

Final  
Initial Study/Environmental Assessment  
Sonoma Creek Marsh Enhancement Project

San Francisco Bay Regional Water Quality Control Board  
1515 Clay Street, Ste. 1400  
Oakland, CA 94612

and

US Fish and Wildlife Service  
San Pablo Bay NWR and Marin Islands NWR  
7715 Lakeville Highway  
Petaluma, CA 94954

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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# Acronyms and Abbreviations

BAAQMD .....	Bay Area Air Quality Management District
CARB.....	California Air Resources Board
CCC.....	California Coastal Commission
CDFW .....	California Department of Fish and Wildlife
CCR.....	California Code of Regulations
CEQ.....	Council on Environmental Quality
CEQA .....	California Environmental Quality Act
CFR .....	Code of Federal Regulations
CH <sup>4</sup> .....	Methane
CNDDDB.....	California Natural Diversity Database
CNEL.....	Community Noise Equivalent Level
CO.....	Carbon Monoxide
CO <sup>2</sup> .....	Carbon Dioxide
CO <sup>2</sup> E .....	Carbon Dioxide Equivalent
CSLC.....	California State Lands Commission
dBA.....	A-weighted Decibels
EA .....	Environmental Assessment
EFH .....	Essential Fish Habitat
EIR .....	Environmental Impact Report
EIS.....	Environmental Impact Statement
ER .....	Engineering Regulation
ESA .....	Endangered Species Act
FONSI.....	Finding of No Significant Impact
GHG .....	Greenhouse Gases
HFC.....	Hydrofluorocarbons
Ldn.....	Average Day-Night 24-Hour Average Sound Level
IS .....	Initial Study
N <sup>2</sup> O.....	Nitrogen Oxides
N/A .....	Not Applicable
NEPA.....	National Environmental Policy Act
NF <sup>3</sup> .....	Nitrogen Trifluoride

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NHPA .....	National Historic Preservation Act
NMFS.....	National Marine Fisheries Service
PFC .....	Perfluorocarbons
PM2.5 .....	Fine Particulate Matter
PM10.....	Coarse Particulate Matter
PRC.....	Public Resources Code
RWQCB.....	Regional Water Quality Control Board
SHPO .....	State Historic Preservation Officer
SFBAAB.....	San Francisco Bay Area Air Basin
SF <sup>6</sup> .....	Sulfur Hexafluoride
SO <sup>2</sup> .....	Sulfur Dioxide
USACE.....	United States Army Corps of Engineers
USC.....	United States Code
USEPA.....	United States Environmental Protection Agency
USFWS.....	United States Fish and Wildlife Service
USGS.....	United States Geological Survey
WRDA.....	Water Resources Development Act

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# 1. INTRODUCTION

## 1.1 Purpose of this Document

This document serves as a joint California Environmental Quality Act (CEQA) Initial Study (IS) and National Environmental Policy Act (NEPA) Environmental Assessment (EA) of the proposed Sonoma Creek Marsh Enhancement Project. Sonoma Creek Marsh is located at the mouth of Sonoma Creek, in southern Sonoma County. The IS/EA is written in compliance with the California Environmental Quality Act of 1970 (California Public Resources Code (P.R.C.) §§ 21000-21177), as amended, the CEQA Guidelines (Title 14 California Code of Regulations (C.C.R.) §§ 15000-15387), as amended, the National Environmental Policy Act of 1969 (42 U.S.C. § 4321 et seq), as amended, and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 C.F.R. §§1500-1508).

The CEQA Lead Agency for the project is the San Francisco Bay Regional Water Quality Control Board (RWQCB), which would issue a Water Quality Certification for the project. The property owner is the California State Lands Commission (SLC), a CEQA Responsible Agency for this project. The project is also sponsored by the Marin-Sonoma Mosquito and Vector Control District (District), which is a CEQA Responsible Agency. The NEPA Lead Agency is the US Fish and Wildlife Service (USFWS), San Pablo Bay National Wildlife Refuge (Refuge), which would implement portions of the project and manages the project site.

The analysis in this document concentrates on aspects of the project that are likely to have a significant effect on the environment, and identifies feasible measures to mitigate (i.e. reduce or avoid) these impacts. The CEQA Guidelines define “significant effect on the environment” as a “substantial or potentially substantial adverse change in any of the physical conditions within the area affected by the project....” (CEQA Guidelines, Section 15382). NEPA requires that significance be determined on the basis of the context and intensity of the effect (40 C.F.R 1502.16). This IS/EA will be circulated for a 30-day public and agency review, as required by CEQA and NEPA. Comments on the IS/EA will be evaluated, and responses will be incorporated into the Mitigated Negative Declaration and Finding of No Significant Impact to be prepared for the proposed project.

## 1.2 Document Structure

The content and format of this document, described below, are designed to meet the requirements of CEQA and NEPA. Where relevant, CEQA terminology is listed first, followed by NEPA terminology.

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- Chapter 1, Introduction, identifies the purpose, scope, and terminology of the document, and identifies public involvement procedures.
- Chapter 2, Proposed Project and Alternatives, describes the objectives and characteristics of the proposed project, the reduced project, and the no project/no action alternatives, and of the alternatives that were considered but eliminated from further study. It also identifies the required permits and approvals.
- Chapter 3, Environmental Checklist, presents responses to the CEQA-based environmental checklist questions under each resource topic for the potential impacts associated with the proposed project.
- Chapter 4, NEPA Considerations, includes a discussion of the additional environmental analysis topics required by NEPA, analysis of impacts of project alternatives, discussion of compliance with federal regulations, and a summary.
- Chapter 5, List of Preparers, identifies the individuals involved in preparing this document and their areas of technical specialty.
- Chapter 6, References, identifies all printed references and personal communications cited in this report.

## 2. PROPOSED PROJECT AND ALTERNATIVES

### 2.1 Introduction

The proposed Sonoma Creek Marsh Enhancement Project (proposed project), described within this document, has been developed to remedy persistent drainage problems in the Sonoma Creek Marsh by improving the connections between isolated, ponded areas and the adjacent tidal waters of Sonoma Creek/San Pablo Bay, and by improving internal drainage pathways within the marsh. These enhancements are expected to reduce mosquito production and improve habitat conditions to the benefit of marsh-dependent wildlife species.

### 2.2 Project Purpose and Need

The Refuge, in collaboration with Audubon California (Audubon) and the District, proposes to enhance drainage conditions in the fringing tidal marsh along the western bank of Sonoma Creek, south of Highway 37 in Sonoma County, California (Figure 1). This marsh routinely ponds water for long periods following spring tides and storm events when high waters inundate the entire marsh and become trapped in a large topographic basin in the marsh interior. A series of relic levee berms (abandoned former levees) along the western boundary of the marsh form additional impediments to marsh drainage, and isolated ponded areas have formed between them. The ponded water in these areas leads to high mosquito production rates and reduced vigor of marsh vegetation, especially pickleweed (*Sarcocornia pacifica*). These conditions, in turn, reduce habitat functions for the endangered salt marsh harvest mouse (*Reithrodontomys raviventris halicoetes*), the endangered California clapper rail (*Rallus longirostris obsoletus*), and other marsh-dependent species.

The District is seeking a long-term solution for managing mosquito populations by improving drainage conditions within the marsh, thereby reducing the need for continuous surveillance and application of mosquito larvicides. The Refuge wishes to improve habitat conditions for salt marsh harvest mouse, California clapper rail, and other tidal marsh-dependent species by: (1) improving tidal exchange and, therefore, overall marsh ecosystem health, (2) increasing the amount and quality of marsh channel habitat, and (3) providing marsh-upland transitional habitat wherever possible. The purpose of the proposed project is to address the needs of both agencies.

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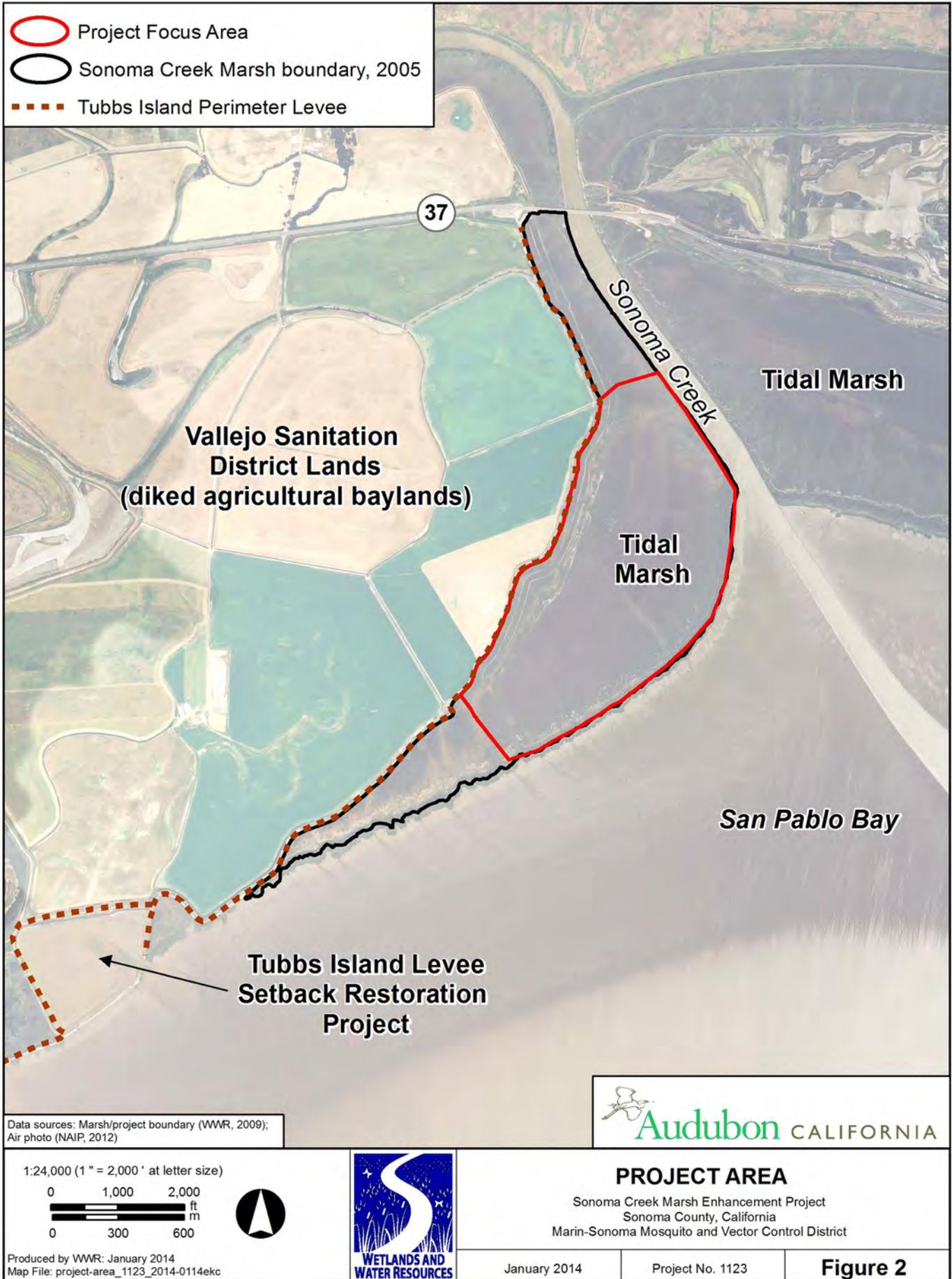
## 2.3 Environmental Setting

### Site History

The project site is located within a large, fringing tidal marsh on San Pablo Bay, within the Refuge boundary, in Sonoma County, California (Figure 2). Prior to European colonization, the current marsh extent was part of the open water of San Pablo Bay (Bay), and was bordered to the west by tidal marshes. In the late 19<sup>th</sup> century, these historic tidal marshes were diked (surrounded by levees and drained) for conversion to agricultural use. Throughout the North San Francisco Bay, this process of conversion of tidal marshes to agriculture was widespread, and resulted in the loss of approximately 82% of the region's historic tidal wetlands (Goals Project 1999). During this time, hydraulic gold mining activities in the Sierra Nevada Mountains sent large sediment loads down the rivers and streams, which, when they entered the Bay, formed extensive mudflats along the newly created levees. These new depositional areas over time grew vertically to create new tidal marshes. These marshes are known as "centennial marshes" as they generally formed between the years 1900 and 2000. The Sonoma Creek Marsh is one of these centennial marshes. Historical aerial photograph interpretation indicates that the marsh expanded rapidly between 1966 and 1989, and that since 1989 this growth has slowed significantly. As of 2005, the areal extent of the marsh was approximately 400 acres. The marsh was added to the Refuge in 1982 under a 66-year, renewable lease agreement from the State Lands Commission, and has been managed for wildlife habitat ever since.

The District began treating the marsh for mosquito abatement in the 1960s. The treatments in the marsh target two main mosquito species: the salt marsh mosquito (*Aedes squamiger*) and the pale marsh mosquito (*Aedes dorsalis*). When mosquito numbers exceed established thresholds, the District treats marshes with EPA-approved larvicides such as Vectobac (*Bacillus thuringiensis* var. *israelensis* or BTI) and Altosid (Methoprene), introducing these chemicals directly to Bay waters and wetlands. Other chemicals that have been proposed for use by the District for adult mosquito control, when necessary, and during human health emergencies include pyrethrins. While the quantities and concentrations of chemicals applied for mosquito control are not currently known to cause deleterious effects on non-target organisms, the reduction of pesticide application in waters connected to San Pablo Bay is preferred from both environmental health and economic perspectives.

Over the years, the District has constructed several small ditches to drain isolated ponded areas in the marsh, and thereby reduce mosquito breeding grounds (mosquito source reduction). While the ditches have helped to reduce mosquito production in some areas, District technicians have noted that much of the mosquito production is spread across a large basin in the center of the marsh, and is not effectively drained by these ditches.



## Existing Site Conditions

The project site is an approximately 300-acre area located within the greater Sonoma Creek tidal marsh. The primary habitats within the project site are displayed in Figure 3 and include:

- **Vegetated high marsh.** The high marsh is a relatively planar surface, vegetated with common San Pablo Bay tidal marsh species including pickleweed, alkali heath (*Frankenia salina*), jaumea (*Jaumea carnosa*), and saltgrass (*Distichlis spicata*). Pacific cordgrass (*Spartina foliosa*) is common along the bay-front edge.
- **Tidal marsh channels and mosquito control ditches.** A number of small, natural channels exist along the Bay-front margin, and extend a short distance (500-1,000 ft) into the marsh interior. The District has also constructed a series of small mosquito control ditches within the vicinity of the relic berms to help manage the mosquito population in these areas. This ditch network connects to San Pablo Bay via three primary ditches (north, central, and south). Pacific cordgrass can be found in some of these channels and ditches.
- **Relic levee berms.** A series of relic levee berms (abandoned former levees) exist along the western border of the marsh. These berms are elevated approximately 1 to 3 ft above the adjacent marsh plain and are vegetated with high-marsh and transitional species, including coyote bush (*Baccharis pilularis*), beeplant (*Scrophularia californica*), yarrow (*Achillea millefolium*), and saltgrass.
- **Tubbs Island perimeter levee.** The project site is bordered to the west by the relatively steep Tubbs Island perimeter levee, which separates the tidal marsh habitats of the project site from the adjacent agricultural lands. The levee is elevated approximately 4 to 5 ft above the adjacent marsh plain, and is vegetated with species similar to those of the relic levee berms. The levee is in need of repair in several locations due to erosion.

The site topography is displayed in Figure 4. A ridge of relatively high elevation, between 6.5 and 7.0 ft NAVD88<sup>1</sup>, runs along the Bay margin. Behind this Bay-front ridge, there is a central basin of approximately 100 acres, with elevations ranging from 6.0 to 6.5 ft NAVD88. The relic levee berms along the western boundary of the site have crest elevations of 7 to 9 ft NAVD88 and the marsh plain between these berms has elevations similar to those found in the central basin.

As the tide rises, water enters the marsh interior through the small tidal channels and mosquito ditches, and inundates the central basin and depressions between the relic berms to depths of up to 0.5 ft. When the tide falls, the existing channel and ditch network does not provide drainage adequate to empty the basins, resulting in long-term ponding (up to three weeks). This ponding produces conditions that stress marsh vegetation, thus reducing vegetation health and habitat structure for marsh-dependent wildlife, and creates mosquito breeding habitat.

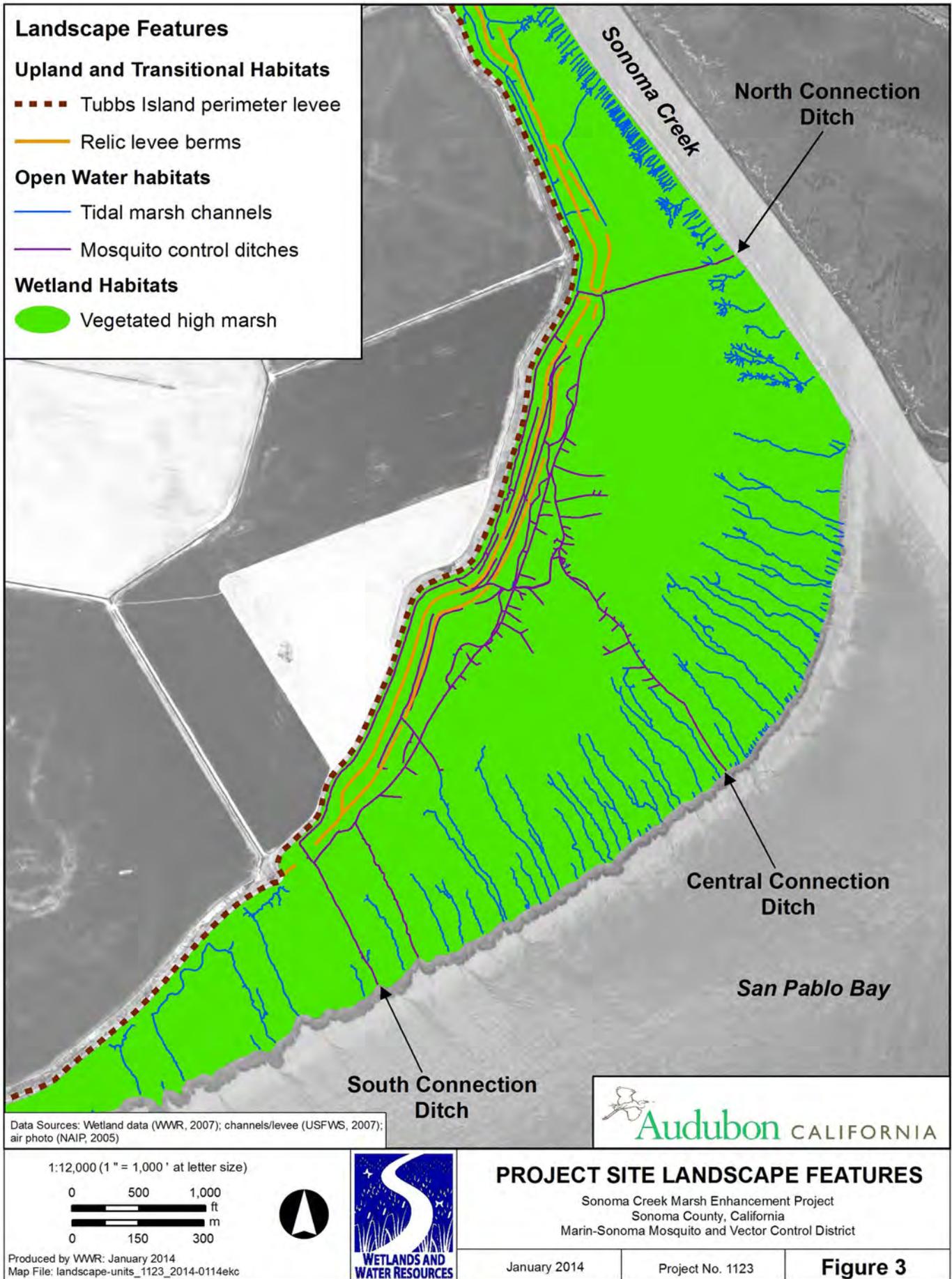
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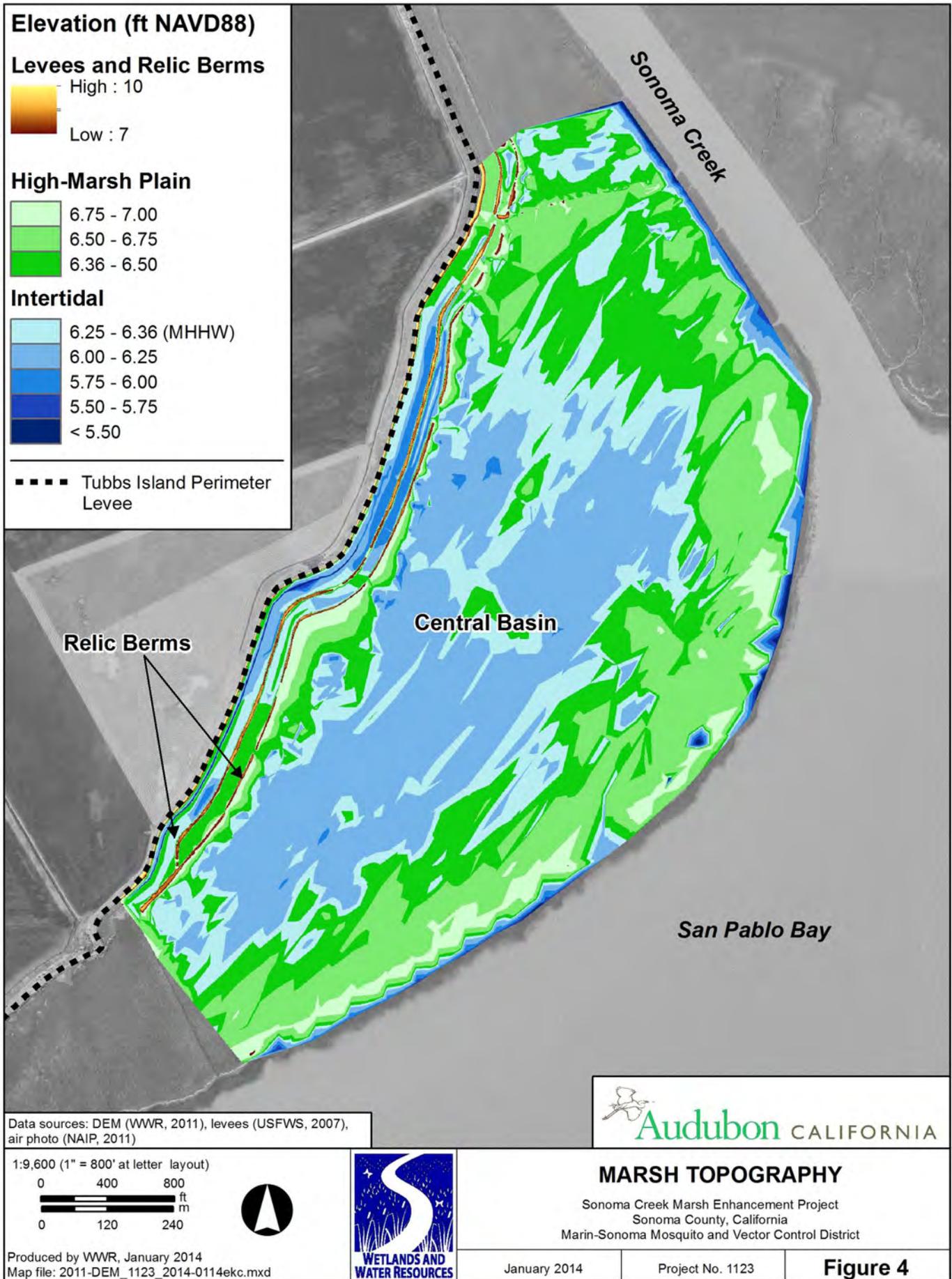
<sup>1</sup> North American Vertical Datum of 1988

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The altered conditions and rapid build-out of the marsh plain over the past 40 years preempted development of the large, natural channel networks that are typical of historic tidal marshes in the San Francisco Estuary. As a result, large expanses of the marsh plain are ineffectively drained. In addition, because the marsh formed on the bayward side of a constructed levee, its marsh-upland transitional zone is limited to a narrow band along the steep slope of the Tubbs Island perimeter levee. Historic tidal marshes in the San Francisco Estuary generally graded gently into adjacent upland habitats, creating broad marsh-upland transitional areas. These transitional habitat areas provide important roosting habitat for several species of birds and offer refugia for tidal marsh-dependent species during extreme high tides and storm events.

The site is bordered to the north by Sonoma Creek, to the east and south by San Pablo Bay, and to the west by diked agricultural baylands owned by the Vallejo Sanitary District, and leased out for farming. Highway 37 crosses Sonoma Creek approximately 0.5 mile north of the project site.





## **2.4 Proposed Action and Alternatives**

This section describes the proposed action (CEQA proposed project) as well as a reduced project alternative. While the proposed project is the preferred action, budgetary constraints at the time of construction may result in a lesser project being implemented. The proposed project evaluated in this document represents the maximum project that may be implemented, while the reduced project represents the minimum project that may be implemented. Therefore, this document covers the full range of environmental impacts that may result from project implementation. The extent of the project that would likely be implemented, based upon preliminary construction cost estimates and currently available funding (as of January 2014), is described at the end of this section (see Current Project Status).

### **Proposed Action (CEQA Proposed Project)**

The proposed project design includes marsh enhancement elements to reduce mosquito production and to enhance marsh and associated upland transitional habitat. These specific enhancement elements are provided separately for the central basin and the relic berm areas. The central basin and relic berm area enhancement designs are presented in Figure 5 and Figure 6, respectively. The extents (length/area) and cut/fill volumes for the various enhancement elements are provided in Table 1.

**Table 1. Enhancement Element Attributes – Proposed Project**

Enhancement Element	Length (ft)	Area (ac)	Cut <sup>1</sup> (cy)	Fill (cy)
<b>Central Basin</b>				
Central Tidal Channel	5,750	4.20	60,000	0
Lateral Starter Channels	200	0.02	140	0
Internal Connector Channels	2,405	0.55	5,560	0
Marsh Mounds	3,500	2.00	0	4,865
Adaptive Management Minor Channels <sup>2</sup>	11,000	0.75	1,970	0
<b>Relic Berm Area</b>				
Marsh-Upland Transition Ramp	3,200	10.00	0	24,200
New Drainage Channels	650	0.07	450	0
Enhanced Drainage Channels <sup>3</sup>	3,200	0.37	900	0
High Marsh Lifts	2,100	3.00	0	2,500
<b>Subtotal Cut-Fill Volumes</b>			<b>69,020</b>	<b>31,565</b>
<b>Soil Volume for Levee Maintenance<sup>4</sup></b>				<b>35,485</b>

Notes:

<sup>1</sup> All cut volumes include a 25% increase to account for soil slumping during excavation<sup>2</sup> Soil volume from adaptive management channels not available for use as levee maintenance material - spread on adjacent marsh plain<sup>3</sup> Excavation volume for enhanced channels assumes that 50% of cross-section area is existing channel void space (excavation volume = 50% design volume)<sup>4</sup> Soil volume left for levee maintenance is subtotal cut volume minus subtotal fill volume with the adaptive management channel volume removed - see footnote 2

### Central Basin Enhancements

- Central Tidal Channel:** Improvement of tidal exchange and drainage within the project area would be accomplished by constructing a new “large” channel that would extend into the central basin and connect to San Pablo Bay via lower Sonoma Creek. The channel connection to Sonoma Creek would be located near the northern mosquito control ditch, approximately 1,500 ft upstream from the confluence with San Pablo Bay. At the connection, the channel mouth would be approximately 50 ft wide and 7 ft deep. These dimensions would be held constant for the first 500 linear ft as the channel extends into the marsh from Sonoma Creek, after which the channel width would taper to 30 ft over the next 50 linear ft, and then hold at 30-ft top width for the remaining approximately 5,200 linear ft of the alignment (total length of 5,750 ft). The depth of the central channel would remain constant throughout most of the alignment; the channel invert would be graded up to the marsh plain elevation at the terminal (southwest) end. The design parameters for this feature were determined based upon two existing channel design models for tidal marshes in the San Francisco Estuary (PWA 2002, Collins 1991). The resulting

cross sectional geometry predictions from the two models were averaged, and a safety factor of 1.75 was applied (to guard against conveyance losses due to channel siltation/slumping) to come up with the design geometry. The design anticipates that a 1:1 channel side slope would develop over time, producing the final channel geometry displayed in Table 2, below.

**Table 2. Anticipated Post-Construction Channel Geometry**

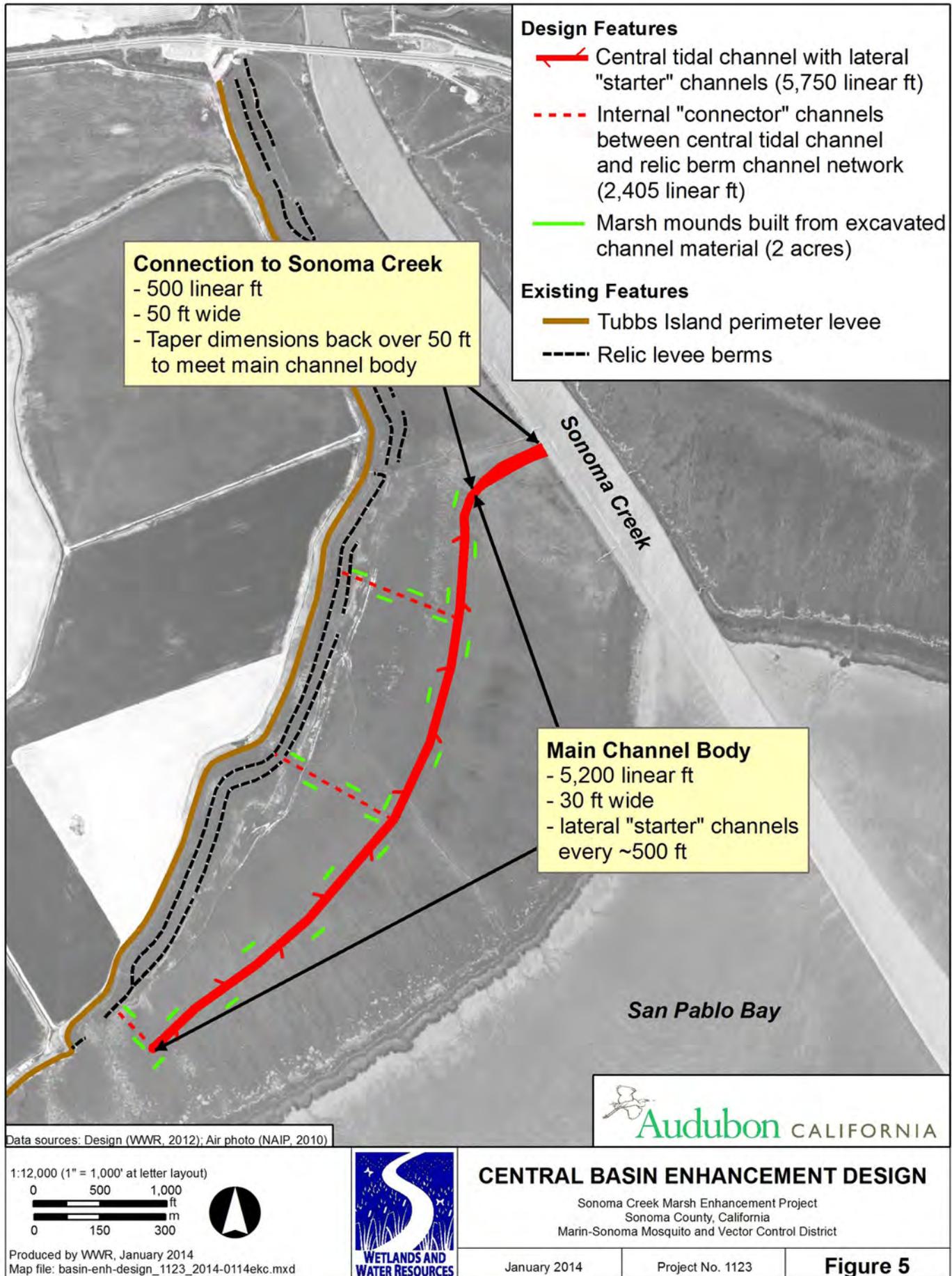
<b>Channel Section</b>	<b>Top Width (ft)</b>	<b>Mean Width (ft)</b>	<b>Bottom Width (ft)</b>	<b>Channel Invert (ft NAVD88)</b>	<b>MHHW Depth (ft)</b>
Sonoma Creek Connection	57	50	43	-1	7
Transition	47	40	33	-1	7
Main Channel	37	30	23	-1	7

- **Lateral Starter Channels:** At approximately 500 ft intervals along the central channel, short (approximately 20-ft long) “starter” channels would be excavated into the marsh plain and connected to the central channel. These channels would be approximately 5 ft wide by 3 ft deep. These channels are designed to serve as nick points for further channel network development through the processes of incision and headcutting. It is expected that over time, these starter channels would enlarge and lengthen, thus further improving tidal exchange and habitat quality throughout the central basin. A conceptualized layout of these features is displayed in Figure 5.
- **Internal Connector Channels:** At up to three locations along the central channel alignment, internal connector channels would be excavated between the central channel and the relic berm channel network. These channels would be approximately 10 ft wide and 5 ft deep. These connector channels would improve the connection of the relic berm area (specifically the depressions between berms) with the source tides, and would contribute to the enhancements that would be constructed within this area. The connector channels would be excavated within the alignments of equipment access roads that would be built on the marsh plain to facilitate construction of the central basin enhancements (see section on Construction Methodology). The proposed locations of these features are presented in Figure 5.
- **Marsh Mounds:** Some of the material excavated for construction of the channels within the central basin would be placed in low, spreading, discontinuous mounds adjacent to the central channel and internal connector channels. These mounds, which would be elevated 1 to 2 ft above the marsh plain (approximately 7.25 to 8.25 ft NAVD88) to support high marsh vegetation, including pickleweed, saltgrass, and salt marsh gumplant, are designed to provide habitat heterogeneity in the marsh interior, as well as high-tide refugia for marsh wildlife, including California clapper rail and salt marsh harvest mouse. These constructed mounds would be placed at irregular intervals along the banks of the central and lateral connector channels, with ample distance between mounds so that they do not impede marsh drainage. The size of these mounds would vary, but each would generally be no greater than 100 ft long by 25 ft wide (2,500 sq. ft). The total area of this created habitat would be no more than two acres. A conceptualized

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layout of these features on the project site is presented in Figure 5. Actual placement locations for these features would be determined in project final design.

- **Adaptive Management “Minor” Channels:** The central channel would improve overall tidal exchange within the central basin. However, isolated areas that are not effectively drained by the central channel may persist following construction. These persistent problem areas, which would be identified during post-restoration monitoring of the project site by the District and the Refuge, would be addressed by constructing small, lateral channels off of the central channel into these areas. The geometry of these channels would be approximately 3 ft wide x 2 ft deep or smaller. The exact alignment and number of these channels is unknown at this time, but the total length of channel created would not exceed 11,000 linear ft. These channels would be constructed over a ten-year period following construction of the central channel, or whatever adaptive management duration is allowed by the project permits.



### *Relic Berm Area Enhancements*

- **Marsh-Upland Transitional Ramp:** The marsh-upland transitional ramp (transitional ramp) would improve drainage within the relic berm areas and provide important refuge habitat for marsh-dependent wildlife during extreme high tides and storm events. The transitional ramp would create a gentle, sloping surface (< 10% slope) that extends from the marsh plain up to the Tubbs Island perimeter levee (Figure 7). The transitional ramp would not extend above local extreme high water (~9 ft NAVD), and would therefore support habitat associated with infrequent tidal inundation. The transitional ramp would extend from the Tubbs Island perimeter levee out to the first relic berm alignment (approx. 100 ft wide), which would be graded to merge with the transitional ramp, thus improving drainage conditions within this area. This feature would be constructed from material excavated to create the channels in the central basin, and would be revegetated with a mix of native, creeping graminoid vegetation (rhizomatous grasses and sedges) typical of remnant North Bay marsh-upland ecotones. To increase habitat complexity, large woody debris (salvaged on-site) would be placed throughout the newly constructed berm and partially buried to increase its stability. Construction of the full transitional ramp alignment may occur over an (up to) 10-year period, due to funding availability/restrictions.
- **New and Enhanced Drainage Channels:** An extensive network of drainage channels constructed by the District exists within the relic berm area. However, many of these channels have reduced functionality due to poor connections with primary mosquito control channels, siltation, or inadequate size. There are also some isolated problem areas that could be addressed by creation of new drainage channels. This enhancement element would improve drainage within the relic berm area by improving connections with primary mosquito control channels, enlarging existing channels, and creating new channels within isolated problem areas. The geometry of the enhanced and created channels would vary by location, based on the estimated tidal prism of each particular problem area, but would generally be no larger than 5 ft wide by 3 ft deep.
- **High Marsh Lifts:** This enhancement element is designed to improve drainage conditions within isolated problem areas between the relic berms by raising the elevations of the marsh plain, and grading the new surfaces to drain toward existing drainage channels (Figure 8). The marsh surface would be raised using material excavated in the creation/enhancement of channels within the relic berm area. The elevation of the placed material would not exceed local mean higher high water (MHHW: ~6.4 ft NAVD88), so that the habitat is maintained as high marsh plain.

