Pierce Island is a designated disposal site for dredge materials removed from nearby channels and Suisun Marina. The City plans to raise the levees on Pierce Island to increase storage capacity within two large interior pond features for disposal of hydraulically dredged sediment from the Suisun Marina and adjacent channels. The previously dredged material within these existing ponds would be used to improve the levees. The weirs and outfall pipes also require improvements to allow for continued use of Pierce Island as a disposal site (Hultgren-Tillis Engineers 2015).

On 9 August 2016, the City entered into an agreement with Marty Ecological Consulting to conduct a preliminary biological assessment on Pierce Island focusing on the existing biological resources including potential jurisdictional wetlands and waters of the United States as well as habitat for or presence of special-status species. Marty Ecological Consulting subcontracted with Coastal Ecologist, Dr. Peter Baye, to conduct a botanical assessment and with Jeff Alvarez, The Wildlife Project, to conduct surveys for special status wildlife species.

1.1 Site Description

Suisun City is located in the northeast part of the San Francisco Bay just south of the City of Fairfield, Solano County, CA. The City is bordered by Suisun Slough with Pierce Island located immediately south of the City, surrounded by the Slough and the Suisun Channel (Figure1). The ponds within Pierce Island were initially constructed as oxidation ponds for sewage treatment. They were converted to accept dredge disposal of sediments within the Suisun Slough, Suisun City Marina and surrounding areas in the 1980s (Harvey and Stanley Associates 1984). Dredging and sediment placement operations were performed at approximately 7 year intervals since the 1990s with the last episode occurring in 2009. During this last dredge disposal operation, the ponds were near capacity. In 2009, dredge sediments were disposed in the east pond, and the conveying water flowed into the west pond before being discharged into the adjoining slough (Hultgren-Tillis Engineers 2015).

In 2015, a survey of the levee embankments surrounding the Pierce Island ponds was conducted by Hultgren-Tillis (2015) and measured the levee crest heights between 10 and 17 feet with a general crest height of 13.5 feet (elevations based on the North American Vertical Datum of 1988 (NAVD88)). The interior of the ponds is relatively flat, however the surface within the east pond is generally higher (range = 6 to 11 feet) than the surface in the west pond (range = 2 to 5 feet) since the east pond was used as the primary disposal area in the 2009 dredge episode.

2 Methods

The following methods were used to characterize the existing habitat and assess the potential for special status species occurrence on Pierce Island.

2.1 Background Research

Special-status species are plants and wildlife that are legally protected or otherwise considered sensitive by federal, state, or local resource conservation agencies and organizations, including:

- species listed or proposed for listing under the Endangered Species Act (ESA) and/or California Endangered Species Act (CESA) as threatened, or endangered;
- species considered candidates for state or federal listing as threatened or endangered; wildlife

species identified by CDFW or USFWS as California species of special concern (SSC);

- wildlife species identified as fully protected under the California Fish and Game Code;
- species afforded protection under local or regional planning documents; and
- plant species considered by CDFW to be "rare, threatened, or endangered in California" And assigned a California Rare Plant Rank (CRPR). The CDFW system includes six rarity and endangerment ranks for categorizing plant species of concern.

Prior to conducting field surveys, we gathered and reviewed available information regarding biological resources on or near Pierce Island. We developed a list of species with potential to occur on the Island using the following sources of information:

- California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) for the Denverton, Elmira, Fairfield North, and Fairfield South California 7.5-minute U.S. Geological Survey (USGS) topographic quadrangles (CNDDB 2016)—see Figures 2 and 3;
- the list of special-status plants was narrowed (Table 1) to those known to occur in fresh-brackish (oligohaline) tidal marsh, ruderal levee, and saline to alkaline diked non-tidal wetlands in the Suisun Marsh based primarily on:
    - Distribution of historical and recent populations of listed plants and species of concern covered in the United States Fish and Wildlife Service (USFWS) Recovery Plan for Tidal Marsh Ecosystems of Central and Northern California (USFWS 2013);
    - Dr. Baye's knowledge of Suisun Marsh tidal and diked estuarine marsh flora (Baye and Grewell 2011, Grewell et al. 2014);
- covered species under the Solano County Habitat Conservation Plan (SCWA 2012);
- Final Environmental Impact Report for Pierce Island (Harvey and Stanley Associates 1984);
- City of Suisun City General Plan, Chapter 2: Biological Resources (City of Suisun City 2015);
- USFWS Recovery Plan for Tidal Marsh Ecosystems of Central and Northern California (USFWS 2013);
- a review of published documents that covered Pierce Island, adjacent sloughs, or surrounding uplands; and
- a general search for special-status species on or near the site that were parts of collections from the Museum of Vertebrate Zoology, Berkeley, CA; California Academy of Sciences, San Francisco, CA; and the California Roadkill Observation System, Davis, CA.

2.2 Wildlife Surveys

Wildlife biologists Jeff Alvarez and Sarah Foster visited Pierce Island to identify existing biological conditions and the site's potential to support special-status species of animals, including salt marsh harvest mouse (SMHM, *Reithrodontomys raviventris*), Suisun shrew (*Sorex ornatus sinuosus*), Ridgway's Rail (CARR, *Rallus obsoletus*), California Black Rail (*Laterallus jamaicensis coturniculus*), Loggerhead Shrike (*Lanius ludovicianus*), Suisun Song Sparrow (*Melospiza melodia maxillaris*) and other migratory nesting birds as well as sensitive/regulated habitats. Due to the location of the site, the surrounding habitat, known observations of special-status species (Figure 2), and the presence of potential habitat, Jeff Alvarez, a zoologist with 30 years of experience with the salt marsh harvest mouse conducted a species-specific survey for habitat suitability, on Pierce Island on 24 Aug 2016.

Sarah Foster, a biologist holding a federal permit for CARR conducted a habitat suitability survey on Pierce Island on 29 Aug 2016 for this rail species. Each survey was conducted by both kayak (water-level survey),

which was hand-paddled around the island, and on foot (walking transects across vegetated habitat). The biologists focused their surveys on collecting data through direct observation. For each species, the biologists surveyed the Island using direct observation of animals, tracks, nest sites, or other sign, including sympatric species, predators, and general habitat characteristics. They conducted diurnal surveys, considering and recording tide, time of day, general weather conditions, and other factors.

The biologists used kayak surveys to collect data on vegetation structure, species composition, presence and extent of tidal channels, and presence and/or extent of potential nesting sites. They directed specific effort at determining the presence and extent of Marsh Wren (*Cistothorus palustris*) and Suisun Song Sparrow nests, which are frequently used by SMHM as nesting site locations (Johnston 1956). They made additional effort to determine if foraging areas (exposed mud flats), cover sites (emergent vegetation), and other specific habitat requirements were present and available for CARR (Garcia 1995). The biologists collected this information, along with subtler habitat variables to determine if there was a likelihood of either SMHM or CARR being present on Pierce Island.

2.3 Vegetation Surveys

2.3.1 Wetland Mapping

Dr. Jaymee Marty surveyed the interior of Pierce Island to identify potential wetlands based on current plant species composition (Baldwin 2012) as well as soil and hydrology conditions on 24 August and 29 August 2016. The soils on the site are atypical given the past history of disturbance, so vegetation and hydrology were the primary focus. Prior to conducting the site visits, Dr. Marty obtained vegetation mapping data for Suisun Marsh prepared by CDFW and the California Department of Water Resources (DWR) as part of their long-term vegetation change detection project (CDFW 2012). She loaded the CDFW data into an Apple iPad device running iGIS software (version 8.2.2) and compared the mapped data with current vegetation observed in the field. She mapped potential wetland boundaries in the field using vegetation, topography, and any signs of wetland hydrology.

2.3.2 Rare Plant Surveys

Dr. Baye subjectively aggregated the CDFW/DWR vegetation patch types (based on dominant species only) into broader eco-geomorphic landscape units based on relative tidal elevation (exterior levee and marsh, flats, and slough), topography, drainage, and substrate correlated with plant species assemblages (described in Appendix B). These landscape units, which are specific to the mostly artificial island, were used to characterize local distribution and ecological affinity of special-status plants and other vascular plants identified in the study area. They may also be used to predict potential special-status plant occurrence in the future, and plan for mitigation or conservation measures.

Dr. Peter Baye conducted rare plant surveys focusing on federal and state-listed species and species of concern covered in the USFWS Tidal Marsh Recovery Plan and records from the CNDDB (Figure 3) including the following listed summer-flowering species:

- *Chloropyron molle* ssp. *molle* – soft bird's beak (endangered)
- *Cirsium hydrophilum* var. *hydrophilum* – Suisun thistle (endangered)
- *Lathyrus jepsonii* var. *jepsonii* – Delta tule pea (CNPS list 1B)
- *Lilaeopsis masonii* – Mason's Lilaeopsis (CNPS list 1B)
- *Castilleja ambigua* ssp. *ambigua* – estuarine populations – owl's-clover (potential summer flowering or fruiting)

Dr. Baye inspected the intertidal outer perimeter of Pierce Island at low tide from a low-draft (6" water depth) inflatable kayak, to observe intertidal levee and marsh scarps and slump blocks that are inaccessible by foot. He inspected the levee top perimeter by foot, with views of inaccessible outer slope vegetation (obstructed by dense, tall continuous blackberry thickets on the levee top and upper outer slope) by binoculars. He inspected the interior basins (fallow dredge sediment basin; wetland to seasonal wetland or upland gradient) by foot.

2.4 Invertebrate Surveys

Local expert entomologist, Mr. William Ericson, conducted surveys of the dry, semi-barren sediment flats of interior Pierce Island habitat for rare terrestrial and amphibious arthropods on 24 August 2016. Arthropod survey coverage and access by Mr. William Ericson was the same as for the plant surveys on levees and island interior non-tidal dredge disposal areas.