### *Levee Maintenance*

Over 69,000 cubic yards (cy) of earthen material would be excavated from the marsh in the construction of the various channel features described above. Some of this material would be used in the construction of other marsh enhancement elements (marsh mounds, transitional ramp, high marsh lifts), but there would still be a large amount of material remaining once these features were

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constructed. All unused material would be hauled to the adjacent Tubbs Island perimeter levee, owned by the Vallejo Sanitation District, where it would be deposited and roughly graded on the levee top and landward slope for later re-use as maintenance material. Figure 9 displays the possible storage and reuse areas along the Tubbs Island levee. It is possible that the Vallejo Sanitation District may have other areas of the levee that are in need of maintenance fill. The Refuge may also use some of the excavated material to repair a section of the levee along Tolay Creek, approximately 2 miles from the project site (Figure 9). The project would work to accommodate these priority needs to the extent possible.

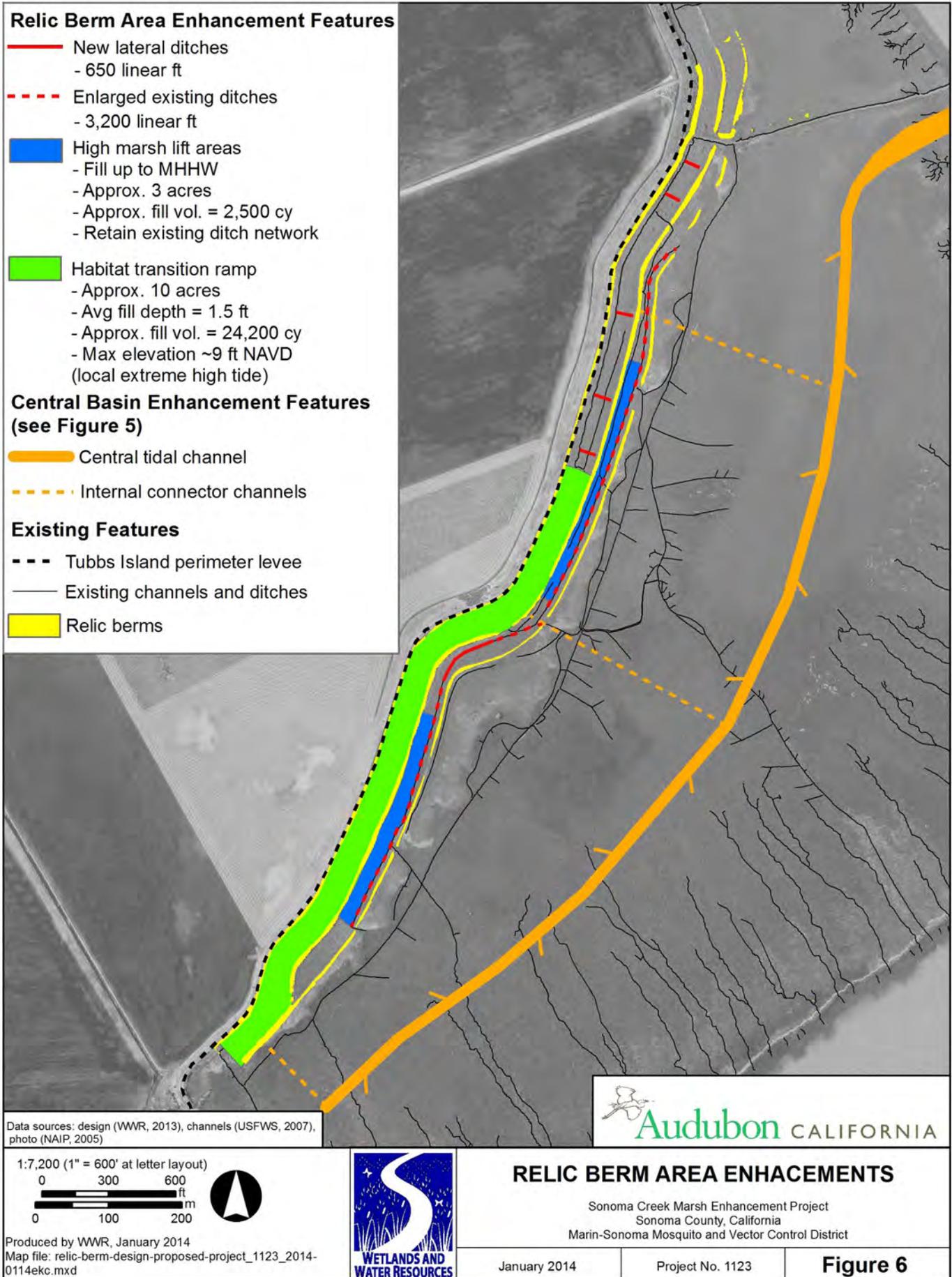


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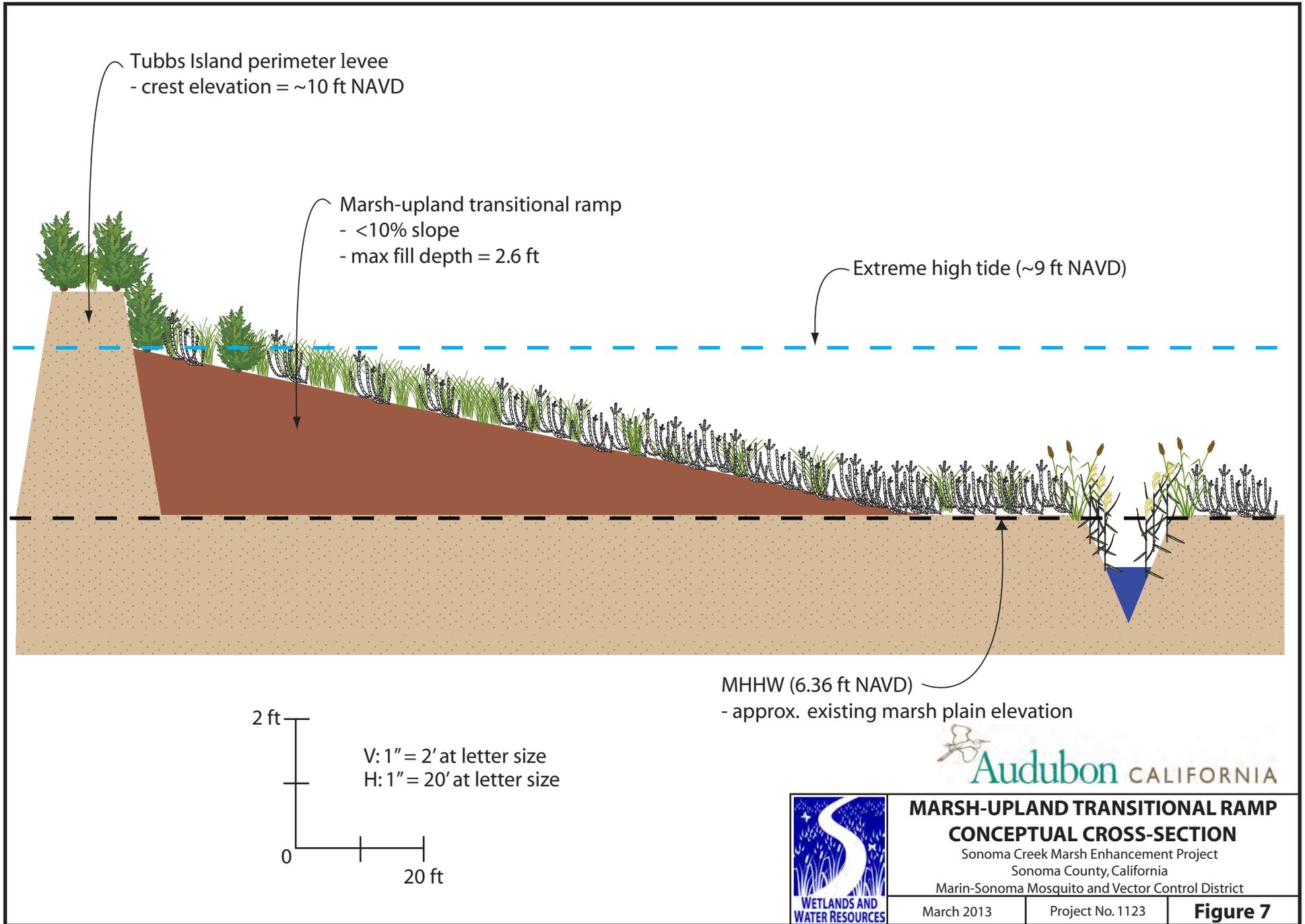
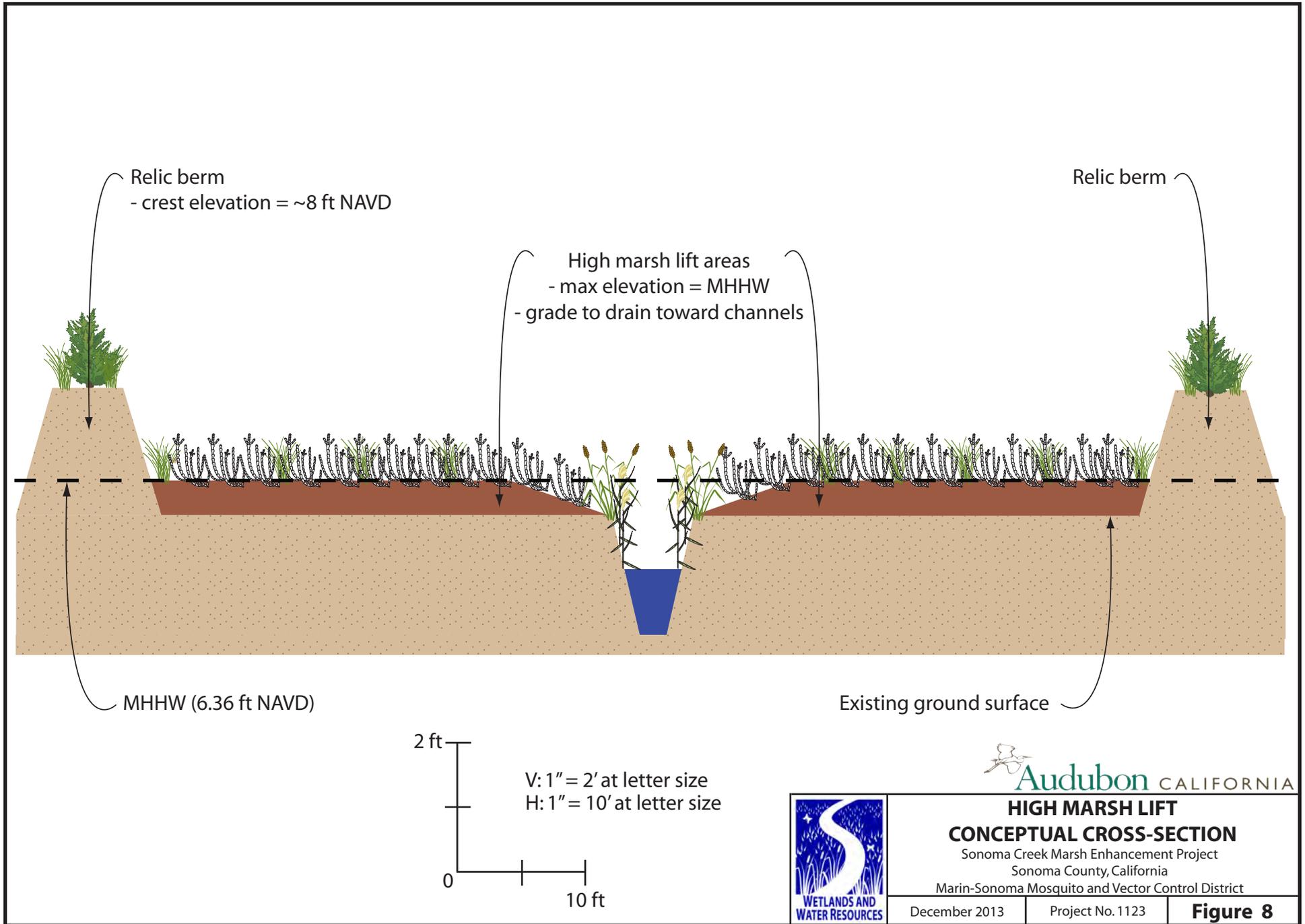
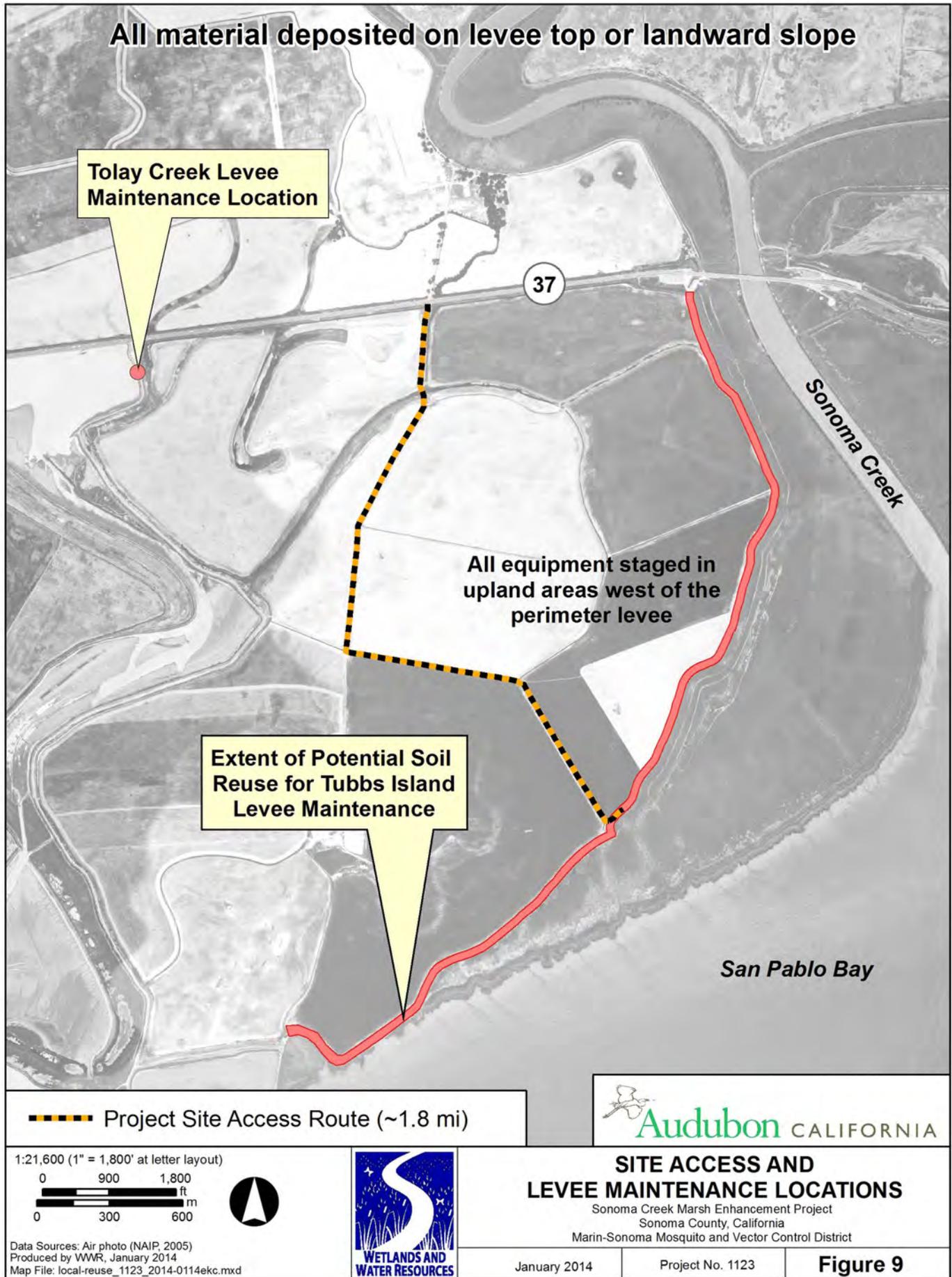


Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration





## Construction Methodology

Construction activities necessary to build the project are described in terms of: (1) construction equipment and crew, (2) site access and equipment staging, (3) earthwork, and (4) revegetation. The maximum earthwork volumes and imported material quantities for the proposed project are presented in Table 3, below.

**Table 3. Estimated Maximum Construction Quantities**

Description	Quantity <sup>1</sup>
Earthwork	
Excavation/grading (cut/fill)	69,020
Imported Materials	
3" Drain rock (road material)	9,275 cy
Geo-textile fabric (road material)	14,000 sy

<sup>1</sup> cy= cubic yards; sy = square yards

### *Equipment and Crew*

The equipment that would be used to construct the various marsh enhancement elements would consist of the following.

- Low Ground Pressure (LGP) Excavators: two long-reach excavators and a single short reach excavator.
- Six LGP tracked dump trucks
- One 10-wheel dump truck
- One LGP tracked bulldozer
- One wheel loader
- One rotary ditcher/snow-cat

The construction crew would likely consist of 10-12 workers at any given time.

### *Site Access and Equipment Staging*

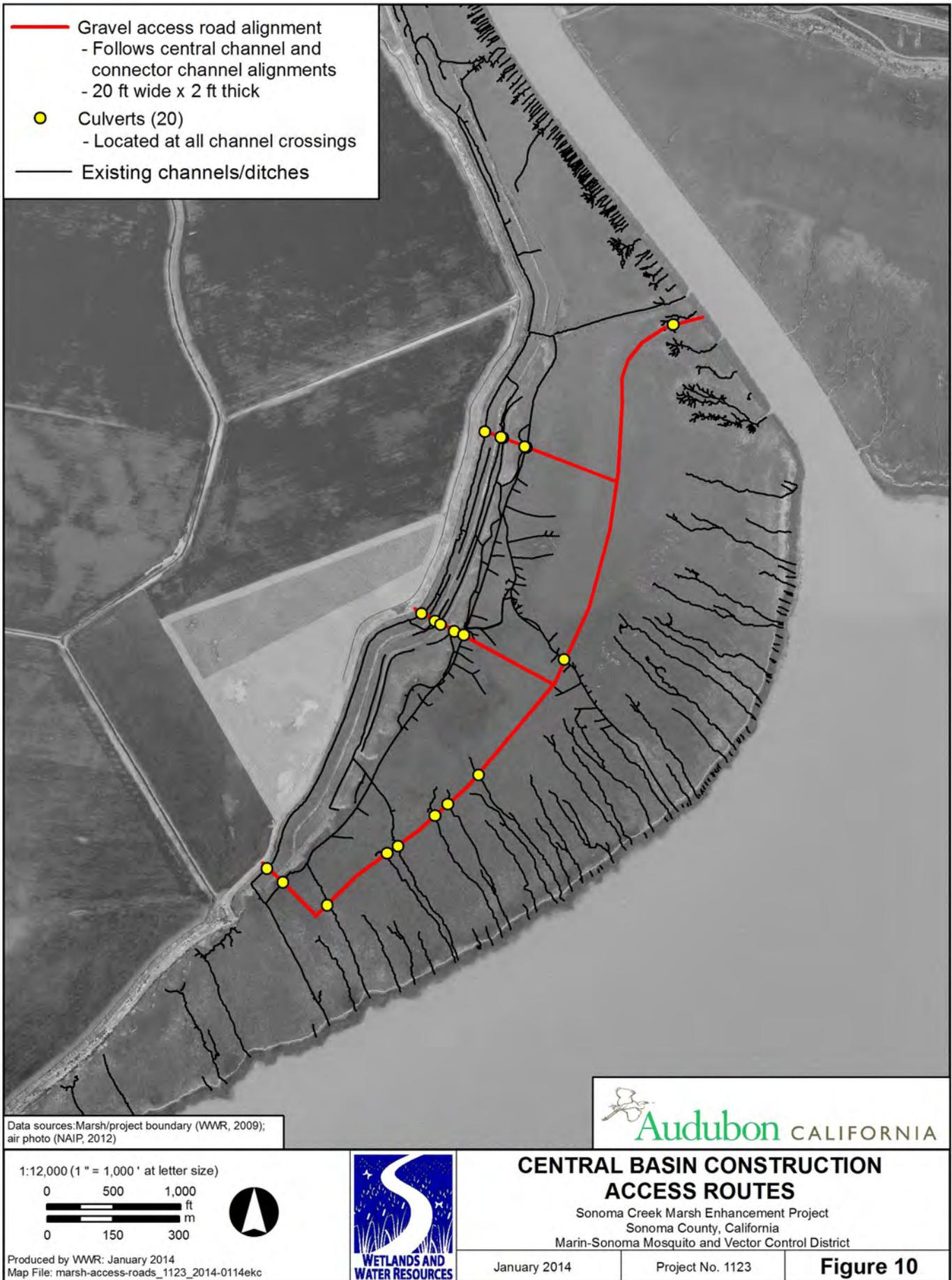
Construction equipment would be transported to the project site via flat-bed trucks. Equipment and personnel would access the project site from Highway 37, via existing roads/equipment paths on Vallejo Sanitation District lands (Figure 9). All equipment would be staged in designated upland areas on farm lands adjacent to the perimeter levee. Any damage to farm lands or access routes on Vallejo Sanitation District lands due to equipment operation would be repaired upon project completion.

Equipment would access the central basin of the marsh for construction of the enhancement elements in this area via a temporary road that would be built atop the marsh plain (Figure 10). This road would consist of a ~2 ft layer of gravel (3" drain rock) placed over geotextile fabric, and would be approximately 20 ft wide. The road material (potentially up to 9,275 cy; see Table 3) would be

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

transported by dump truck to the project site, where it would be stockpiled in an upland location on Vallejo Sanitation District agricultural lands. The road gravel would be loaded into track dump trucks, transported to the construction location, dumped, and spread by LGP bulldozer to the desired thickness over the geotextile base. The road would be built atop the central tidal channel alignment, or parallel to it, with lateral access routes to the perimeter levee at up to three locations. The road alignment would depend on construction feasibility, contractor recommendation, and whether the construction for the central basin enhancement elements would be one, two, or three years (see section on Construction Timing, below). Culverts would be installed in the road at all channel crossings along its alignment to allow tidal exchange within the area landward (northwest) of the road. This road would be removed from the marsh plain as the channel is excavated. It is possible that construction of the central basin enhancement elements may take longer than a single construction season, due to construction window limitations for state and federally listed species and availability of construction funds (see section on Construction Timing, below). If the central channel cannot be constructed within a single construction season, the remainder of the construction access road may either be left in place between construction seasons, or removed and stockpiled on adjacent Vallejo Sanitation District lands, depending on permit requirements. In this document, we analyze the environmental impacts associated with leaving the access road in place between construction seasons.

If the construction duration for the central basin enhancement elements is only one year, the access road would be built along the entire central channel alignment, with a single lateral road at the southern end. If construction is performed across multiple years (potentially up to three years), the access road would only be built along the portion of the channel to be constructed in that year, with a lateral access road constructed at the end of this alignment. Assuming that the access road would be left in place between construction seasons, the road would be extended along the channel alignment as it is removed from the channel cut. This re-use approach under multi-year construction scenarios would save on road material costs. The lateral access road(s) would be removed at the end of each construction season, and the material stockpiled on the Vallejo Sanitation District Lands. The stockpiled material would be used to construct a new lateral access road at the start of the next construction season. Once construction of the entire central tidal channel is completed, the access road material would be either used to improve existing roadways on Refuge lands, or would be sold to recover some of the project material costs. The maximum volume of material required to construct the access roads on the marsh plain (under a 1-year construction scenario) is presented in Table 2. Multi-year construction scenarios would involve the use of less material, because road materials can be reused in subsequent construction years.



## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

If the road along the central channel alignment is completely contained within the channel footprint, there would be no long-term impacts to the marsh from road construction and use in this area. If the road is built parallel to the channel alignment, it would create a depression in the marsh plain that would persist after the road material is removed. Under this scenario, the road depression would be backfilled with material excavated from the channel alignment and graded to drain toward the newly constructed channel. In this document, we analyze the environmental impacts associated with the road being located outside of the channel alignment to address the maximum potential impact.

The lateral road(s) to the levee would be removed upon completion of the channel excavation and the internal connector channels would be constructed within their footprints to improve drainage within the road alignment depressions and provide the needed hydrologic connections to the relic berm enhancement area.

Equipment would access the relic berm enhancement areas from the perimeter levee via the lateral access roads or construction mats placed on the marsh plain. Work within the relic berm enhancement area that cannot be completed from the levee or the existing berms would be performed from construction mats.

### *Earthwork*

#### **Central Basin Enhancements**

The central channel and lateral starter channels within the central basin would be constructed using a long-reach, low-ground pressure excavator. The excavator would be positioned atop the constructed access road and would work from north to south, away from the central channel connection point on Sonoma Creek. The active construction area of the channel would be isolated from the adjacent tidal waters by either (1) leaving a 50-100-ft section of marsh in place at the mouth of the channel as a “plug”, which would be removed at the end of the first construction year, or (2) placing a turbidity curtain/fish screen in front of the active construction area. These approaches would prevent fish from entering the active work area during construction, and would prevent construction-related turbidity impacts to the adjacent waters of Sonoma Creek and San Pablo Bay. These impact avoidance measures may be modified or eliminated in consultation with regulatory and resource agencies during the permitting process if alternate methods are deemed more appropriate for this project.

The excavator would load material removed from the channel cut and the access road into track dump trucks that would be moving ahead of the excavator. The gravel road material would be kept separate from the excavated marsh soils, as the gravel would not be used for creation of marsh enhancement elements or levee maintenance. The track dump trucks would maneuver along the proposed channel alignment to take the excavated materials to the appropriate reuse/stockpile locations. At specific locations along the channel alignment, the excavator would use excavated material to create marsh mounds by placing and spreading material to the appropriate dimensions. The excavator would also backfill the resulting road depression with excavated material as the road is removed. Once the central channel construction is complete, the excavator would exit the marsh via the lateral road(s), removing the road material as it backs out, and constructing the small,

connector channels within these road alignments. The excavator would create marsh mounds at specific locations along these lateral road alignments using materials excavated from the connector channels.

Adaptive management channels would be created using a rotary ditcher or small low ground-pressure excavator (e.g. Bobcat). The locations and alignments of these channels would be determined by the Refuge and District, based on the results of post-construction monitoring and identification of persistent problem areas. The material cut from the channel alignments by the rotary ditcher would be sprayed in a wide pattern across the adjacent marsh by the machinery (much like a snow-blower). This material would be raked by hand to < 4” thick, so as not to bury marsh vegetation or impede surface water flow. Material cut from channels using the excavator would be placed on the adjacent marsh plain and raked by hand to < 4” thick. Due to the low ground pressure nature of the equipment and the lack of need to transport the extracted material by track truck, the construction equipment used to create these adaptive management channels would be able to work directly from the marsh plain, and no access roads or construction mats would be needed.

### **Relic Berm Area Enhancements**

The construction methods for the relic berm enhancement elements are described individually, below. Equipment access within the relic berm area would be via the Tubbs Island perimeter levee or the relic berms themselves.

**Marsh-Upland Transitional Ramp:** The marsh-upland transitional ramp would be constructed from material excavated in creation of the central basin channels. This material would be transported to the ramp construction location via track dump truck, where it would be dumped immediately adjacent to the levee on the existing marsh plain. The material may need to de-water to some extent, which may take anywhere from one week to one year, before it can be contoured into the transitional ramp feature. Once the material has sufficiently dried, it would be graded to final design specifications using an excavator and/or bulldozer. ~~This feature may be built over a period of up to 10 years following completion of the central basin enhancements. If the placed material cannot be contoured to final design specifications within two construction seasons of placement (i.e., material placed during the 2014 construction season must be graded by the end of the 2015 season), it would be stockpiled in upland areas on the landward side of the levee, in areas to be determined in consultation with the landowner and tenant farmer.~~

**Channel Creation/Enhancement:** The existing drainage ditches within the relic berm area that are targeted for enhancement would be cut with an excavator. Soil excavated from these channels would be loaded into a track dump truck and transported to a suitable re-use location (or spread directly in re-use locations, if close enough to the excavation site), which may include high-marsh lifts, the transitional ramp, or levee maintenance. Smaller, new lateral ditches may be constructed using either a small excavator (e.g., Bobcat), or rotary ditcher.

**High-Marsh Lifts:** High-marsh lift areas would be created from material excavated from the various channels created in the relic berm area. Most material would be used in the area immediately surrounding the channel excavation location, but some areas may require the import of additional

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

material. In these cases, the material would be transported to the desired fill location by track dump trucks, where it would be dumped and spread to the desired thickness and slope by an excavator.

### *Levee Maintenance*

All material excavated in channel construction that is not used for other marsh enhancement elements would be used for Tubbs Island levee maintenance. Track dump trucks (for disposal locations <0.5 mi from the marsh access point) or wheeled dump trucks (for disposal locations >0.5 mi from the marsh access point) would transport the material to the appropriate disposal locations on the levee top or landward slope (Figure 9) where it would be deposited and roughly graded into discrete piles by a wheel loader. The material would be left to dry in this configuration until the farmer responsible for levee maintenance is ready to perform the finish grading. Erosion control measures (i.e., straw wattles, sediment fencing) would be installed around the disposal piles to prevent runoff of sediments into the adjacent marsh and farm lands.

### *Revegetation*

Disturbed areas of the marsh plain (i.e., areas within the footprint of the construction access roads) and the constructed marsh mounds and high marsh lifts would be allowed to revegetate naturally. The transitional ramp, however, would be actively planted/seeded with a mix of native plants typical of remnant North Bay marsh-upland ecotones. Revegetation would not begin until at least one year after construction is completed, and soil tests indicate that the soils are suitable for vegetation establishment. A detailed revegetation plan would be developed for the transitional ramp during final design.

### *Construction Timing and Duration*

Since California clapper rails are present within the project vicinity, construction of project elements within 700 ft of active clapper rail nests would not commence until September 1, at the end of the clapper rail nesting season. In addition, in-water construction activities have seasonal work windows set by state and federal resource agencies for the purposes of protecting essential fish habitat and migratory species (Table 4). These windows vary by species and would be established in consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS).

**Table 4. Work Windows for Special Status Fish Species in San Pablo Bay**

<b>Special Status Species</b>	<b>Regulating Agency</b>	<b>Work Window Period</b>
Steelhead trout	NMFS	June 1 to November 30
Chinook salmon	NMFS	June 1 to November 30
Longfin smelt	CDFW	Aug 1 to January 30
Sacramento splittail	CDFW	Aug 1 to January 30

Source: [http://swr.nmfs.noaa.gov/overview/sroffice/2dredge\\_restriction\\_No\\_san\\_pablo.html](http://swr.nmfs.noaa.gov/overview/sroffice/2dredge_restriction_No_san_pablo.html)

The total amount of time that would be needed to build the entire project is estimated to be seven months, if construction could be completed in a single attempt. Construction production rates, funding availability, and regulatory constrictions may result in construction of the project occurring over more than one season (year). A maximum of three construction seasons would be required to build the central basin enhancements, while construction of the relic berm enhancements may occur over a period of up to 10 years. Adaptive management actions (minor channel construction in the central basin) would take place over an approximately five- to ten-year period following construction of the central basin enhancements, depending on the conditions of the project permits. In this document, impacts associated with different construction durations are analyzed where appropriate.

### **Reduced Project Alternative**

The reduced project alternative is included to describe the minimum version of the project that may be built. The reduced project alternative is the minimum project that can be constructed that would still meet the primary project goals of increasing tidal exchange within the project area to improve habitat conditions for marsh dependent wildlife and to reduce mosquito production. However, this alternative would not address the project goal of increasing the amount of marsh-upland transitional habitat in the project area, and the creation of associated high tide refugia for marsh dependent wildlife, roosting/nesting habitat for bird species, and sea-level rise accommodation space.

The reduced project enhancement elements within the central basin and relic berm area are described individually below. These enhancement elements are presented in Figure 11. The extents (length/area) and cut/fill volumes for the reduced project enhancement elements are compared to those of the proposed project in Table 5. The construction methods for the reduced project would be identical to those described for the proposed project. The impacts associated with a reduced project alternative are analyzed relative to the proposed project in Chapter 4, NEPA Considerations.

**Table 5. Proposed Project and Reduced Project Comparison**

Enhancement Element	Proposed Project				Reduced Project			
	Length (ft)	Area (ac)	Cut <sup>1</sup> (cy)	Fill (cy)	Length (ft)	Area (ac)	Cut <sup>1</sup> (cy)	Fill (cy)
<b>Central Basin</b>								
Central Tidal Channel	5,750	4.20	60,000	0	4,500	2.13	33,630	0
Lateral Starter Channels	200	0.02	140	0	140	0.02	80	0
Internal Connector Channels	2,405	0.55	5,560	0	1,980	0.23	1,375	0
Marsh Mounds	3,500	2.00	0	4,865	3,500	2.00	0	4,865
Adaptive Management Minor Channels <sup>2</sup>	11,000	0.75	1,970	0	15,000	1.03	2,690	0
<b>Relic Berm Area</b>								
Marsh-Upland Transition Ramp	3,200	10.00	0	24,200	0	0.00	0	0
New Drainage Channels	650	0.07	450	0	945	0.11	655	0
Enhanced Drainage Channels <sup>3</sup>	3,200	0.37	900	0	6,390	0.75	2,220	0
High Marsh Lifts	2,100	3.00	0	2,500	2,800	3.75	0	3,000
<b>Subtotal Cut-Fill Volumes</b>			<b>69,020</b>	<b>31,565</b>			<b>40,650</b>	<b>7,865</b>
<b>Soil Volume for Levee Maintenance<sup>4</sup></b>				<b>35,485</b>				<b>30,095</b>

Notes:

<sup>1</sup> All cut volumes include a 25% increase to account for soil slumping during excavation

<sup>2</sup> Soil volume from adaptive management channels not available for use as levee maintenance material - spread on adjacent marsh plain

<sup>3</sup> Excavation volume for enhanced channels assumes that 50% of cross-section area is existing channel void space (excavation volume = 50% design volume)

<sup>4</sup> Soil volume left for levee maintenance is subtotal cut volume minus subtotal fill volume with the adaptive management channel volume removed - see footnote 2

### Central Basin Enhancements

- Central Tidal Channel:** Under the reduced project, the central tidal channel would have a reduced length and geometry from that which would be constructed under the proposed project. The channel length is reduced from approximately 5,750 linear ft to 4,500 linear ft. The cross sectional channel geometry is reduced to the minimum geometry appropriate for the marsh tidal prism. This cross sectional geometry was determined using the average of the two channel design models (PWA 2002, Collins 1991) with a safety factor of 1.25 (as opposed to 1.75 in the proposed project) applied to guard against conveyance losses due to channel siltation/slumping. The geometry was also tapered according to reductions in marsh tidal prism along the channel<sup>2</sup> as opposed to maintaining the maximum tidal prism geometry along the entire channel length, as was done in the proposed project. The first 500 ft of the channel, near the connection with

<sup>2</sup> The marsh tidal prism is the amount of water held on the marsh plain within the project area at MHHW. The amount of the tidal prism that must be conveyed by the channel reduces with distance from the channel mouth. Therefore, the channel cross-section geometry does not have to be as large at the distal end of the channel as at the mouth.

Sonoma Creek, retains the same geometry as under the proposed project (50 ft wide and 7 ft deep). The design anticipates that a 1:1 channel side slope would develop, producing the channel geometry displayed in Table 6, below.

**Table 6. Anticipated Post-Construction Channel Geometry – Reduced Project Alternative**

Channel Section	Section Length (linear ft)	Top Width (ft)	Mean Width (ft)	Bottom Width (ft)	Channel Invert (ft NAVD88)	MHHW Depth (ft)
Sonoma Creek Connection	500	57	50	43	-1	7
Main Channel, Section 1	925	29	22	15	-1	7
Main Channel, Section 2	1,425	25	18	11	-1	7
Main Channel, Section 3	1,425	21	14	7	-1	7
Main Channel, Section 4	225	16	9	2	-1	7

- **Lateral Starter Channels:** Lateral starter channels of the same general size and configuration would be constructed along the central channel, as described for the proposed project. However, the total number of channels would be less due to the reduced length of the central channel.
- **Internal Connector Channels:** Under the reduced project alternative, a maximum of two internal connector channels would be constructed between the central channel and the relic berm channel network. The channels would also be smaller in geometry (5 ft wide and 3 ft deep) than under the proposed project.
- **Marsh Mounds:** Marsh mounds of the same general size and configuration as under the proposed project would be constructed along the central channel and internal connector channels. The total area of these features would remain the same as under the proposed project, requiring them to be placed at more frequent intervals along the channel. The mound placement configuration would still be designed so as not to impede marsh drainage in adjacent areas. Actual placement locations for these features would be determined during project final design.
- **Adaptive Management “Minor” Channels:** Under the reduced project, adaptive management channels would become more important, due to the reduced length of the central channel. The reduced central channel length would leave the distal (southern) end of the central basin without adequate drainage improvement, requiring additional construction of minor channels within this area to allow full tidal exchange. The minor channel geometries and construction methods would be the same as under the proposed project, but the overall maximum length of channels would be increased to 15,000 linear ft.

### *Relic Berm Area Enhancements*

- **Marsh-Upland Transitional Ramp:** The transitional ramp is not included as an enhancement element in the reduced project alternative. Therefore, the reduced project would not provide any marsh-upland transitional habitat.

- **New and Enhanced Drainage Channels:** The networks of new and enhanced drainage channels would be similar to those that would be created under the proposed project, but an additional 3,485 ft of new and enhanced channels would be created within the area that is the footprint of the transitional ramp under the proposed project, to remedy drainage issues in this area. The channel geometries would be similar to those in the proposed project (5 ft wide and 3 ft deep).
- **High Marsh Lifts:** The area of high marsh lifts would be expanded by 0.75 ac within the area that is the footprint of the transitional ramp under the proposed project, to remedy drainage issues in this area. The design characteristics of the high marsh lift features would be the same as under the proposed project.

### *Levee Maintenance*

Over 40,000 cy of earthen material (approx. 28,400 cy less than under the proposed project) would be excavated from the marsh under the reduced project. All material not utilized in the construction of on-marsh enhancement elements would be stockpiled on the landward side of the Tubbs Island perimeter levee for use as levee maintenance material (Figure 9). Since the transitional ramp is not included in the reduced project, the total amount of material available for levee maintenance is only approximately 5,400 cy less than under the proposed project.

### **Other Alternatives Considered and Rejected**

Various other design alternatives for both the central basin and relic berm areas were considered during the development of this project. These alternatives were rejected for various reasons, including lack of construction feasibility, high costs, and/or failure to meet project goals and objectives. These rejected design alternatives are described below.

- **Central Basin:** The original design for the project included a branching and meandering tidal channel network throughout the central basin, mimicking the channels found in ancient tidal marshes in San Pablo Bay. This design alternative was rejected due to the complexities of construction and cost estimates outside the range of fundraising capabilities.
- **Relic Berm Area:** Two other design alternatives for addressing tidal exchange problems in the relic berm area were considered. One of these alternatives was purely focused on creating new and enhancing existing drainage channels, and did not include the transitional ramp or high marsh lifts. The other alternative was purely focused on high marsh lifts to improve drainage and did not include the transitional ramp or channel creation/enhancement. Both of these alternatives were rejected because a diversified approach to enhancing habitats in the relic berm area would provide greater habitat diversity, and thus greater benefits to marsh-dependent wildlife.

### **Current Project Status**

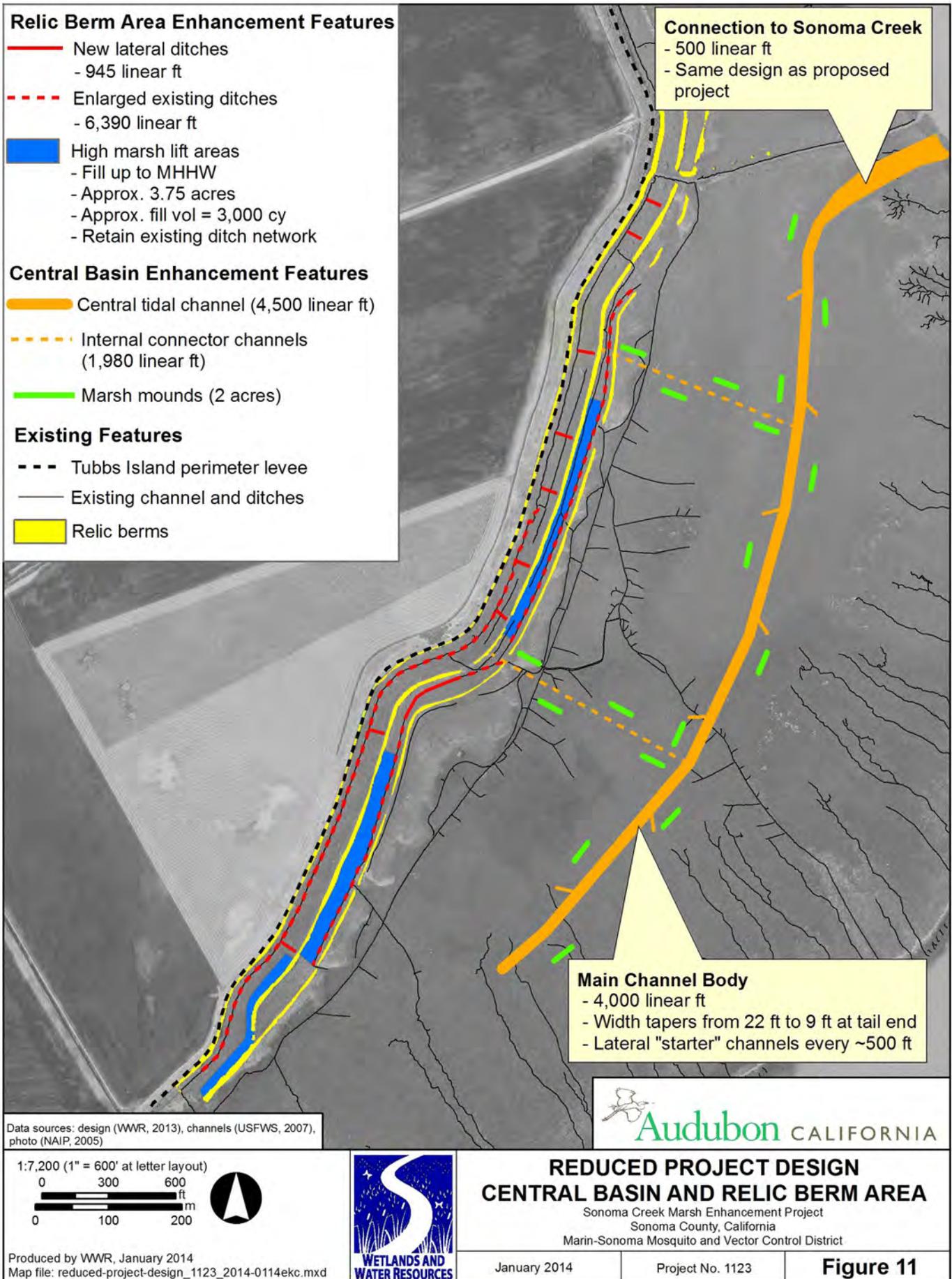
As described earlier in this section, due to project funding constraints, the project that is ultimately implemented may fall somewhere between the proposed project and reduced project alternative. At

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

the time of the publication of this document (January 2014), the anticipated project that would be implemented, based upon preliminary construction cost estimates and available funds, is as follows:

- The central basin enhancements would be as described for the reduced project alternative
- The relic berm Area enhancements would be as described for the proposed project

Construction of the central basin enhancements would likely take place over a single construction season, while construction of the relic berm Area enhancements and adaptive management minor channels in the central basin would take place over a period of up to 10 years following completion of the central basin enhancements. As described in the impact analysis in this IS/EA, all environmental impacts of this level of project build-out would be less than or similar to those identified for the proposed project.



## 3. INITIAL STUDY / ENVIRONMENTAL ASSESSMENT

### 3.1 Project Information

- 1. Project title:** Sonoma Creek Marsh Enhancement Project
- 2. Lead agency contact information**
- CEQA lead agency name and address:** San Francisco Bay Regional Water Quality Control Board,  
1515 Clay Street, Ste. 1400  
Oakland, CA 94612
- NEPA lead agency name and address:** US Fish and Wildlife Service,  
San Pablo Bay National Wildlife Refuge  
7715 Lakeville Hwy  
Petaluma, CA 94954
- 3. Contact persons**
- CEQA Contact person and phone number:** Abigail Smith, (510) 622-2413
- NEPA Contact person and phone number:** Don Brubaker, (707)-769-4200
- 4. Project location:** Sonoma Creek Marsh, located at the mouth of Sonoma Creek at the northern edge of San Pablo Bay within the San Pablo Bay National Wildlife Refuge in unincorporated Sonoma County. (See Figure 1)
- 5. Project sponsor's name and address:** USFWS San Pablo Bay National Wildlife Refuge  
7715 Lakeville Hwy  
Petaluma, CA 94954
- 6. General plan designation:** LEA 100 – Land Extensive Agriculture, 100-acre minimum parcel
- 7. Zoning:** LEA B6 100 Z, BR F2 SR - Land Extensive Agriculture, 100-acre minimum parcel size, Biotic Resources, Floodplain, and Scenic Resources Combining Districts
- 8. Description of the project:** See Chapter 2, Proposed Project and Alternatives.

**9. Setting and surrounding land uses:**

See Chapter 2, Proposed Project and Alternatives.

**10. Other public agencies whose approval may be required:**

The proposed project would require consultation with the following agencies and municipalities with jurisdiction over the project area:

- U.S. Army Corps of Engineers (USACE): A Section 404 Clean Water Act (CWA) permit and a Section 10 Rivers and Harbors Act (RHA) permit would be required for placement of dredge or fill material into waters of the U.S. and work within navigable waters, respectively. The USACE would consult with USFWS and NMFS during permit review.
- USFWS: A Section 7 Biological Opinion would be required for working in habitat where federally threatened and endangered species are present.
- NOAA/NMFS: A Biological Evaluation would be needed for working in habitat where federally threatened and endangered fish species may occur or in essential fish habitat
- San Francisco Bay Regional Water Quality Control Board: the RWQCB would issue Water Quality Certification in accordance with Section 401 of the CWA; and Waste Discharge Requirements in accordance with the Porter-Cologne Water Quality Control Act. The RWQCB is also the State lead agency under CEQA. The RWQCB may consult USFWS, NMFS, and CDFW during permit review.
- San Francisco Bay Conservation and Development Commission (BCDC): A Federal Consistency Determination from BCDC would be required to implement enhancement activities within the project site. BCDC will consult with USFWS, NMFS, and CDFW during permit review.

## 3.2 Environmental Factors

The environmental factors checked below would be potentially significantly affected by this project, but the project includes mitigation measures that avoid any potentially significant impacts as indicated by the checklist on the following pages.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Aesthetics                                    | <input type="checkbox"/> Agriculture and Forest Resources | <input checked="" type="checkbox"/> Air Quality             |
| <input checked="" type="checkbox"/> Biological Resources               | <input type="checkbox"/> Cultural Resources               | <input checked="" type="checkbox"/> Geology/Soils           |
| <input type="checkbox"/> Greenhouse Gas Emissions                      | <input type="checkbox"/> Hazards/Hazardous Materials      | <input checked="" type="checkbox"/> Hydrology/Water Quality |
| <input type="checkbox"/> Land Use/Planning                             | <input type="checkbox"/> Mineral Resources                | <input type="checkbox"/> Noise                              |
| <input type="checkbox"/> Population/Housing                            | <input type="checkbox"/> Public Services                  | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Transportation/Traffic                        | <input type="checkbox"/> Utilities/Service Systems        |   |
| <input checked="" type="checkbox"/> Mandatory Findings of Significance |   |   |

### 3.3 CEQA LEAD AGENCY DETERMINATION

#### MITIGATED NEGATIVE DECLARATION

#### San Francisco Bay Regional Water Quality Control Board

Pursuant to Section 21000 et. seq. of the Public Resources Code, 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 revisions in the project have been made by or agreed to by the project proponent. 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” impact 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. 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, because all potentially significant effects (a) have been analyzed adequately in an **earlier EIR or NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

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Signature

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Date

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Printed Name

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Title

### 3.4 CEQA EVALUATION OF ENVIRONMENTAL EFFECTS

The Environmental Checklist and discussion that follows is based on sample questions provided in Appendix G of the CEQA Guidelines which focus on various individual concerns within 16 different broad environmental categories, such as air quality, cultural resources, land use, and traffic (and arranged in alphabetical order). The Guidelines also provide specific direction and guidance for preparing responses to the Environmental Checklist. Each question in the Checklist essentially requires a “yes” or “no” reply as to whether or not the project will have a potentially significant environmental impact of a certain type, and, following a Checklist table with all of the questions in each major environmental heading, citations, information and/or discussion that supports that determination. The Checklist table provides, in addition to a clear “yes” reply and a clear “no” reply, two possible “in-between” replies, including one that is equivalent to “yes, but with changes to the project that the proponent and the Lead Agency have agreed to”, and another “no” reply that requires a greater degree of discussion, supported by citations and analysis of existing conditions, threshold(s) of significance used and project effects than required for a simple “no” reply. Each possible answer to the questions in the Checklist, and the different type of discussion required is discussed below:

- Potentially Significant Impact. Checked if a discussion of the existing setting (including relevant regulations or policies pertaining to the subject) and project characteristics with regard to the environmental topic demonstrates, based on substantial evidence, supporting information, previously prepared and adopted environmental documents, and specific criteria or thresholds used to assess significance, that the project will have a potentially significant impact of the type described in the question.
- Less than Significant with Mitigation. Checked if the discussion of existing conditions and specific project characteristics, also adequately supported with citations of relevant research or documents, determine that the project clearly will or is likely to have particular physical impacts that will exceed the given threshold or criteria by which significance is determined, but that with the incorporation of clearly defined mitigation measures into the project, that the project applicant or proponent has agreed to, such impacts will be avoided or reduced to less-than-significant levels.
- Less than Significant Impact. Checked if a more detailed discussion of existing conditions and specific project features, also citing relevant information, reports or studies, demonstrates that, while some effects may be discernible with regard to the individual environmental topic of the question, the effect would not exceed a threshold of significance that has been established by the Lead or a Responsible Agency. The discussion may note that due to the evidence that a given impact would not occur or would be less than significant, no mitigation measures are required.

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

- No Impact. Checked if brief statements (one or two sentences) or cited reference materials (maps, reports or studies) clearly show that the type of impact could not be reasonably expected to occur due to the specific characteristics of the project or its location (e.g. the project falls outside the nearest fault rupture zone, or is several hundred feet from a 100-year flood zone, and relevant citations are provided). The referenced sources or information may also show that the impact simply does not apply to projects like the one involved. A response to the question may also be "No Impact" with a brief explanation that the basis of adequately supported project-specific factors or general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a basic screening of the specific project).

### 3.5 CEQA Checklist Responses

<b>I. AESTHETICS</b>	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?				X

### Background

Sonoma Creek Marsh is visually characterized as a low-lying, natural-looking, vegetated wetland expanse bounded by the Tubbs Island perimeter levee and heavily managed agricultural operations to the west, the waters of Sonoma Creek to the east, and other marshes and the open waters of San Pablo Bay to the south (Figure 2). The only breaks in the low-lying, homogeneous character of the site are several rows of relic berms (former levee alignment) protruding from the marsh near the major perimeter levee. These low-lying levee berms are framed in views eastward by a backdrop of the east bay hills.

The marsh is visible (wholly or in part) in primary views from the SR 37 Sonoma Creek Bridge, from boats on the nearby San Pablo Bay or Sonoma Creek waters, and from the private levee separating the site from Tubbs Island. Because the marsh is very low-lying, it is not visually prominent, nor is it clearly distinguishable from background features in more distant views (Figure 12 - Figure 13).



**Figure 12. View of Sonoma Creek Marsh Looking East from Tubbs Island Levee**



**Figure 13. View of Relic Levee Berms from Tubbs Island Levee**

## Discussion of Impacts

### a) Have a substantial adverse effect on a scenic vista?

**Less than Significant Impact.** The project site is visible as part of an expanse of marshes that graduate into the bay waters in scenic vistas from SR 37 and local levees, as well as from San Pablo Bay and Sonoma Creek. The proposed project would clear, grade, and revegetate portions of the marsh. A new large, open channel would be cut through the central basin of the marsh. The relic berm area would be filled, graded, and channelized. During and for a period following construction, the marsh's appearance would change from that of a heavily vegetated landscape, to that of an active construction zone. Visual impacts would diminish as the marsh gradually revegetates over the following years. This would result in a short-term change in visual quality. Because the marsh is not a prominent visual feature and would revert to natural conditions within a year or two after completion of construction, this impact is considered less than significant.

### b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

**No Impact.** The portion of State Route 37 near the site is eligible for designation as a Scenic Highway, but has not been so designated by Sonoma County (California Department of Transportation, Scenic Highway Map available at [http://www.dot.ca.gov/hq/LandArch/scenic\\_highways/index.htm](http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm)). The project would not affect any outcroppings, trees, or historic buildings. Therefore, it would not affect any scenic resources.

### c) Substantially degrade the existing visual character or quality of the site and its surroundings?

**Less than Significant Impact.** As described above, the marsh is visible as part of a larger complex of marshes and open waters in near and more distant views from SR 37 and adjacent levees. Project construction would create a temporary road and soil spreading and stockpile areas. This would temporarily alter views of the marsh from these viewpoints during construction. The levee and disturbed areas of the marsh would gradually grow to maturity over a period of two to five years. Significant green cover would be established in the first growing season following grading. Vegetation cover would consolidate and become denser within two to five years after construction. The impact on visual character and quality would be less than significant because of the lack of visual prominence and aesthetic character of the marsh currently, and because all proposed project enhancement elements would create natural landscape features, including open water channels and vegetation marsh areas.

**d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?**

**No Impact.** The project would not include any lighting or structures. Therefore it would have no impact to light and glare.

# Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

## II. AGRICULTURE 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? |  | X |   |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?   |  | X |   |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526)?   |  |   | X |
| d) Resulting in the loss of forest land or conversion of forest land to non-forest use?  |  |   | X |
| 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.   |  |   | X |

## Background

The project site is a tidal marsh and no agricultural activity or designated Prime Farmland exists on the site. The area west of the Tubbs Island levee is actively farmed. The project site is mapped as “water” in the USDA soil survey of Sonoma County (USDA 1972), likely because the marsh had not yet grown out over the mudflats at the time of the survey. The adjacent agricultural lands are mapped as Reyes silty clay, a hydric soil that is common in ancient tidal marshes around San Pablo Bay.

## Discussion of Impacts

- 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?**

**Less than Significant Impact.** The site is designated Land Extensive Agriculture in the Sonoma County General Plan (Sonoma County 2008). Some of the materials graded from project site would be used to shore up levees on the adjacent agricultural parcel; however no farmland would be affected by this fill placement. Graded materials and gravel also may be stockpiled on this agricultural site; however that stockpiling would not occur on actively farmed areas. Therefore, the project would not impact prime agricultural lands.

- b) **Conflict with existing zoning for agricultural use, or a Williamson Act contract?**

**Less than Significant Impact.** The project site is publically owned and not under Williamson Act contract. Although the site is designated for agricultural use in the County General Plan, it has never been used for agricultural purposes and functions as open space and wetland (Sonoma County 2008). The project would not change existing site uses.

- c) **Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526)?**

**No Impact.** The proposed project is in an area that is zoned BFC-RMP-0.2 (Residential, Multiple Planned, with a Bay Front Conservation Overlay). No adjacent lands exist that meet the definitions of forest land or timberland. Therefore, there would be no impact.

- d) **Result in the loss of forest land or conversion of forest land to non-forest use?**

**No Impact.** No forest lands are located within or adjacent to the project area and, as such, the project would not result in any direct loss of forest land.

- 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?**

**No Impact.** As described in Items a) and b), above, the project would not result in conversion of farmland.

# Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>III. AIR QUALITY</b>				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c) 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 (including releasing emissions that exceed quantitative thresholds for ozone precursors)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?		X		
e) Create objectionable odors affecting a substantial number of people?			X	

## Background

### Area Air Quality Overview

The project area is located in the extreme southern portion of the Sonoma Valley, west of the Napa Valley. The Sonoma Valley is long and narrow, approximately five miles wide at its southern end, and less than a mile wide at the northern end.

The air pollution potential of the Sonoma Valley could be high if there were significant sources of pollution nearby. However, local sources of air pollution are minor. With the exception of some processing of agricultural goods, such as wine and cheese manufacturing, there is little industry in this valley. Increases in motor vehicle emissions and wood smoke emissions from stoves and fireplaces may increase pollution as the valley grows in population and as a tourist attraction (BAAQMD 1999; 2012).

### Criteria Pollutants

Criteria pollutants are air pollutants regulated by the federal Clean Air Act and the California Clean Air Act. Below are descriptions of criteria pollutants of concern in the Bay Area Air Basin, as identified by the Bay Area Air Quality Management District (BAAQMD).

## **Ozone (O<sub>3</sub>)**

Ozone, the main component of photochemical smog, is primarily a summer and fall pollution problem. Ozone is not emitted directly into the air, but is formed through a complex series of chemical reactions involving other compounds that are directly emitted. These directly emitted pollutants (also known as ozone precursors) include reactive organic gases (ROG) and nitrogen oxides (NOX). The principal sources of ROG and NOX are the combustion of fuels and the evaporation of solvents, paints, and fuels. Motor vehicles are often the major generator of ozone precursors. The time required for ozone formation allows the reacting compounds to spread over a large area, producing a regional pollution problem. Depending on meteorological conditions, ozone precursors can be transported well away from the source area before ozone concentrations peak.

While ozone in the upper atmosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground-level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. The Air Basin is in nonattainment for federal and state ozone standards.

## **Suspended Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)**

PM<sub>10</sub> and PM<sub>2.5</sub> consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. (A micron is one-millionth of a meter.) PM<sub>2.5</sub> is a subset of PM<sub>10</sub> and, therefore, is incorporated by reference in any mention of PM<sub>10</sub>. One common source of PM<sub>10</sub> is diesel emissions. Traffic generates PM<sub>10</sub> and PM<sub>2.5</sub> emissions through entrainment of dust and dirt particles that settle onto roadways and parking lots. PM<sub>10</sub> also is emitted by burning wood in residential wood stoves and fireplaces, and from open agricultural burning. PM<sub>10</sub> can remain in the atmosphere for up to seven days before gravitational settling, rainout, and washout remove it.

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases; heart and lung disease; and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant, direct association between mortality and daily concentrations of particulate matter in the air. Additional effects include reduced visibility and soiling of buildings. State standards for PM<sub>10</sub> and PM<sub>2.5</sub> are periodically exceeded in the Air Basin.

## **Air Quality Monitoring Data**

The BAAQMD operates a regional monitoring network for ambient concentrations of criteria air pollutants. Criteria air pollutants are regulated by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels (National Ambient Air Quality Standards). The criteria pollutants are particle pollution (often referred to as particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. These pollutants can harm human health and the environment, and cause property damage.

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

California also regulates criteria air pollutants with California Ambient Air Quality Standards, which are generally equal to, but in some cases are more restrictive than, the national standards.

Currently, the criteria pollutants of most concern in the San Francisco Bay Area are ozone and particulate matter. Nearby monitoring stations closest to the project site include the San Rafael Station for ozone, PM10 and PM2.5 for 2011; and the 5<sup>th</sup> Street Station in Santa Rosa for PM2.5 for 2009 and 2010. Table 7 summarizes violations for the most recent three years of data for these air-monitoring stations. The data show a limited number of daily violations related to the state 24-hour PM10 and the federal PM2.5 24-hour standards. There were no ozone standard violations. These measurements show that the area has generally very good air quality.

The Bay Area is currently designated “nonattainment” for the state and federal 8-hour ozone standards, the federal 24-hour PM2.5 standard, and the state standards for PM10, annual PM2.5, and 1-hour ozone. The Bay Area is designated “attainment” or “unclassified” with respect to the other ambient air quality standards.

**Table 7. Air Quality Data Summary**  
**Project Area, 2009 – 2011**

Pollutant	Standard	Days Standard Exceeded		
		2009	2010	2011
Ozone	State 1–Hour	0	0	0
Ozone	Federal 8–Hour	0	0	0
Ozone	State 8–Hour	0	0	0
PM10	Federal 24–Hour	0	0	0
PM10	State 24–Hour	0	6	6.1
PM2.5	Federal 24–Hour	0	0	1

Note: Ozone and PM10 are from the San Rafael Station and PM2.5 for 2011 (annual PM2.5 data are not available for the San Rafael Station before 2011), PM2.5 data for years 2009 and 2010 are from the Santa Rosa 5<sup>th</sup> Street Station. PM10 and PM2.5 days are “estimated days” over the standard extrapolated for 365 days per year from the days that were measured (particulate measurements are only taken every 6<sup>th</sup> day throughout the year).

Source: California Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2013.

## Sensitive Receptors

People that are more susceptible to the effects of air pollution than the general population at large include children, elderly, and those that suffer from certain illnesses or disabilities. Therefore, schools, convalescent homes, and hospitals are considered to be sensitive receptors to air pollution.

There are no residences or other sensitive receptors in close proximity to the construction areas for the proposed project. Project construction would be at least 5,000 feet from the nearest residences.

## Regulatory Framework

### Criteria Pollutants

The BAAQMD monitors and regulates air quality pursuant to the federal Clean Air Act, as amended, and the 1988 California Clean Air Act. The BAAQMD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs. Other District responsibilities include monitoring air quality, preparation of clean air plans, and responding to citizen air quality complaints.

### Air Quality Significance Criteria

In 1999, the BAAQMD adopted the BAAQMD CEQA Guidelines to assist lead agencies with CEQA impact analyses (BAAQMD 1999). The guidelines were revised in 2010, and included new impact significance thresholds; however, the BAAQMD's 2010 significance thresholds were challenged in a lawsuit, and the Alameda County Superior Court issued a judgment finding that BAAQMD had failed to comply with CEQA when it adopted the thresholds. In May 2012, to comply with the court's order, the BAAQMD updated its CEQA Air Quality Guidelines to include no reference of the BAAQMD's adopted 2010 thresholds (BAAQMD 2012). The revised 2012 guidelines indicate that lead agencies should examine substantial evidence in determining appropriate air quality thresholds, and identify the BAAQMD's 1999 Thresholds of Significance (BAAQMD, 1999) as a source of information for thresholds of significance. The lead agency has determined that the BAAQMD's 1999 Thresholds of Significance are supported by substantial evidence and therefore can be used as significance thresholds for this project. The 1999 BAAQMD CEQA Guidelines do not require quantification of construction emissions and comparison to thresholds, but instead rely upon inclusion of feasible control measures for PM10 (fugitive dust).

The analysis of operational impacts is not necessary because the 1999 Guidelines indicate that the BAAQMD does not recommend a detailed air quality analysis for projects generating less than 2,000 vehicles per day, unless warranted by the specific nature of the project or project setting. The proposed restoration project would not generate 2,000 vehicles per day and the nature of the restoration project does not warrant a detailed air quality analysis.

## Discussion of Impacts

### a) Conflict with or obstruct implementation of the applicable air quality plan?

**Less than Significant Impact.** The Bay Area is currently designated as a nonattainment area for state and federal ozone standards, for the state particulate matter (PM10 and PM2.5) standards, and the national 24-hour PM2.5 standard. As required by federal and state air quality laws, the Bay Area 2010 Clean Air Plan (2010 CAP) has been prepared to address ozone and particulate matter (mainly PM2.5) nonattainment issues, air toxics, and GHG. The 2010 CAP includes stationary and mobile source control strategies, transportation

control measures, land use and local impact measures, and energy and climate measures to be implemented through BAAQMD regulations incentive programs, and programs in cooperation with the Metropolitan Transportation Commission (MTC), local governments, transit agencies, and others. The BAAQMD implements a number of regulations and programs to reduce PM10 emissions; however, no PM10 plan has been prepared nor is one currently required under state air quality planning law.

A project would be judged to conflict with or obstruct implementation of the regional air quality plan if it would be inconsistent with the growth assumptions, in terms of population, employment, or regional growth in vehicle miles traveled. Potential air quality impacts from the proposed project are mainly related to construction, any increase in vehicle miles travelled from operations would not be substantial. The project would include an in-depth post-construction monitoring program; but air quality impacts of the monitoring (and potential maintenance to correct the project functions) would not be substantial. Thus, the proposed project would not be a conflict with the growth assumptions made in the preparation of these air quality plans nor obstruct implementation of any of the proposed control measures contained in these air quality plans. Therefore this impact would be less than significant.

**b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

**Less than Significant with Mitigation.** This project would have potentially significant air quality construction impacts (that can be mitigated to less than significant levels) and minimal operational impacts from post-construction monitoring and maintenance. BAAQMD rules and regulations govern certain aspects of the construction phase of projects. BAAQMD regulations applicable to the construction of the project relate to portable equipment (e.g., gasoline- or diesel-powered engines used for power generation, pumps, compressors, and cranes), architectural coatings, fugitive dust, and paving materials. Fugitive dust could cause or contribute to exceedance of the state PM10 standard during project construction. Project operations related to post-construction monitoring and maintenance are expected to be minimal and would comply with applicable BAAQMD regulations.

***Construction Impacts***

Construction-related impacts to air resources would be related to emissions from earth-moving equipment and transportation equipment (trucks) to bring materials to the project site. The project could involve the excavation and local transport of up to 69,020 cy of material and the marsh access road could require the import of up to 9,000 cy of gravel. The emissions generated from these construction activities include dust (including PM10 and PM2.5), primarily from “fugitive” sources. Fugitive dust could cause or contribute to exceedance of the state PM10 standard during project construction, which would be a potentially significant impact.

Project construction would generate short-term emissions of criteria pollutants including particulate matter and equipment exhaust emissions. The 1999 BAAQMD CEQA

Guidelines do not call for quantification of construction emissions, but considers any project's construction-related impacts to be less than significant with appropriate implementation of BAAQMD recommended dust control measures. The 2012 BAAQMD CEQA air quality guidelines identify basic construction mitigation measures that take the place of the basic mitigation measures identified in 1999 BAAQMD CEQA guidelines. Therefore, implementation of Mitigation Measure III-1, which includes the basic mitigation measures identified in the 2012 BAAQMD CEQA air quality guidelines, would ensure that short-term construction impacts would be mitigated and the impact would be less than significant after mitigation.

### **Mitigation Measure III-1**

The selected contractor shall implement a dust control plan that shall include the following Basic Construction Mitigation Measures, as recommended by the BAAQMD:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, or as needed.
- All haul trucks transporting dry soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day, or as needed. The use of dry power sweeping is prohibited.
- All construction equipment shall be cleaned of mud and dirt either at the project site, or at the selected contractor's facility following the completion of construction. Wheel-washing of construction equipment prior to de-mobilization (off-site transport) may occur, but is not required because all construction equipment shall be transported on flat-bed trucks that will not access the active work area.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- Engines in all construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.

- A sign with the telephone number and person to contact at the lead agency regarding dust complaints shall be posted in a publically visible location. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Some common BAAQMD measures for mitigating construction impacts to air quality are not included in Mitigation Measure III-1 due to their inapplicability at the project site. For example, the covering or watering of material stockpiles is not required because (1) the only imported material would be clean, drain rock, which has been washed to remove any fines; and (2) materials excavated from the project site would be saturated, and thus not prone to wind dispersal. This material would also need to dry to some extent before it could be re-used in the construction of project enhancement elements, so watering or covering are not options. ~~In addition, wheel washing of construction equipment to prevent mud tracking outside of the project site would not be required, because all construction equipment that would be used within the marsh would be transported off-site on flatbed trucks. Flatbed trucks would remain on the landward side of the perimeter levee and would not enter the marsh work area.~~

**c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

**Less than Significant Impact.** The 1999 BAAQMD CEQA Guidelines state that for any project that does not individually have significant air quality impacts, the determination of a significant cumulative impact can be determined based on consistency of the project with the local general plan and of the general plan with the regional air quality plan. As disclosed in this air quality analysis, with mitigation, the proposed project would not result in individual significant air quality impacts. Therefore, the project would not generate cumulatively considerable air emissions and the cumulative impact would be less than significant.

**d) Expose sensitive receptors to substantial pollutant concentrations?**

**Less than Significant with Mitigation.** The nearest residences are approximately 5,000 feet north of the project site. As noted in b), operation of the proposed project (post-construction monitoring and maintenance) would not generate substantial pollutant concentrations and thus would not expose sensitive receptors to substantial pollutant concentrations. Toxic air contaminants (TACs) would be generated by the use of diesel fueled construction equipment. Diesel particulate matter emissions can be carcinogenic over long exposure durations (i.e., most analyses consider exposure time frames of 10 to 70 years). However, for this construction, nearby receptors would be exposed to construction emissions for one to three construction seasons and the construction equipment sources would move around the area and be dispersed by various wind patterns; thus further limiting

exposure of any individual residential receptors. Also, as noted in item b) above, the project's construction-related dust emissions would be reduced to less than significant through implementation of Mitigation Measure III-1.

**e) Create objectionable odors affecting a substantial number of people?**

**Less than Significant Impact.** The BAAQMD defines public exposure to offensive odors as a potentially significant impact. In general, the types of land uses that pose potential odor problems include refineries, chemical plants, wastewater treatment plants, landfills, composting facilities, and transfer stations. No such uses are proposed.

Diesel engines would be used for some construction equipment. Odors generated by construction equipment would be variable, depending on the location and duration of use. Diesel odors are unlikely to be noticeable to any individuals outside of the construction area. Operation of the proposed project would not be anticipated to result in odor emissions. Offensive odors are typically associated with industrial land uses, not open space uses. The impact of the project with regard to odors would be less than significant.

# Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
<b>IV. BIOLOGICAL RESOURCES</b>				
Would the project:				
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 Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
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?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
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?				X

## Background

Existing biological resources at the Sonoma Creek project site and vicinity were evaluated based on site investigation/monitoring data collected by the Refuge over multiple years, as well as queries of the following natural resource databases:

- CDFW California Natural Diversity Database (CNDDB)
- California Native Plant Society (CNPS) database

As described in the Project Description, the project site is made up of four primary landscape units, including (1) vegetated high marsh, (2) tidal channels and mosquito control ditches, (3) relic levee berms, and (4) the Tubbs Island perimeter levee (Figure 3). The dominant habitat type on the project site is vegetated high marsh, much of which is in a degraded state due to poor hydrologic exchange resulting from inadequate tidal channel development (see Section IX, Hydrology and

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

Water Quality). The degraded state of this habitat reduces its quality for native wildlife species. In addition, the Sonoma Creek Marsh, like most centennial marshes in the Estuary, was formed on the bayward side of a constructed levee, and lacks a gradual marsh-upland transition zone. Historic tidal marshes in the San Francisco Estuary generally graded gently into adjacent upland habitats, creating broad, marsh-upland transitional habitat zones. These transitional habitats provide important roosting habitat for several species of birds and offer refugia for tidal marsh-dependent species during extreme high tides and storm events. This habitat type is also important for many plant species that grow primarily in the transition zone, including soft bird's beak (*Cordylanthus mollis* spp. *mollis*), a federally endangered species endemic to north San Pablo Bay and Suisun Bay. Under current conditions, the marsh-upland transition of the Marsh is limited to a narrow band along the steep levee slopes of the Tubbs Island perimeter levee.

The project site is bordered to the east and south by San Pablo Bay, and to the north by Sonoma Creek, which consist of open water and adjacent mudflat habitats. Agricultural lands owned by the Vallejo Sanitation District border the site to the west. An extensive centennial marsh known as "Sonoma Creek East" exists to the northeast of the project site, across Sonoma Creek. The Tubbs Island Levee Setback tidal marsh restoration project exists to the southwest of the site (Figure 2).

The existing biological resources on the project site are described below in terms of the following attributes:

- Plant Communities
- Fish and Wildlife Communities
- Jurisdictional Habitats
- Sensitive Plant Communities
- Special-Status Species

### Plant Communities

The tidal marsh of Sonoma Creek is dominated by perennial pickleweed (*Salicornia pacifica*). Other native species that regularly occur in the low, middle, or upper tidal marsh zones include annual pickleweed (*Salicornia depressa*), gumplant (*Grindelia stricta*), alkali heath (*Frankenia salina*), jaumea (*Jaumea carnosa*), Pacific cordgrass (*Spartina foliosa*), and saltgrass (*Distichlis spicata*). Invasive, non-native species of concern in the tidal marsh include *Spartina* species (e.g., *S. alterniflora*, *S. densiflora*) and perennial pepperweed (*Lepidium latifolium*). While no occurrences of invasive *Spartina* have been documented in the project area, the species has been detected within 1 mile of the site. The Refuge has an active monitoring and control program for pepperweed, and partners with the Invasive *Spartina* Project (ISP) to control invasive *Spartina* species within its boundaries.

Many of the tidal marsh plants on site are negatively impacted by the anoxic soil conditions resulting from water impoundment. These plants have sparse distribution and stunted growth and do not afford the necessary cover and structure to provide suitable habitat for marsh-dependent species. Resolving this condition is one of the project goals.

The vegetation on the levee slopes and relic berms within the project area consist largely of native coyote bush (*Baccharis pilularis*) intermixed with native and non-native annual and perennial plants. Native species include beeplant (*Scrophularia californica*), yarrow (*Achillea millefolium*), and saltgrass. Non-native species include perennial pepperweed, yellow star thistle (*Centaurea solstitialis*), milk thistle (*Silybum marianum*), purple starthistle (*Centaurea calcitrapa*), fennel (*Foeniculum vulgare*), mustard (*Brassica* spp.), stinkweed (*Dittrichia graveolens*), wild radish (*Raphanus sativus*), and non-native grass species (e.g., *Bromus diandrus*, *Hordeum marinum*, *Avena sativa*).

### **Fish and Wildlife Communities**

Many wildlife species characteristic of tidal marshes, including several special-status mammal, fish, and bird species, use the Sonoma Creek Marsh during some portion of the year (see discussion on special-status species below). The bay-shore subtidal environments at the mouth of Sonoma Creek are used extensively by diving ducks (e.g., canvasback (*Aythya valisineria*), scaup (*Aythya marila*), and dabblers. Shorebirds utilize the extensive mudflat habitats that border the project area to the east and southeast at low tide. Harbor seals (*Phoca vitulina*) occur in the adjacent San Pablo Bay, and may use the site for basking. River otters (*Lontra canadensis*) have been observed within the nearby San Pablo Bay Wildlife Area, and may be found in the adjacent Sonoma Creek.

The channel habitats and adjacent open water of San Pablo Bay provide important aquatic habitat for a number of native and non-native fish species. Additionally, the tidal marsh vegetation on the site contributes to organic exports from the marsh, which support the aquatic food web of adjacent San Pablo Bay and Sonoma Creek. The ecological benefits that vegetated tidal marsh offers to fish species have been well documented (Kneib 1997), and include food resources, cover from predation, and spawning grounds. Tidal marsh channels are known to provide foraging habitats for adult steelhead (*Oncorhynchus mykiss*) and Chinook salmon (*Oncorhynchus tshawytscha*), and rearing habitat for juveniles of the same species. However, the majority of existing tidal marsh channels in the project area are presumably of relatively low habitat value to these species, due to their narrow and shallow geometry. As described earlier in this document, the poor tidal exchange within the marsh interior has reduced the habitat quality for many species of marsh-dependent wildlife.