3 Results

3.1 Existing Habitat

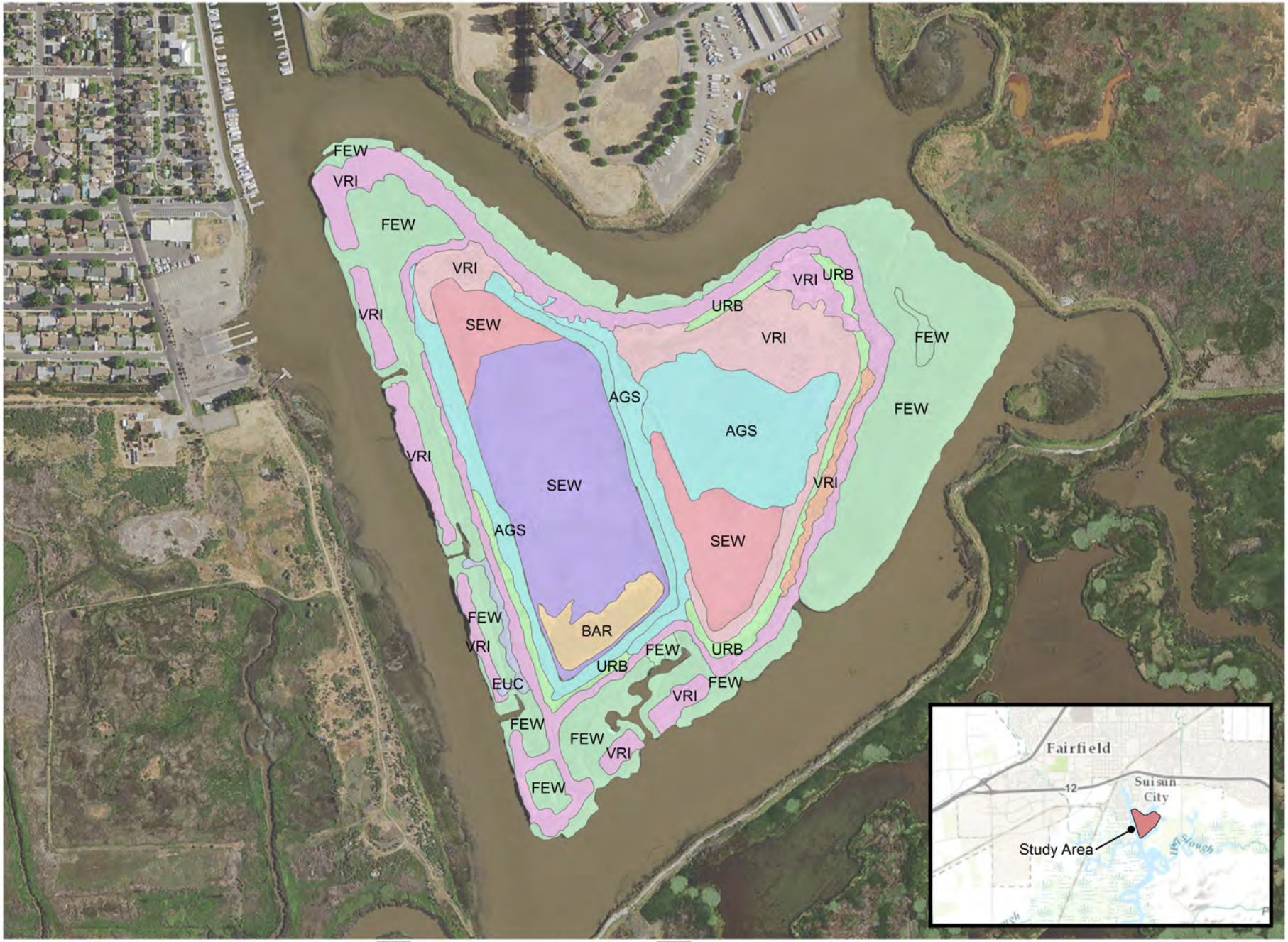
The upland and near-shore aquatic habitat on Pierce Island is similar to that on surrounding islands to the east and to the west along Suisun Slough, Duck Slough, and Peytonia Slough. Principally, the habitat surrounding the island is comprised of emergent vegetation that extends outward into the tidal slough from one to 500 feet or more (Appendix E; Figure 5). In some areas minor tidal channels cut through the emergent vegetation allowing access by kayak during high tide and revealing extensive tidal mudflats during low tide (Appendix E; Figure 6).

The uplands on the island consist of a steep-sided levee that rises approximately 5 to 11 feet above the existing high water line and encircles the entire island. Upland vegetation includes a wide range of plant species, but the majority of the vegetative structure is comprised of Himalayan blackberry (*Rubus armeniacus*), wild radish (*Raphanus sativa*), non-native annual grasses, and several ornamental trees. Within the interior of the island is a lower seasonal wetland area that is comprised of pickleweed (*Sarcocornia pacifica*), annual beard grass and other non-native annual grasses (see section 3.2). Vegetative cover is sparse to patchy at the peak of the levee, with some areas completely covered by mixed patches of vegetation and other areas nearly bare. The wetland areas are densely vegetated, with only patches of bare soils. Soils in the interior are extremely friable and comprised mainly of previously dredged materials.

3.2 Wetland Habitat

The wetland features associated with Pierce Island can be categorized as tidal and non-tidal. The tidal wetlands are broadly categorized as freshwater emergent wetlands (FEW) and fringe the outside of the Island where sediment has accreted and where the levees protecting old settling ponds have deteriorated over time. These wetlands are dominated by California tules (*Schoenoplectus californicus)* and cattails (*Typha latifolia)*. Approximately 27.7 acres of freshwater emergent wetlands were mapped in the area surrounding the island (Figure 1).

The non-tidal wetlands on Pierce Island occur within two large ponds that become seasonally inundated or saturated during the rainy season and gradually dry through the spring and early summer. The duration of inundation in these ponds is dependent on rainfall patterns, but the west pond can remain wet well into the summer. Both ponds were dry during our site visit in late August 2016. A relatively unvegetated 1.7-acre



Map prepared by Jaymee Marty, Sep 2016
Data Source: CDFW 2012; updated by J. Marty August 2016
Imagery Source: Bing, 2015

0 160 320 640 960 1,280 Feet

- Annual Grasses and Forbs (AGS)
- Barren (BAR)
- Coyote Brush Scrub (VRI)
- Eucalyptus (EUC)
- Levee Crest
- Pampas grass (VRI)
- Pickleweed (SEW)
- Pickleweed-beardgrass (SEW)
- Riparian Mixed Shrub (VRI)
- Tule-Cattail (FEW)

N

Figure 1
Vegetation Associations
Pierce Island
Solano County, CA

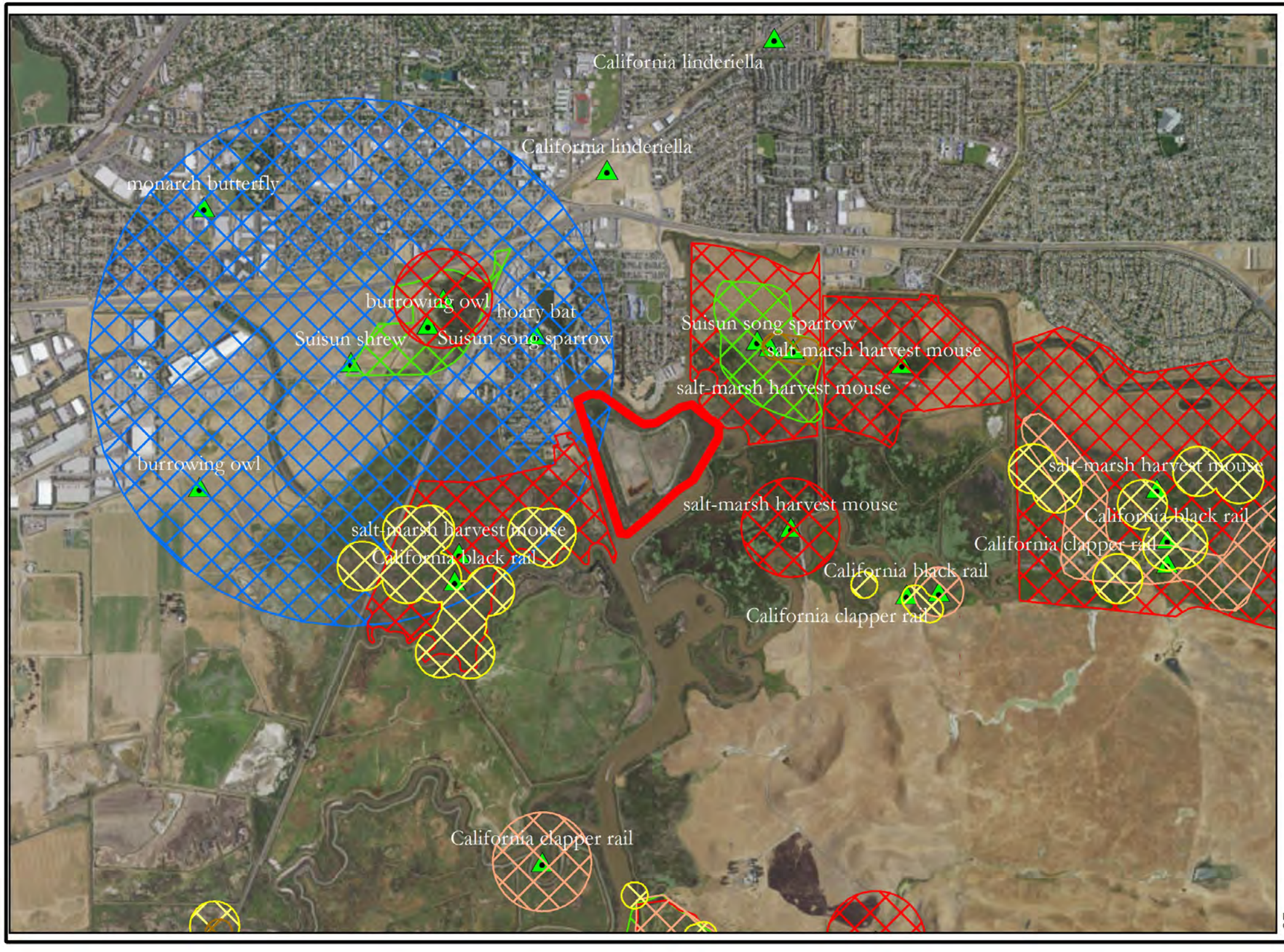


FIGURE 2
SENSITIVE BIOLOGICAL RESOURCES
ANIMALS
Pierce Island Project Site Vicinity