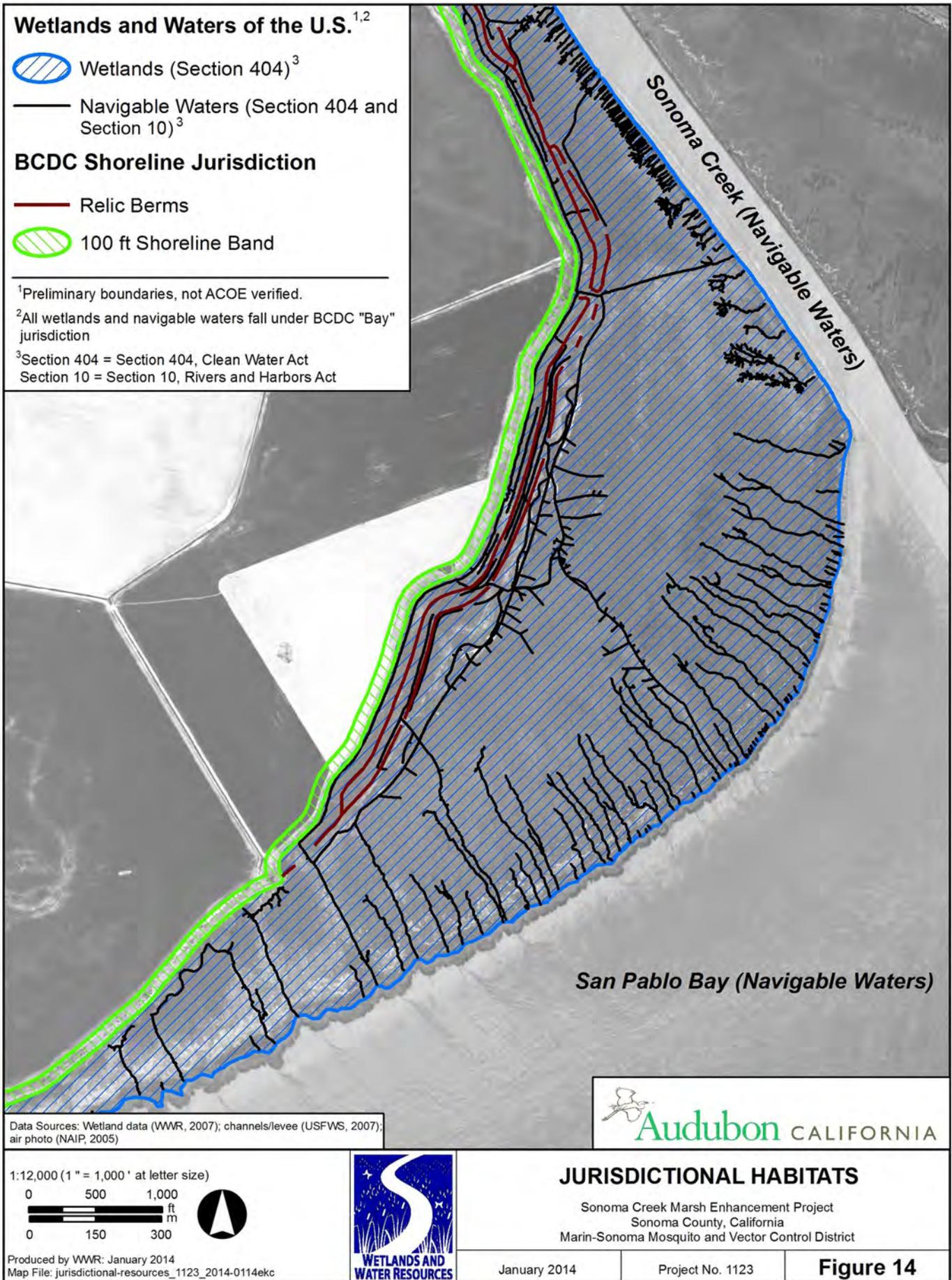
### **Jurisdictional Habitat Areas**

Aground-based wetland delineation has not been performed at the project site, as the divisions between wetlands and uplands are quite clear, and can be delineated based on aerial photography and topographic data interpretation. The project area consists of tidal marsh plain, tidal marsh channels, and marsh-upland transition habitats. As such, all lands within the project area, with the exception of higher elevation areas of the perimeter levee and relic berms, will qualify as wetlands or waters of the United States, and will thus be subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the Clean Water Act (CWA) (Figure 14). The adjacent mudflats and open waters of San Pablo Bay, Sonoma Creek, as well as the tidal marsh channels, below Mean High Water (MHW), will qualify as Navigable Waters of the U.S., subject to USACE jurisdiction under Section 10 of the Rivers and Harbors Act (RHA).

All lands subject to USACE jurisdiction are also subject to the “Bay” jurisdiction of BCDC. The relic berms within the project area, as well as the perimeter levee and agricultural lands falling within a 100 ft band to the west of the tidal marsh edge are subject to BCDC “Shoreline” jurisdiction (Figure 14).

### **Sensitive Plant Communities**

The tidal marsh vegetation on the project site, which comprises the majority of the site, qualifies as a sensitive plant community under standard California Vegetation classification systems, such as the Manual of California Vegetation (Sawyer and Keeler-Wolf 2009) or the CDFW CNDDDB Vegetation Classification and Mapping Program (CDFW 2013). However, as noted above, the tidal marsh vegetation within much of the site interior has been detrimentally impacted by the anoxic soil conditions due to the ineffective tidal exchange within the site, resulting in poor vegetation health.



## Special Status Species

For the purposes of this Initial Study, the term “special-status species” refers to all plants or animals listed as threatened, endangered, or proposed for listing under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA); plants listed as rare under the California Native Plant Protection Act; plants considered by the California Native Plant Society to be “rare, threatened, or endangered in California”; species that meet the definition of rare or endangered under CEQA; animals fully protected in California; and nesting raptors protected in California.

### Plants

There have been no reported occurrences of special-status plant species within the project area, and no special status plant species were found within the project area during Refuge surveys in 2013 (Meg Marriott, USFWS. *pers. comm.* 1/9/2014). However, there are numerous reported occurrences of special-status plant species within the project vicinity that have potential to occur at the site. Database queries identified several species that occur within tidal marsh habitats of the general area, several of which have documented occurrences within 10 miles of the project site. A list of these species, along with their habitat requirements and analysis of potential to occur on-site, is provided in Appendix A. Species with some potential to occur at the site include Delta tulle pea (*Lathyrus jepsonii* var. *jepsonii*), Mason’s lilaeopsis (*Lilaeopsis masonii*), and saline clover (*Trifolium hydrophilum*). Two hemiparasitic plant species, Point Reyes bird’s beak (*Chloropyron maritimum*) and soft bird’s beak (*Chloropyron mollis* ssp. *mollis*) have some potential to occur at the site in areas with suitable host plants (pickleweed and saltgrass). Delta tulle pea is a climbing herb, and thus requires a suitable climbing substrate, such as riparian scrub; therefore, potential habitat for this species is limited to those tidal areas with adjacent, tall plant/substrate material. Several of these species are often documented together in similar habitats, including Delta tulle pea, Mason’s lilaeopsis, and soft bird’s beak (LSA 2007).

### Wildlife

Database queries identified several special-status birds, mammal, and fish species with the potential to occur on the project site. A list of these species, along with their habitat requirements and analysis of potential to occur on-site, is provided in Appendix B.

### Birds

The pickleweed-dominated high marsh plain of the Sonoma Creek Marsh is known to support populations of the federal and state endangered California clapper rail (*Rallus longirostris obsoletus*), the state threatened California black rail (*Laterallus jamaicensis coturniculus*), and the state species of concern San Pablo song sparrow (*Melospiza melodia samuelis*) and salt marsh common yellowthroat (*Geothlypis trichas sinuosa*).

Surveys for clapper rail conducted by the Refuge in Sonoma Creek Marsh (since 2004) show that densities are historically low (or absent altogether) relative to tidal marshes west of Sonoma Creek (USFWS 2009a). Protocol-level surveys for clapper rail in 2012 and 2013 did not document their presence within the project area (USFWS 2013a). However, an individual clapper rail (potentially

with a mate) was detected within the project area by Refuge staff in February 2013 (Meg Marriott, USFWS, *Pers. Comm.*, 6/22/2013). Lower densities or absence of this species within the Sonoma Creek Marsh is likely a result of the lack of functional habitat. Clapper rails are absent or occur in low densities in tidal marshes east and north of the project area (e.g., CDFW Napa Sonoma Marsh).

### **Mammals**

Special-status mammals that may be found within the project area include the salt marsh harvest mouse and Suisun shrew (*Sorex ornatus sinuosus*). In addition, harbor seals, which are protected under the Marine Mammals Protection Act (MMPA), may be present within the adjacent waters of Sonoma Creek and San Pablo Bay. Surveys for salt marsh harvest mouse conducted within the project area in 2003 and 2004 indicated a moderate population size, based on capture efficiency<sup>3</sup> (7.8 and 4.4 in 2003 and 2004, respectively), relative to other tidal marsh areas of the Refuge (13.3 at Lower Tubbs Island in 2003 and 19.4 at Strip Marsh East in 2004). However, no salt marsh harvest mice were found during September 2013 protocol-level surveys conducted by the Refuge in the project area (Meg Marriott, USFWS, *Pers. Comm.* 12/10/2013). It is unclear, therefore, whether populations of this mammal persist within the project area. The Suisun shrew has not been detected within the project area.

### **Fish**

Several special-status fish species have been documented or have the potential to occur within San Pablo Bay in the project vicinity, including steelhead (both Central California Coastal and Central Valley runs), Chinook salmon (Central Valley spring-run and Sacramento winter-run), Delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*), tidewater goby (*Encyclogobius newberryi*), and green sturgeon (*Acipenser medirostris*). San Pablo Bay has been designated as Critical Habitat for Central California Coastal steelhead and Sacramento winter-run Chinook salmon. The waters of San Pablo Bay and adjacent tidal marsh channels have also been identified as Essential Fish Habitat under the Magnusen-Stevens Fishery Conservation and Management Act (MSA) for various life stages of fish species managed with the following Fishery Management Plans (FMPs) under the MSA:

- Pacific groundfish FMP: various rockfishes, flatfishes, sharks, etc.
- Coastal Pelagic FMP: northern anchovy, Pacific sardine
- Pacific Coast Salmon FMP: Chinook salmon

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<sup>3</sup> Capture efficiency is expressed as No. mice captured/ No. trap nights, where trap nights is calculated as No. traps set X No. nights of trapping

## Discussion of Impacts

- 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 Game or U.S. Fish and Wildlife Service?**

**Less than Significant with Mitigation.** The impacts to special-status plants and wildlife species and recommended mitigation measures are described individually below.

### *Plants*

No special-status plant species have been observed on the project site. However, potential habitat does exist on the site for several special-status species, including Point Reyes bird's beak, soft bird's beak, Delta tule pea, Mason's lilaepsis, and saline clover. These species, if present, could be negatively impacted by construction activities through incidental damage or outright removal. Implementation of Mitigation Measure IV-1 in each construction year would reduce these impacts to a less-than significant level.

#### **Mitigation Measure IV-1**

Prior to project construction, a qualified botanist shall perform a survey for special-status plant species within the project footprint. The timing of these surveys shall correspond with the blooming period of the target species, when they are most conspicuous and easily identifiable. Any discovered special-status plant occurrences/populations shall be marked in the field (i.e., staked and flagged) and the locations recorded with a GPS. Any special-status plants occurring within the project impact area shall be salvaged for transplanting to a suitable location outside of the impact area.

### *Birds*

At least one federally endangered California clapper rail (and potentially a pair of rails) was detected, and may potentially have nested, within the project area as of February 2013. Project related construction activities, if conducted during the nesting season (January 31 – September 1), could disturb nesting California clapper rails if they occur on the site, and lead to loss or abandonment of an active nest(s). In addition, other nesting birds, including those protected under CDFW Code and/or the Migratory Bird Treaty Act (MBTA), could be impacted by construction activities that occur during nesting season (typically February – August). The implementation of Mitigation Measure IV-2 in each construction year would reduce this impact to a less-than significant level.

#### **Mitigation Measure IV-2**

If construction activities are scheduled to occur between January 31 and September 1, the following actions shall occur:

1. Protocol-level surveys for California clapper rail shall be performed by qualified wildlife biologists between January 15<sup>th</sup> and April 15<sup>th</sup>. If any clapper rail is detected within the project area, the location will be determined using standard survey protocol (Block and Albertson 2005); No construction activities would occur within 700 ft of the identified rail location prior to September 1.
2. Surveys for nesting birds shall be conducted by qualified wildlife biologists within two weeks of the commencement of construction activities. The purpose of the surveys shall be to determine if active nests or roosts of bird species protected by the MBTA and/or the CDFW Code are present in or within 300 feet (500 feet for raptors) of the construction zone. The surveys shall be timed such that the last survey is concluded no more than one week prior to initiation of vegetation clearance or other construction work. If nesting birds are detected during surveys, construction shall be halted until appropriate resource agencies (CDFW, USFWS) have been contacted and appropriate avoidance measures are taken, such as establishing disturbance buffers or halting construction until nests have been vacated. If ground disturbance activities are delayed, then additional pre-construction surveys shall be conducted such that no more than one week will have elapsed between the last survey and the commencement of ground disturbance activities.

The implementation of Mitigation Measure IV-4, described below, would further reduce potential impacts to special status bird species.

### ***Marine Mammals***

Harbor seals, which are protected under the MMPA, may be subject to short-term, temporary, adverse disturbance impacts during the excavation of the connection of the central tidal channel to Sonoma Creek. Seals could be impacted by construction via direct physical harm by construction equipment or disruption of feeding/movement behavior if they are present near the connection point. Increased water column turbidity created by excavation activities could also cause disturbance to these animals through a reduction in visibility that may inhibit feeding ability. However, the duration of construction of the channel connection would be brief (1-2 days) and would be limited to a very small (< 0.1 ac) area, thus reducing the potential for impacts to these species. Harbor seals should easily be able to avoid the work area, further reducing the likelihood of impacts. Implementation of Mitigation Measure IV-3 would reduce the impact to harbor seals to a less-than-significant level.

### **Mitigation Measure IV-3**

A qualified wildlife biologist shall be present during the construction of the connection between the central tidal channel and Sonoma Creek to ensure that harbor seals are not in the vicinity of the work area. If harbor seals are present, construction activities shall halt until the individuals have vacated the work area.

### ***Small Marsh Mammals (rodents)***

Special-status mammals, including salt marsh harvest mouse and Suisun shrew, have the potential to occur within the project area, and could therefore be impacted by construction activities. If present within the work areas, mammals could be injured or killed by construction equipment. Much of the equipment movement within the marsh would be on the access road that would be built atop the marsh plain. Once constructed, equipment movement along the road would not impact mammals. However, individuals could be injured or killed during the construction of the road and project enhancement elements. Implementation of Mitigation Measure IV-4 would reduce construction impacts to a less-than significant level.

### **Mitigation Measure IV-4**

During construction, a team lead by a qualified wildlife biologist shall move in front of construction equipment and flush all animals from the footprints of the access road and enhancement elements by brushing and tapping the vegetation with sticks or brooms. This flushing shall occur no more than 30 minutes prior to construction equipment moving into the impact area. If required by USFWS or CDFW, vegetation shall also be removed from the impact area after animal flushing by either mowing with a string trimmer or scraping with an excavator. These practices would prevent marsh mammals and other wildlife from being crushed by construction activities.

### ***Fish***

Special-status fish species, including Chinook salmon, steelhead, green sturgeon, longfin smelt, Delta smelt, and tidewater goby, may occur within the project vicinity at various times of the year. These species could be negatively impacted by in-water construction activities through direct physical harm, or through localized increases in turbidity. As described in the Project Description section, the construction window would be established in consultation with NMFS and USFWS to avoid impacts to special-status fish. Table 5 provides a list of common work windows for special-status fish species in San Pablo Bay. If required by regulatory/resource agencies, isolation of the active channel excavation areas, by either deploying a fish screen and/or turbidity curtain or leaving a “plug” at the mouth of the channel, would further reduce potential impacts to fish. In addition, fish could be negatively impacted by the runoff of sediment, petroleum products, and other construction waste from the work areas. Implementation of Mitigation Measure IX-1, in the Hydrology and Water Quality Section, would reduce this impact to a less-than significant level

### **Mitigation Measure**

See Mitigation Measure IX-I in the Hydrology and Water Quality Section.

- b) **Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife?**

**Less than Significant with Mitigation.** No riparian woodland or scrub habitats would be impacted as a result of project construction. The tidal marsh on the project site is classified as a sensitive natural community under standard California vegetation classification systems such as the Manual of California Vegetation (Sawyer and Keeler-Wolf 2009) or the CDFW CNDDDB Vegetation Classification and Mapping Program (CDFW 2013). Impacts to these wetland habitats are discussed in response to Item c) below.

- c) **Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

**Less than Significant with Mitigation.** Construction of the project would result in both permanent and temporary impacts to federally protected wetlands and waters of the U.S. The maximum extent of potential project-related impacts are displayed in Figure 15 and described below. All of these impacts would result in a net gain in wetland ecosystem function and habitat value to marsh-dependent wildlife species.

***Permanent Impacts***

The permanent impacts to wetlands and waters of the U.S., under CWA Section 404 and RHA Section 10 include permanent changes of habitat type (e.g., change from wetlands to waters) or loss of wetland as a result of project implementation (e.g., conversion of wetland to upland). Gain of wetland (conversion of upland to wetland) is also illustrated on Figure 15 for the purpose of calculating net habitat change. Habitat type changes primarily involve the conversion of wetlands to waters, due to the construction of the new tidal channel network within the project site. A small amount of waters would be converted to wetlands where small drainage ditches are filled in the construction of the transitional ramp. A maximum net conversion of 5.96 ac of wetland habitat to channel habitat (waters) could result from project implementation. This habitat conversion would provide the needed improvements in tidal exchange within the site interior that would improve wetland ecosystem functions. In addition, the added channels would provide much needed habitat for several species of marsh-dependent wildlife (including the federally endangered California clapper rail) and several species of special-status fish. Therefore, this habitat change is considered a less-than significant impact.

The construction of the transitional ramp would result in the conversion of approximately 2 ac of jurisdictional wetland and water habitat to “uplands”, while approximately 0.09 ac of “upland” habitat would be converted to wetlands by lowering a section of the existing relic levee berms. The “upland” habitat created in this conversion is not upland in the general sense, but a unique, ecotonal habitat containing a mix of wetland and upland vegetation that is an important part of the wetland-upland transitional zone. The transition zone is a unique habitat type, separate from either marsh habitat or upland habitat, and is an essential

component of a functional tidal marsh system. Approximately 2 acres of the transitional ramp, at the upper (landward) end, would be considered jurisdictional uplands because it would fall above the high tide line<sup>4</sup> (approximately 8.4 ft NAVD88) and, therefore, would not likely possess the jurisdictional wetland hydrologic indicators associated with the high tide zone. However, the conversion of this wetland habitat to jurisdictional uplands through the creation of the transitional ramp would improve habitat for several species of marsh dependent wildlife by providing refugia during extreme high tides and storm events and providing nesting/roosting habitat for several marsh-dependent bird species, as well as accommodation space for future sea-level rise. As mentioned in the Background section, transitional habitat is severely lacking at the project site, being limited to a narrow band along the steep Tubbs Island perimeter levee. The lack of marsh-upland transitional habitat is so ubiquitous in the fringing tidal marshes of San Pablo Bay, that its creation and enhancement is called for in several regional resource planning documents, including:

- The Baylands Ecosystem Habitat Goals (Goals Project 1999)
- The USFWS Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013b)
- The USFWS San Pablo Bay National Wildlife Refuge Comprehensive Conservation Plan (USFWS 2011)

The wetland conversion, gain, and loss impacts described above combine to result in a net loss of 7.59 ac of jurisdictional wetland habitat. The wetland conversion to waters results in a net gain of 5.68 ac of jurisdictional waters. Therefore, the net loss of jurisdictional wetland/water habitat that would result from implementation of the project is estimated to be 1.91 ac. While the implementation of the project would result in the net loss of jurisdictional wetland/water habitat, the project would enhance over 100 ac of existing wetlands by improving tidal exchange and vegetation health, which would improve habitat conditions for marsh-dependent wildlife. Also, because the conversion of wetland to upland habitat associated with construction of the transitional ramp would improve overall marsh ecosystem structure and function, this habitat loss is considered a less-than significant impact.

### ***Temporary Impacts***

The short-term, temporary impacts to jurisdictional wetland and water habitats caused by construction activities would not result in a net change in habitat area, or change in jurisdictional habitat type. The temporary impacts to wetland habitats would be due to fill placement on the marsh plain during project construction, resulting in the burial of existing

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<sup>4</sup> The high tide line elevation was determined by a topographic survey of the wrack (marine debris) line along the Tubbs Island perimeter levee, within the project area, by WWR in May 2013. BCDC staff indicated that the wrack line elevation should be used to determine the break between wetland and upland habitat for the purpose of quantifying wetland loss due to the construction of the transitional ramp (Bob Batha, BCDC. *pers comm*, Feb 2013).

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

marsh vegetation. Fill placement on the wetlands would be required to construct several of the marsh enhancement elements, including the marsh mounds, the transitional ramp (the lower half would be retained as jurisdictional wetland habitat), and the high marsh lift areas. Fill placement would also be required within the footprint of the marsh access roads to backfill the depressions created by the road itself. Based on the outcomes of similar tidal marsh enhancement projects within the Refuge, these fill areas should fully revegetate with marsh vegetation within 2 years of project construction (Spadafore and Marriott *In Prep*). These areas would be retained as jurisdictional wetlands following project construction. Implementation of the project would result in temporary impacts to approximately 16.19 ac of wetland habitat.

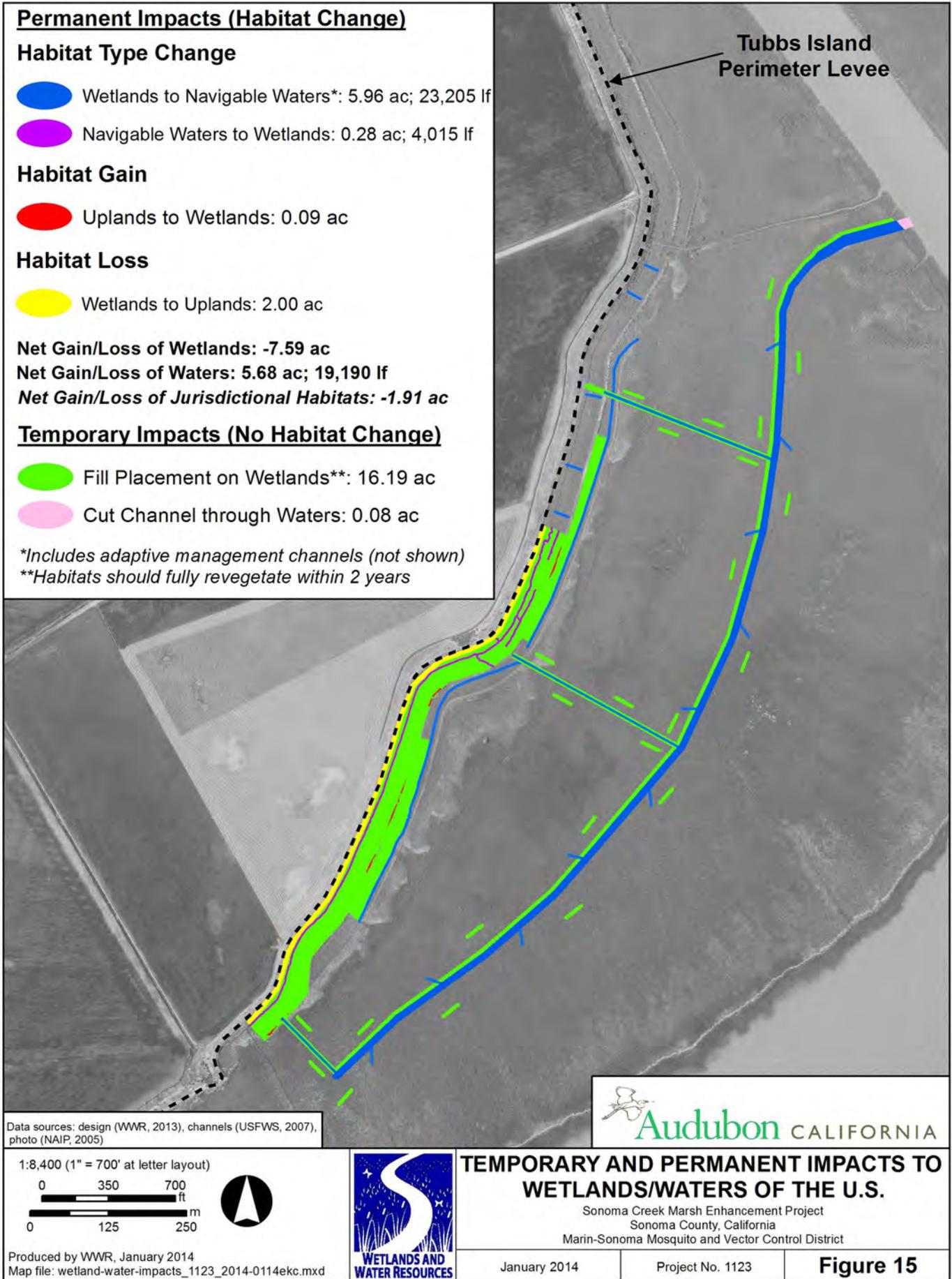
As described in the section on construction methodology, the material used to construct the transitional ramp would be stockpiled on the marsh, adjacent to the perimeter levee, until it is contoured into the ramp configuration. As construction of the transitional ramp may take place over a 10-year period following the completion of the central basin enhancements, there would be temporary impacts to wetland habitats from this material stockpiling. Much of the soil stockpile would extend above the high tide line elevation (8.4 ft NAVD88), resulting in the temporary conversion of wetlands to upland habitat. The area of temporary wetland conversion due to the stockpile is estimated at a maximum of 5 acres. Following the final grading of the transitional ramp, 3 acres of this 5-acre area would be returned to wetland habitat (the permanent wetland loss due to construction of the ramp would be 2 acres – see discussion above).

Temporary impacts to waters of the U.S. would be limited to those associated with construction of the connection of the central tidal channel to Sonoma Creek, where the channel would be excavated through the mudflats on the Sonoma Creek perimeter. This area would be retained as jurisdictional waters following project construction. Approximately 0.08 ac of waters would be impacted by project implementation.

Since the temporary impacts described above would not result in permanent habitat type changes, and since wetland habitats would revegetate quickly, these impacts are considered to be less-than significant. Additional temporary impacts to wetlands and waters of the U.S. outside of the project footprint could result from the input of construction-related sediments, contaminants, and/or other waste from active construction areas. Implementation of Mitigation Measure IX-1 in the Hydrology and Water Quality Section would reduce this impact to a less-than significant level.

### **Mitigation Measure**

See Mitigation Measure IX-I in the Hydrology and Water Quality Section.



**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?**

**Less Than Significant Impact.** Under current conditions, the site provides marginal quality habitat for most native resident or migratory wildlife, including fish and birds. However, the salt marsh harvest mouse may utilize the Sonoma Creek Marsh project site, and its movements may be temporarily affected by construction. The movements of the salt marsh harvest mouse, whose home range is small (mean = 0.21 hectares) (USFWS 2009b), and those of other small mammals may be affected during the actual months of construction. Temporary access roads through the marsh and construction of the main channel may initially block north to south movements of small mammals whose territories are already established. It is thought, however, that small mammals would adapt to these features in time. The temporary access road which would block the north side of the project site from the south side of the project site would be removed after construction, and would not pose a long-term hindrance to movement. The salt marsh harvest mouse is an adept swimmer (Goals Project. 2000), and may either cross or move around, the main channel after construction. The project is expected to expand and improve migration corridors for native species through the creation of functional tidal channels and enhanced tidal marsh habitat. The improved tidal channels would enhance rearing habitat for out-migrating juveniles of several anadromous salmonid species, and provide preferred foraging habitat for California clapper rail, and California black rail. The enhanced tidal marsh habitat and marsh-upland transitional areas are expected to improve habitat for migratory shorebirds and waterfowl, as well as for all marsh dwelling small mammals.

**e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

**No Impact:** See analysis in Section X, Land Use and Planning, Item b).

**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?**

**No Impact.** The project would be implementing the provisions and goals of the San Pablo Bay National Wildlife Refuge Conservation Plan including:

- Goal #1 - support and contribute to the recovery and protection of threatened and endangered species and related ecosystems of the San Francisco Estuary
- Goal #2 - protect, enhance, and restore high quality roosting and foraging environments for overwintering and migratory shorebirds and waterfowl
- Goal #3 - acquire, protect, enhance, and restore functioning tidal marsh and associated upland systems to benefit all native wildlife and plants that use environments of the Refuge

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

Specific design elements that would serve to implement these goals include:

- Restoration of tidal marsh ecosystem functions via improved hydrologic connectivity
  - Would improve conditions for expansion of pickleweed, the preferred habitat for salt marsh harvest mouse and other marsh-dependent species
  - Would create channels and associated plant communities that are preferred habitats for California clapper rail and California black rail.
  - Would restore fish passage within the marsh by improving connections between isolated ponded areas to the adjacent waters of Sonoma Creek/San Pablo Bay
- Expansion of marsh/upland transition and marsh mound habitats
  - Excavated material would be used for construction of the transitional ramp habitat and internal marsh mounds, which would support high marsh vegetation and provide habitat heterogeneity in the marsh interior
  - Mounds would provide high-tide refugia for marsh wildlife including California clapper rail and salt marsh harvest mouse

The proposed project also implements habitat restoration actions called for in regional resource management plans including:

- The San Francisco Bay Plan (BCDC 2008)
- The Baylands Ecosystem Habitat Goals (Goals Project 1999)
- The USFWS Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013b)

# Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>V. CULTURAL RESOURCES</b>				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remains, including those interred outside of formal cemeteries?				X

## Background

Sonoma Creek Marsh is a “centennial marsh” that has developed over San Pablo Bay mudflats in the past 100 years. The vast majority of this marsh formed since 1960. No significant cultural resources have been observed at the site; however, a full archeological investigation has not been performed. There are several small, manmade structures present on the site including hunting blinds, wooden signs, and recent and relict levee berms. There are no utility lines (PG&E, water, cable, etc.) on the property (Don Brubaker, USFWS, *Pers. Comm.*).

Holman & Associates Archaeological Consultants (Holman & Associates) conducted a records search at the Northwest Information Center (NWIC), which found that no archaeological resources have been recorded within the project study area (Holman & Associates 2013; see Appendix C). Additionally, Holman & Associates reviewed the California Office of Historic Preservation's Historic Property Data file (which combines several state and federal inventories including the National Register of Historic Places and the California Register of Historical Resources, California Historic Landmarks, and most Points of Historic Interest) and the California Inventory of Historic Resources, both of which listed no resources within or directly adjacent to the project site (Holman & Associates 2013). Because the site was open water of San Pablo Bay until a few decades ago, and only recently filled in as a marsh, it is unlikely that any archaeological resources occur on the site.

Denise Bradley, Landscape Historian, conducted an Historic Resource Evaluation within the project area, which assessed the built environment features (including the Tubbs Island perimeter levee, relic levee berms, mosquito control ditches, and a collapsed shed) that appear old enough to be potentially eligible for the California Register of Historical Resources (CRHR) and National Register of Historic Places (NRHP) (Denise Bradley 2013; see Appendix D). The purpose of this investigation was to evaluate the potential significance of these features under the CRHR and NRHP criteria.

The Tubbs Island perimeter levee was found to be a common example of a levee constructed as part of the reclamation process that occurred throughout the San Pablo Bay tidelands during the late nineteenth and early twentieth centuries and does not possess significance under NRHP/CRHR criteria. Additionally, the levee has been altered over the years and does not appear to possess integrity in relationship to its association with the reclamation of Tubbs Island in the early 1900s. Several rows of relic levee berms (abandoned segments of levees that are no longer maintained) are located along the western side of the project site. These relic levee berms appear to be common examples of the types of smaller dikes or levees found in reclamation landscapes throughout the San Pablo Bay area and do not possess significance under NRHP/CRHR criteria. Additionally, these relic levee berms are no longer intact and do not possess integrity. There are three main mosquito control ditches on the site: one at the south end of the site, one in the middle, and one at the north end. The District began treating the Marsh for mosquito abatement in the 1960s and has constructed these ditches since then. These mosquito control ditches are common examples of this type of mosquito control feature and do not possess significance under NRHP/CRHR criteria. A collapsed wood-frame shed is located in the western portion of the project site. The history and origin of this shed is not known; however no structure appears in this general location on any of the historical maps consulted in the investigation. This collapsed shed does not appear to possess significance under NRHP/CRHR criteria. Additionally, it is no longer intact and does not possess integrity (Denise Bradley 2013).

### Discussion of Impacts

**a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?**

**No Impact.** The project would not involve demolition or modification of any structures. The Bradley report concluded that the Tubbs Island perimeter levee, the relic levee berms, the mosquito control ditches, and the collapsed shed do not appear to be eligible for the NRHP or CRHR, and there are no historical resources related to the built environment within the project site. Therefore, no historic resources would be affected by the proposed project.

**b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?**

**No Impact.** All of the marsh, with the exception of the relic levees, formed since 1960 of sedimentary material deposited by flows through the Delta and flows down Sonoma Creek. The marsh did not exist as upland prior to this time, and no archaeological resources would be expected to occur beyond the relic levees. As described in the Holman & Associates report, no archaeological resources are known to exist on the site.

**c) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?**

**No Impact.** As described above, the marsh developed recently from sediments carried from upstream sources. There are no known paleontological resources or unique geological features on the proposed project site, nor would any be expected to be found because of the recent depositional nature of the marsh and its lack of older geologic strata. See also response to item V. (b), above.

**d) Disturb any human remains, including those interred outside of formal cemeteries?**

**No Impact.** Most of proposed project site did not exist prior to the 1960's; therefore it is very unlikely that the site would contain any human remains.

# Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
<b>VI. GEOLOGY AND SOILS</b>				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			X	
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.			X	
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?		X		
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?			X	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
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?				X

## Background

The project site is mapped as “water” in the USDA soil survey of Sonoma County (USDA 1972), likely because the marsh had not yet built out over the mudflats at the time of the survey. The adjacent agricultural lands are mapped as Reyes silty clay, a hydric soil that is common in ancient tidal marshes around San Pablo Bay. The Marsh, however, formed more recently on mudflats, built largely from hydraulic mining sediments washed down from the Sierra Nevada Mountains over the past 150 years. The soils in the Marsh are hydric due to the consistent presence of surface water and/or shallow groundwater. The soil characteristics of the Marsh are representative of it being a centennial marsh; centennial marsh soils commonly have a thin organic soil horizon at the surface, underlain by a thick mineral layer of deposited sediments. This soil differs from ancient marsh soils,

which generally have a thick organic soil horizon due to many years of accumulation of vegetative and other organic material.

The project site is located between the Rogers Creek fault and the inferred extension of the Hayward fault in the seismically active San Francisco Bay Area. It is possible that the Rogers creek fault underlies or runs very close to the site, however that fault has not been mapped in the sediments near the site. The United States Geological Survey (USGS) Working Group on California Earthquake Probabilities concludes that there is a 63% probability of at least one Richter magnitude 6.7 or greater earthquake striking somewhere in the San Francisco Bay region before 2038 (USGS 2008). This size earthquake is capable of causing widespread damage. The Working Group identifies the Hayward/ Rogers Creek fault system as having the highest likelihood, 31 percent chance, for a magnitude 6.7 or greater earthquake occurring within that timeframe (Sonoma County 2011).

The project area has not been evaluated for liquefaction potential (ABAG 2011), however, given its loose, water-saturated soils and proximity to the Hayward and Rogers Creek faults, liquefaction hazards are likely to be high. Although most of the site is not mapped as being in a tsunami run-up hazards zone, the relict levee area and Sonoma Creek itself are mapped as being susceptible to tsunami hazards (ABAG 2009). It is possible that the project marsh was mapped as water at the time the study was done and is, in fact, subject to tsunami run-up.

### Discussion of Impacts

- a) **Expose people or structures to 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?**

**Less than Significant Impact.** The site is not located within an Alquist-Priolo earthquake fault rupture hazard zone. However, the Alquist-Priolo fault rupture zone associated with the Rogers Creek fault extends to the northern edge of Tubbs Island and that zone, although unmapped, likely crosses the project site. (CADO 1983). Very strong seismic shaking can be expected in the project area in a major earthquake on a nearby fault, and fault rupture on the site is possible. The marsh is a wildlife refuge and human access is limited to occasional visits by Refuge and District staff for monitoring and mosquito control activities. Although levees on the site may be damaged by seismic shaking and possible fault rupture, the project would not increase the likelihood of property damage or human injury on the site, or in the surrounding areas, resulting from seismic activity. In fact, the construction of the transitional ramp on the bayward side of the Tubbs Island levee and use of excavated material for levee maintenance would improve the strength of the levee and reduce the chance of failure due to seismic activity.

**ii) Strong seismic shaking?**

**Less than Significant Impact.** See response to item (i), above.

**iii) Seismic-related ground failure?**

**Less than Significant Impact.** See response to item (i), above. Although ground failure is likely to occur at the marsh in a major earthquake, ground failure would not result in loss of property, injury, or death because the marsh is not used for structures of human occupancy.

**iv) Landslides?**

**No Impact.** See response to item VI. (i), above. The site is generally flat and low-lying, and therefore not prone to landslides.

**b) Result in substantial soil erosion or the loss of topsoil?**

**Less than Significant with Mitigation.** The project would involve the creation of some exposed soil areas (marsh mounds, transitional ramp, high-marsh lift areas, etc.) that would be subject to some wind/wave erosion following construction and prior to vegetation re-establishment. Based on experiences in similar tidal wetland enhancement projects within the Refuge, the amount of erosion of these features would be minimal and would not reduce the effectiveness of the constructed elements. A small amount of erosion is preferred for the generation of micro-topographic variation and irregular feature edges, thus mimicking a more natural system. There also exists some potential for construction activities to cause erosion on the marsh and the adjacent farm lands due to the movement of construction equipment. Implementation of the Stormwater Pollution Prevention Plan, as outlined in Mitigation Measure IX-1, described in Section IX, Hydrology and Water Quality, would reduce this short-term impact to a less-than-significant level.

**Mitigation Measure**

See Mitigation Measure IX-1 in Section IX, Hydrology and Water Quality.

**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?**

**Less than Significant Impact.** The project earthmoving activities include grading, excavation, compaction, and temporary road substrate import and placement. Construction on the marsh and levees would not drastically alter its sub-surface profile, increase slope heights, or over-steepen slopes, and should therefore not lead to any decreased geologic stability over current conditions. The levee enhancement would involve the placement of excavated material to create thicker, more gently sloping levees, which would strengthen them. None of these features would cause any environmental impact or danger to humans or structures.

- d) **Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?**

**No Impact.** No structures or are proposed as part of the project and no impacts to buildings would occur, in keeping with current existing conditions.

- 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?**

**No Impact.** No septic tanks or wastewater disposal systems exist on the neither marsh, nor are any included in the proposed project.

<b>VII. GREENHOUSE GAS EMISSIONS</b>	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

## Greenhouse Gas Setting

Gases that trap heat in the atmosphere are referred to as greenhouse gas (GHG) emissions because they capture heat radiated from the sun as it is reflected back into the atmosphere, similar to the function of a greenhouse. The major concern is that increases in GHG emissions are causing Global Climate Change. Global Climate Change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation, and temperature. Although there is disagreement as to the speed of global climate change and the extent of the impacts attributable to human activities, the vast majority of the scientific community now agrees that there is a direct link between increased GHG emissions and long term global temperature increases. Potential global climate change impacts in California may include, but are not limited to, loss in snow pack, sea-level rise, more extreme heat days per year, more high ozone days, more large forest fires, more drought years, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

In California, GHGs are defined to include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), perfluorocarbons (PFCs), nitrogen trifluoride (NF<sub>3</sub>), and hydrofluorocarbons. To account for the warming potential of GHGs, GHG emissions are quantified and reported as CO<sub>2</sub> equivalents (CO<sub>2</sub>e). The effects of GHG emission sources (i.e., individual projects) are reported in metric tons per year of CO<sub>2</sub>e.

## Regulatory Framework

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., also known as AB 32), which requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures, such that statewide GHG emissions would be reduced to 1990 levels by 2020.

CARB adopted The Climate Change Scoping Plan in December (CARB 2008a). The Scoping Plan included recommended actions that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our

natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities.

Sonoma County has taken a leadership role in climate protection by being the first county in the nation where 100 percent of its cities and the county pledged by resolution to reduce both greenhouse gas and air pollution emissions throughout the community, and by being the first county in the nation where 100 percent of its cities and the county determined their baseline greenhouse gas emissions for municipal operations. Sonoma County released its Community Climate Action Plan in October 2008. This plan presents a number of solutions to reduce countywide GHG emissions by 25 percent below 1990 levels by 2015. These solutions focus on reductions in four sections: Electricity and Natural Gas, Transportation and Land Use, Agriculture and Forests, and Solid Waste (Climate Protection Campaign 2008).

## GHG Emissions Impacts

### Significance Criteria

The 1999 BAAQMD CEQA Guidelines do not address GHG emissions and the BAAQMD 2010 thresholds (that have been set aside by the writ of mandate) do not require quantification of GHG emissions from construction. This analysis considers the proposed project construction and/or as project operational emissions as significant if the project emissions would conflict with the AB 32 state goals for reducing GHG emissions. The potential for the project to conflict with AB 32 goals is assessed by determining if the project would: conflict with any of CARB's 39 recommended actions; result in emissions that would be equivalent to the size of major facilities that are required to report GHG emissions (25,000 metric tons/year of CO<sub>2</sub>e) to the state and federal governments; not be inherently energy efficient; or conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions.

Four types of analyses are used to determine whether the project could conflict with the state goals for reducing GHG emissions. The analyses are as follows:

- A. Any potential conflicts with the CARB's thirty-nine recommended actions.
- B. The relative size of the project. The project's GHG emissions will be compared to the size of major facilities that are required to report GHG emissions (25,000 metric tons/year of CO<sub>2</sub>e)<sup>5</sup> to the state; and the project size will be compared to the estimated GHG reduction state goal of 174 million metric tons per year of CO<sub>2</sub>e emissions by 2020. As noted above, the 25,000 metric ton annual limit identifies the large stationary point sources in California that make up approximately 94 percent of the stationary emissions. If the project's total

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<sup>5</sup> The State of California has not provided guidance as to quantitative significance thresholds for assessing the impact of GHG emissions on climate change and global warming concerns.

emissions are below this limit, its total emissions are equivalent in size to the smaller projects in California that as a group only make up six percent of all stationary source emissions. It is assumed that the activities of these smaller projects generally would not conflict with the state's ability to reach AB 32 overall goals. In reaching its goals, CARB will focus upon the largest emitters of GHG emissions.

- C. The basic energy efficiency parameters of a project; to determine whether the project design is inherently energy efficient.
- D. Potential conflicts with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

## Impact Analysis

- a) **Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

**Less than Significant Impact.** See response to Item (b) below.

- b) **Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

**Less than Significant Impact.** Primarily because of the small size of the project, the project would not conflict with implementation of state goals for reducing GHG emissions and would thereby not have a negative effect on Global Climate Change. Therefore, with regard to GHG significance threshold Item A, the project does not pose any apparent conflict with the CARB recommended actions.

With regard to GHG significance threshold Item B, potential GHG emission impacts from the proposed project are mainly related to construction, any increase in vehicle miles travelled from operations would not be substantial. The project would include an in-depth post-construction monitoring program; but GHG emission impacts of the monitoring (and potential maintenance to correct the project functions) would not be substantial. Project construction GHG emissions have been estimated using the Road Construction Emissions Model, Version 7.1.2. Project construction GHG emissions would be approximately 580 tons of CO<sub>2</sub> (526 metric tons of CO<sub>2</sub>e) for a one-year (one season) construction plan. If construction were to occur over multiple seasons (years), the annual construction emissions would be less.

The proposed project would result in a relatively small construction crew (< 12 people) working over a maximum of 10 construction seasons. As with other individual and relatively small projects (i.e., projects that are not cement plants, oil refineries, electric generating facilities/providers, co-generation facilities, or hydrogen plants or other stationary combustion sources that emit more than 25,000 metric tons/year of CO<sub>2</sub>e), the specific emissions from this project would not be expected to individually have an impact on Global Climate Change (AEP 2007). The project would not be classified as a major source of GHG

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

emissions (actually construction emissions from the one year construction plan would be about two percent of the lower reporting limit, which is 25,000 metric tons/year of CO<sub>2</sub>e). When compared to the overall state reduction goal of approximately 174 million metric tons/year of CO<sub>2</sub>e, the one-year construction plan GHG emissions for the project (526 metric tons/year of CO<sub>2</sub>e or less than 0.001 percent of the state reduction goal) are quite small and would not conflict with the state's ability to meet the AB 32 goals. Under multi-year construction scenarios, single-year emissions would be even less.

With regard to GHG significance threshold Item C, the proposed project would be inherently energy efficient because the site is conveniently located near Highway 37; accessible by potential haul roads from the north, east and west; excavated materials would be used as part of the project; and there are adjacent lands to the west of the project area that can be used for staging, and short-term and/or long-term storage of excavated soils (Figure 9).

With regard to GHG significance threshold Item D, the construction would occur in a remote portion of an unincorporated area of Sonoma County. The restoration construction and resulting improvements to the marsh would not be expected to conflict with any local or state GHG plans, policies, or regulations.

The review of GHG significance threshold Items A, B, C, D indicates that the project would not conflict with the state goals in AB 32 or any applicable plans, and therefore, these impacts would be less than significant.

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## VIII. HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X
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?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) 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?				X
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 for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

## Background

The marsh formed primarily in the 1960's through 1990's on material naturally transported via the Delta and Sonoma Creek. Since its formation, no land uses have occurred on the marsh that may have resulted in the use, generation, or disposal of hazardous materials on or near the site. Preliminary sampling and analysis of project area soils for typical contaminants of concern (metals, polyaromatic hydrocarbons, pesticides, and polychlorinated biphenyls) was carried out by Stellar Environmental Solutions in May, 2013 (SES 2013; see Appendix E). The results of the analysis were compared to screening criteria established by the RWQCB for soil reuse in wetland environments (RWQCB 2000). None of the soils samples collected throughout the project site showed

concentrations of contaminants in excess of the applicable RWQCB screening criteria. Therefore, the excavation and movement of marsh soils at the project site would not increase the potential for exposure to any contaminants. Construction of the proposed project would not involve the use or transport of any hazardous materials, aside from fuels and lubricants for construction equipment.

Methylmercury (MeHg), an organic form of mercury that is produced by iron- and sulfate-reducing bacteria in anaerobic environments (environments lacking oxygen), is a neurotoxin of concern due to its propensity for biological uptake and bioaccumulation in fish and wildlife and its ability to cause deleterious effects to the nervous system of affected organisms (Heim et al. 2003). There is a large amount of elemental mercury available within the San Francisco Estuary ecosystem due to the presence of abandoned mercury mines in the Coast Range, the historic use of mercury for gold extraction in the Sierra Nevada, and ongoing atmospheric deposition. As indicated above, the results of the preliminary soil sampling did not indicate mercury contamination at the project site. In addition, there are no known point sources of mercury in the Sonoma Creek or Tolay Creek watersheds that would indicate that the project site could be a “hot spot” for mercury in the region.

Wetlands have long been known as producers of MeHg as they can possess the conditions ideal for methylation (shallow water, elevated water temperatures, ample sources of labile carbon, low DO levels, etc.) (Hurley et al., 1995; Rudd, 1995; St. Louis et al., 1994). Hydroperiod (depth, duration, and frequency of inundation) is a key factor in dictating the types of wetland habitats that could produce the most MeHg. Habitats that experience occasional shallow flooding for extended periods of time, such as floodplains, seasonal wetlands, and high-elevation tidal marshes, generally produce high amounts of MeHg, while tidal marshes that experience more regular tidal inundation tend to have lower MeHg concentrations (Windham-Myers et al. 2010; Siegel et al. 2011; Yee et al. 2005; Alpers et al. 2008). Implementation of the proposed project would be expected to result in an overall reduction in MeHg production within the Marsh by improving tidal exchange within areas that experience prolonged periods of inundation following high tides and storm events.

## Discussion of Impacts

- a) **Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

**No Impact.** The proposed project does not include any elements that would expose people to potential health hazards through the routine transport 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?**

**Less than Significant Impact.** The project would involve the use of small amounts of fuels and lubricants during construction. The gravels proposed for use on the temporary roadway would not be considered hazardous, and would be removed at the completion of construction. The project would not result in any reasonably foreseeable upset or accident

conditions, on either water or land. No herbicides or fertilizers would be used as part of the project. Development and implementation of a stormwater pollution prevention plan (SWPPP), as described in Mitigation Measure IX-3 in the Hydrology and Water Quality section, would prevent contamination of sensitive habitats by construction-related hazardous materials. The SWPPP shall require staging of construction equipment in upland areas on adjacent agricultural lands when not in use and refueling or maintenance of equipment only in designated upland areas, away from aquatic habitats to prevent the introduction of hazardous chemicals into the water.

- c) 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.** There are no schools within ¼ mile of the site. In addition, as noted in response to Items (a) and (b), above, the project would not involve handling or emitting any hazardous materials. Therefore it would have no impact on schools.

- d) 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.** The project site is not included on the Hazardous Waste and Substances Site List ([http://www.dtsc.ca.gov/SiteCleanup/Cortese\\_List.cfm](http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm), accessed February 2013). In addition, as described in the Background section, above, site soils were sampled and found not to have any contaminants at levels exceeding RWQCB screening criteria.

- 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 for people residing or working in the project area?**

**No Impact.** The project area is not within an airport land use plan (Sonoma County 2001) and the proposed project is an ecological restoration and mosquito control effort that would not result in any new structures or other features that could potentially pose an airport safety hazard.

- f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

**No Impact.** The proposed project is not located in the vicinity of a private airstrip; it is about 3.5 miles south of the Sonoma Valley Airport (Sonoma County 2001).

- g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

**No Impact.** The proposed marsh enhancement project would not interfere with any adopted emergency response or evacuation plans because the project would be located on an uninhabited marsh, not open to public access or easily accessible, where the need for

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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emergency access is not anticipated. The project would result in no change from current conditions.

**h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

**No Impact.** The project area is not located within the designated wildland-urban interface. The proposed earthwork, removal of vegetation, and revegetation with native species on a marsh separated from urbanized areas would not create new fire hazards.

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<b>IX. HYDROLOGY AND WATER QUALITY</b>	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?		X		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?			X	
e) 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?			X	
f) Otherwise substantially degrade water quality?				X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?			X	
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

## Background

The project site is located at the edge San Pablo Bay, at the mouth of Sonoma Creek, within the 100-year flood zone (FEMA *undated*). The Marsh is regularly inundated by the movement of the tides in adjacent San Pablo Bay. Tidal datums in San Pablo Bay were calculated by WWR for the

nearby Sears Point Restoration Project (WWR 2006) (Table 8) and are assumed to be applicable at the Marsh.

**Table 8. Tidal Datums near the Project Site**

Tidal Datum	Elevation (ft NAVD88)
HOWL (highest observed water level) <sup>1</sup>	8.89
MHHW (mean higher high water)	6.36
MHW (mean high water)	5.79
MTL (mean tide level)	3.31
MLW (mean low water)	1.26
MLLW (mean lower low water)	0.27

<sup>1</sup>Observed 1/8/2005

There are a number of small, natural channels (mean width = 2 ft, mean depth = 1 ft) along the bay-front margin of the marsh that connect to the marsh interior (Figure 3). These channels generally disappear a short distance into the central basin area. As the tides rise, water enters the marsh interior through these channels, and at MHHW the 100 acre central basin becomes inundated to a depth of up to 0.50 ft, producing a marsh tidal prism of approximately 16 acre feet. When the tide falls, these small channels are unable to provide adequate drainage to empty the entire basin, which results in long-term ponding. The altered conditions and rapid build-out of the marsh plain over the past 40 years preempted development of large, natural channel networks, thus leading to current conditions in which large expanses of the marsh plain are ineffectively drained at low tide.

There are three main mosquito control ditches on the site: one at the south end of the site, one in the middle, and one at the north end (Figure 3). These ditches are larger in size than the naturally-formed bay-front channels, and connect to a network of mosquito control ditches that drain depressional areas around the relic berms along the western end of the project site. These internal mosquito control ditches are undersized, and many no longer have effective connections to the main mosquito control ditches, thus they do not provide adequate drainage.

The fact that most of the natural and man-made channels on the marsh connect to the San Pablo Bay shoreline makes them inherently unstable. The marsh has accreted at a very rapid rate due to the unnaturally large sediment load derived from hydraulic mining and agricultural activities in the contributing watershed. Re-suspended sediments moving in waters along the Bay shoreline can fill small channels and reduce their capacities, thus further hindering drainage of the greater marsh area.

Global sea-level rise has the potential to radically change the hydrology of San Pablo Bay and the project site through increased frequency and duration of inundation. The National Research Council (NRC) estimates that sea-levels along the California coast could rise by 5-24” by the year 2050, and by 17-66” by the year 2100 (CO-CAT 2013). Tidal wetlands are able to adapt to sea-level rise, so long as marsh plain sedimentation rates keep pace with rates of sea-level rise and room for land-

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ward migration is available (BCDC 2011). If sea-level rise outpaces the rate of marsh plain accretion, high tidal marsh habitat will, over time, revert to low marsh habitat, and eventually mudflat.

The RWQCB has identified Beneficial Uses for San Pablo Bay and Sonoma Creek in the current Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) (RWQCB 2007). The Basin Plan sets narrative and numeric water quality objectives for a wide range of physical, chemical, and biological properties to protect the beneficial uses in these water bodies. The beneficial uses are as follows:

### **San Pablo Bay**

- Industrial service supply
- Ocean, commercial, and sport fishing
- Estuarine habitat
- Fish migration
- Navigation
- Preservation of rare and endangered species
- Water contact recreation
- Non-contact water recreation
- Shellfish harvesting
- Wildlife habitat
- Fish spawning

### **Sonoma Creek**

- Cold freshwater habitat
- Warm freshwater habitat
- Fish migration
- Preservation of rare and endangered species
- Fish spawning
- Wildlife habitat
- Water contact recreation
- Non-contact water recreation

## Discussion of Impacts

### a) Violate any water quality standards or waste discharge requirements?

**Less than Significant with Mitigation.** It is possible that construction activities may cause short-term, temporary impacts to water quality. Earth-moving and material placement within the marsh could cause increases in suspended sediment concentration and introduce petroleum contaminants (oil, grease, fuel, etc.) into the waters of the Bay. As noted in Section VII (Hazards and Hazardous Materials), the levels of typical contaminants of concern (metals, polyaromatic hydrocarbons, pesticides, and polychlorinated biphenyls) in project area soils are below the screening guidelines established by the RWQCB for wetland reuse (SES 2013). During the period between the completion of earthmoving and vegetation reestablishment, bare graded areas could be subject to erosion from these forces as well. Implementation of Mitigation Measure IX-1, below, would reduce these impacts to a less than significant level.

#### **Mitigation Measure IX-1**

The project includes the development of a Stormwater Pollution Prevention Plan (SWPPP) that includes best management practices (BMPs) for minimizing stormwater runoff, erosion, and potential water quality impacts associated with construction activities. An erosion control plan shall be developed and shall identify erosion control BMPs and construction phasing and techniques to prevent excessive erosion and sedimentation.

Construction BMPs that would be incorporated into the project may include, but are not limited to:

- Installation of silt fences or straw wattles along the toes of slopes and designated staging areas on the landward side of the perimeter levee, to minimize soil erosion and prevent sediment from spreading off-site.
- Staging of construction equipment in upland areas on adjacent agricultural lands when not in use and refueling or maintenance of equipment only in designated upland areas, away from aquatic habitats to prevent the introduction of hazardous chemicals into the water.
- Training for all contractors working on the site regarding the environmental sensitivity of the project site and surrounding area and the need to minimize impacts.
- Training for all contractors in implementation of stormwater BMPs for protection of water quality.

**b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge?**

**No Impact.** The proposed project would not include any features that would interfere with local groundwater recharge or supply.

**c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?**

**Less than Significant with Mitigation.** The proposed project involves creating channels and other features that would alter the drainage patterns of the marsh in order to improve habitat conditions and reduce mosquito populations. These drainage alterations within the marsh would not contribute to excessive erosion or siltation on- or off-site. The project is intended to promote some siltation within the marsh to enhance marsh accretion (elevation gain) to increase habitat resilience to sea-level-rise. The temporary access road that would be built atop the marsh plain to facilitate construction would alter drainage patterns within the marsh while it is present, but not in a manner that would contribute to erosion. Some siltation may occur on the landward side of the road while it is in place, but this would be beneficial as sediment deposition is required to raise the elevations of the central basin. This road would be removed at the end of construction. Following construction, recently graded features of the marsh plain (e.g., marsh mounds, high-marsh fill areas, and the transitional ramp) would initially be devoid of vegetation. Prior to vegetation re-establishment, some minor erosion of these features would be expected, but not to an extent that would be considered detrimental to adjacent marsh habitats as the amount of added unvegetated mud surfaces would be insignificant as compared to the existing acreage of mudflat habitat (i.e., potential sediment re-suspension areas) within San Pablo Bay. A small amount of sediment movement and spreading of constructed enhancement elements is preferred, to create irregular and undulating micro-topographic habitats, representative of natural conditions. Construction-related disturbances to the marsh plain may have the potential to increase erosion and siltation on- and off-site, but implementation of Mitigation Measure IX-1, above, would reduce these impacts to a less than significant level.

**Mitigation Measure**

See Mitigation Measure IX-1, above.

**d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?**

**Less than Significant Impact.** The purpose of the project is to reduce the presence of standing water on the marsh plain (i.e., on-site flooding) in order to improve habitat conditions for marsh-dependent wildlife and reduce mosquito production. In addition, the project involves improving and strengthening the Tubbs Island perimeter levee, which would reduce the chances for flooding off-site. During construction, the temporary access

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road atop the marsh plain may cause a slight increase in ponding (i.e. onsite flooding) in the area to the northwest of the road (i.e., the landward side). This increased ponding would be minor and would not impact the stability of Tubbs Island perimeter levee, or contribute to off-site flooding. As indicated in the Project Description, culverts would be installed at all locations where the road crosses existing marsh channels, thus providing existing levels of drainage within the project area.

As indicated in the background section, global sea-level rise has the potential to increase the frequency and duration of flooding on the project site, causing eventual loss of wetland habitat through submergence. Implementation of the proposed project would help to improve the resilience of the marsh to sea-level rise in several ways. The construction of the new channel network throughout the central basin and relic berm area would allow increased import of sediments from San Pablo Bay to the marsh interior. This increased sediment load would increase marsh plain sedimentation rates, thus helping marsh plain elevations keep pace with sea-level rise. In addition, improved tidal exchange within the marsh interior would improve marsh plain vegetation density and health, which would increase the rate of organic material deposition within the marsh, further contributing to marsh plain accretion rates. Construction of the transitional ramp would provide a 10-acre space for gradual marsh migration with sea-level rise. The transitional ramp and marsh mounds in the marsh interior would also provide important refugia for marsh wildlife as extreme high tide events become more common. Construction of the high marsh lifts within the relic berm area would increase marsh elevations within subsided areas, thus making them more resilient to sea-level rise.

Construction of the proposed project would help the Marsh adapt to moderate amounts of sea-level rise. The local suspended sediment concentration within San Pablo Bay is very high due to the presence of extensive offshore mudflats that contain a large reservoir of material that is readily mobilized by wind waves (Ruhl et al. 2001). Tidal marsh restoration projects in the vicinity have experienced relatively high rates of marsh plain accretion due to these high suspended sediment concentrations (Siegel 2002; Woo et al. 2004). These potentially high sedimentation rates make the Sonoma Creek marsh more likely to adapt to sea-level rise than marshes in more sediment starved areas of the estuary. It is anticipated that the Sonoma Creek marsh could be resilient under moderate amounts of sea-level rise (15” by 2050; 40” by 2100) following implementation of the project, however it’s resilience under higher estimates (24” by 2050; 66” by 2100) is unlikely. These high-end estimates would cause catastrophic changes to the San Francisco Estuary ecosystem.

**e) 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.** Stormwater systems currently do not exist on the marsh and the proposed project would not create stormwater systems. A series of drainage ditches exist on the adjacent farm lands, but project-related activities would not contribute a

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significant amount of runoff that could exceed capacity. Implementation of Mitigation Measure IX-1 would prevent polluted runoff from entering these ditches.

Implementation of the project would reduce mosquito breeding habitat, thus reducing the need for the District to treat the marsh with mosquito larvicides. Treatment reduction would reduce the runoff of mosquito larvicides into the waters of San Pablo Bay and Sonoma Creek.

**f) Otherwise substantially degrade water quality?**

**No Impact.** All potential water quality degradations are covered in the above responses.

**g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?**

**No Impact.** No housing is proposed as part of the proposed project.

**h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?**

**Less than Significant Impact.** The proposed project would involve the construction of channels and low, sloping mounds and berms within the 100-year flood zone. All of these proposed enhancement elements are meant to improve drainage and reduce incidents of flooding and standing water on the project site. The newly constructed channels and other features would direct flood flows back into San Pablo Bay and Sonoma Creek on falling tides and would not increase flood hazards off-site.

**i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?**

**No Impact.** No people or structures exist on the project site, nor are they planned for the project site. The proposed project would involve strengthening the Tubbs Island perimeter levee, thus improving flood protection to adjacent lands.

**j) Inundation by seiche, tsunami, or mudflow?**

**No Impact.** In its current configuration, the project site may be inundated by seiche or tsunami. Implementation of the project would not alter this condition.

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	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>X. LAND USE AND PLANNING</b>				
Would the project:				
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

## Background

The project site is undeveloped open space designated as Extensive Agriculture (100-acre minimum parcel size) in the Sonoma County General Plan Land Use Element (Sonoma County 2008) and is zoned Extensive Agriculture, (100-acre minimum parcel size) with Biotic Resources, Floodplain, and Scenic Resources Combining Districts in the County Zoning Ordinance. The marsh is adjacent to agricultural lands, other marshes, and the open waters of Sonoma Creek and San Pablo Bay. It is distant from any urbanized areas. Levees leading to the marsh are privately owned.

The entire extent of the project site is within BCDC Bay or Shoreline jurisdiction. The San Francisco Bay Plan (BCDC 2008) states that the addition and restoration of land with high aquatic life and wildlife habitat value or good habitat restoration potential, to the San Pablo Bay National Wildlife Refuge would be in accord with Bay Plan Policies. The Plan also identifies San Pablo Bay tidal marshes as providing valuable wildlife habitat and encourages their protection. Numerous other regional resource management plans recommend the preservation, restoration, and enhancement of tidal marsh and adjacent marsh-upland transitional areas in San Pablo Bay, including:

- The Baylands Ecosystem Habitat Goals (Goals Project 1999)
- The USFWS Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013b)
- The USFWS San Pablo Bay National Wildlife Refuge Comprehensive Conservation Plan (USFWS 2011)

## Discussion of Impacts

**a) Physically divide an established community?**

**No Impact.** The proposed restoration project would be located on an uninhabited marsh and would not change its character or land use. Therefore it would not physically divide an established community.

**b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?**

**No Impact.** As noted above, the site is designated as Extensive Agriculture in the Sonoma County General Plan. The project would be consistent with this designation. The Sonoma County General Plan includes a number of policies that apply to the proposed project. These are summarized in Table 9, below, along with an assessment of the project’s compliance. As can be seen in the table, the proposed project would fully comply with and help to implement relevant general Plan goals and policies.

**Table 9. Sonoma County Land Use Policies**

Policy	Project Compliance
<p><b>Land Use - LU.20w:</b></p> <p>1) Marshes and mudflats should be maintained to the fullest possible extent to conserve fish and wildlife and to abate air and water pollution. Filling and diking that eliminate marshes and mudflats should therefore be allowed only for purposes providing substantial public benefits and only if there is no reasonable alternative. Marshes and mudflats are an integral part of the Bay tidal system and therefore should be protected in the same manner as open water areas,</p> <p>(2) Any proposed fills, dikes, or piers should be thoroughly evaluated to determine their effects on marshes and mudflats and then modified as necessary to minimize any harmful effects, and</p> <p>(3) To offset possible additional losses of marshes due to necessary filling and to augment the present marshes:</p> <p style="padding-left: 40px;">(a) former marshes should be restored when possible through removal of existing dikes,</p> <p style="padding-left: 40px;">(b) in areas selected on the basis of competent ecological study, some new marshes should be created through carefully placed lifts of dredged spoils, and</p> <p style="padding-left: 40px;">(c) the quality of existing marshes should be improved by appropriate measures whenever possible.</p>	<p>The project would enhance the existing marsh habitat and create additional wetland-upland transitional habitat. Existing relict dikes would be removed. Impacts of proposed filling and appropriate mitigations are addressed in Section IV, Biological Resources, in this Initial Study.</p>

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Policy	Project Compliance
<p><b>Open Space: GOAL OSRC-7:</b> Protect and enhance the County's natural habitats and diverse plant and animal communities.</p> <p><b>Objective OSRC-7.1:</b> Identify and protect native vegetation and wildlife, particularly occurrences of special status species, wetlands, sensitive natural communities, woodlands, and areas of essential habitat connectivity.</p> <p><b>Objective OSRC-7.4:</b> Where appropriate, support regulatory efforts by other agencies to protect biotic habitat.</p> <p><b>Objective OSRC-7.5:</b> Maintain connectivity between natural habitat areas.</p> <p><b>Objective OSRC-7.6:</b> Establish standards and programs to protect native trees and plant communities.</p> <p><b>Objective OSRC-7.7:</b> Support use of native plant species and removal of invasive exotic species.</p> <p><b>Objective OSRC-7.8:</b> Encourage voluntary efforts to restore and enhance biotic habitat.</p> <p><b>Objective OSRC-7.9:</b> Preserve and restore the Laguna de Santa Rosa, San Pablo Bay and Petaluma marshes and other major marshes and wetlands.</p> <p><b>Objective OSRC-7.10:</b> Promote production of native marine and shoreline plant and animal habitats along the Pacific Coast and San Pablo Bay shorelines.</p>	<p>The project would enhance and promote development of the natural habitats on the marsh, which is located adjacent to San Pablo Bay. Revegetation with native species would be encouraged. The project would be conducted in concert with the Audubon Society, USFWS, Marin-Sonoma Mosquito and Vector Control District, and the State Lands Commission.</p>
<p><b>Policy OSRC-7s:</b> Develop comprehensive programs for preservation and restoration of the San Pablo Bay area and shoreline habitats, including mechanisms for preservation and enhancement such as acquisition, zoning and easements and avoiding activities such as filling, grading or construction that would be detrimental to the biotic resources or historic water retention functions.</p>	<p>The proposed project would preserve and protect shoreline habitats through marsh enhancement and provision of transitional habitats. Filling associated with the project would be to enhance wetland habitat, strengthen levees adjacent to agricultural lands, or to create marsh-upland transitional habitat elements.</p>

**c) Conflict with any applicable habitat conservation plan or natural community conservation plan?**

**No Impact.** See analysis in Section IV, Biological Resources, Item f).

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	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>XI. MINERAL RESOURCES</b>				
Would the project:				
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?				X
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?				X

## Background

The project site is located within Sonoma Creek marsh, which formed over the last 50 years on San Pablo Bay mudflats. There are no records of current or historic oil or gas wells, or any other economically valuable mineral resources, on the project site.

## Discussion of Impacts

**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?**

**No Impact.** No mineral resources that would be of value to the region and the residents of the state are known to occur within the project area, which is comprised of recently deposited Bay sediments.

**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?**

**No Impact.** No locally important mineral resources recovery area is designated for the site on in the Sonoma County General Plan (Sonoma County 2008).

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	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>XII. NOISE</b>				
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
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 expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

## Background

### Introduction to Noise Concepts, Terms, and Descriptors

Table 10 identifies decibel levels for common sounds heard in the environment. Noise levels that are generally considered acceptable or unacceptable can characterize various environments. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones.

**Table 10. Typical Noise Levels**

Noise Level decibels (dBA)	Outdoor Activity	Indoor Activity
90+	Gas lawn mower at 3 feet, jet flyover at 1,000 feet	Rock Band
80–90	Diesel truck at 50 feet	Loud television at 3 feet
70–80	Gas lawn mower at 100 feet, noisy urban area	Garbage disposal at 3 feet, vacuum cleaner at 10 feet
60–70	Commercial area	Normal speech at 3 feet
40–60	Quiet urban daytime, traffic at 300 feet	Large business office, dishwasher next room
20–40	Quiet rural, suburban nighttime	Concert hall (background), library, bedroom at night
10–20		Broadcast / recording studio
0	Lowest threshold of human hearing	Lowest threshold of human hearing

Source: Modified from Caltrans Technical Noise Supplement, 1998

The A-weighted decibel scale (dBA)<sup>6</sup> is cited in most noise criteria. The most commonly used noise descriptors are the equivalent sound level over a given time period (Leq)<sup>7</sup>; average day-night 24-hour average sound level (Ldn)<sup>8</sup>; and community noise equivalent level (CNEL)<sup>9</sup>.

## Sonoma County General Plan

The Sonoma County General Plan Noise Element (Noise Element) was updated and adopted on September 23, 2008. The project site is in an unincorporated area of Sonoma County. The Noise Element sets various goals and objectives that apply to projects in Sonoma County. General Plan noise level performance standards in Table 11, below, are performance standards for noise producing land uses that may affect noise sensitive land uses.

<sup>6</sup> A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure level (commonly called “sound level”) measured in dB. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels.

<sup>7</sup> The Equivalent Sound Level (Leq) is a single value of a constant sound level for the same measurement period duration, which has sound energy equal to the time-varying sound energy in the measurement period.

<sup>8</sup> Ldn is the day-night average sound level that is equal to the 24-hour A-weighted equivalent sound level with a ten-decibel penalty applied to night between 10:00 p.m. and 7:00 a.m.

<sup>9</sup> CNEL is the average A-weighted noise level during a 24-hour day, obtained by addition of five decibels in the evening from 7:00 to 10:00 p.m., and an addition of a ten-decibel penalty in the night between 10:00 p.m. and 7:00 a.m.

**Table 11. Maximum Allowable Exterior Noise Exposures for Non-transportation Noise Sources<sup>a</sup>**

Hourly Noise Metric <sup>b</sup> , dBA	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
L50 (30 minutes in any hour)	50	45
L25 (15 minutes in any hour)	55	50
L8 (5 minutes in any hour)	60	55
L2 (1 minute in any hour)	65	60

a. These are the standards from Table NE-2 from the Sonoma County General Plan Noise Element.

b The sound level exceeded “n” percent of the time in any hour. For example, the L50 is the value exceeded 50 percent of the time or 30 minutes in any hour; this is the median noise level. The L2 is the sound level exceeded approximately 1 minute in any hour.

Source: Sonoma County General Plan 2020 Noise Element, September 2008

The following goals, objectives, and policies from the Noise Element are applicable to the project:

Objective NE-1.2      Develop and implement measures to avoid exposure of people to excessive noise levels.

Objective NE-1.3      Protect the present noise environment and prevent intrusion of new noise sources which would substantially alter the noise environment.

Policy NE-1a            Designate areas within Sonoma County as noise impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dB Ldn, 60 dB CNEL, or the performance standards in Table NE-2 from the Sonoma County General Plan Noise Element.

Policy NE-1b            Avoid noise sensitive land use development in noise impacted areas unless effective measure are included to reduce noise levels. For noise due to traffic on public roadways, railroad and airports, reduce exterior noise to 60 dB Ldn or less in outdoor activity areas and interior noise levels to 45 dB Ldn or less with windows and doors closed. Where it is not possible to meet this 60 dB Ldn standard using a practical application of the best available noise reduction technology, a maximum level of up to 65 dB Ldn may be allowed but interior noise level shall be maintained so as not to exceed 45 dB Ldn.

Policy NE-1c            Control non-transportation related noise from new projects. The total noise level resulting from new sources and ambient noise shall not exceed the standards in Table 10 as measured at the exterior property line of any affected residential land use. Limit exceptions to the following:

1. If the ambient noise level exceeds the standard in Table 10, adjust the standard to equal the ambient level, up to a maximum of 5

dB(A) above the standard, provided that no measurable increase (i.e. +/- 1.5 dB(A)) shall be allowed.

5. Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of the exterior property line of the adjacent noise sensitive land use where:
  - a. the property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning, and
  - b. there is available open land on those noise sensitive lands for noise attenuation.

Policy NE-1f                      Require development projects that do not include or affect residential uses or other noise sensitive uses to include noise mitigation measures where necessary to maintain noise levels compatible with activities planned for the project site and vicinity.

Policy NE-1h                      Prepare and consider a noise control ordinance to regulate existing noise sources as follows:

7. The ordinance may exempt or modify noise requirements for agricultural uses, construction activities, school functions, property maintenance, heating and cooling equipment, utility facilities, waste collection and other sources.

## Existing Conditions

Noise sensitive receptors (land uses associated with indoor and/or outdoor activities that may be subject to stress and/or significant interference from noise) typically include residential dwellings, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. The nearest sensitive receptor to the site appears to be a residence north of State Route 37(SR 37), approximately 5,000 feet from potential construction areas. There are no nearby residences south of SR 37 in the vicinity of the proposed construction.

The analysis presented in this section is based on noise measurements and observations by RCH Group near the project site on February 15, 2013.

To quantify existing ambient noise levels in the immediate project vicinity, short-term noise levels were measured. Noise levels were measured on the levee access road at the midpoint of the proposed project area and noise was also measured in the Vista Point parking area west of the bridge over Sonoma Creek. The noise measurements are summarized in Table 12.

The existing ambient noise levels at the project site are defined primarily traffic noise from Highway 37. Minor contributing noise sources included birds, aircraft flying overhead, and bird calls in the marsh.

Short-term measurements near the midpoint of the proposed project area indicate that the project is in a very quiet area with average 5-minute noise levels ranging from 44 to 48 dBA  $L_{eq}$ . Noise levels in the Vista Point Parking Area were 68 to 70 dBA over two 5-minute noise monitoring periods.

**Table 12. Existing Noise Environment at the Project Site**

Location	Time Period	Leq (decibels)	Noise Sources
Site 1: On levee road near the middle of the proposed construction areas, approximately 5,000 feet south of SR 37.	Friday 5/15/2013 1:25 – 1:40 PM	5-minute Average Noise Levels, Leq 47, 48, 44	Noise from traffic on SR 37; birds in the marsh, one aircraft flyover. Passing cars 47 dBA.
Site 2: Vista Point Parking Area. 75 feet directly south of SR 37.	Friday 5/15/2013 2:29 – 2:39 PM	5-minute Average Noise Levels, Leq 68, 70	Noise from traffic on SR 37. Passing cars 68 dBA, passing trucks ~75 dBA.

Source: RCH Group, 2013.

## Discussion of Impacts

### a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

**Less than Significant Impact.** Construction activity noise levels at and near the construction areas would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. Table 13 shows typical noise levels during different construction stages. Table 14 shows typical noise levels produced by various types of construction equipment.

Noise from construction activities generally attenuates at a rate of 6 to 7.5 dBA per doubling distance. Based on the project site layout and terrain, an attenuation of 7.5 dBA would be assumed because the site is consistent with the characteristics of a “soft site,” as described above. The closest sensitive receptor would be approximately 5,000 feet from project construction. Residences along haul routes would also be exposed to increased traffic levels due to trucks hauling gravel and potentially other materials to build temporary construction roads. However, the construction haul trips would be temporary and would not double traffic on the main haul route (SR 37). The doubling of a moving noise source produces a 3 dBA increase in sound pressure level which is barely detectable by the human ear (ICF 2009). Noise levels at residences along SR 37 would increase by less than 3 dBA and would not be a significant increase in noise levels.