Special-Status Species Legend

- Pierce Island boundary
- California black rail
- California clapper rail
- Suisun shrew
- Suisun song sparrow
- salt-marsh harvest mouse
- saltmarsh common yellowthroat
- Special-status animal points

N
W E
S

0 0.15 0.3 0.6 0.9 1.2 Miles

1:95,040 (1 in = 1.5 miles at B-size layout)
1:47,520 (1 in = 0.75 mile at D-size layout)

Data Source: CNDDB, 12/2016
GIS/Cartography by Jaymee Marty, Sep 2016

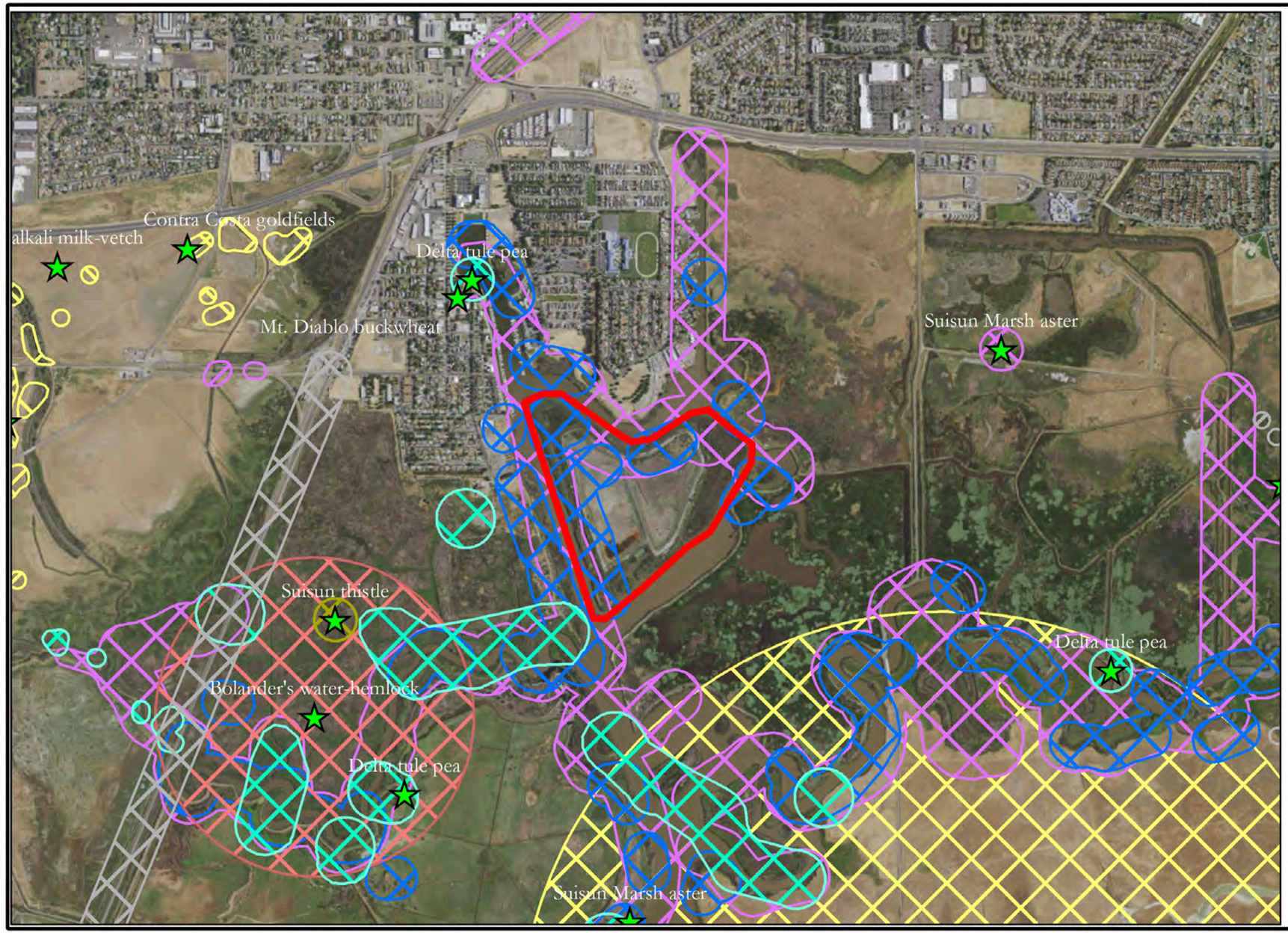


FIGURE 3
SENSITIVE BIOLOGICAL RESOURCES
PLANTS
Pierce Island Project Site Vicinity

Special Status Plant Species Legend
(Labels are for point occrrences)

- Pierce Island boundary
- Bolander's water-hemlock
- Brewer's western flax
- Contra Costa goldfields
- Delta tule pea
- Mason's lilaeopsis
- Suisun Marsh aster
- Suisun thistle
- hispid salty bird's-beak
- soft salty bird's-beak
- Special status plant species

N
W E
S

0 0.1 0.2 0.4 0.6 0.8 Miles

Data Source: CNDDB, 12/2016
GIS/Cartography by Jaymee Marty, Sep 2016

gypsum evaporite bed (BAR) is located in the southern portion of the west pond. This is the lowest point on the interior island so it remains inundated longest and has accumulated salts over time. Saline emergent wetlands (SEW) were mapped in the west and east ponds and were further refined by the dominance of pickleweed to characterize the potential SMHM habitat. Wetlands dominated by pickleweed (12.16 acres) occur in low-lying portions of the west pond. The remaining wetlands in the west pond are a dominated by the following species (wetland indicator status follows Lichvar 2016): pickleweed (OBL), beardgrass (*Polypogon monspeliensis*, FACW), alkali Russian-thistle (*Salsola soda*, FACW), Australian saltbush (*Atriplex semibaccata*, FAC), brass buttons (*Cotula coronopifolia*, OBL), western sea purslane (*Sesuvium verrucosum*, OBL), saltmarsh aster (*Symphyotrichum subulatum* var. *parviflorum*, no indicator status), and alkali-heath (*Frankenia salina*, FACW). These pickleweed-beardgrass non-tidal seasonal brackish wetlands cover approximately 2.21 acres in the west pond and 3.76 acres in the east pond (Table 1; Figure 1). The total acreage of potentially jurisdictional wetlands in the interior of the island is approximately 19.84 acres. A formal wetland delineation was beyond the scope of this effort but would be required to accurately determine the wetland acreage on the site.

TABLE 1. ESTIMATED AREA OF HABITAT FEATURES ON PIERCE ISLAND

Location	Feature Type	Acres
Island Interior including Levees	Annual Grasses and Forbs	13.45
	Barren	1.74
	Coyote brush scrub	7.33
	Eucalyptus	0.49
	Levee crest	2.74
	Pampas grass	0.79
	Pickleweed	12.16
	Pickleweed-beardgrass	5.97
	Riparian mixed shrub	14.06
Exterior to Island Levees	Tule-cattail	27.71

3.3 Rare Plants

Two rare plants were present in tidal marsh and tidal marsh transition zones along the outer levee slopes of the island: Suisun Marsh aster and Mason's lilaeopsis. Both species would require evaluation for potential significant impacts and mitigation in CEQA documents.

Kayaking around the Island perimeter at lower tide revealed extensive emerald green low-intertidal turf mats of mixed *Lilaeopsis masonii*, *Triglochin striata*, and *Isolepis cernuus*. These plants were mostly in a vegetative state but enough were flowering to identify species composition. The populations were most concentrated along the southwest and south shores with very few in the north, northeast and east (Table 2).

Suisun Marsh aster (*Symphyotrichum lentum;* CNPS list 1B.2) colonies were visible only along eroded scarps of the south and southwest shores on older levees. This species is quite widespread to prevalent and associated with other clonal populations of uncommon native creeping/colonial marsh plants like white hedge nettle (*Stachys albens*).

No other sensitive plant species were detected during the late August survey. Most, but not all, potential rare estuarine plant species would have been detectible at this date if they were present, since they would be in active vegetative growth, flowering, or seed stage, including Suisun thistle, soft bird's-beak, Jepson's tule pea, and Bolander's water-hemlock. The non-detection of three rare annual estuarine plant species (salt marsh owl's-clover, forked peppercress, and Contra Costa goldfields) was inconclusive because the survey date was too long after their growth and flowering periods. However, absence of suitable habitat for salt marsh owl's-clover along the dense, tall, perennial marsh vegetation (incompatible with species requirements for short, sparse high brackish marsh/transition zone vegetation, similar to that of soft bird's-beak) makes the possibility of undetected individual plants of this species very unlikely (Table 2). The other two annual rare plants, Contra Costa goldfields and forked peppercress, are typically associated with alkali grassland flats or pools and not likely to occur on the site. Appendix A lists all plants observed on Pierce Island during the surveys. A summary of special-status plant species observations is provided in Table 2.

3.4 Special-status Wildlife Species

Suisun Song Sparrow was observed foraging within the Himalayan blackberry and wild radish on Pierce Island. This bird is a species of concern in California and likely nests on the site during the migratory nesting bird season (February 1 through August 30). Although not directly observed, the Suisun shrew, a mammalian species of concern, is known throughout the area of Pierce Island and likely occurs on the site. These animals are typically detected while trapping and may be difficult to detect visually. They frequently co-occur with both the SMHM and CARR, all of which use similar habitat types (Bolster 1998).