Table 13 shows that excavation and finishing are the loudest phases of typical construction; the noise from these phases of construction would be up to 89 dBA at a reference distance of 50 feet. This project would have noise levels typical of excavation. If attenuated out to

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5,000 feet, the construction noise would attenuate to approximately 39 dBA during excavation, the loudest of construction activities that would occur. Because of the existing traffic-noise level on SR 37 (68 – 70 dBA; see Table 12), the construction noise would not be audible at receptors on the north side of SR 37. After construction, there may be some trips to the site associated with monitoring the functioning of the marsh, but these would be minimal and there would not be any noticeable increase in noise from operations of the proposed project.

**Table 13. Typical Construction Noise Levels**

<b>Construction Phase</b>	<b>Noise Level<sup>a</sup> (dBA, Leq)</b>
Ground clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

a. Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

Source: Bolt, Baranek, and Newman, 1971; Cunniff, 1977.

**Table 14. Typical Noise Levels from Construction Equipment**

Construction Equipment	Noise Level <sup>a</sup> (dBA, Leq at 50 Feet)
Dump truck	88
Portable air compressor	81
Concrete mixer (truck)	85
Scraper	88
Jackhammer	88
Dozer	87
Paver	89
Generator	76
Backhoe	85
Rock Drilling	98

a. Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

Source: Bolt, Baranek, and Newman, 1971; Cunniff, 1977.

**b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?**

**No Impact.** Depending on the construction equipment used, groundborne vibrations can be perceptible within 30 to 100 feet of a source. The nearest sensitive receptor would be approximately 5,000 north of the project site. Therefore, there would be no groundborne noise impact from vibrations.

**c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?**

**No Impact.** See discussion under item a) above. There would be no long-term change in ambient noise as a result of project implementation.

**d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?**

**Less than Significant Impact.** As discussed above in a), the project would result in an incremental increase in temporary or periodic noise levels in the area but these would not be noticeable at the nearest sensitive receptor due to the distance between the construction

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noise sources and the nearest residence (approximately 5,000 feet). The construction noise would be further masked by the steady traffic noise on SR 37.

- 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 expose people residing or working in the project area to excessive noise levels?**

**No Impact.** The project site is not located within two miles of a public airport land use plan area. The project is not located within an airport land plan or within two miles of an airport. The nearest public airport, Gness Field Airport, is approximately 11 miles southwest of the project site. Noise from the airport does not have any effect on the project. No impact would occur.

- f) **For a project within the vicinity of a private airstrip, 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 the vicinity of a private airstrip. The project would not increase onsite exposure to aircraft noise and thus, no impact would occur.

<b>XIII. POPULATION AND HOUSING</b>	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Induce substantial 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)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

## Background

The project site is an undeveloped tidal marsh and contains no housing structures. No housing is planned in the proposed project.

## Discussion of Impacts

- a) **Induce substantial 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.** As noted in the Project Description, the proposed project would not involve construction of any new homes, or any growth inducement.

- b) **Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?**

**No Impact.** No housing exists on the marsh and none would be displaced with project implementation.

- c) **Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

**No Impact.** See Item (b), above. The proposed project would not displace any people or housing.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>XIV. PUBLIC SERVICES</b>				
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 public services:				
i) Fire protection?				X
ii) Police protection?				X
iii) Schools?				X
iv) Parks?				X
v) Other public facilities? - Vector Control Services				X

## Background

The site currently requires minimal public services. It is served by the Sonoma County Fire and Emergency Services Department and the Sonoma County Sheriff's Office, and also is patrolled by USFWS Law Enforcement officers. The Marin-Sonoma Mosquito and Vector Control District conducts vector control on the marsh.

## Discussion of Impacts

- a) **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:**
- i) **Fire protection**
  - ii) **Police protection**
  - iii) **Schools**
  - iv) **Parks**
  - v) **Other public facilities – Vector Control**

### **Fire and Police Protection, Schools, Parks (i – iv)**

**No Impact.** The proposed project would construct marsh channels and transitional habitat features and maintain/enhance existing marsh plant communities, therefore, fire hazards would not change compared with existing conditions. The proposed project would have no impact on the need for police services. The project does not include new housing or commercial uses and would not result in demand for schools or other public services.

### **Other Public Facilities – Vector Control (v)**

**No Impact.** The existing marsh is a major producer of mosquitoes and currently requires substantial mosquito control efforts. One of the primary goals of the project is to reduce the extent and duration of shallow water on the project site to reduce mosquito breeding habitat and hence the need to monitor and treat for mosquitoes. The District is one of the project partners and has approved the current Project Enhancement Plan (WWR 2013) for mosquito source reduction. Following project implementation, it is anticipated that the District would continue its existing monitoring and treatment activities on the marsh, but those activities would be drastically reduced from current conditions.

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	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>XV. RECREATION</b>				
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?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X

### Background

There is currently no public use allowed on the marsh. Although levees accessing the marsh are not gated or posted for no trespassing, they are privately managed and have no developed trails. The marsh itself is posted with “no entry” signs. Therefore, recreational use of the levee and marsh is informal and low intensity. The project site would continue to be managed by the USFWS as wildlife habitat.

### Discussion of Impacts

- 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 proposed marsh enhancement plan would have no effect on existing parks. Access and use would not change from current conditions except during construction, when access would be prohibited.

- 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?**

**No Impact.** See response to Item a), above. The project is not designed to alter public use of the marsh.

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	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>XVI. TRANSPORTATION/TRAFFIC</b>				
Would the project:				
a) Exceed the capacity of the existing circulation system, based on applicable measures of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b) Conflict with an applicable congestion management program, including but not limited to, level of service standards and travel demand measures and other standards established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
e) Result in inadequate emergency access?				X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

## Background

Access to the project area by land is via a driveway from State Route 37 (Figure 8), which connects from US 80 to the east to US 101 to the west. There are no airports or rail lines near the site; the nearest airport is Sonoma Valley Airport, which is about 3.5 miles north of the site.

## Discussion of Impacts

- a) **Exceed the capacity of the existing circulation system, based on applicable measures of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?**

**Less than Significant Impact.** The proposed project would generate small amounts of traffic during construction. Much of the off-site traffic associated with the project would occur during equipment mobilization and de-mobilization. The construction equipment would be brought to the site on flatbed trucks, requiring a maximum of 13 round trips per mobilization/de-mobilization event (one mobilization and de-mobilization event required per construction year). These 13 trips would occur over a period of one or two days. Also, in the first construction year, a maximum of 700 round trips with 13-cubic yard end-dump trucks would be required to bring the gravel for road construction to the project site. These trips would be staggered over a two to five week period, with a maximum of 40 round trips/day (80 one-way trips). These trips would occur at a rate of 5 trucks/hour over an 8-hour work day.

After equipment and material mobilization has finished, traffic throughout the remainder of construction would be limited to workers (10-12 people) accessing the project site. Regular carpooling would limit the number of daily round-trips for worker access to a maximum of six trips. Workers would park on Vallejo Sanitation District Lands and would therefore have no effect on circulation, roadway capacities, intersection operations, bicycle paths, or mass transit.

- b) **Conflict with an applicable congestion management program, including but not limited to, level of service standards and travel demand measures and other standards established by the county congestion management agency for designated roads or highways?**

**No Impact.** See response to Item a), above.

- c) **Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?**

**No Impact.** The proposed project would not result in increased air travel or otherwise affect air travel.

- d) **Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

**Less than Significant Impact.** No new roads or new/changes to land uses are proposed as part of this project. The driveway to the marsh from SR 37 may present hazards for large haul trucks. Trucks hauling gravel would come from Vallejo and, therefore, would need to

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make a left turn into the project site from SR 37. Vallejo Sanitation District end-dump trucks regularly make left turns at this access point without difficulty. However, if left turns across SR 37 are infeasible due to daily traffic conditions, trucks may proceed to the traffic signal at the intersection of SR 37 and SR 121 (1.5 miles away), where they could make a U-turn and proceed back to the driveway and make a right turn. As part of the proposed project, the construction contractor would prepare a basic traffic management plan to address any potential site access issues.

**e) Result in inadequate emergency access?**

**No Impact.** The proposed project would not affect access along local streets.

**f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?**

**No Impact.** The proposed project would not interfere with the provision of alternative transportation services, and would therefore not conflict with any associated alternative transportation policies.

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	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<b>XVII. UTILITIES AND SERVICE SYSTEMS</b>				
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X	
e) Result in a determination by the wastewater treatment provider that 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?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X

### Background

Sonoma Creek Marsh is undeveloped and has no public services, utilities, or utility alignments.

### Discussion of Impacts

**a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

**No Impact.** The proposed project is a habitat enhancement and mosquito abatement project and, as such, would result in no demand for wastewater treatment. Portable toilets would be placed on the site to serve project workers.

- b) **Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**Less than Significant Impact.** The proposed project is a habitat enhancement and mosquito abatement project, and, as such, would result in no demand for, or construction of, water or wastewater treatment facilities. If irrigation were required during vegetation re-establishment (not anticipated), water would be provided via water trucks.

- c) **Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**No Impact.** The proposed project would include an erosion control plan/SWPPP (see Mitigation Measure IX-1). No new stormwater runoff would be generated by the project and no stormwater facilities exist or are proposed.

- d) **Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

**Less than Significant Impact.** No expanded water supply resources would be needed for the project. Freshwater irrigation needs (if any) during revegetation would be minor, and provided by water trucks.

- e) **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.** See response to Item a), above.

- f) **Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?**

**Less than Significant Impact.** All materials excavated during this project would be re-used on-site. Imported gravels used to construct the marsh access road would either be re-used for road maintenance on Refuge lands, or would be re-sold to recover some material costs. Project construction would generate small amounts of non-hazardous solid waste. Most every-day trash associated with construction activities would be stored in waste receptacles on the project site, which would be regularly emptied at designated locations (receptacles at the Refuge office complex, or at the contractor's facility). The largest construction-related source of solid waste would be the geo-textile fabric used in construction of the marsh access road. This material cannot be reused after construction and must be disposed of offsite. A maximum of 14,000 square yards (approx. 200 cubic yards) of this material would need to be disposed of. This volume of material can easily be accommodated by the nearby Redwood landfill and would not overwhelm the capacity of this facility.

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**g) Comply with federal, state, and local statutes and regulations related to solid waste?**

**No Impact.** All solid wastes would be disposed of at approved facilities.

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<b>XVIII. MANDATORY FINDINGS OF SIGNIFICANCE</b>	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
a) Does the project have the potential to 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?		X		
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)?			X	
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?				X

## Discussion of Impacts

- a) **Does the project have the potential to 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 noted throughout the Checklist above, the project area contains some sensitive biological resources that could be affected by the construction of the proposed project. All of these would be reduced to a less-than-significant level with the implementation of mitigation measures identified in this Initial Study. With mitigation identified in this document, the proposed project would not significantly affect local waterways or cause a fish or wildlife species to drop below self-sustaining levels, threaten to eliminate a plant or 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.

- 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)?**

**Less than Significant Impact.** A review of Sonoma County Permit and Resource Management Department's current projects list shows no pending applications for development in the immediate project area (<http://www.sonoma-county.org/prmd/>). San Pablo Bay has been the site of several tidal marsh restoration and enhancement projects. Within the project vicinity there are two tidal marsh restoration projects currently under construction (Cullinan Ranch and Sears Point). These restoration projects are situated within the Refuge boundaries and will contribute to the tidal marsh restoration goals for the Refuge and greater San Pablo Bay. The Cullinan Ranch Tidal Restoration Project is situated in the Napa River Estuary, approximately five miles from the proposed project site, and will restore over 1,500 acres of tidal wetland habitat. Construction on the Cullinan Ranch project began in 2011 and is expected to be completed by the end of 2013. The Sears Point Restoration Project is situated approximately 2 miles west of the proposed project on the shores of San Pablo Bay and will restore 2,327 acres of tidal marsh, seasonal wetlands, and grassland habitats. Construction on this project began in 2012 and is expected end in 2016. The Skaggs Island/Haire Ranch Restoration Project is situated approximately 1 mile directly north of the proposed project on Sonoma Creek, and will restore approximately 4,400 acres of tidal marsh and associated upland habitats.

Construction activities at the Sonoma Creek project in 2014 would overlap with construction activities at Sears Point, and Skaggs Island. Potential subsequent Sonoma Creek construction years may overlap with construction activities at Sears Point and Skaggs Island/Haire Ranch. All three of these restoration projects would access their sites via SR 37, and, therefore, could potentially impact traffic on this roadway. Traffic associated with the Cullinan Ranch, Sears Point, and Skaggs Island/Haire Ranch restoration projects will be minimal, as they involve very little import of materials from off-site. Therefore, the bulk of the traffic associated with these projects will be due to equipment mobilization and site access by construction crews. The cumulative impacts to traffic would, therefore, be less than significant.

The Cullinan Ranch, Sears Point, and Skaggs Island/Haire Ranch restoration projects would have similar types of impacts to hydrology and water quality, biological resources, geology and soils, noise, and air quality as the Sonoma Creek project. However, as appropriate mitigation measures would be employed in all of these projects to reduce the severity of the impacts (based on review of the CEQA documents available for these projects), the impacts would not be cumulatively considerable. The implementation of all four restoration and enhancement projects would greatly improve the health of the San Pablo Bay and surrounding ecosystem. Therefore, the cumulative impact of the proposed Sonoma Creek Marsh enhancement project and past, present, and likely future projects would be less than significant.

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

**No Impact.** As noted above in the Environmental Review Checklist, the proposed project would not have any significant environmental effects that could not be mitigated to less than significant levels. All mitigation measures identified in the Initial Study are incorporated into the project and would be implemented by the applicant. A Mitigation Monitoring and Reporting Plan would be developed prior to project implementations.

## 4. OTHER NEPA CONSIDERATIONS

This section covers NEPA-related analyses that are not required as part of CEQA. Topics covered in this section include:

- Additional Environmental Considerations
- Summary of Environmental Compliance
- Alternatives Analysis
- Summary

### 4.1 Additional Environmental Considerations

#### Socioeconomics

Implementation of the project would generate a minor amount of economic activity in the project area. However, because project implementation would occur over a relatively short period (a few months per year over up to 10 years), and because some of the labor would be provided by existing Refuge and District staff, this impact would be minimal. The project would have no long-term social or economic effects.

#### Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, requires that a federal agency analyze the effects of a proposed action to ensure that it does not disproportionately affect low income or minority populations. Incorporation of environmental justice principles throughout the planning and decision-making processes implements the principles of NEPA, Title VI of the Civil Rights Act, and the Uniform Relocation Act. The project's potential effects on environmental justice would be negligible, because it would have no significant unmitigatable impacts, and would be a small, short-term project with no negative effect on any minority or low-income population.

### 4.2 Summary of Environmental Compliance

Detailed compliance information, supporting reports, and environmental compliance history for this project is presented in the preceding CEQA Environmental Checklist discussion, and is summarized in Table 15, below.

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### Table 15. Summary of Environmental Compliance

Statute	Status of Compliance
<p>National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321 <i>et seq</i>)</p> <p>Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR §§ 1500-1508) dated July 1986</p> <p>California Environmental Quality Act of 1970 (California P.R.C. §§ 21000-21177) as amended; CEQA Guidelines (Title 14 C.C.R. §§ 15000-15387) as amended</p>	<p>This EA has been prepared in compliance with NEPA and CEQ regulations. All agency and public comments will be considered as appropriate. Following public review the Service will determine whether a Finding of No Significant Impact (FONSI) is the appropriate conclusion for the NEPA process.</p> <p>This IS has been prepared in compliance with CEQA regulations. All agency and public comments will be considered and evaluated. If appropriate, a Mitigated Negative Declaration will be signed with a conclusion of no significant impacts from this proposed action.</p>
<p>Clean Air Act, as amended (42 USC § 7401 <i>et seq</i>)</p>	<p>The proposed action is not expected to exceed <i>de minimus</i> thresholds for pollutant emissions or adversely impact air quality. Air emissions associated with the proposed action would be associated with temporary construction-related activities. No further evaluation is necessary.</p>
<p>Clean Water Act, as amended (33 USC § 1251 <i>et seq</i>), section 404</p> <p>Rivers and Harbors Act of 1899 (33 USC § 403), section 10</p>	<p>The proposed action, would result in the conversion of approximately 6.34 ac of wetlands to waters, and the net loss of 1.91 ac of jurisdictional wetlands. Figure 14 identifies jurisdictional wetlands in the project area and Figures 15 and 16 identify impacts to jurisdictional resources. A section 404 Nationwide or Individual permit will be obtained.</p> <p>This action would involve minor work in navigable waters of the U.S. As described in the Environmental Checklist, Section IX, above, this impact would be mitigated to a less-than-significant level.</p>

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Statute	Status of Compliance
Executive Order 11990, Protection of Wetlands, (42 FR 26961, 1977)	The proposed action is in compliance with EO 11990. As described in the Environmental Checklist, Section IV (c), the project would result in the conversion of approximately 6.34 ac of wetlands to navigable waters, and the net loss of 1.91 ac of jurisdictional wetlands. There would also be temporary, construction-related impacts to 16.19 ac of wetlands. These impacts are considered less-than-significant. Implementation of the project would result in ecosystem enhancement of over 100 ac of tidal wetland habitat. We are circulating the draft IS/EA to provide the public an opportunity for early public review of the proposal as required under Section 2(b) of EO 11990.
McAteer/Petris Act of 1965 (established San Francisco Bay Conservation and Development Commission)	The project is within of the jurisdiction of the San Francisco Bay Conservation and Development Commission, which would be responsible for ensuring consistency with the San Francisco Bay Plan through issuance of development permits.
Endangered Species Act as amended (16 USC § 1531 <i>et seq</i> )	Given the proposed project design and mitigation measures, our analysis indicates that the project would be not likely to adversely affect endangered species. The final determination of effects upon listed species will be made in consultation with USFWS and NOAA-NMFS.
Fish and Wildlife Coordination Act (16 USC § 661 <i>et seq</i> )	The proposed project is designed to minimize impacts to fish, wildlife, and existing habitat and is in compliance with the Fish and Wildlife Coordination Act.
Magnuson-Stevens Fishery Conservation and Management Act - Fishery Conservation Amendments of 1996, (16 USC § 1801 <i>et seq</i> ) – Essential Fish Habitat (EFH)	No impacts to EFH are expected from the proposed action. The final determination of effects upon EFH will be made in consultation with NOAA-NMFS.
Migratory Bird Treaty Act (16 USC 703-711)	The project includes mitigation and avoidance measures for any potential impacts to nesting migratory birds.
Marine Mammal Protection Act (16 USC § 1361 <i>et seq</i> )	The project includes mitigation and avoidance measures for any potential impacts to marine mammals.

### **4.3 Alternatives Analysis**

This section analyzes the potential environmental impacts of the reduced project and no-action alternatives relative to those of the proposed project. The potential impacts of the reduced-project alternative and of the no-project alternative are summarized in Table 16, provided as a supplement to the impact analysis in Chapter 3.0, which analyzes the proposed project/action. The Council on Environmental Quality Regulations implementing the National Environmental Policy Act direct federal agencies to "...present the environmental impacts of the proposal and the alternative in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision-maker and the public." The table below has been prepared to highlight differences between the alternatives. Because the differences between the proposed project and reduced project alternative are minor, the environmental analysis provided in Chapter 3.0 for the proposed project is also applicable to the reduced project alternative. All mitigation measures identified for the proposed project would be implemented for the reduced project alternative. Potential impacts associated with the no action alternative are also described in the table below. Under the no action alternative, enhancement of the Sonoma Creek Marsh would not proceed. A description of the general conditions that would persist under the no action alternative is provided in the Background section for each resource in Chapter 3; although, these descriptions of existing site conditions do not take into account that, for some resources, conditions under the no action alternative would degrade over time.

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**Table 16. Comparison of Impacts of Alternatives**

Resource	No Action Alternative	Reduced Project Alternative
Aesthetics	No impact.	Similar to proposed project. The reduced project does not include the transitional ramp feature, so the site appearance would be slightly different.
Agriculture and Forest Resources	No impact.	Same as proposed project.
Air Quality	No impact.	Similar to proposed project. This alternative would reduce excavation and transport of material by about 40%, with a commensurate reduction in air pollutant emissions compared with the proposed project. This alternative would not expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors.
Biological Resources	The marsh would continue to provide less than optimal conditions for special status species. Over time, large areas of the marsh interior may revert to mudflat, resulting in wetland loss.	Similar to proposed project, but the reduced project extent reduces impact extents (and habitat improvements). Reduced extent of impacts to jurisdictional wetlands and waters are quantified in Table 17.
Cultural Resources	No impact.	Same as proposed project.
Geology and Soils	No impact.	Similar to proposed project. The reduced project extent would reduce the area of potentially erodible soils after construction. The lack of transitional ramp would remove the benefit of added stability to the perimeter levee.
Greenhouse Gas Emissions	No impact.	Similar to proposed project. This alternative would reduce excavation and transport of material by about 40%, with a commensurate reduction in greenhouse gas emissions compared with the proposed project.
Hazards and Hazardous Materials	The marsh would continue to produce high numbers of mosquitoes, requiring regular surveillance and treatment by the District.	Same as proposed project.
Hydrology and Water Quality	The hydrology of the marsh would continue to be compromised. High levels of mosquito larvicides would continue to be applied for mosquito control.	Same as proposed project.
Land Use Planning	No impact.	Same as proposed project.
Mineral Resources	No impact.	Same as proposed project.
Noise	No impact.	Same as proposed project.
Population and Housing	No impact.	Same as proposed project.
Public Services	No impact.	Same as proposed project.
Recreation	No impact.	Same as proposed project.
Transportation/Traffic	No impact.	Similar to, but slightly reduced from the proposed project traffic, due to the reduction in road material import and reduced construction duration.
Utilities and Service Systems	No impact.	Same as proposed project.
Socioeconomics/ Environmental Justice	No impact.	Same as proposed project.

### ***No Action Alternative***

Selection of the no action alternative would result in continuation of existing conditions on the site into the future. No actions would be taken to improve the hydrology within the project area, and therefore prolonged ponding events would continue to occur with negative consequences from ecological, economic, and human health perspectives. Continued prolonged ponding within the central basin would continue to reduce vegetation health and habitat quality for marsh-dependent wildlife species. Eventually, isolated open-water areas may form in the marsh interior as vegetation dies off. The lack of adequate tidal exchange within the central basin of the marsh reduces the sediment load to this area. Low sedimentation rates (and hence low rates of marsh plain accretion) may result in the marsh eventually being drowned with sea-level rise.

Increased ponding duration within the project area and expansion of open water may also lead to increases in mosquito production and potential for the spread of mosquito-borne illnesses such as West Nile Virus. To combat an increase in mosquito production, the District would need to increase surveillance and treatment frequencies at the project site, resulting in greater expense to taxpayers and increased inputs of mosquito control chemicals to the marsh and waters of San Pablo Bay.

### ***Reduced Project Alternative***

The potential impacts of the reduced project alternative are analyzed by comparison to those of the proposed project. Impact analyses for the proposed project are presented in Chapter 3 and Chapter 4.1 of this document. The potential environmental impacts of the reduced project alternative would be very similar to those of the proposed project, due to the similarities in project elements. Construction-related impacts would generally be less under the reduced project, due to the reduced extent of the project elements. For several environmental resource categories, the differences in the impacts between the proposed project and reduced project alternative would be indistinguishable. These categories are, therefore, not discussed further in this document. These categories are:

- Agriculture and Forest Resources (Checklist item II)
- Cultural Resources (Checklist item III)
- Hazards and Hazardous Materials (Checklist item V)
- Land Use and Planning (Checklist item X)
- Mineral Resources (Checklist item XI)
- Noise (Checklist item XII)
- Population and Housing (Checklist item XIII)
- Public Services (Checklist item XVI)
- Recreation (Checklist item XV)
- Utilities and Service Systems (Checklist item XVII)
- Socio-Economics and Environmental Justice (Section 4.1, above)

For all remaining environmental categories, a brief description of the differences in the potential impacts under the reduced alternative, as compared to those of the proposed project, is provided below.

### **Aesthetics (Checklist Item I)**

The reduced project has similar enhancement elements as the proposed project. The key differences are a reduction in the extent of the central basin enhancements and the elimination of the transitional ramp enhancement element. These differences would cause a minor change in the appearance of the project during and after construction. There would be no difference in the significance of any impacts associated with aesthetics compared to the proposed project.

### **Air Quality and Greenhouse Gas Emissions (Checklist Items III and VII)**

The excavation volume for the reduced project would be approximately 40% less than under the proposed project. The amount of material import required to build the marsh access road could be reduced by up to 20% from that needed for the proposed project. Therefore, the construction-related emissions of criteria pollutants and greenhouse gasses would be reduced by similar amounts. There would be no difference in the significance of any impacts associated with air quality or greenhouse gasses compared to the proposed project. This alternative would not expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors. All mitigation measures identified for the proposed project would be implemented for the reduced project alternative.

### **Biological Resources (Checklist Item IV)**

The nature of impacts to biological resources under the reduced project alternative would be similar to those identified for the proposed project. The reduced extent of project elements, and resulting reduction in construction activities, under the reduced project alternative would result in a lesser extent of construction-related impacts to biological resources. However, the reduced project alternative would not include the transitional ramp feature, and therefore the habitat benefits of this feature (refugia during extreme high tides and storm events; nesting/roosting habitat for marsh-dependent bird species) for marsh-dependent wildlife would not be realized. As described in the Biological Resources section, marsh-upland transitional habitat is severely lacking in northern San Pablo Bay tidal wetlands and its creation and enhancement is called for in several regional resource planning documents, including the Final Comprehensive Conservation Plan for the San Pablo Bay National Wildlife Refuge (2011).

The impacts of the reduced project alternative to jurisdictional wetlands and waters are displayed in Figure 16, and are compared to the impacts under the proposed project in Table 17, below. There would be fewer acres of wetlands impacted under this alternative compared to the proposed project, although the reduction in impacts is confined primarily to areas of temporary impact. Although temporary wetland impacts would be reduced under this alternative, the wildlife benefits associated with marsh-upland transitional habitat would not be created. The marsh-upland transitional habitat provides important refuge habitat for marsh-dependent wildlife during extreme high tides and storm events and is considered an important functional component of the tidal marsh ecosystem. The

impact determination under this alternative would also be the same as described for the proposed project. All mitigation measures identified for the proposed project would be implemented for the reduced project alternative.

**Table 17. Impacts to Wetlands and Waters: Proposed Project vs. Reduced Project**

Design Alternative	Permanent Impacts <sup>1</sup> (ac)				Temporary Impacts <sup>2</sup> (ac)	
	Wetlands to Waters	Waters to Wetlands	Uplands to Wetlands	Wetlands to Uplands	Fill Placement on Wetlands	Channel through Waters
Proposed Project	5.96	0.28	0.09	2.00	16.19	0.08
Reduced Project	4.27	0	0	0	8.57	0.08

<sup>1</sup> Permanent habitat type change

<sup>2</sup> No habitat type change

### Geology and Soils (Checklist Item VI)

Impacts related to geology and soils would be similar under the reduced project alternative as under the proposed project, and there would be no change in the significance levels of potential impacts. The reduced extent of project enhancement elements under the reduced project alternative would have a minor effect on the characteristics of the associated impacts. The reduction in extent of unvegetated marsh plain areas following construction would reduce the area of potentially erodible soils as compared to the proposed project. Also, the lack of the transitional ramp in the reduced project alternative would eliminate the benefit of reinforcement of the Tubbs Island perimeter levee provided by this element. However, enhancing levee stability is not a project objective, and this would not result in any negative impact. All mitigation measures identified for the proposed project would be implemented under the reduced project alternative.

### Hydrology and Water Quality (Checklist Item IX)

Impacts to hydrology would be essentially identical under the reduced project alternative and the proposed project. The reduction in project extent would result in fewer potential construction-related impacts to water quality from sediment inputs into tidal waters and from lubricant and fuel contaminants contributed by construction equipment. There would be no difference in the significance of any impacts to water quality under the reduced project alternative as compared to those of the proposed project. All mitigation measures identified for the proposed project would be implemented under the reduced project alternative.

### Transportation and Traffic (Checklist Item XVI)

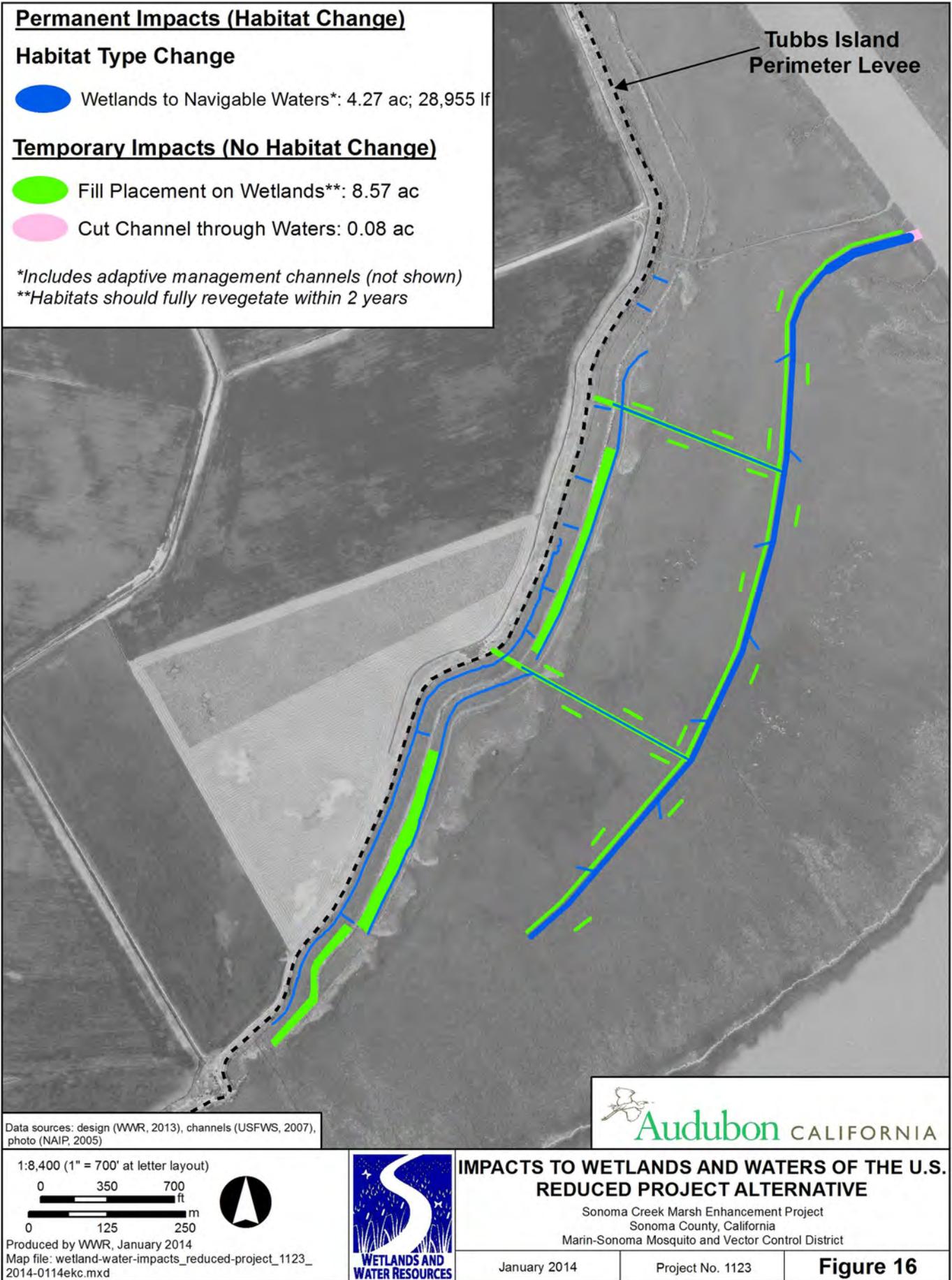
The reduced project alternative may have slightly fewer impacts to transportation and traffic as compared to the proposed project. The reduced project alternative may require less road material to be purchased and delivered to the project site, resulting in a reduction in the number of truck trips. Also, the smaller extent of the reduced project may result in a shorter construction duration, thus reducing the number of trips required by construction crews to access the site. There would be no

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difference in the significance of any impacts to transportation and traffic under the reduced project alternative as compared to the proposed project. All mitigation measures identified for the proposed project would be implemented under the reduced project.



## 4.4 Summary

The proposed project described within this document has been developed to remedy drainage problems and improve habitat conditions in the marsh by (1) improving the connections between isolated, ponded areas and the adjacent tidal waters of Sonoma Creek/San Pablo Bay, (2) by improving internal drainage pathways within the marsh, and (3) by providing marsh-upland transitional habitat. These enhancements are expected to reduce mosquito production and improve habitat conditions to the benefit of marsh-dependent wildlife species, including the endangered salt marsh harvest mouse and California clapper rail.

In addition to meeting the project purpose and need, this proposed action has been designed such that it would have minimal adverse effects on environmental resources while maximizing benefits to fish and wildlife. No significant direct, indirect, or cumulative adverse impacts to environmental resources are expected from construction of the proposed action upon incorporation of mitigation measures. The proposed action is expected to result in direct and indirect benefits to habitats, organisms, and special-status species in Sonoma Creek Marsh by enhancing and diversifying habitat in the marsh. While the reduced project alternative would also improve hydrology and diversify marsh habitat it would not be as effective at addressing the drainage problems within the marsh as the proposed project and it would require much more intensive post-construction monitoring and adaptive management actions to ensure that project goals are met. In addition, the reduced project alternative does not include the transitional ramp and therefore would not address the project goal of increasing marsh-upland transitional habitat in the marsh. The no-action alternative would result in continued degradation of the existing condition of environmental resources in and around the action area and reduced habitat quality for marsh-dependent wildlife. Mosquito control efforts would remain high compared to those that would be necessary with the proposed project or reduced project alternative.

A Finding of No Significant Impact (FONSI) and CEQA Mitigated Negative Declaration are anticipated (33 CFR Part 325; Title 14 C.C.R. §§ 15070-15075); however, the determination of whether to prepare the FONSI and Mitigated Negative Declaration will be made after agency and individual comments are reviewed and incorporated into this IS/EA as appropriate.

## 5. REPORT PREPARERS

### **San Francisco Bay Regional Water Quality Control Board**

Abigail Smith, Environmental Scientist

### **US Fish and Wildlife Service**

Don Brubaker, Refuge Manager

Meg Marriott, Refuge Biologist

Patricia Roberson, NEPA Coordinator

### **Wetlands and Water Resources, Inc.**

Dan Gillenwater, Environmental Scientist

Esa Crumb, Ecologist

Eve Pier-Kieli, Senior Environmental Scientist

### **Grassetti Environmental Consulting**

Richard Grassetti, Principal

### **Lux Environmental Consulting**

April Zohn, Principal

### **Audubon California**

Rachel Spadafore, Restoration Ecologist

### **The RGH Group**

Paul Miller, Principal (Air Quality, Noise, GHG)

### **Holman and Associates**

Miley Holman, Principal (Archaeological Resources)

### **Other**

Denise Bradley, Landscape Historian (Historic Resources)

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Restoration Program. SFEI Contribution #621. San Francisco Estuary Institute, Oakland, CA.