No SMHM were directly observed during surveys, however suitable habitat exists for this species. Two distinct patches, one within the wetland depression, on the inside of the levee, and the other along the levee, included numerous to abundant tracks from unidentified rodents—likely Cricetidae or Muridae (see Figure 4; Appendix E, Figure 7). Although rodent burrows may have been obscured by vegetation and difficult to visually detect, generally rodent burrows were uncommon or absent from the majority of the island. The northern portion of the west pond included an area with approximately 50 to 60 small burrows (≤ 1 inch) per acre, surrounded by numerous tracks from unidentified rodents. A single rodent or shrew nest was found under a small piece of debris but no effort was made to determine species or to disturb the nest enough to detect the presence of any particular species.

No CABRs or CARRs were detected during any portion of upland or kayak surveys. Sign of these species is very difficult to detect without disturbing refuge habitat, therefore no effort was made to conduct extensive walking transects into or through refuge habitat surrounding the island.

Existing vegetation on Pierce Island included sign of nesting migratory birds. Species considered migratory, which also nest within the borders of the United States are protected by the Migratory Bird Treaty Act (1918) and its amendments, which protects migratory birds from harm or harassment during the breeding season (February 1 through August 30). We observed numerous migratory birds during two days of surveys (Appendix C). These and other species undoubtedly nest on the site. A summary of special-status wildlife species observations is provided in Table 3.

Coyotes (*Canis latrans*) and raccoons (*Procyon lotor*) appear to be using the island regularly and left numerous scats. The majority of scats were made of Himalayan blackberry fruits interspersed with rodent fur. Approximately 10% of scats were made up entirely of mammalian prey that included the bones or hair of unidentified rodents, a striped skunk (*Mephitis mephitis*), and a domestic cat (*Felis sylvestris*). Some of these prey items could have been transported internally, from other areas, and left on the island during brief visits to the site.

TABLE 2. SPECIAL-STATUS PLANT SURVEY LIST AND DETECTION SUMMARY

Species	Common name	Associated habitat, vegetation, and species	Accessible Proximate Reference populations	Detection at Pierce Island
*Castilleja ambigua (*ssp. *ambigua)*	Owl's-clover (salt marsh populations)	High tidal brackish marsh at terrestrial transition zone, with low vegetation or gaps; or Baltic rush	Southampton Marsh, Benicia, at Military West; Point Pinole Whittell Marsh	No; no suitable habitat or compatible vegetation observed [T-high marsh]
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	Alkali grassland, ruderal, and tidal marsh/terrestrial grassland transition zone	None currently known in Suisun vicinity; historically present between Benicia and Cordelia	No; no native tarweeds observed [ST-scrub, I-upland, I-brackish seasonal]. Suitable habitat present.
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	High tidal fresh-brackish marsh banks and adjacent plains	Rush Landing, Rush Ranch NERR, Suisun Marsh; Brown's Island	No; would be conspicuous mid to late summer. Suitable habitat present.
Cirsium hydrophilum var. hydrophilum	Suisun thistle	High tidal fresh-brackish marsh banks and adjacent plains	SW Rush Ranch NERR, Suisun Marsh	No; no thistle (Cirsium) species observed in any vegetation on Pierce Island
Chloropyron molle ssp. molle	Soft bird's-beak	high tidal brackish marsh banks and terrestrial transition zones with low vegetation or gaps; saltgrass, pickleweed, alkali-heath	Rush Ranch NERR, Spring Branch Creek lower valley (artificially seeded self-maintaining established population)	No; no suitable habitat or compatible vegetation observed [T- marsh]
Lasthenia conjugens	Contra Costa goldfields	Alkali vernal pool, alkali/subsaline seasonal wetlands, high tidal brackish – grassland marsh pan transition zones	Travis AFB	Not detectible late summer; annual requires spring survey April-May; potential habitat I- brackish seasonal, low probability
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	Freshwater marsh, riparian scrub, fresh-brackish to brackish tidal marsh	Montezuma Slough, Suisun Slough at NW Rush Ranch Suisun Marsh	No; conspicuous during summer. Potential habitat around island but no detection.
Lepidium oxycarpum	Forked peppercress	Alkali grassland and flats, high tidal marsh valley grassland transition zone (sparse cover)	Rush Ranch NERR, Suisun Marsh; Tolay Creek delta flats and grasslands, San Pablo Bay	Not detectible late summer; annual requires late winter/spring survey Feb-April potential habitat I-; brackish seasonal, low probability
Lilaeopsis masonii	Mason's lilaeopsis	Low to mid-intertidal marsh ground layer/turf	Rush Landing, Rush Ranch NERR, Montezuma Wetlands (Suisun Marsh)	Yes; locally common and abundant W and SW shore [T-low turf]
Symphyotrichum lentum	Suisun Marsh aster	high tidal brackish marsh banks and moist terrestrial transition zones	Peytonia Slough, Hill Slough, Rush Landing (Suisun Marsh)	Yes; locally common and abundant W and SW shore; sporadic N, E, SE [T-high marsh]

TABLE 3. SPECIAL-STATUS WILDLIFE SURVEY LIST AND DETECTION SUMMARY

Species/status	Listing status	Common name	Associated habitat	Accessible proximate reference populations	Detection at Pierce Island
Reithrodontomys Raviventris	FE, SE, FP	Salt marsh harvest mouse	Pickleweed salt marsh flats in the SF Bay and lower Delta.	Duck Slough and Peytonia Slough	No; could occur--suitable habitat observed (see Figure 4)
Sorex ornatus sinuosus	SSC	Suisun shrew	Tidal marshes along the northern shores of San Pablo and Suisun Bays.		No; could occur--suitable habitat observed
Rallus obsoletus	FE, SE, FP	Ridgway's Rail	Tidal salt and brackish marsh along larger sloughs and bays.	Suisun, Cutoff, and Hill Sloughs	No; could occur--suitable habitat observed (see Figure 4)
Laterallus jamaicensis coturniculus	FE, SE, FP	California Black Rail	Tidal salt and brackish marsh bordering sloughs and large bays.	Suisun, Peytonia, and Hill Sloughs	No; could occur--suitable habitat observed (see Figure 4)
Melospiza melodia maxillaris	FE, SE, FP	Suisun Song Sparrow	Forages and nests in dense marsh and scrub habitat along the margins of Suisun Bay.		Yes; seen foraging in Himalayan blackberry and wild radish on levees
Lanius ludovicianus	SSC	Loggerhead Shrike	Open areas such as desert, grasslands, and savannah. Nests in thick foliage in trees or tall shrubs. Forages from trees, fence posts, utility poles and other perches.		No; could occur—suitable habitat observed
Cicindela senilis senilis	Species of Regional Conservation Significance (USFWS 2013)	Old man tiger beetle	Open unvegetated areas such as marsh pannes and levees for hunting. Larval tiger beetles occur in vertical burrows in, often moist, unvegetated substrates.		Yes; seen flying around saline seasonal wetlands bordering gypsum evaporite bed (BAR, Figure 1)

FE=federally endangered; SE=state endangered; FP=state fully protected; SSC=state species of concern

One special-status insect was detected. Old man tiger beetle (*Cicindela senilis senilis*; family Carabidae, order Coleoptera) occurred as adults flying very late in the season. At least 24 adults were found in and around saline seasonal wetlands bordering gypsum flats (BAR, Figure 1). This is a significant number of observations for late summer in dry/desiccated saline/alkaline seasonal pool habitat. The relatively high frequency of flying adults in desiccated late summer conditions suggests that a relatively substantial local breeding population exists during pool drawdown and moist substrate conditions in spring to early summer. Appendix D lists all insects observed on Pierce Island on 24 Aug 2016.

4 Discussion and Recommendations

4.1 Special-status Wildlife

One special-status wildlife species (Suisun Song Sparrow) was observed during surveys, and four additional species were suspected or presumed extant based on existing suitable habitat and numerous reported observations on adjacent islands (i.e., Suisun shrew, SMHM, CARR and CABR). The Suisun Song Sparrow, CARR and CABR are also protected during the breeding season by federal treaty.

The Suisun Song Sparrow likely uses the site during much of the year and relies on vegetation on the island to maintain its presence. This vegetation supports the species by offering nesting sites, refuge sites, and foraging areas, as well as food sources.

There is a relative paucity of information related to the Suisun shrew. Its presence, however, is highly likely and the effects of any ground disturbing activity is likely to be similar for the SMHM. Hereafter, recommendations for avoidance or mitigation for the Suisun shrew will be grouped with the SMHM.

Pierce Island is immediately adjacent to existing, known SMHM habitat, which occurs in marshes surrounding Duck Slough (eastern side of Pierce Island) and Peytonia Slough (western side of Pierce Island) (Figure 2; USFWS 2010). Habitat on and adjacent to the island which lay along these sloughs to the east and to the west is similar to that existing on and surrounding Pierce Island. The presence of extant local populations of SMHM, along with the presence of suitable habitat on Pierce Island suggests that the proposed project site is suitable for SMHM. Some portions of the island may be more suitable than others, and SMHM population may have considerable inter-annual variability (Figure 4). Existing conditions on the site cannot be excluded from being potential habitat for the species.

The site is also adjacent to habitat occupied by CARR and CABR. CARR is known to occur along Suisun, Cutoff, and Hill Sloughs, which surround Pierce Island or lay immediately adjacent to the site (Figure 2). The expansive area covered by emergent vegetation on the eastern side, and the western and southwestern borders of the island include tidal areas protected by bulrush and cattail. These vegetative characters are consistent with adjacent areas that are known to support CARR. Existing conditions on the site cannot be excluded from being potential habitat for the subspecies. The majority of Pierce Island is not suitable for CABR, which thrives in areas of wet marsh. However, paralleling the specific habitat types preferred by the CARR, the CABR would likely use portions of the emergent vegetation on the eastern side, and the western and southwestern borders of the island include tidal areas protected by bulrush and cattail. The inner portions of the island that are covered predominantly by pickleweed may be used seasonally by CABR but are not suitable during the majority of the year when the site is completely dry at the surface.

Due to the presence, or high likelihood of the presence of species that range from California species of concern (Suisun Song Sparrow and Suisun shrew) to State Endangered, Federally Endangered and State

FIGURE 4. LISTED WILDLIFE SPECIES SUITABILITY MAP.

Orange = CARR and CABR suitable habitat.
Red = SMHM highly suitable habitat and likely present, based on tracks and burrows.
Yellow = SMHM suitable habitat, based on vegetation, topography, and other components.
Blue = SMHM seasonally suitable habitat, based on vegetation, topography, and other components.

Fully Protected (SMHM, CABR and CARR), effects from the proposed project are likely to have impacts on these species, as well as nesting migratory birds.

Specific, project-related impacts to Suisun Song Sparrow and nesting migratory birds could be minimized or eliminated if upland vegetation on the island was removed. This would effectively remove the purpose of utilizing the island for most species. However, other species, not currently using the island, can find increased suitability when vegetation is removed. Therefore, any vegetation removal should occur during the period of 1 September through 31 January , immediately preceding ground-disturbing activity. Migratory nesting bird surveys should occur if construction activity does not begin immediately after vegetation removal.

Vegetation outside of the island (i.e., emergent vegetation, and as much upland vegetation on the toe of the slough-side of the levee [≤3 feet from the high-water line]) should be left intact for foraging and refuge habitat for CARR and CABR. If emergent vegetation removal is required for project implementation, then minimization, to the greatest extent possible, should be considered and implemented, but only during the non-breeding season for CARR and CABR (1 September – 31 January). Due to the sensitivity of the CARR and CABR, and their status as endangered at the federal and state level, as well as being state fully protected, agency consultation will be critical in minimizing the impacts them.

The project, as proposed, is likely to alter the suitability of Pierce Island for SMHM and Suisun shrew. Alteration of the levees, as well as filling the inner areas of the island, will likely reduce or eliminate any level of suitability of the site over the majority, or nearly all of the island. This nearly complete elimination of habitat for SMHM and Suisun shrew will have an impact on the species regionally since SMHM and shrews attempting to cross between islands and moving further on to other islands will not be able to utilize Pierce Island as a stop-over site or as a refuge for an extended period. The recommendation (above) to include protection of all emergent vegetation and the lower extent of upland vegetation on the slough side of the island can reduce the effects of complete loss of the island and offer short-term refuge or stop-over areas for SMHM and Suisun shrews. This would only be effective if a non-climbable (metal) and buried barrier (i.e., exclusion-fence) were installed on the slough side of the levee, approximately 4 feet up the slope. However, equally important would be maintenance of the barrier to the extent that zero attempts to dig under or climb over would result. This barrier could attempt to eliminate, or at least minimize any recolonization of the area of the island that may be subject to continued disturbance.

Prior to the onset of project disturbance, and with agency authorization, a trapping effort could be focused on the lethal removal of non-native species [i.e., black rat (*Rattus rattus*) and house mouse (*Mus musculus*)] and relocation of SMHM. This would require a surrogate site for translocation of mice. Additionally, if detection of exclusion-fence breaches is noted, a permitted biologist, with specific authorization, could trap and relocate individual SMHM, if a surrogate site were located.

Given that on-going dredge deposition would be planned for the site, continued ground disturbance (i.e., disking) should be conducted twice or more annually to eliminate habitat for nesting birds and to reduce suitability for SMHM and Suisun shrew. Artificial burrows could be constructed of PVC-tubing, half of which would be buried in the ground, and placed along the inside of the exclusion-fence. This may provide refuge sites for mice that may inadvertently breach the fence and can also facilitate focused trapping efforts. Additionally, it would also provide refuge locations for SMHM and shrews that are disturbed by disking, all of which would require refuge sites to avoid predation.

If this site is going to be subject to continued disturbance that will include the removal of habitat for SMHM, a plan to mitigate for the loss of habitat may include the translocation of SMHM to a suitable site (if

allowed by CDFW and USFWS) coupled with complete avoidance of recolonization. However, the fully protected status of SMHM makes simple, direct, and clear recommendations difficult since the species cannot be taken (killed, injured, or similar) in any way for any reason. This makes consultation with the resource agencies mandatory. Given a proposed project date of 2017, consultation with the agencies should start as soon as possible.

4.2 Wetlands and Special-status Plants

The types of wetlands found on and around Pierce Island are generally subject to the jurisdiction of the US Army Corps of Engineers (USACE) under Section 404 of the Federal Clean Water Act. The Corps has jurisdiction up to the Mean High Water mark in tidal areas that are considered "Waters of the U.S." as defined by the Clean Water Act. The limits of jurisdiction in wetlands extends beyond the ordinary high water mark to the outer edge of the wetlands. Wetlands are defined by the Corps as "those areas that are inundated or saturated by surface or groundwater at a frequency or duration to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." (Environmental Laboratory 1987). The presence and extent of wetland areas in this region of the country are normally determined by examination of the vegetation, soils, and hydrology of a site according to the methods outlined in the Corps' Wetland Delineation Manual of 1987 (Environmental Laboratory 1987) and the Regional Arid West Supplement (USACE 2008). The Corps' definition of wetlands requires that all three wetland identification parameters be met.

Projects that place fill in jurisdictional wetlands and non-wetland waters of the United States require either an individual or a nationwide permit from the USACE. Nationwide permits are issued by the USACE for specific types of activities that have minimal individual or cumulative adverse environmental impacts. Individual permits are required for large and/or complex projects, or projects that exceed the impact threshold for nationwide permits.

Potential direct, indirect, or cumulative impacts to special-status plants could occur to Suisun Marsh aster and Mason's lilaeopsis, which are present in uneven abundance (abundant, scarce, or absent locally) along the island perimeter wetlands. No special-status plants were detected in the non-tidal interior seasonal wetlands or uplands.

The following activities could potentially directly impact Suisun Marsh:

- placement of dredge pipelines,
- construction or installation of choker berms or silt fencing (sediment retention features) on existing levee outboard slopes or tops;
- grading or grubbing levee exterior slope vegetation in preparation for equipment access
- fill placement or grading for levee reconstruction/upgrade/maintenance activities;
- herbicide applications aimed at contiguous or proximate Himalayan blackberry. (Brush cutting would likely not adversely affect Suisun Marsh aster unless conducted in summer).

The following activities could potentially directly impact Mason's lilaeopsis:

- Shoreline stabilization measures (armoring or repair) of exterior levee scarps, particularly on the SW and W shores of the island
- Pipeline placement across sites occupied by Mason's lilaeopsis

- Dredging or excavation activity for installation of structures along the edge of levee marsh scarps or tule marsh.

The following conservation measures are provided as potential avoidance and mitigation measures to minimize impacts to the two rare plant species known to occur on Pierce Island:

1. **Flag Suisun Marsh aster colonies within 50 feet of work areas.** Prior to construction or site preparation activities, conspicuously flag all levee edge/slope colonies of Suisun Marsh aster based on current-year surveys during the flowering season, or during the previous flowering season (optimal: Sept-Oct);
2. **Flag Mason's lilaeopsis occupied marsh zones within 50 feet of work areas.** Prior to construction or site preparation activities, conspicuously flag all levee edge/slope colonies of Mason's lilaeopsis based on current-year surveys during summer to mid-fall.
3. **Wetland vegetation impact minimization**. The dredge disposal interior consists of a north-south gradient of uplands to wetlands in the east dredge disposal cell (Pond 3), and a comparable north-south gradient of seasonal wetlands to seasonal pond and non-tidal pickleweed marsh in the western dredge disposal cell (Pond 2). Partitioning the cells internally (internal levees with spillways or weirs) could maintain dredge decant water storage capacity in lower elevation portions of the cells that would function as long-term conserved wetlands, while impacting only ruderal uplands (Pond 3 N) or lower- quality, weedy seasonal wetland transition zones (Pond 2 N). This would result in loss of long-term disposal capacity area, but conserve decant pond capacity.
4. **Develop long-term off-site dredge sediment beneficial re-use alternatives**. Potential short-term tidal marsh restoration project opportunities, as well as long-term tidal marsh maintenance opportunities, exist for beneficial re-use of dredged sediment near the project site. One permitted project, Hill Slough wetland restoration (California Dept. of Fish and Wildlife; Sarah Estrella, CDFW contact; Michelle Orr, ESA, consulting project manager contact), lies NE of Pierce Island, and may be close enough for feasible sediment hydraulic slurry placement using pipelines and booster pumps connected directly to dredging. Long-term maintenance of its high marsh/terrestrial transition zone may benefit during future accelerated sea level rise from "thin-layer" (< 15 cm thick) sediment placement over dormant (winter) vegetation. This option, if feasible and timely, would provide long-term sediment placement options favored by regulatory and resource agencies, and may occur over multiple dredging cycles. Montezuma Wetlands also accepts dredged material commercially. Its net disposal costs may be comparable with full cycle permit and engineering costs for local placement at Pierce Island, especially if endangered wildlife habitat restrictions constrain the proposed project due to high costs for mitigation and permitting.

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Appendix A: Vascular Plants Observed on Pierce Island

Vascular Plant Species Observed at Pierce Island
Dr. Peter Baye
24 Aug 2016

* introduced species
Eco-geomorphic unit categories (e.g. T, ST, I) are described in Appendix B.

AIZOACEAE

Sesuvium verrucosum – Western sea-purslane. I-brackish seasonal. Common to abundant, I-brackish seasonal. Closely associated with seasonally inundated wetlands (water-dispersed seed, wetland-reliant seedling habitat).