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## Appendix A

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### Table of Special Status Plants in the Project Vicinity

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**Special Status Plants In the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<b>FEDERAL/STATE LISTED, PROPOSED, CANDIDATE AND/OR FULLY PROTECTED SPECIES, CALIFORNIA NATIVE PLANT SOCIETY SPECIES OF CONCERN</b>				
<b>PLANTS:</b>				
<i>Astragalus tener</i> var. <i>tener</i> Alkali milk-vetch	CNPS – 1B.2	Inhabits valley and foothill grasslands, alkali sinks, freshwater wetlands, and vernal pools; flowering period is March through June	Suitable habitat does not occur within the project site. The nearest occurrence to the site was reported roughly 7.5 miles away along American Canyon Creek.	Not expected
<i>Atriplex joaquinana</i> San Joaquin spearscale	CNPS - 1B.2	Occurs in alkali wetlands/sinks, chenopod scrub, alkali meadows, and grasslands up to 835 meters in elevation; flowering period is April to October	Suitable habitat is not present at the project site. There are two reported occurrences within 8 miles of the site, one along the Napa River and a second along the American Canyon Creek (east of the Napa River)	Not expected
<i>Chloropyron maritimum</i> ssp. <i>palustre</i> Point Reyes bird's beak	CNPS - 1B.2	Inhabits coastal marshes and swamps below 10 meters; flowering period is June through October	Suitable habitat is present at the site in areas with suitable host plants; the closest reported occurrences is roughly 8.5 miles from the site within the Petaluma Marsh, between Woloki and Mud Hen sloughs	Possible
<i>Chloropyron mollis</i> ssp. <i>mollis</i> Soft bird's beak	FE, SR, CNPS - 1B.2	Inhabits coastal marshes and swamps below 10 meters; flowering period is July through November	Suitable habitat is present at the site in marsh areas with suitable host plants; there are multiple occurrences within 10 miles of the site, the nearest was reported less than 4 miles from the site on a levee bordering Dutchman Slough at the confluence with South Slough	Possible
<i>Cicuta maculata</i> var. <i>bolanderi</i> Bolander's water-hemlock	CNPS – 2.1	Occurs in coastal marshes and swamps, in fresh or brackish water, below 200 meters; flowering period is July through September	Suitable habitat is present; however, there are no reported occurrences within 10 miles of the site	Not Expected
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> Delta tule pea	CNPS - 1B.2	Inhabits the Central Valley and San Francisco Bay Area coastal and estuarine marshes below 30 meters in elevation; flowering period occurs from May through July	Suitable habitat is present at the site on levees with suitable riparian scrub; there are multiple occurrences within 10 miles of the site the nearest of which occurs roughly 4 miles from the site at the former Cullinan ranch at confluence of South and Dutchman sloughs	Possible
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	SR, CNPS - 1B.1	Inhabits approximately sea-level intertidal marshes and streambanks within the Sacramento Valley and San Francisco Bay Area; flowering period persists from April through November	Suitable habitat does occur on the site along tidal channels with suitable bank habitat; there are several occurrences within 10 miles of the site. The closest reported occurs is roughly 7 miles from the site along the east shore of the Napa River near the mouth of White Slough.	Possible

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

**Special Status Plants In the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Symphotrichum lentus</i> Suisun marsh aster	CNPS - 1B.2	Endemic to brackish and freshwater marshes and along banks of sloughs and waterways within the Suisun Marsh and the Delta; found at elevations below 150 meters; flowering period extends from May through November	This species inhabits brackish and freshwater habitat; therefore, the Project area is likely too saline to support this species. This species has been documented within 10 miles of the site, including two occurrences roughly 7 miles away within the (brackish) Fagan Marsh Ecological Reserve	Not Expected
<i>Trifolium hydrophilum</i> saline clover	CNPS - 1B.2	Inhabits marshes and swamps, mesic and alkaline valley and foothill grasslands, and vernal pools up to 300 meters; flowering period is April through June	Suitable habitat may potential be present within tidal marsh areas dominated by saltgrass. This species has been documented in multiple areas within 10 miles of the site, with the closest documented occurrence roughly 5.5 miles from the site within the Viansa Wetlands west of Sonoma Creek.	Possible

<sup>1</sup> Explanation of State and Federal Listing Codes

Federal listing codes:		California listing codes:		California Native Plant Society:	
FE	Federally listed as Endangered	SE	State listed as Endangered	1B.1	Rare, threatened or endangered in California and elsewhere: Seriously endangered in California
FT	Federally listed as Threatened	ST	State listed as Threatened	1B.2	Rare, threatened or endangered in California and elsewhere: Fairly endangered in California
				2	Rare, threatened or endangered in California and elsewhere: More common elsewhere

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## Appendix B

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### Table of Special Status Wildlife and Fish in the Project Vicinity

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration  
**Special Status Wildlife and Fish in the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<b><u>INVERTEBRATES:</u></b>				
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	FT	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County. Common in vernal pools; also found in sandstone rock outcrop pools.	Suitable habitat not present on the site. A single occurrence record exists roughly 8 miles from the site near the Napa airport.	Not Expected
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	FT	Central Valley, found only in association with its host plant, the elderberry ( <i>Sambucus</i> sp.), a common scrub of riparian forests/scrub along river corridors of the Central Valley.	Suitable host plants not present on the site and there are no reported occurrences within 10 miles of the site.	Not Expected
<i>Syncaris pacifica</i> vernal pool tadpole shrimp	ST	Inhabits freshwater perennial streams and is known from Marin, Napa, and Sonoma Counties. Has a limited distribution, last reported to occur within 17 stream segments.	Suitable habitat not present at the site. A single occurrence has been reported roughly 8 miles from the site in a tributary creek (Huichica Creek) to the Napa River.	Not Expected
<b><u>FISH:</u></b>				
<i>Acipenser medirostris</i> Green sturgeon	FT	Generally found in marine waters, adults and subadults are oceanic but enter the San Francisco estuary during the spring and remain through autumn. Spawns in the Sacramento and Klamath Rivers; spawns at temperatures between 8-14 C; preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	Suitable habitat present in the open waters adjacent to the site. No CNDDDB documented occurrences within 10 miles of the site, but this species has been captured in San Pablo Bay (Keller et al. 2006).	Possible
<i>Eucyclogobius newberryi</i> tidewater goby	FE, CH	Inhabits fresh-saltwater interfaces where salinity is less than 10 to 12 ppt, such as the upper edge of tidal bays, near entrances of freshwater tributaries, and in coastal lagoon. This species prefers relatively shallow and still waters with aquatic vegetation.	Potential habitat is present adjacent to the site in San Pablo Bay. The nearest occurrence record is roughly 8 miles from the site.	Possible

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration  
**Special Status Wildlife and Fish in the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Hypomesus transpacificus</i> delta smelt	FT, CH, ST, AFS-T	Inhabits brackish water in the Sacramento-San Joaquin Delta. Delta smelt have been documented as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River and downstream as far as San Pablo Bay. Breed in freshwater habitat during winter and spring.	Suitable habitat is present adjacent to the site. There are multiple CNNDDB records within 10 miles of the site, including one documented occurrence less than three miles from the site within San Pablo Bay (south of the junction of Highways 37 and 29).	Possible
<i>Oncorhynchus mykiss</i> steelhead (central California coast DPS)	FT	Inhabits freshwater (hatch/spawn) and migrate to the ocean to mature. The CCC DPS spawns in coastal streams from the Russian River to Aptos Creek, and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island; and tributary streams to Suisun Marsh.	Suitable habitat present adjacent to the site in San Pablo Bay and in tidal channels on the site. Several occurrences have been reported within 10 miles of the site, the closest documented occurrence was 7 miles from the site within North Slough, a tributary of the Napa River. Steelhead are known to spawn in Sonoma Creek.	Possible
<i>Oncorhynchus tshawytscha</i> Chinook salmon (Central Valley fall - and late fall –run ESU)	SC/SSC	Inhabits the open water habitats of San Pablo Bay for feeding before returning to freshwater to spawn. Fall-run salmon migrate back to their freshwater spawning habitats within the Napa River Watershed and Sonoma Creek Watershed , among others. Genetic data suggest these populations are Central Valley Fall/Late Fall run (NMFS 2011).	Suitable habitat present in the open water habitat of San Pablo Bay and the tidal channels on the site.	Possible
<i>Pogonichthys macrolepidotus</i> Sacramento splittail	CSC	Historically found in the sloughs, slow-moving waters, and lakes of the Central Valley and were once common in San Pablo Bay (LSA 2009); prefers warm water, aquatic vegetation is essential for young.	Suitable habitat present in the adjacent San Pablo Bay and in tidal channels on the site. No documented CNNDDB occurrences are within 10 miles of the site; however, this species has been documented within the San Pablo Bay Wildlife Area.	Possible

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**Special Status Wildlife and Fish in the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Spirinchus thaleichthys</i> longfin smelt	ST	Short lived species that spends most of their adult life in bays, estuaries, and nearshore coastal areas, and migrate to freshwater rivers to spawn.	Suitable habitat present in adjacent San Pablo Bay and in tidal channels on the site. Known to occur in San Pablo Bay and has been documented within the San Pablo Bay Wildlife Refuge.	Possible
<b>AMPHIBIANS AND REPTILES:</b>				
<i>Actinemys marmorata</i> western pond turtle	CSC	A moderate sized freshwater turtle that inhabits permanent or nearly permanent bodies of water and low gradient slow moving streams below 6000 feet elevation. Range extends from Washington to the northern Bay Area counties along the Pacific slope drainages. Two recognized subspecies the northwestern pond turtle ( <i>A. m. marmorata</i> ) which ranges north of the American River and the southwestern pond turtle ( <i>A. m. pallida</i> ) which ranges from the coastal areas south of San Francisco. Subspecies interbreed within the gradation zone that defines the two subspecies.	Suitable habitat is not present at the Project site; however, suitable habitat is present in tributary creeks to Sonoma Creek. The nearest reported occurrence to the Project area is roughly 8 miles east of the site.	Not Expected
<i>Masticophis lateralis euryxanthus</i> Alameda whipsnake	FT, ST	Inhabits coastal sage scrub and chaparral communities with rock outcrops, will also venture into adjacent grasslands and open woodlands to forage.	This species has a very limited range and is not expected to occur at the site	Not Expected
<i>Rana draytonii</i> California red-legged frog	FT, CH CSC	Inhabits lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation up to 1,500 meters in elevation (Jennings and Hayes 1994, Bulger et al. 2003, Stebbins 2003). Range extends from Redding to Baja California, Mexico with hybridization occurring with the California red-legged frog from the Oregon border to Marin County. Breeding occurs between November and April in standing or slow moving water at least 0.7 meters (2 ½ feet) in depth with emergent vegetation, such as cattails ( <i>Typha</i> spp.), tules ( <i>Scirpus</i> spp.) or overhanging willows ( <i>Salix</i> spp.) (Hayes and Jennings 1988).	Suitable habitat is not present within the project area as this species cannot tolerate brackish conditions; however, tributary creeks to Sonoma Creek do provide potential habitat. The nearest reported CNDDDB occurrence is from an unnamed tributary creek to Sonoma Creek less than 3 miles from the Project site.	Not Expected

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration  
**Special Status Wildlife and Fish in the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<b><u>BIRDS:</u></b>				
<i>Agelaius tricolor</i> tricolored blackbird (nesting colony)	CSC	Highly colonial species, most numerous in central valley & vicinity. Largely endemic to California. Nest in emergent vegetation within aquatic and riparian habitats. Breeding begins in March; double-brooded (Baicich & Harrison 2005).	No suitable nesting habitat present at the site due to a lack of riparian woodland. Nearest documented occurrence is roughly 4 miles west of the site.	Not Expected
<i>Athene cunicularia hypugaea</i> western burrowing owl	CSC	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows. Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas.	Suitable habitat not present at the site; however, there are numerous occurrence within 10 miles of the site, with the nearest documented occurrence 2 miles northwest of the site.	Not Expected
<i>Buteo swainsoni</i> Swainson's hawk	ST	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields. Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, and Yolo County.	Suitable habitat not present at the site. A few occurrences have been documented roughly 9 miles northeast of the site.	Not Expected
<i>Charadrius alexandrinus nivosus</i> western snowy plover	FT	Nesting typically occurs just above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creeks and river mouths, and salt pans at lagoons and estuaries (USFWS 2007).	Suitable nesting habitat is not present at the site. The nearest documented occurrence is roughly 3.5 miles east of the site, west of the Napa River.	Not Expected
<i>Geothlypis trichas sinuosa</i> salt marsh common yellowthroat	CSC	Inhabits freshwater marshes, coastal swales, swampy riparian thickets, brackish marshes, salt marshes, and the edges of disturbed weed fields and grasslands that border soggy habitats. In the San Francisco Bay regions, the majority (60%) breed in brackish marsh and small percentage (5%) in salt marsh (LSA 2007).	Suitable habitat present at the site. There are numerous reported occurrences within 10 miles of the Project area. The nearest reported occurrence is less than a half miles from the site, directly east of the site, on the opposite side of Sonoma Creek.	Expected
<i>Laterallus jamaicensis coturniculus</i> California black rail	ST	Inhabit fresh, brackish, and pickleweed dominated salt marshes. Prefers a heavy canopy of pickleweed for nesting in salt marsh habitats. (LSA 2007). Wintering habitat similar to breeding habitat. Breeding begins in March (Baicich & Harrison 2005).	Suitable habitat present is areas with dense pickleweed cover. There are numerous documented occurrences within 10 miles of the Project area; the closest reported occurrence is approximately 2 miles SW of the site at Tubbs Island.	Possible

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration  
**Special Status Wildlife and Fish in the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Melospiza melodia samuelis</i> San Pablo song sparrow	CSC	Subspecies restricted to tidal marshes surrounding the San Pablo Bay sub-region (northern edge of San Pablo Bay to Tiburon). San Pablo song sparrows are found in nearly all tidal marshes salt marshes of San Pablo Bay. This species requires dense vegetation (cordgrass, pickleweed, and gumplant) for nesting sites, perches, and cover (LSA 2007).	Suitable habitat present in vegetated areas. There are numerous reported occurrences within 10 miles of the site, including a documented occurrence within the Project area.	Expected
<i>Rallus longirostris obsoletus</i> California clapper rail	FE,SE	Inhabits tidal salt and brackish marshes of the greater San Francisco Bay. Prefers areas dominated by tall pickleweed and Pacific cordgrass and are also associated with gumplant, saltgrass, alkali heath, and jaumea in high marsh (LSA 2007).	Suitable habitat present at the site in areas dominated by pickleweed and cordgrass. Numerous occurrences reported within 10 miles of the site, including a documented occurrence less than a half-mile from the site, across from Sonoma Creek (east).	Possible
<i>Sterna caspia</i> Caspian tern	Other	Winter resident of California, occurs in shallow estuarine or inshore marine habitats, freshwater lakes, marshes, sloughs, reservoirs, irrigation canals, and low salinity saline lakes.	A single occurrence was documented roughly 5 miles from the site. Suitable open-water habitat not present on-site.	Not Expected
<b><u>MAMMALS:</u></b>				
<i>Antrozous pallidus</i> pallid bat	CSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Man-made roosts are also used.	No suitable habitat present at the site. Several occurrences have been documented within 10 miles of the site, the nearest being roughly 5 miles east of the site.	Not Expected
<i>Reithrodontomys raviventris</i> salt marsh harvest mouse	FE,SE	Inhabits saline or subsaline marsh habitats around the San Francisco Bay estuary and some saline/brackish habitats within Suisun Marsh. Occurrence is strongly correlated with presence of abundance pickleweed, but also require high tide cover areas and escape habitat (USFWS 2010).	Potentially suitable habitat present in areas dominated by pickleweed with adjacent refuge/escape habitat. There are numerous reported occurrences within 10 miles of the Project area, including 2 occurrences along the northern boundary of the Project site.	Possible

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration  
**Special Status Wildlife and Fish in the Project Vicinity**

SPECIES NAME COMMON NAME	LISTING STATUS <sup>1</sup>	HABITAT REQUIREMENTS & ADDITIONAL NOTES	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Sorex ornatus sinuosus</i> Suisun shrew	CSC	Inhabit tidal marshes with cordgrass, pickleweed, and gumplant. Also found in brackish marshes. Require dense, low lying cover where invertebrates are abundant and adjacent uplands for cover and food during prolonged flood periods.	Potentially suitable habitat present in areas dominated by dense pickleweed and cordgrass cover with suitable adjacent uplands. Numerous occurrences documented within 10 miles of the site including an occurrence less than a half miles from the site, across the mouth of Sonoma Creek.	Possible
<i>Taxidea taxus</i> American badger	CSC	Commonly associated with grasslands, savannas, mountains meadows, and open areas of desert scrub (LSA 2007).	No potential habitat present. A single occurrence was documented roughly 9.5 miles north of the site.	Not Expected

<sup>1</sup> **Explanation of State and Federal Listing Codes**

Federal listing codes:

- FE Federally listed as Endangered
- FT Federally listed as Threatened
- FPE Federally proposed for listing as Endangered
- FPT Federally proposed for listing as Threatened
- FPD Federally proposed for delisting
- FC Federal candidate species (former Category 1 candidates)
- SC Species of Concern (NMFS regulated species only)

California listing codes:

- SE State listed as Endangered
- ST State listed as Threatened
- SR State listed as Rare
- SCE State candidate for listing as Endangered
- SCT State candidate for listing as Threatened
- CSC California Species of Special Concern
- FP Fully Protected

**CH** Critical Habitat (Proposed or Final) is designated.

**AFS** American Fisheries Society identifies marine, estuarine and diadromous fish species that are at risk of extinction in North America. The AFS has designated the following four classifications in order of conservation importance E – Endangered, T – Threatened, V – Vulnerable, and CD – Conservation Dependent.

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

## Appendix C

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Cultural Resources Report (Holman and Associates 2013)



**holman & ASSOCIATES**  
Archaeological Consultants

"SINCE THE BEGINNING"

**3615 FOLSOM ST. SAN FRANCISCO,  
CALIFORNIA 94110 415/550-7286**

25 March 2013

Richard Grasseti  
Grasseti Environmental Consulting  
7008 Bristol Dr.  
Berkeley, CA 94705

Re: Results of an Archaeological Records Search for Sonoma Creek Enhancement Project, along Tubbs Island in Southeastern Sonoma County within and adjacent to San Pablo Bay National Wildlife Refuge

Dear Mr. Grasseti:

On 9 November 2011, I conducted a records search at the Northwest Information Center of the California Historical Resources Information System (NWIC), an adjunct to Sonoma State University in Rohnert Park (File number 12-0924). All cultural resources within one half mile were examined and reviewed, and all cultural resources investigations within one half mile were reviewed with pertinent information discussed below.

### **CULTURAL RESOURCES IDENTIFIED**

No cultural resources have been recorded within the study area (Map 1). Within a half mile of the study area, four historic-era resources have been recorded; all had been directly shaped by their proximity to San Pablo Bay, and the adjacent reclaimed marshlands. A brief description of these resources is provided.

**P-48-212/P-28-1324** refers to the Duck Clubhouse/Fleishhacker Club/Detjen Duck Club a vernacular two-story building constructed around 1900. The building was located at the border of Napa and Solano counties on Island No. 1 between State Route 37 and the Napa Slough (McKee 1995a). The resource was designated with two primary numbers to reflect its span within two counties: Napa and Solano.

**P-49-3947** denotes two pump houses, two pumping stations, and a levee associated with the reclamation of Skaggs Island and now situated within Skaggs Island's Naval Reserve (Ghabhláin and Stringer-Bowsher 2008).

**P-49-4272** was assigned to the Yenni Ranch Complex, a combination of historic-era and modern buildings and structures which includes a Craftsman-style house, outbuildings including a pump house,

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

historic-era landscaping, a historic-era dirt road, and a historic-era dump (Ballestros et al. 2010). Situated on Tubbs Island, the complex is north of State Route 37 on a western levee bank by Sonoma Creek.

**P-49-4275** consists of a concrete pier or foundation fragment, and a grove of historic-era eucalyptus trees that is situated north of State Route 37 on Tubbs Island (Elliot et al. 2010).

### **PERTINENT STUDIES**

Four projects studied the lands in the northernmost portion of the Sonoma Creek Enhancement Project or the lands abutting it. None of these identified any cultural resources within or near the current study area. In 1980, an archaeological sensitivity study was conducted for the Lakeville-Sobrante Transmission Line (Damon and Gerike 1980). A portion of that project area was situated a short distance north of the northern portion of the current study area. The geology for that location was labeled as “areas of unstable slopes in soft sedimentary rock” that was interpreted as having a low potential for Native American archaeological sites based on the range of recorded Native American sites in the area. This sensitivity study was followed by a 1983 survey for portions of that pipeline including an area that crossed onto the north side of State Route 37 near the Sonoma Creek Enhancement Project. That area is beyond the levee system that frames Tubbs Island south of the highway (Roper 1983).

Two surveys were conducted either for or by California Department of Transportation (Caltrans) consisting of lands on either side of State Route 37 including those adjacent to the northern portion of the Sonoma Creek Enhancement Project’s study area (Chavez 1997; Hayes 1995). Hayes (1995:2-3) noted that the previously recorded nearby sites were Nelson shellmounds (Native American midden sites) that were situated on higher lands overlooking the marshlands. Chavez (1997:2, 3) described his area of potential effects (APE) as fill on top of reclaimed marshlands.

Within a half mile of the current study area, five other studies have been completed, documenting the prehistoric and historic-era use of those specific lands as well as providing various historic contexts for the reclamation and use of this area. These investigations are presented from oldest to most recent. In 1996, Valentine conducted a study for the Tolay Creek Restoration Project as part of U.S. Fish and Wildlife Services. He documented that Upper Tubbs Island east and west of Tolay Creek and north of the current State Route 37 was reclaimed between 1866 and 1900, and that Lower Tubbs Island was reclaimed and a levee system constructed between 1900 and 1940. Most of his pedestrian survey was limited to the levee and railroad tracks. Although Valentine briefly discussed the levees, he did not record any of them, conduct further research to refine their initial date of construction, or present a formal evaluation, but he stated that no historic properties were present within his APE.

Beard (2005, 2010) conducted two studies of Dickson Ranch which lies west of Tolay Creek and south of Sears Point Road. A cultural resources survey identified nine historic-era resources consisting of an early 20<sup>th</sup> century ranch complex, segments of a 1880s railroad grade and three related features, and a levee system. The second study consisted of an evaluation of these historical features, buildings, structures, and complexes. Her research into the Dickson Ranch Water System documented the initial levee constructed in the 1870s with improvements continuing to the 1940s. The recorded system consisted of levee, ditches, pumps, sheds, footbridge, house pumps, and other machinery. None of the resources appeared eligible to the National Register of Historic Places.

An historic resources survey and evaluation of the Naval Security Group Activity at Skaggs Island identified P-49-3947 described above, and many other building and structures (Ghabhláin and Stringer-Bowsher 2009). These resources date from the early 1910s farming of the area through the late

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

1930s, followed by a small number constructed during World War II, and several more associated with Cold War activities dating before 1958.

As part of Caltrans fieldwork, an historic architectural survey report was prepared that recorded several buildings and structures from a former duck club including the above described clubhouse designated P-48-212/P-28-1324 (McKee 1995b). Like Beard's studies, McKee's overview included the reclamation of this area along with other research issues consisting of transportation, ranches, duck clubs, and salt ponds.

California Office of Historic Preservation's *Historic Property Data File* combines several state and federal inventories, including the *National Register of Historic Places* and the *California Register of Historical Resources, California Historic Landmarks*, and most *Points of Historic Interest*. This inventory and the *California Inventory of Historic Resources* list no resources within or directly adjacent to the Project APE (CA-DPR 1976; CA-OHP 2012).

Historic-era maps pertaining to the Sonoma Creek Enhancement study area depict the changes in the bay, marshlands, and dry lands of this area over time. An 1856 map shows the area as marshy wetlands prior to infilling of the bay from mining debris washed downstream from hydraulic mining in the Sierras and deposited throughout San Francisco Bay (Nichols and Wright 1971 citing, U.S. Coast and Geodetic Survey 1856). By 1876, a levee had been constructed on the west side of Sonoma Creek encircling much of San Pablo Bay (Bowers 1867, Thompson 1876). By 1902, the levee is clearly depicted encompassing dry land called Tubbs Island (U.S. Coast and Geodetic Survey 1902, 1916).

If you have any questions, please contact me or Miley Holman,

Sincerely,



Sunshine Psota, M.A., RPA  
Senior Historical Archaeologist

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

## Appendix D

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Historic Resources Evaluation Report (Bradley 2013)

# **Historic Resources Evaluation Report Sonoma Creek Enhancement Project Sonoma County, CA**



**Prepared  
for  
Grassetti Environmental Consulting  
7008 Bristol Drive  
Berkeley, CA 94705**

**Prepared  
by  
Denise Bradley, Landscape Historian  
520 Frederick Street, No. 37  
San Francisco, CA 94117**

**5 April 2013**

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Results of an Archaeological Record Search for Sonoma Creek Enhancement Project (Psota 2013)

## **INTRODUCTION**

### **Project Description**

The Marin-Sonoma Mosquito and Vector Control District (District) in collaboration with the U.S. Fish and Wildlife Service San Pablo Bay National Wildlife Refuge (Refuge) wishes to enhance drainage conditions in the fringing tidal marsh (the Marsh) along the western bank of Sonoma Creek, south of Highway 37 in Sonoma County, California (Figures 1 and 2). This marsh routinely ponds water for long periods following spring tides and storm events when high waters inundate the entire marsh and become trapped in a large topographic basin in the marsh interior. In addition, a series of relic levee berms (abandoned former levee alignments) exist along the western boundary of the marsh, which serve as impediments to marsh drainage, and isolated ponded areas have formed between them. The ponded water in these problem areas leads to high mosquito production rates and reduced vigor of marsh vegetation, especially pickleweed (*Sarcocornia pacifica*), which, in turn, reduces habitat functions for the endangered salt marsh harvest mouse (*Reithrodontomys raviventris halicoetes*) and other marsh-dependent species (WWR 2013: 1).

The District routinely monitors and treats the Marsh with approved chemicals to manage the mosquito populations that develop following high tides and storm events. They have also installed small drainage ditches throughout the Marsh to reduce ponding in isolated areas; however limited improvement of overall marsh drainage has resulted. The District is seeking a longer term solution for managing mosquito populations by improving drainage conditions within the Marsh, thereby reducing the need for continuous surveillance and pesticide application. The Refuge wishes to improve habitat conditions for salt marsh harvest mouse and other tidal marsh-dependent species by (1) improving drainage conditions to increase the quality of the dominant marsh vegetation (pickleweed), (2) increasing the amount and quality of marsh channel habitat, and (3) providing marsh-upland transitional habitat wherever possible (WWR 2013: 1).

The Enhancement Plan, developed by Wetlands and Water Resources, Inc. (WWR) in collaboration with the District and the Refuge, aims to remedy the drainage problems and improve habitat conditions in the Marsh by improving the connections between isolated, ponded areas and the adjacent tidal waters of Sonoma Creek/San Pablo Bay, and by improving internal drainage pathways within the Marsh. These enhancements are expected to reduce mosquito production and improve habitat conditions to the benefit of marsh-dependent wildlife species (WWR 2013: 1).

### **Purpose of Historic Resources Evaluation Report**

Several built environment features (including the Tubbs Island perimeter levee, relic levee berms, mosquito control ditches, and a collapsed shed) located within the Project site appear to be old enough to be potentially eligible for the California Register of Historical Resources (CRHR) and National Register of Historic Places (NRHP). The purpose of this report is to evaluate the potential significance of these features under the CRHR and NRHP criteria.

## **REGULATORY CONTEXT**

The evaluations of the built environment features within the Project footprint were conducted in compliance with both the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA), and its implementing regulations (36 Code of Federal Regulations [CFR] Part 800).

### **Federal Regulations**

The NHPA is triggered when a project requires federal permits. To establish the significance of a property, the NRHP criteria for evaluation set forth in 36 CFR Part 60.4 must be applied. The following criteria are designed to guide the states, federal agencies, and the Secretary of the Interior in evaluating potential entries for the NRHP. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that:

- A. Are associated with events that have made significant contribution to the broad patterns of our history; or
- B. Are associated with the lives of persons significant in our past; or
- C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. Have yielded, or may be likely to yield, information important in prehistory or history.

The question of integrity is another factor that must be addressed when determining the eligibility of a resource for listing in the NRHP. The Secretary of the Interior describes integrity as “the ability of a property to convey its significance.” A property must retain certain intact physical features in order to convey its significance under one or more of the NRHP criteria. Integrity is judged on seven aspects; location, design, setting, workmanship, materials, feeling, and association.

If a particular resource meets one or more of these criteria and retains sufficient integrity to convey its historical significance, it is considered as an eligible “historic property” for listing in the NRHP. Additionally, unless exceptionally significant, a property must be at least 50 years old to be eligible for listing.

### **State Regulations**

The State of California implements the NHPA of 1966, as amended, through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state’s jurisdictions.

***California Register of Historical Resources***

The CRHR is “an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change” (Public Resources Code [PRC] Section 5024.1[a]). The criteria for eligibility to the CRHR are based on NRHP criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined eligible for or listed in the NRHP.

To be eligible for the CRHR a historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the CRHR, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

***California Environmental Quality Act***

CEQA, as codified in PRC Sections 21000 et seq., is the principal statute governing the environmental review of projects in the state involving discretionary actions by public agencies. CEQA requires lead agencies to determine if a proposed project would have a significant effect on important historical resources, including archaeological resources. The State CEQA Guidelines section 15064.5 [a] and [b] define a historical resource as: (1) a resource in the CRHR; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency’s determination is supported by substantial evidence in light of the whole record.

## **METHODS**

### **Personnel**

This *Historic Resources Evaluation Report* was prepared by cultural landscape specialist Denise Bradley. Ms. Bradley documented and evaluated the Tubbs Island perimeter levee and relic levees in the Sonoma Creek Marsh for their potential as historic cultural landscape features. Ms. Bradley (MLA, Louisiana State University, 1986) has worked as a cultural landscape historian in California and has evaluated cultural landscape features as part of the built environment under the NRHP and CRHR criteria since 1993. She meets the Secretary of the Interior's Historic Preservation Professional Qualifications for Historians.

### **Field Methods**

Denise Bradley visited the Project site on 29 March 2013. The photographs and field notes taken during this visit were used in the preparation of the description of the built environment features under review and aided in the analysis and evaluation of the potential significance for these features.

### **Research Methods**

Holman & Associates Archaeological Consultants conducted a records search at the Northwest Information Center (NWIC) which found that no cultural resources have been recorded within the project study area (Psota 2013:1). Additionally, the California Office of Historic Preservation's *Historic Property Data* file (which combines several state and federal inventories including the *National Register of Historic Places* and the *California Register of Historical Resources, California Historic Landmarks*, and most *Points of Historic Interest*) and the *California Inventory of Historic Resources* listed no resources within or directly adjacent to the Project site (CA-DPR 1976; CA-OHP 2012) (Psota 2013: 3). Copies of cultural resource reports within or near the current study area were obtained that provided information on the history of Tubbs Island and historic contexts related to reclamation, agriculture, transportation, and duck hunting for this general vicinity (Beard 2010; Ghabhlain and Stringer-Bowsher 2009; Jones & Stokes 2003, McKee 1995; URS 2009; Valentine 1996); this information and the relevant references cited in these reports were reviewed. The *Sonoma Creek Enhancement Project Administrative Final Enhancement Plan* (WWR 2013) provided information on the history of the development of the Sonoma Creek Marsh as a centennial marsh. Other research included a review of United States Coast and Geodetic Survey (USCGS) maps (various dates), United States Geological Survey (USGS) maps (various dates), county surveys (Bowers 1867; Thompson 1877; Reynolds & Proctor 1898; Ricksecker 1900; McIntire & Lewis 1908; Peugh 1934), and aerial photographs (n.a. 1951; Aero Service Corp. 1941; Google Earth various dates) available through online sources and the University of California Berkeley Earth Sciences and Map Library. The focus of this research was obtaining information on the dates for the construction of the Tubbs Island perimeter levee and the relic levees in the Sonoma Creek Marsh and subsequent changes to these features. A full list of the references is provided in the bibliography.

### **Evaluation Methods**

The CRHR and NRHP criteria were used in evaluating the significance of the Tubbs Island perimeter levee (adjacent to the project footprint), relic levees located within the project footprint. The California OHP's *Technical Assistance Series #6: California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register)* (CA-OHP n.d.) and *Technical Assistance Series #7: How to Nominate a Resource to the California Register of Historical Resources (Revised 2001)* (CA-OHP 2001) were consulted in relation to the CRHR criteria. The CRHR does not provide specific guidance for evaluating cultural landscapes. However, the CRHR was consciously designed on the model of the NRHP (the two programs are extremely similar, although there are areas in which these programs differ), and the National Park Service publications *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (NPS 2002) and *National Register Bulletin 30: How to Evaluate and Document Rural Historic Landscapes* (NPS 1999) were consulted in relation to the NRHP criteria. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (NPS 1998) was consulted on the procedures related to research and documentation for cultural landscapes.

### **HISTORIC CONTEXTS**

A summary of the historic contexts related to the reclamation of the San Pablo Bay tidelands, transportation, agriculture, and duck hunting is provided below.

The tidelands of the San Pablo Bay became part of the state's land holdings following California's entry into the United States in 1850 but remained largely undeveloped during the 1850s and 1860s (URS 2009: 3-91). Changes to the landscape and natural environment within the tidelands began in earnest in the 1870s following the passage of the state legislation commonly known as the Green Act (after the author of the legislation, Democratic assemblyman Will Green). Under the Green Act, the previous 640-acre limit on the amount of "swampland" that an individual could purchase was removed so that individuals were then able to purchase an unlimited amount of land for a dollar an acre. The Green Act also included a provision whereby swampland developers could receive back this purchase price after proving that their land had been cultivated for three years (thereby proving that they had reclaimed and "improved" the land) (Kelley 1989: 58-61). With these new provisions and "[w]ith the impetus of the wheat boom behind it, the Green Act set off a great and historic land rush in California (Kelley 1989: 61), and between 1868 and 1871 "practically all of the state's millions of acres of swampland holdings passed into private lands" (Kelley 1989: 62).

By 1880, 15,000 acres of tidelands on the northern margins of the San Pablo Bay was in the process of reclamation (Monro-Fraser 1880). Two companies dominated the reclamation efforts in this area. The Pacific Reclamation Company owned approximately 12,000 acres situated primarily west of Sonoma Creek, and the San Pablo Land Company owned about 5,000 acres including the area that became Tubbs Island (located immediately west of the Project site) (Thompson 1877; Monro-Fraser 1880; Caltrans 2005). The two companies had initially planned on hiring Chinese workers and building the levees with hand labor (Wilson 1997); "however, this method proved ineffective

because the strong tidal action of the bay outpaced the workers and eventually a floating dredge was used to complete the levees" (Beard 2010: 5). By the early twentieth century, most of the tidelands along the northern margins of the Bay had been enclosed by some form of a levee system and drained and were being used for livestock grazing and raising grain crops, in particular alfalfa hay for dairies and for livery stables within the greater San Francisco Bay Area (Caltrans 2005; URS 2009: 3-92). Although the market for hay declined drastically in the 1920s as automobiles and trucks became the dominant form of transportation, farming operations switched to other crops and continue today on portions of the reclaimed tidelands, including Tubbs Island.

Flat-bottom scows and later steamers and local rail lines were used to transport the hay to these markets. Landings on the newly enclosed islands provided access to creeks and sloughs, and seasonal wagon roads provided transportation links between these landings and the rail lines. By the early 1900s, these transportation features were present on Tubbs Island; a landing on the northwest side of Tubbs Island provided access to Sonoma Creek, and a wagon road cut across the north end of Tubbs Island between Tolay Creek and the Tubbs Island landing on Sonoma Creek (USCGS 1906; USGS 1902).

On the west side of Tolay Creek, a rail line, which had been built in 1878 by the Sonoma Valley Railroad Company (SVRR; later the Northwestern Pacific Railroad) linked Sonoma to the Sonoma Landing. Here a quarter-mile long wharf allowed steamers to load and unload cargo and passengers (Beard 2010: 6). In 1886, the Marin and Napa Railroad Company was formed to construct a rail line across the Petaluma River to Pacheco (now Ignacio) and departed from the SVRR south of Sears Point where it joined the San Francisco & North Pacific Railroad (SF&NP) at Ignacio, where rail lines ran north to Cloverdale and south to Tiberon (Beard 2010: 7). The rail lines remained viable modes of transportation "well into the twentieth century when the advent of the automobile and paved roadways eventually eclipsed rail transport" (USFWS 2012: 3.13-10).

During the late nineteenth and early twentieth centuries, roads in the San Pablo Bay tidelands were limited to unpaved wagon roads—such as the one across the north end of Tubbs Island—which were often not accessible during the winter rainy season (Jones and Stokes 2003: 17). The 10.2 mile Sears Point Toll Road, which ran along the north shore of the San Pablo Bay between Sears Point, across Tubbs Island, and to Vallejo, opened in 1928 and was built within a 160-foot-wide right-of-way on dredged fill. The road was added to the state highway system around 1939 as Route 208 and then later renumbered to Route 37. It was widened in 1942, and the original steel bascule bridge across Sonoma Creek Bridge (north of the Project site) was replaced with a concrete bridge in 1967. The road was realigned and widened again in 1969 and in the late 1990s (McKee 1995: 2 and 4).

For centuries, parts of California, including the tidal marshes near the San Pablo Bay, have served as the main wintering quarters for migratory waterfowl in the Pacific Flyway. As early as the 1850s, duck hunters traveled to the area to shoot waterfowl commercially for the San Francisco markets (Jones & Stokes 2003: 15). The *Cultural Resources Inventory and Evaluation Report* prepared by Jones & Stokes for the Napa

River Salt Marsh Restoration Project, provided the following historic context on duck clubs:

*An outgrowth of market hunting, duck clubs were first established in California as a result of unregulated game fowl hunting. By the 1870s, the number of waterfowl in California had drastically decreased because of over-hunting by sportsmen and market hunters (those who hunted either for subsistence or to sell their catch). Urban sport hunters, seeking to improve their hunting success, began purchasing tidelands that were generally considered unfit for agriculture and modifying the land to attract waterfowl. In general, the improvement included diking areas to create ponds and providing grain as feed. The first duck club in California was Hardland Club established in the Suisun Bay in 1879. Others soon followed in every region of the state . . . (Kozlik 1985, 8-9).*

*Over the years, the original founders or their direct descendents maintained many of the duck clubs. Since their inception, the clubs were expensive to own and operate. In addition to the dikes and levees to create the ponds, many duck clubs built blinds, plank walkways, and clubhouses and maintained several small boats . . . (Kozlik 1985, 10; Wilson 1933, 15–20).*

By the late nineteenth century, there were duck clubs in the San Pablo Bay area (McKee 1995: 5), and in the 1940s, there were dozens of duck clubs located throughout the marshlands (Jones & Stokes 1995: 16). Lower Tubbs Island, located just south of the Project site, was a typical example and previously contained berms and culverts used by a local duck club to manage the hydrology for waterfowl (USFWS 2011: 59). Many of these clubs no longer exist due changes to the landscape due to flooding by salt companies in the 1950s or by restoration projects that have occurred over the past several decades (Jones & Stokes 1995: 16).

## **SITE HISTORY**

### **Tubbs Island and Tubbs Island Perimeter Levee**

The tidelands area that became Tubbs Island was purchased from the State through a reclamation process by Thomas Moore in 1871 (McKee 1995: 4). On the 1877 Sonoma County atlas, the land—still shown as marsh—was owned by the San Pablo Land Company (Thompson 1877). The exact date the perimeter levee was built around Tubbs Island and when the reclamation was completed are not known, but based on a review of historical maps, it appears that a levee was first built and the land reclaimed in the early 1900s. By 1898, the land was owned by Frank and Susan Tubbs (Reynolds & Proctor 1898) but was still shown as marsh on the 1892 and 1903 San Pablo USCGS maps; although the 1902 Napa 30-minute USGS map shows a levee defining the island. The 1906 San Pablo USCGS map shows a levee along the perimeter of the island. However, the levee's alignment is somewhat different than what exists today. In 1906, two large natural drainage channels still connected directly to Tolay Creek from the interior portion of Tubbs Island. Also, the perimeter levee extended around areas that today are known as

Lower Tubbs Island and the Tubbs Setback, both of which are currently units of the San Pablo Bay National Wildlife Refuge (1906 USCGS; USFWS 2011: 8).<sup>1</sup> Around 1916, the perimeter levee along the west side of the island was extended across the mouths of the two natural drainage channels that connected directly to Tolay Creek (USCGS 1915 and 1927; USGS 1916). Also during this same period, a levee was built across the north side of Lower Tubbs Island separating this area from the main body of the island, and Lower Tubbs Island reverted back to marsh (USCGS 1927 and 1934). The configuration of the levee around the southern end of Tubbs Island was again altered when new section of levee was constructed around 1997 as part of the marsh restoration plan for the Tubbs Island Setback, a 72 acre parcel located between Lower Tubbs Island and Tubbs Island (USFWS 2011: 60; Google Earth 2002). Additionally, it seems likely that the current perimeter levee is higher and wider than the one constructed as part of the original reclamation process in the early 1900s. A historic resources evaluation of similar levees west of Tolay Creek noted that original levees were narrower and lower and that ground subsidence has required that they be enlarged over the years (Beard 2010: 15); a similar process likely occurred with the Tubbs Island perimeter levee (and may account for the changed appearance of the levee along the east [bay] side of the island on the USCGS maps after 1927—the levee has a more regular alignment with fewer small curves and indentations).