APIACEAE

Foeniculum vulgare – ST, Levee trail
Lilaeopsis masonii – Mason's lilaeopsis. W, SW, shores, locally common and dominant or subdominant, T-low turf; rare N shore, not detected E shore.
Oenanthe sarmentosa - water-parsley. W shore T-high marsh, locally common

ASTERACEAE

Achillea millefolium – yarrow. Local, uncommon, T-high marsh.
Ambrosia psilostachya – western ragweed. T-high marsh, occasional.
Artemisia douglasiana – mugwort. T-high marsh, occasional to locally common.
Baccharis pilularis – coyote-brush. ST-levee trail, I-upland. Common to abundant or subdominant.
Baccharis glutinosa – marsh baccharis. T-high marsh. Occasional/infrequent colonies, E, S, W T-high marsh.
*Cotula coronopifolia** – brass-buttons. Very common and abundant, I- brackish seasonal. Narrowly associated with seasonally inundated wetlands.
*Dittrichia graveolens** - Mediterranean tarweed. Local, infrequent, I-uplands, N end. Expected to become invasive and dominant in response to disturbance in subsaline soils.
Euthamia occidentalis – western goldenrod. T-high marsh, common and frequently abundant colonies.
Helianthus californicus – W shore T-high marsh (scarp), one colony.
Lactuca serriola – I-upland, common.
Pluchea odorata – salt marsh fleabane. W shore T-high marsh, one colony (nr. PG&E)
Symphyotrichum lentum – Suisun Marsh aster. W, SW, S and E shore; common W, sporadic S-E colonies, T-high marsh
Symphyotrichum subulatum var. *parviflorum* – I-brackish seasonal; common, locally abundant or dominant

BRASSICACEAE

Raphanus sativa – wild radish. Very common and dominant, levee interior slope and top and locally common I-upland. Other weedy annual mustards, nearly all or all non-native, may be present but were not identified from dead, dry plants.

CHENOPODIACEAE

Atriplex semibaccata – Australian saltbush. Locally common, I-brackish seasonal and adjacent interior levee.
Salicornia pacifica – pickleweed. I-pickleweed (single-species stands), I-seasonal brackish (common, abundant to edge of gypsum flats), I-gypsum (sparse).

*Salsola soda** - Mediterranean saltwort, alkali Russian-thistle. Locally dominant I- brackish seasonal; not widespread in all seasonal brackish wetlands in the study area. Dead dry plants may be confused with *S. tragus*.

*Salsola tragus** – tumbleweed. I-seasonal brackish (occasional); tumbles into gypsum flats and other habitats after death.

CONVOLVULACEAE

Calystegia sepium subsp. *limnophilum* – marsh morning-glory. T-high marsh, common colonies.

CYPERACEAE

Isolepis cernuus – club-rush

Schoenoplectus californicus – California tule – all shores, T-low marsh, widespread and dominant. May co-occur with *S. acutus.*

FAGACEAE

Quercus lobata – valley oak. Single sampling on W levee top. Possibly planted.

FRANKENIACEAE

Frankenia salina – alkali-heath. I-brackish seasonal. Common and abundant.

JUNCAGINACEAE

Triglochin striata – ribbed arrow-grass. T-low turf, common W and SW in association with *Lilaeopsis masonii.*

JUGLANDACEAE

Juglans hindsii – Northern California black walnut. Occasional, ST levee trail, scrub. Possibly including non-native (rootstock) waifs in population.

LAMIACEAE

Stachys albens – white hedge-nettle. T-high marsh; uncommon W and SW at scarp crest, associated with *Symphyotrichum lentum.*

MYRTACEAE

*Eucalyptus camaldulensis** – red river gum. One tree, E levee. Occasional on duck club levees, Suisun Marsh.

PHYTOLACCACEAE

*Phytolacca americana** – pokeweed, pokeberry. Two waifs, east levee trail near PG&E line.

PINACEAE

*Pinus pinea** – Italian stone pine (tentative identification of sapling). Ornamental escape, levee top, NE.

POACEAE

Agrostis avenacea – Australasian (Pacific) bentgrass. Locally common, I-brackish seasonal.

*Arundo donax** - giant reed. One colony, SE shore levee.

Phragmites australis (* in part?) – common reed. Locally dominant dense S shore T-low to T-high marsh levee; colonies occasional on other shores. Possible native population (slender all-green stems, sparse and mixed with native high to mid-marsh forbs) at W shore.

Phalaris aquatica *– Harding grass. Occasional to locally common, I-upland, N end.

*Polypogon monspeliensis** – rabbit's-foot grass. Very common and abundant, I- brackish seasonal. Strongly associated with seasonally inundated wetlands, associated with *Cotula* and *Salicornia* locally.

POLYGONACEAE

Persicaria punctata – spotted smartweed – W shore T-high marsh, locally common *polygonum* sp*. (*P. aviculare* var. *depressum*?) ST-levee trail and I-upland, occasional.

POTAMOGETONACEAE

Stuckenia sp. (affinity *S. pectinata* but incongruent with type description and TJM2 key characters). Common and abundant in Suisun Slough, S shore, local in W shore. Similar plants previously determined as *S. filiformis* from Brown's Island under TJM1 key).

RHAMNACEAE

*Pistacia atlantica** - Mt. Atlas mastic tree, pistachio. Single waif, levee near E PGE tower. Most records in region from Sacramento County.

ROSACEAE

*Rubus armeniacus** – Himalayan blackberry. Nearly continuous thicket on levee top and exterior (ST), dominant.

TAMARICEAE

Tamarix sp.* *(T. parviflora*?) – Tamarisk. Occasional, edge between I-seasonal brackish and interior levee slope.

TYPHACEAE

Typha spp. (likely predominantly *T. latifolia*; some *T. dominguensis*; *T. angustifolia* not identified) – widespread, not dominant – T-low marsh.

Appendix B: Eco-geomorphic Landscape Unit Classification

As described in Section 2, Dr. Peter Baye developed an eco-geomorphic classification scheme for Pierce Island. These landscape units, which are specific to the mostly artificial island, were used to characterize local distribution and ecological affinity of special-status plants and other vascular plants identified in the study area. They may also be used to predict potential special-status plant occurrence in the future, and plan for mitigation or conservation measures. The abbreviation for each unit is shown in brackets.

Tidal Units – Tidal Wetlands and Levee [**T**]

Subtidal and lower intertidal slough/mud and submerged aquatic vegetation beds (Sago pondweed) [**T-subtidal**]

Low intertidal prostrate marsh turf (Mason's lilaeopsis, three rib arrow-grass, club rush) [**T-low turf**]

Low intertidal emergent marsh (tule-cattail) [**T-low marsh**]

Mid-High intertidal marsh and terrestrial transition zone including levee erosion scarp (variable composition) [**T-high marsh**]

Supratidal Units – Levee crest [**ST**]

Blackberry thicket (Himalayan blackberry – monotypic stands) [**ST-blackberry**]

Mixed scrub thicket (blackberry, coyote-brush, California walnut and trail) [**ST-scrub**]

Pampas grass [**ST-pampas**]

Interior Non-tidal Basin [**I**]

Gypsum evaporite bed (barren) [**I-gypsum**]

Monotypic pickleweed marsh [**I-pickleweed**]

Mixed pickleweed/seasonal brackish marsh [**I-brackish seasonal**]

Upland ruderal forb and scrub [**I-upland**]

Appendix C: Vertebrates Observed on Pierce Island

Identified Vertebrates Observed during Kayak and Walking Transect Surveys of Pierce Island
Jeff Alvarez and Sarah Foster
24 and 29 August 2016

Species	Scientific Name	Satus	Habitat on Site
BIRDS			
Canada Goose	*Branta canadensis*	Common	Suisun Slough
Mallard	*Anas platyrhynchos*	Common	Suisun Slough
Double-crested Cormorant	*Phalacrocorax auritus*	Common	Suisun Slough
American White Pelican	*Pelecanus erythrorhynchos*	CSC*	Suisun Slough
Great Egret	*Ardea alba*	Common	Suisun Slough/tule marsh
Snowy Egret	*Egretta thula*	Common	Suisun Slough/tule marsh
Turkey Vulture	*Cathartes aura*	Common	Aerial foraging
Osprey	*Pandion haliaetus*	Common	Aerial foraging
Virginia Rail	*Rallus limicola*	Common	Mudflats/tule marsh
Greater Yellowlegs	*Tringa melanoleuca*	Common	Mudflats/tule marsh
Short-billed Dowitcher	*Limnodromus griseus*	Common	Mudflats/tule marsh
Western Gull	*Larus occidentalis*	Common	Suisun Slough
Belted Kingfisher	*Megaceryle alcyon*	Common	Suisun Slough
American Kestrel	*Falco sparverius*	Common	Aerial foraging
Common Raven	*Corvus corax*	Common	Aerial foraging
California Scrub-jay	*Aphelocoma californica*	Common	Non-native trees/blackberry
Barn Swallow	*Hirundo rustica*	Common	Aerial foraging
Northern Mockingbird	*Mimus polyglottos*	Common	Non-native trees/blackberry
European Starling	*Sturnus vulgaris*	Pest	Aerial foraging
Marsh Wren	*Cistothorus palustris*	Common	Tule marsh
Common Yellowthroat	*Geothlypis trichas*	Common	Tule marsh
Northern Mockingbird	*Mimus polyglottos*	Common	Non-native trees/blackberry
Suisun Song Sparrow	*Melospiza melodia maxillaris*	Common	Tule marsh/blackberry
House Finch	*Haemorhous mexicanus*	Common	Non-native trees/blackberry
Red-winged Blackbird	*Agelaius phoeniceus*	Common	Emergent vegetation
Great-tailed Grackle	*Quiscalus mexicanus*	Common	Emergent vegetation
Bullock's Oriole	*Icterus bullockii*	Common	Non-native trees/blackberry
MAMMALS			
Beaver	*Castor canadensis*	Common	Suisun Slough/tule marsh
Coyote	*Canis latrans*	Common	Uplands/levee interior
Domestic Cat	*Felis sylvestris*	Feral	Uplands/levee interior

*CSC = California Species of Concern

Appendix D: Insects Observed on Pierce Island

Insects Observed on Pierce Island levee and interior diked baylands
Diurnal wandering transect surveys
25 July 25 2016 (W. Ericson)

Order Coleoptera
- Family Carabidae
  - *Cicindela senilis senilis* (SSC)

Order Hymenoptera
- Family Chrysididae
- Family Crabronidae
  - *Liris argentatus*
  - *Tachysphex yolo*
- Family Ichneumonidae
- Family Pompilidae
- Family Sphecidae
  - *Sphex lucae*
- Family Tiphiidae
  - (Subfamily) Brachycistidinae
- Family Vespidae
  - (Subfamily) Eumeninae
- Family Apoidea
- Family Adrenidae
  - *Calliopsis scutellaris*
- Family Apidae
  - *Anthophora* sp.
  - *Bombus* sp.
  - *Exomalopsis chionura*
- Family Halictidae
  - *Lasioglossum* sp.
  - *Sphecodes* sp.
- Family Megachilidae
  - *Anthidiellum* sp.
  - *Megachile* sp.

Order Lepidoptera
- Family Papilionidae
  - *Papilio zelicaon*
- Family Lycaenidae
  - *Brephidium exile*

Order Neuroptera
- Family Myremeleontidae

Order Orthoptera
- Family Tettigoniidae
  - *Microcentrum* sp.

Appendix E: Photographs

FIGURE 5. FRESHWATER EMERGENT WETLAND HABITAT ON THE SOUTH SIDE OF PIERCE ISLAND.

FIGURE 6. TIDAL CHANNELS ON EAST SIDE OF PIERCE ISLAND.

FIGURE 7. MOUSE TRACKS THROUGH THE INLAND HABITAT IN THE NW SECTION OF THE INNER PORTION OF PIERCE ISLAND.

FIGURE 8. INTERIOR LEVEE ON PIERCE ISLAND.

FIGURE 9. GYPSUM EVAPORITE BED ON INTERIOR PIERCE ISLAND.

FIGURE 10. PICKLEWEED AND PICKLEWEED-BEARDGRASS ECOTONE IN WEST BASIN ON PIERCE ISLAND.

FIGURE 11. BLACKBERRY SCRUB ON LEVEE WITH FRESHWATER EMERGENT MARSH AND SUISUN SLOUGH IN BACKGROUND.

Appendix B

Suisun Marina Dredging and Pierce Island Levee Rehabilitation Notice of Exemption

Print Form

Notice of Exemption

Appendix E

To: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

County Clerk
County of: Solano
675 Texas Street, Suite 1900
Fairfield, CA 94533

From: (Public Agency): City of Suisun City
701 Civic Center Boulevard
Suisun City, CA 94585
(Address)

Project Title: Suisun Marina Dredging and Pierce Island Levee Rehabilitation

Project Applicant: City of Suisun City

Project Location - Specific:
Suisun Slough Channel and connecting channels, adjacent to the Suisun Marina and Marina Village Residential District; Latitude: 38° 14' North; Longitude: 122° 02' West

Project Location - City: Suisun City Project Location - County: Solano

Description of Nature, Purpose and Beneficiaries of Project:
Maintenance dredging to an elevation of -6' to -8' MLLW plus 2' overdredge allowance will be conducted in Suisun Slough and connecting channels in up to 2 episodes over the next 10 years by hydraulic dredge with disposal at Pierce Island disposal site. Perimeter levees at Pierce Island will be repaired.

Name of Public Agency Approving Project: City of Suisun City City Council

Name of Person or Agency Carrying Out Project: City of Suisun City, Department of Public Works

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: Sec. 15304(g)
- ☐ Statutory Exemptions. State code number: _____

Reasons why project is exempt:
The project is maintenance dredging and repair to existing facilities where the dredged material will be disposed of at the Pierce Island disposal site which is authorized by all applicable state and federal agencies (USACE, BCDC, RWQCB).

Lead Agency Contact Person: Timothy J. McSorley Area Code/Telephone/Extension: (707) 421-7316

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project?. ☐ Yes ☒ No

Signature: _____ Date: 5/12/2017 Title: Director of Building & Public

☒ Signed by Lead Agency ☐ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: _____

Appendix C
Mitigation Monitoring and Reporting Program

Suisun Marina October and November Maintenance Dredging Project

MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

Introduction

This document is the Mitigation Monitoring and Reporting Program (MMRP) for the Suisun Marina October and November Maintenance Dredging Project (Project). This MMRP has been prepared pursuant to Section 21081.6 of the California Public Resources Code, which requires public agencies to "adopt a reporting and monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment." A MMRP is required for the proposed Project because the Initial Study/Mitigated Negative Declaration (IS/MND) has identified mitigation measures to reduce potential impacts to less than significant.

Mitigation Monitoring and Reporting Program

As the lead agency, the City of Suisun City will be responsible for monitoring compliance with all mitigation measures. Different departments within the City are responsible for aspects of the Project. It is expected that one or more departments will coordinate efforts to ensure compliance. The MMRP is presented in tabular form on the following pages. The components of the MMRP are described briefly below:

- **Mitigation Measure:** The mitigation measure(s) are taken from the IS/MND, in the same order that they appear in the IS/MND.
- **Method of Verification:** Identifies the potential method(s) that will be used to confirm that each mitigation measure has been implemented.
- **Timing of Verification:** Identifies at which stage of the Project the mitigation must be completed.
- **Monitoring Responsibility:** Identifies the City as responsible for mitigation monitoring and other parties potentially needed to facilitate implementation.
- **Verification (Date and Initials):** Provides a contact who reviewed the mitigation measure and the date the measure was determined complete.

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Mitigation Monitoring and Reporting Program (MMRP)				
Mitigation/Avoidance Measure	**Method(s) of Verification**	**Timing of Verification**	**Monitoring Responsibility**	**Verification (Date/Initials)**
Biological Resources				
BIO-1 Prior to placement of dredge materials, the Project's biologist shall perform a preconstruction presence/absence survey to flag the location of any sensitive plant species including Suisun Marsh aster and Mason's lilaeopsis plants or plant colonies within 50 feet of dredging placement work areas. Any such identified plant or colony shall be avoided.	Biologist compliance documentation	Prior to and during dredging and placement	City/City Biologist	
BIO-2 All Project work on Pierce Island shall be conducted according to the USFWS and CDFW approved work window of September 1st – January 31st to avoid potential impacts to the Suisun song bird.	Biologist compliance documentation	Applicable work window	City/City Biologist	
BIO-3 No project activities shall occur within 50 feet of suitable tidal marsh habitat for the salt marsh harvest mouse (SMHM) within two (2) hours before and after an extreme high tide event (6.5 feet or higher measured at the Golden Gate Bridge and adjusted to the timing of local high tides) or when adjacent marsh is flooded unless SMHM proof exclusion fencing has been installed around the work area.	Biologist compliance documentation	Prior to and during dredging and placement	City/City Biologist	
BIO-4 No project activities shall occur within 50 feet of suitable Ridgway's (California clapper) rail (CCR) or California black rail (CBR) habitat during extreme high tide events or when adjacent tidal marsh is flooded. Extreme high tides events are defined as a tide forecast of 6.5 feet or higher measured at the Golden Gate Bridge and adjusted to the timing of local high tides.	Biologist compliance documentation	Prior to and during dredging and placement	City/City Biologist	
BIO-5 The City will retain a qualified biologist to survey, monitor and document compliance with measures AM BIO-3 through AM BIO-5 with the submittal of weekly summary reports/emails or through requirements outlined in the Project's regulatory permit conditions.	Biologist compliance documentation	Prior to and during dredging and placement	City/City Biologist	
BIO-6 The City shall implement the following BMPs: • Construction debris will not be allowed to enter the water. • The cutterhead shall remain at or below the sediment surface during dredging. • Any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into the stream or its tributaries shall be contained in water tight containers or removed from the Project Site.	Contractor Agreement and Contractor work log	Prior to and during dredging	City/City Contractor	

Mitigation Monitoring and Reporting Program (MMRP)				
Mitigation/Avoidance Measure	**Method(s) of Verification**	**Timing of Verification**	**Monitoring Responsibility**	**Verification (Date/Initials)**
BIO-7 Prior to start of October through November dredging, The City shall obtain a CDFW-issued Incidental Take Permit for potential impacts to delta smelt and longfin smelt resulting from dredging activities conducted outside of the CDFW Environmental Work Window. The City shall implement the permit conditions according to permit timing and requirements, which may include purchase of mitigation credits, removal of creosote pilings, or other form of mitigation acceptable to CDFW.	Obtain Incidental Take Permit	Prior to October/ November dredging	City	
Hydrology and Water Quality				
HWQ-1 The City shall implement the following BMPs: • No water or sediment shall be allowed to leak from the pipeline under any circumstances. • The cutterhead shall remain at or below the sediment surface during dredging. • Turbidity monitoring shall be conducted downstream as well as at an appropriate reference area upstream. If turbidity is found to threaten aquatic like, CDFW approved control methods will be installed. • No overflow or decant water shall be discharged at the site from the barge. • The barge will remain afloat at all times and shall not rest on the bed or bank of the water body.	Contractor Agreement and/or Contractor work log	Prior to and during dredging	City/City Contractor	

Appendix D

Air Quality and GHG Emissions Calculation Sheets

Equipment Type	THC	NOX	PM	CO2
750 hp main engine	1.36	21.35	0.87	4112.51
250 hp auxiliary engine	0.61	8.94	0.36	1830.22
95 hp workboat engine	0.18	1.01	0.04	103.09
350 hp workboat engine	0.48	8.28	0.17	768.69
200 hp CAT D6 dozer	0.12	1.82	0.07	371.85
Total	2.75	41.40	1.51	7186.36
THC (1.21)= ROG	3.33			

Input	Input Engine Here
Horsepower (hp)	749
Model year Calendar year	2008 2019
Activity (annual hours)	341.69
Accumulated hours on equipment (estimate using annual-hours*age if you only know the age of the equipment)	3762
Load factor (check the lookup table)	0.42

Intermediate steps	
HPbin	750
NOx_EF0	2.75
NOx_DR	3.6E-05
NOx_FCF	0.950
PM_EF0	0.11
PM_DR	5.5E-06
PM_FCF	0.86
THC_EF0	0.10
THC_DR	2.5E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	2.74
PM_EF (g/hp-hr)	0.11
THC_EF (g/hp-hr)	0.17
CO2_EF (kg/gallon-diesel)*	10.21
BSFC (lb/hp-hr)	0.367
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Results	
Fuel Used (gallon)	5549
NOx Emissions (kg)	294.2
PM Emissions (kg)	12.0
THC Emissions (kg)	18.8
CO2 Emissions (kg)	56657.0
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	2.74
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.11
THC Emission Factor (including deterioration and fuel correction factor): gram/ bhp-hr	0.17

NOx Emissions (lb)	648.57
PM Emissions (lb)	26.56
THC Emissions (lb)	41.39
CO2 Emissions (lb)	124907.13

Assume main engine operates 15 hrs/day at 75% efficiency

Assume auxiliary engine operates 15 hours/day

4.3 wks/mo

6 work days/wk

Main Engine (hrs/day)	11.25
Total dredge quantity (cy)	53,000
Dredge quantity/day (cy)	1,745
Number of days to complete	30.37
NOx Emissions (lb/day)	21.35
PM Emissions (lb/day)	0.87
THC Emissions (lb/day)	1.36
CO2 Emissions (lb/day)	4112.51

Loac Factor Lookup Table

Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
	Others		0.40
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
	Yard tractor		0.39
Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
	TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
	Other GSE		0.34
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
	Other General Industrial Equipment		0.34
	Other Material Handling Equipment		0.40
	Sweepers/Scrubbers		0.46
Oil and Drill Rigs	Drill Rig (Mobile)		0.50
	Workover Rig (Mobile)		0.50
	Bore/Drill Rigs		0.50

Suisun Marina October and November Maintenance Dredging Project
250 hp Auxiliary Engine Emission Calculations

Input	Input Engine Here
Horsepower (hp)	250
Model year Calendar year	2008 2019
Activity (annual hours)	455.59
Accumulated hours on equipment (estimate using annual-hours*age if you only know the age of the equipment)	3762
Load factor (check the lookup table)	0.42

Intermediate steps	
HPbin	300
NOx_EF0	2.58
NOx_DR	3.3E-05
NOx_FCF	0.950
PM_EF0	0.10
PM_DR	5.1E-06
PM_FCF	0.86
THC_EF0	0.10
THC_DR	2.5E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	2.57
PM_EF (g/hp-hr)	0.10
THC_EF (g/hp-hr)	0.17
CO2_EF (kg/gallon-diesel)*	10.21
BSFC (lb/hp-hr)	0.367
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Results	
Fuel Used (gallon)	2470
NOx Emissions (kg)	123.1
PM Emissions (kg)	5.0
THC Emissions (kg)	8.4
CO2 Emissions (kg)	25214.5
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	2.57
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.10
THC Emission Factor (including deterioration and fuel correction factor): gram/ bhp-hr	0.17

NOx Emissions (lb)	271.42
PM Emissions (lb)	10.98
THC Emissions (lb)	18.42
CO2 Emissions (lb)	55588.40
Assume auxiliary engine operates 15 hours/day	
4.3 wks/mo	
6 work days/wk	
Auxiliary Engine (hrs/day)	15
Total dredge quantity (cy)	53,000
Dredge quantity/day (cy)	1,745
Number of days to complete	30.37
NOx Emissions (lb/day)	8.94
PM Emissions (lb/day)	0.36
THC Emissions (lb/day)	0.61
CO2 Emissions (lb/day)	1830.22

Loac Factor Lookup Table

Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
	Others		0.40
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
	Yard tractor		0.39
Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
	TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
	Other GSE		0.34
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
	Other General Industrial Equipment		0.34
	Other Material Handling Equipment		0.40
	Sweepers/Scrubbers		0.46
Oil and Drill Rigs	Drill Rig (Mobile)		0.50
	Workover Rig (Mobile)		0.50
	Bore/Drill Rigs		0.50

Input	Input Engine Here
Horsepower (hp)	95
Model year Calendar year	1999 2019
Activity (annual hours)	60.74
Accumulated hours on equipment (estimate using annual-hours*age if you only know the age of the equipment)	3762
Load factor (check the lookup table)	0.42

Intermediate steps	
HPbin	100
NOx_EF0	5.68
NOx_DR	1.3E-04
NOx_FCF	0.930
PM_EF0	0.23
PM_DR	1.7E-05
PM_FCF	0.71
THC_EF0	0.99
THC_DR	4.6E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	5.75
PM_EF (g/hp-hr)	0.21
THC_EF (g/hp-hr)	1.05
CO2_EF (kg/gallon-diesel)*	10.21
BSFC (lb/hp-hr)	0.408
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Results	
Fuel Used (gallon)	139
NOx Emissions (kg)	13.9
PM Emissions (kg)	0.5
THC Emissions (kg)	2.5
CO2 Emissions (kg)	1420.3
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	5.75
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.21
THC Emission Factor (including deterioration and fuel correction factor): gram/ bhp-hr	1.05

NOx Emissions (lb)		30.70
PM Emissions (lb)		1.11
THC Emissions (lb)		5.59
CO2 Emissions (lb)		3131.13
Assume engine operates 2 hours/day		
	4.3	wks/mo
	6	work days/wk
Main Engine (hrs/day)	11.25	
Auxiliary Engine (hrs/day)	2	
Total dredge quantity (cy)	53,000	
Dredge quantity/day (cy)	1,745	
Number of days to complete	30.37	
NOx Emissions (lb/day)	1.01	
PM Emissions (lb/day)	0.04	
THC Emissions (lb/day)	0.18	
CO2 Emissions (lb/day)	103.09	

Loac Factor Lookup Table

Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
	Others		0.40
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
	Yard tractor		0.39
Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
	TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
	Other GSE		0.34
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
	Other General Industrial Equipment		0.34
	Other Material Handling Equipment		0.40
	Sweepers/Scrubbers		0.46
Oil and Drill Rigs	Drill Rig (Mobile)		0.50
	Workover Rig (Mobile)		0.50
	Bore/Drill Rigs		0.50

Input	Input Engine Here
Horsepower (hp)	350
Model year Calendar year	1999 2019
Activity (annual hours)	136.68
Accumulated hours on equipment (estimate using annual-hours*age if you only know the age of the equipment)	3762
Load factor (check the lookup table)	0.42

Intermediate steps	
HPbin	600
NOx_EF0	5.74
NOx_DR	9.6E-05
NOx_FCF	0.930
PM_EF0	0.13
PM_DR	7.1E-06
PM_FCF	0.71
THC_EF0	0.32
THC_DR	1.1E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	5.68
PM_EF (g/hp-hr)	0.11
THC_EF (g/hp-hr)	0.33
CO2_EF (kg/gallon-diesel)*	10.21
BSFC (lb/hp-hr)	0.367
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Results	
Fuel Used (gallon)	1037
NOx Emissions (kg)	114.0
PM Emissions (kg)	2.3
THC Emissions (kg)	6.5
CO2 Emissions (kg)	10590.1
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	5.68
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.11
THC Emission Factor (including deterioration and fuel correction factor): gram/ bhp-hr	0.33

NOx Emissions (lb)		251.39
PM Emissions (lb)		5.04
THC Emissions (lb)		14.44
CO2 Emissions (lb)		23347.13
Assume engine operates 4.5 hours/day		
	4.3 wks/mo	
	6 work days/wk	
Main Engine (hrs/day)	11.25	
Auxiliary Engine (hrs/day)	4.5	
Total dredge quantity (cy)	53,000	
Dredge quantity/day (cy)	1,745	
Number of days to complete	30.37	
NOx Emissions (lb/day)	8.28	
PM Emissions (lb/day)	0.17	
THC Emissions (lb/day)	0.48	
CO2 Emissions (lb/day)	768.69	

Loac Factor Lookup Table

Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
	Others		0.40
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
	Yard tractor		0.39
Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
	TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
	Other GSE		0.34
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
	Other General Industrial Equipment		0.34
	Other Material Handling Equipment		0.40
	Sweepers/Scrubbers		0.46
Oil and Drill Rigs	Drill Rig (Mobile)		0.50
	Workover Rig (Mobile)		0.50
	Bore/Drill Rigs		0.50

Input	Input Engine Here
Horsepower (hp)	200
Model year Calendar year	2008 2019
Activity (annual hours)	121.49
Accumulated hours on equipment (estimate using annual-hours*age if you only know the age of the equipment)	3762
Load factor (check the lookup table)	0.4

Intermediate steps	
HPbin	300
NOx_EF0	2.58
NOx_DR	3.3E-05
NOx_FCF	0.950
PM_EF0	0.10
PM_DR	5.1E-06
PM_FCF	0.86
THC_EF0	0.10
THC_DR	2.5E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	2.57
PM_EF (g/hp-hr)	0.10
THC_EF (g/hp-hr)	0.17
CO2_EF (kg/gallon-diesel)*	10.21
BSFC (lb/hp-hr)	0.367
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Results	
Fuel Used (gallon)	502
NOx Emissions (kg)	25.0
PM Emissions (kg)	1.0
THC Emissions (kg)	1.7
CO2 Emissions (kg)	5122.9
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	2.57
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.10
THC Emission Factor (including deterioration and fuel correction factor): gram/ bhp-hr	0.17

NOx Emissions (lb)	55.15
PM Emissions (lb)	2.23
THC Emissions (lb)	3.74
CO2 Emissions (lb)	11294.15
Assume CAT D6 dozer operates 2-4 hours/day	
4.3 wks/mo	
6 work days/wk	
CAT dozer engine (hrs/day)	4
Total dredge quantity (cy)	53,000
Dredge quantity/day (cy)	1,745
Number of days to complete	30.37
NOx Emissions (lb/day)	1.82
PM Emissions (lb/day)	0.07
THC Emissions (lb/day)	0.12
CO2 Emissions (lb/day)	371.85

Loac Factor Lookup Table

Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
	Others		0.40
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
	Yard tractor		0.39
Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
	TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
	Other GSE		0.34
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
	Other General Industrial Equipment		0.34
	Other Material Handling Equipment		0.40
	Sweepers/Scrubbers		0.46
Oil and Drill Rigs	Drill Rig (Mobile)		0.50
	Workover Rig (Mobile)		0.50
	Bore/Drill Rigs		0.50