As noted above, by 1898 the land that became Tubbs Island was owned by Frank and Susan Tubbs (Reynolds & Proctor 1898), and their name became associated with the island and the landing on Sonoma Creek (located at the northwest edge of the island in the area north of present-day Highway 37). Members of the Tubbs family owned the land at least through the mid-1930s; "Hiram Tubbs Est Co." and the "Tubbs Island Co." are shown as the owners on the 1908 and 1934 official county maps, respectively (McIntire & Lewis 1908; Peugh 1934). According to the information in the *Historic Architectural Survey Report* (HASR) prepared in 1995 for the portion of Highway 37 between Sears Point and Mare Island, the Tubbs Island Co. existed between 1918 and 1932 and was probably succeeded by the Noble Land and Cattle Company (McKee 1995: 4). The Vallejo Sanitation and Flood Control District purchased Tubbs Island in 1983 (VSFCD n.d.), and the land is currently farmed by the Yenni family (WWR 2013: 3).

### **Relic Levee Berms**

The origins of the several rows of smaller levees located east and generally parallel to the bay-side portion of the Tubbs Island perimeter levee, where the combined Sonoma and Napa creeks enter into the bay, is not known. They are visible in a 1941 aerial photograph (Aero Service Corp. 1941), but by 1951, portions of the levees had begun to erode (n.a. 1951). Today, these levee alignments have been abandoned and are no longer maintained (WWR 2013).

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<sup>1</sup> The 249 acre Lower Tubbs Island was transferred to the U.S. Fish and Wildlife Service from The Nature Conservancy in 1978, and in 1981, the U.S. Fish and Wildlife Service acquired a 66-year lease from the California State Land Commission to manage the 72-acre Tubbs Island Setback as part of the San Pablo Bay National Wildlife Refuge (USFWS 2011: 59-60).

## **Sonoma Creek Marsh**

The *Sonoma Creek Marsh Enhancement Project Administrative Final Advancement Plan* (WWR 2013) provided the following explanation about the development of the Sonoma Creek Marsh (Marsh).

*Prior to European colonization, the current Sonoma Creek Marsh extent was part of the open water of San Pablo Bay and was bordered to the west by tidal marshes (Figure 3). In the late nineteenth century, these historic tidal marshes were diked (surrounded by levees and drained) for conversion to agricultural use. Throughout the North Bay, this process of conversion of tidal marshes to agriculture was widespread, and resulted in the loss of approximately 82 percent of the region's historic tidal wetlands (Goals Project 1999). During this time, hydraulic gold mining activities in the Sierra Nevada Mountains sent large sediment loads down the rivers and streams, which, when they entered the Bay, formed extensive mudflats along the newly created levees. These new depositional areas, over time, grew to create new tidal marshes. These marshes are known as 'centennial marshes' as they have formed over the last 100 years" (WWR 2013: 3). "The Sonoma Creek Marsh is one of these centennial marshes. Historical aerial photograph interpretation indicates that the Sonoma Creek Marsh experienced rapid growth between 1966 and 1989, but since 1989 this growth has slowed significantly (Figure 4). As of 2005, the areal extent of the Sonoma Creek Marsh was approximately 400 acres (WWR 2013: 3).*

A number of small, natural channels have developed along the bay-front margin of the marsh, and water enters the marsh interior through these channels. However, when the tide falls, these small channels are unable to provide adequate drainage, which has resulted in long-term ponding within the central basin of the marsh (WWR 2013: 13). The Marin-Sonoma Mosquito and Vector Control District (District) began treating the marsh for mosquito abatement in the 1960s, and over the years, the District has constructed several small ditches to drain areas that pond in order to reduce mosquito breeding grounds (WWR 2013: 8).

The Marsh is located within the San Pablo Bay National Refuge (Refuge) which was established in 1970 and property acquisitions for the Refuge began in 1974. The mission of the Refuge is to serve as a sanctuary for migratory waterfowl; it also provides recreational opportunities (including bird watching, hunting, fishing, and hiking) to the public. The Marsh was acquired by the Refuge in 1982 and has been managed for wildlife habitat since then that date (WWR 2013: 8).

## **DESCRIPTION**

The Project site, which consists of tidal marsh plain, tidal marsh channel, and mudflat habitats, is located within a large, fringing tidal marsh on San Pablo Bay that is within the Refuge boundary, in Sonoma County, California (Figure 2). The site is owned and managed by the Refuge and is bordered to the north by the Sonoma Creek channel, to the

east and south by the San Pablo Bay, and to the west by diked agricultural baylands of Tubbs Island which are owned by the Vallejo Sanitary District and farmed by the Yenni family. Highway 37 crosses Sonoma Creek approximately 0.5 mile north of the Project site. Built environment features within the Project site include the Tubbs Island perimeter levee, relic levee berms along the western edge of the Project site, mosquito control ditches, and a collapsed wood-frame shed.

### **Tubbs Island Perimeter Levee**

Approximately two of the eight miles of the Tubbs Island perimeter levee is located within the Project site. The earthen levee has sloped sides that are covered with a variety of vegetation (mainly native coyote bush intermixed with native and non-native perennial plants for the portion of the levee within the Project site) and an unpaved road along the top (although this road is overgrown with vegetation and not maintained for the portion of the levee within the Project site). Figure 5 shows the location of the Tubbs Island perimeter levee within the Project site and Photos 1 and 3 provide representative views of the levee.

### **Relic Levee Berms**

Several rows of relic levee berms (abandoned segments of levees that are no longer maintained) are located along the western side of the Project site. Erosion has created gaps in the berms but they are generally aligned parallel to the Tubbs Island perimeter levee along the west side of the Project site and have crest elevations of 7 to 9 feet NAVD88.<sup>2</sup> Figure 5 shows the location of these berms within the Project site and Photos 2 and 3 provide representative views.

### **Mosquito Control Ditches**

There are three main mosquito control ditches on the Project site: one at the south end of the site, one in the middle, and one at the north end. These ditches connect to a network of mosquito control ditches that drain depressional areas around the relic levee berms at the western end of the Project site (WWR 2013: 15). Figure 6 shows the location of these ditches within the Project site, and Photo 3 provides a representative view.

### **Collapsed Shed**

A collapsed wood-frame shed is located in the western portion of the Project site. Figure 5 shows the general location of the collapsed shed, and Photo 4 provides a view of this shed.

## **EVALUATION**

Built environment features within the Project site include the Tubbs Island perimeter levee, relic levee berms along the western edge of the Project site, mosquito control ditches, and a collapsed wood-frame shed. These features were evaluated for their potential eligibility for inclusion on the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR).

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<sup>2</sup> North American Vertical Datum of 1988.

### **Tubbs Island Perimeter Levee**

Approximately two of the eight miles of the Tubbs Island perimeter levee is located within the Project site. The levee is associated with the reclamation of the San Pablo Bay tidelands that occurred during the late nineteenth and early twentieth centuries. The exact date this perimeter levee was built around Tubbs Island is not known but based on a review of historical maps, it appears that a levee was first built and the land was reclaimed in the early 1900s. The Tubbs Island area is shown as marsh on the 1892 and 1903 San Pablo USCGS maps. A levee is shown around the perimeter of the newly reclaimed island on the 1902 Napa 30-minute USGS map and the 1906 San Pablo USCGS map. As described in this report's site history, the alignment of the Tubbs Island perimeter levee has been altered along the west side and south end since its original construction. Additionally it seems likely that the current perimeter levee is higher and wider than the one constructed as part of the original reclamation process in the early 1900s. A historic resources evaluation of similar levees west of Tolay Creek noted that original levees were narrower and lower and that ground subsidence has required them to be enlarged over the years (Beard 2010: 15); a similar process likely occurred with the Tubbs Island perimeter levee (and may account for the changed appearance of the levee along the east [bay] side of the island on the USCGS maps after 1927—the levee has a more regular alignment with fewer small curves and indentations).

The Tubbs Island perimeter levee is a common example of a levee constructed as part of the reclamation process that occurred throughout the San Pablo Bay tidelands during the late nineteenth and early twentieth centuries and does not possess significance under NRHP/CRHR criteria A/1, B/2, C/3, or D/4. Additionally, the levee has been altered over the years and does not appear to possess integrity in relationship to its association with the reclamation of Tubbs Island in the early 1900s. In summary, the Tubbs Island perimeter levee does not appear to be eligible for the NRHP or CRHR.

### **Relic Levee Berms**

Several rows of relic levee berms (abandoned segments of levees that are no longer maintained) are located along the western side of the Project site. The origin and date of construction for these berms is not known. However, they were visible in a 1941 aerial photograph (Aero Service Corp. 1941), but by 1951, portions of the berms had already begun to erode (n.a. 1951). The continued erosion and lack of maintenance has resulted in gaps in the berms and but they are generally aligned parallel to the Tubbs Island perimeter levee. These relic levee berms appear to be common examples of the types of smaller dikes or levees found in reclamation landscapes throughout the San Pablo Bay area and do not possess significance under NRHP/CRHR criteria A/1, B/2, C/3, or D/4. Additionally, these relic levee berms are no longer intact and do not possess integrity. In summary, the relic levee berms within the Project Site do not appear to be eligible for the NRHP or CRHR.

### **Mosquito Control Ditches**

There are three main mosquito control ditches on the site: one at the south end of the site, one in the middle, and one at the north end. The District began treating the Marsh for mosquito abatement in the 1960s and has constructed these ditches since then (WWR

2013: 15). These mosquito control ditches are common examples of this type of mosquito control feature and do not possess significance under NRHP/CRHR criteria A/1, B/2, C/3, or D/4. In summary, the mosquito control ditches located within the Project site do not appear to be eligible for the NRHP or CRHR.

### **Collapsed Shed**

A collapsed wood-frame shed is located in the western portion of the Project site. The history and origin of this shed is not known; however no structure appears in this general location on any of the historical maps consulted for this report. According to a field supervisor for the District, who conducted a field visit for the project, the structure washed into the Project site from farther out in the Sonoma Creek Marsh or from a nearby marsh at some point (Sequeria 2013). This collapsed shed does not appear to possess significance under NRHP/CRHR criteria A/1, B/2, C/3, or D/4. Additionally, it is no longer intact and does not possess integrity. In summary, the collapsed shed located within the Project site does not appear to be eligible for the NRHP or CRHR.

### **Summary**

The Tubbs Island perimeter levee, the relic levee berms, the mosquito control ditches, and the collapsed shed do not appear to be eligible for the NRHP or CRHR, and there are no historical resources related to the built environment within the Project site.

### **IMPACTS ANALYSIS**

There are no historical resources related to the built environment within the Project site and no impact on historical resources related to the built environment.

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

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**APPENDIX: FIGURES, EXISTING CONDITIONS PHOTOGRAPHS,  
AND RECORD SEARCH**

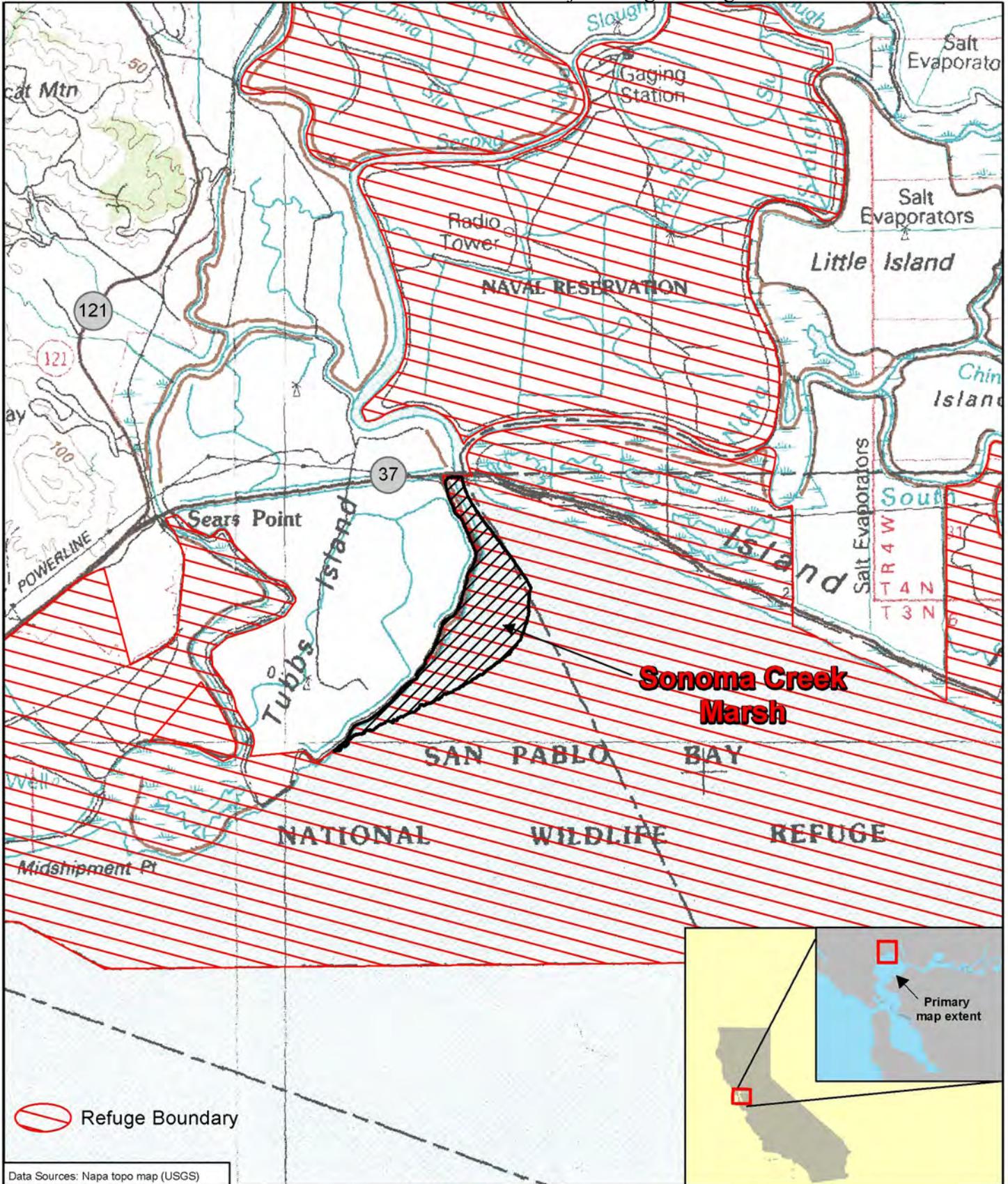
Figures

- Figure 1: Project Vicinity
- Figure 2: Project Area
- Figure 3: Tidal Marshes 1856 (showing location of Sonoma Creek Marsh in relationship to pre-reclamation landscape)
- Figure 4: Marsh Development and Change Detection Map
- Figure 5: Current Marsh Topography (showing the location of the Tubbs Island perimeter levee, relic levee berms, and collapsed shed)
- Figure 6: Site Hydrology (showing the location of the Tubbs Island perimeter levee and mosquito control ditches)

Existing Condition Photographs

- Photo 1: Tubbs Island Perimeter Levee
- Photo 2: Relic Levee Berms
- Photo 3: Relic Levee Berms, Mosquito Control Ditches, and Tubbs Island Perimeter Levee
- Photo 4: Collapsed Shed

Results of an Archaeological Record Search for Sonoma Creek Enhancement Project (Psota 2013)



Data Sources: Napa topo map (USGS)

1:60,000 (1" = 5,000' at letter size)  
 0 2,500 5,000  
 ft  
 0 800 1,600  
 m



**PROJECT VICINITY**

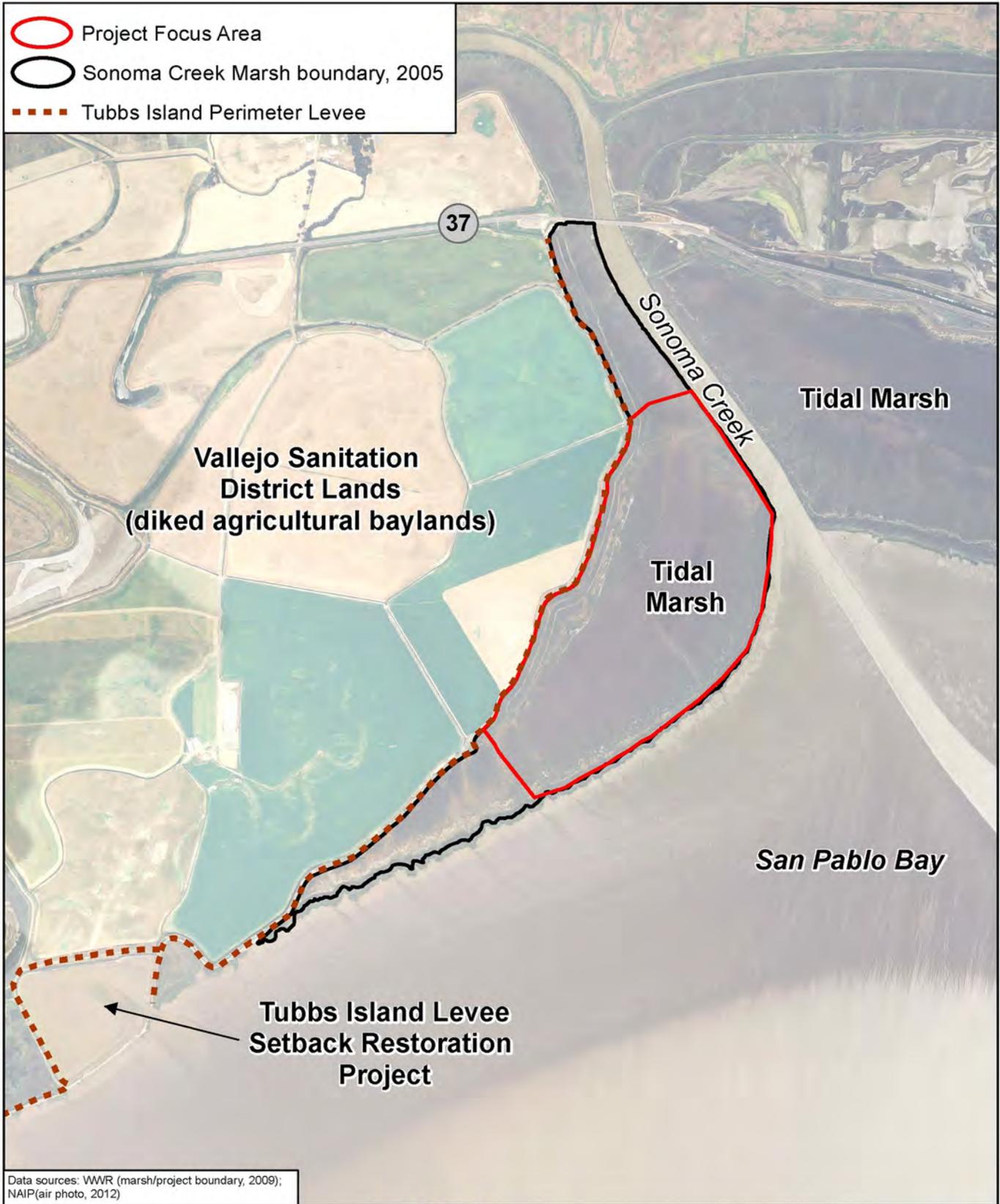
Sonoma Creek Marsh Enhancement Project  
 Sonoma County, California  
 Marin-Sonoma Mosquito and Vector Control District

February 2013

Project No. 1123

**Figure 1**

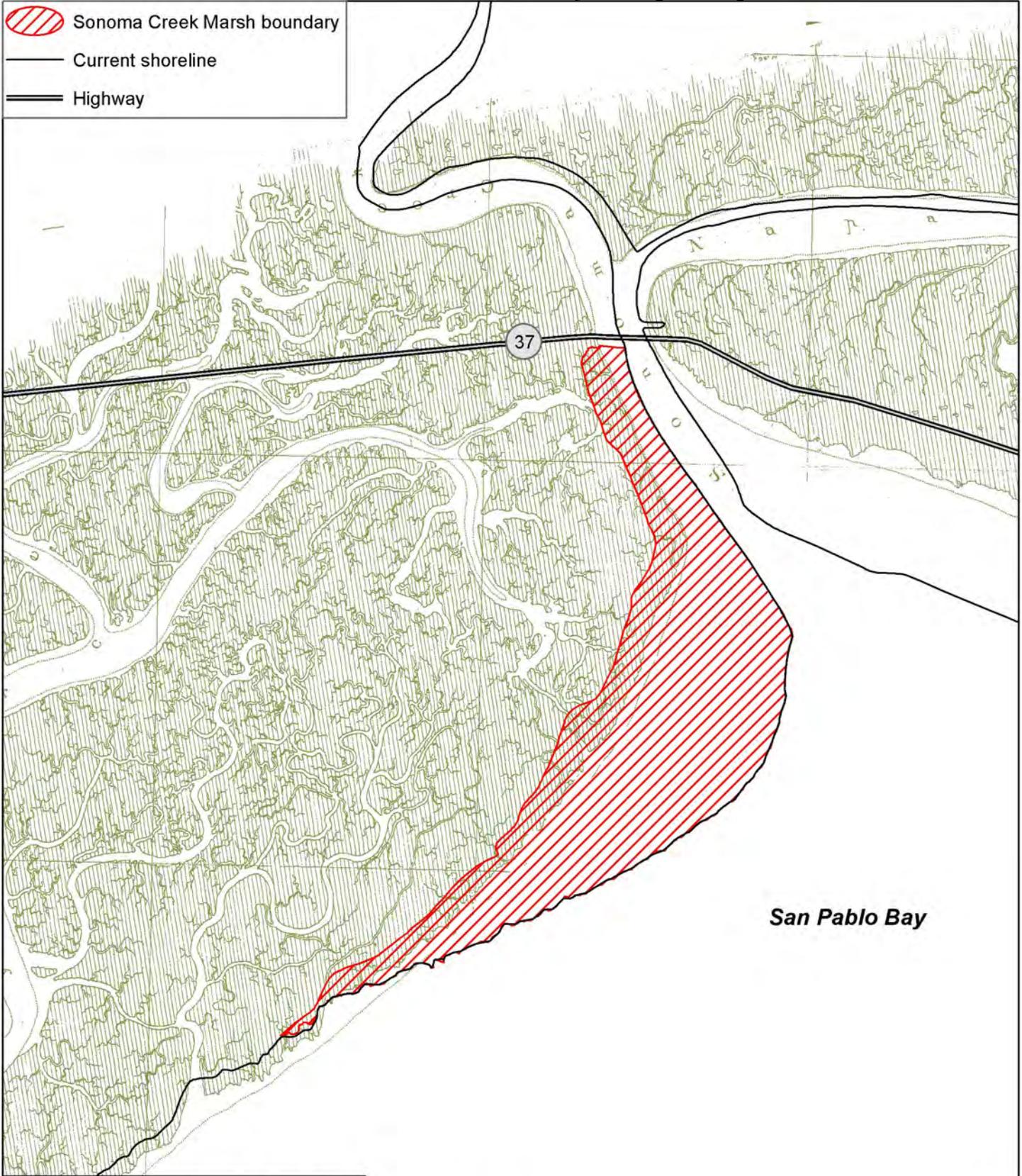
Produced by WWR, February 2013  
 Map File: Vicinity-map\_1123\_2013-0214gal.mxd



Data sources: WWR (marsh/project boundary, 2009); NAIP (air photo, 2012)

<p>1:24,000 (1" = 2,000' at letter size)</p> <p>0 1,000 2,000 ft</p> <p>0 300 600 m</p> 		<p align="center"><b>PROJECT AREA</b></p> <p align="center">Sonoma Creek Marsh Enhancement Project Sonoma County, California Marin-Sonoma Mosquito and Vector Control District</p>	
<p>Produced by WWR: February 2013 Map File: Fig-02_project-area_1123_2013-0214gal</p>	<p>February 2013</p>		<p>Project No. 1123</p>

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration



Data Sources: Historic Wetlands (U.S. Coast Survey, 1856);  
Shoreline Data (SFEI 1998)

1:24,000 (1"=2000' at letter layout)

0 1,000 2,000  
ft  
0 300 600  
m

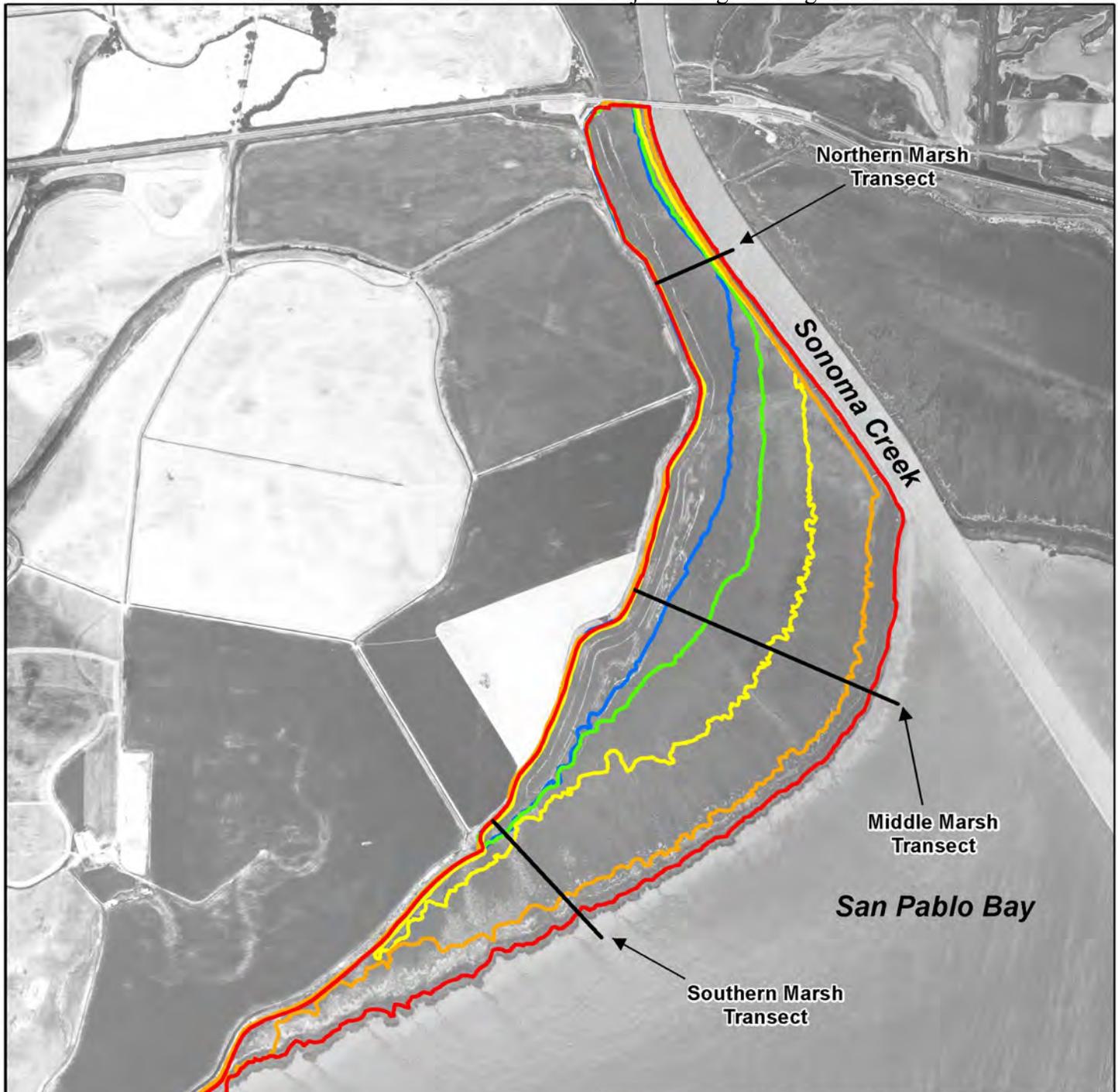


Produced by WWR, February 2013  
Map File: Hist-Wetlands\_11231\_2013-0214gal.mxd

**TIDAL MARSHES, 1856**

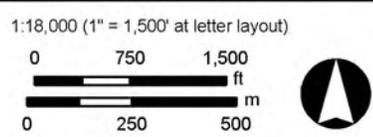
Sonoma Creek Marsh Enhancement Project  
Sonoma County, California  
Marin-Sonoma Mosquito and Vector Control District

February 2013	Project No. 1123	<b>Figure 3</b>
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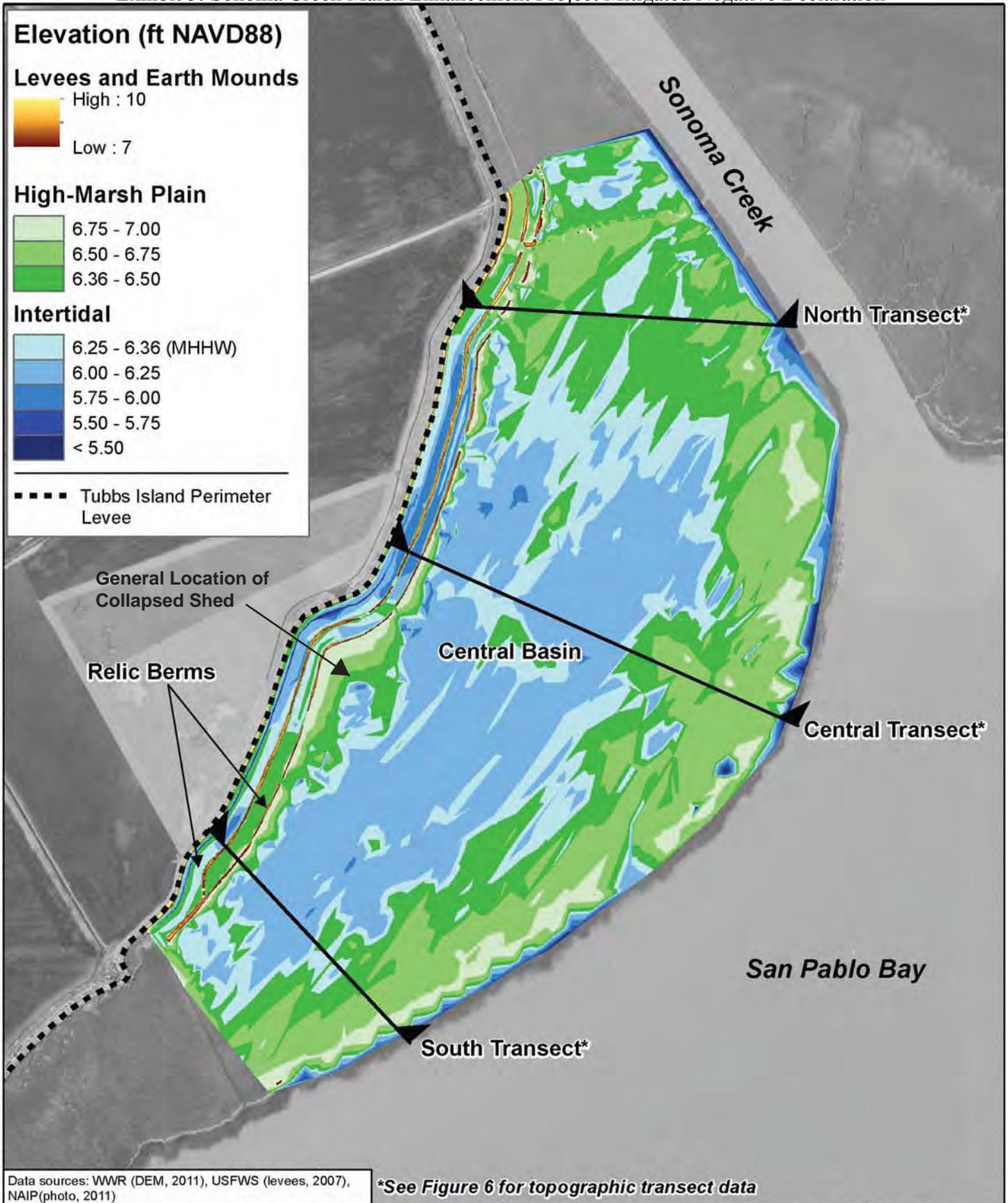
Year	Marsh Area (acres)	Distance along marsh transect (ft)		
		Northern	Middle	Southern
1966	85	590	360	165
1970	120	580	805	165
1980	195	600	1445	270
1989	340	635	2365	1050
2005	400	700	2600	1275

Data sources: NAIP (photo, 2005); WWR (data, 2007)



**MARSH DEVELOPMENT  
CHANGE DETECTION MAP**  
Sonoma Creek Marsh Enhancement Project  
Sonoma County, California  
Marin-Sonoma Mosquito and Vector Control District

Produced by WWR, February 2013  
Map file: Marsh-develop-overlay\_1123\_2013-0214gal.mxd



1:9,600 (1" = 800' at letter layout)

0 400 800 ft

0 120 240 m

Produced by WWR, February 2013  
Map file: 2011-DEM\_1123\_2013-0214gal.mxd



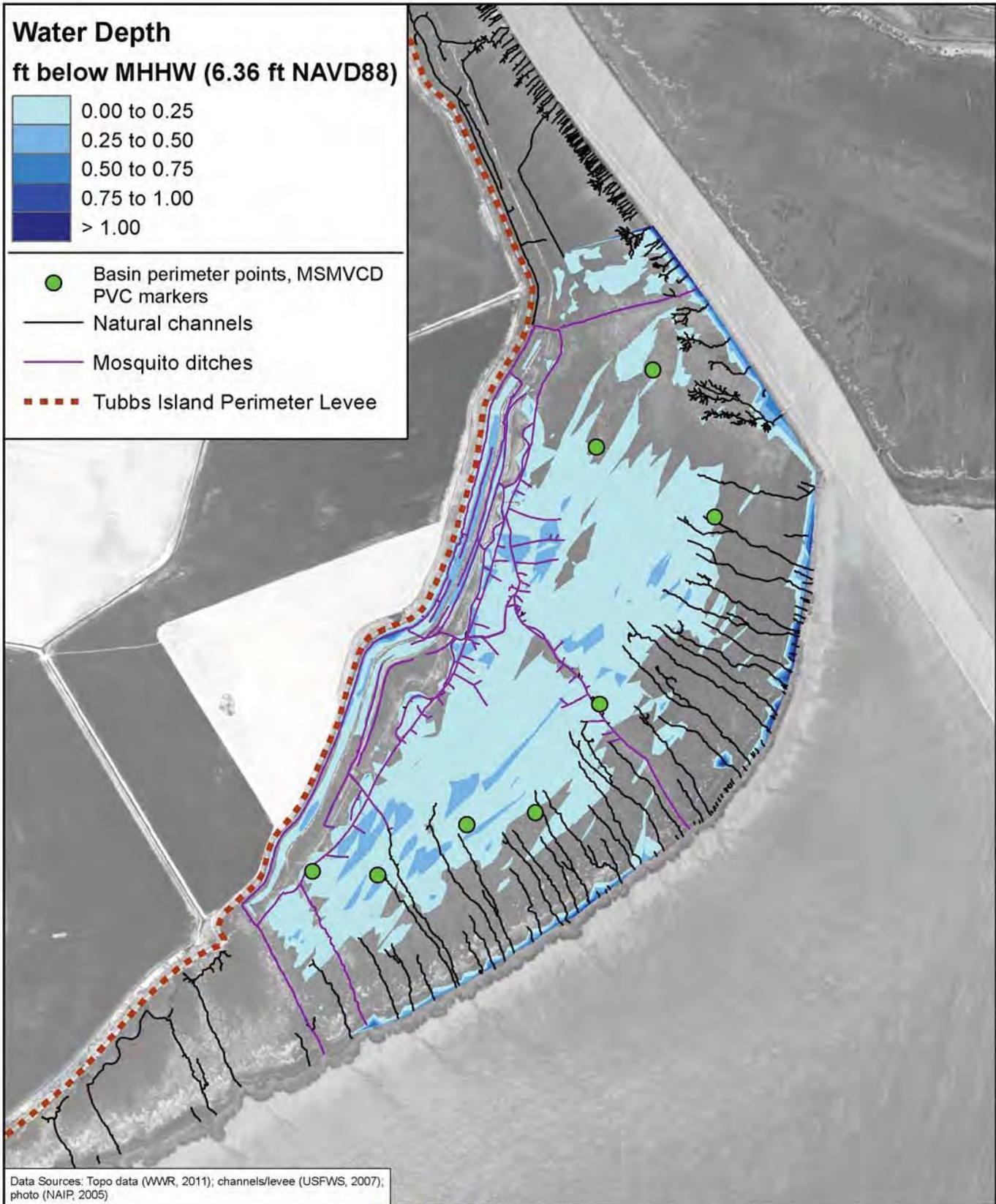
**CURRENT MARSH TOPOGRAPHY**

Sonoma Creek Marsh Enhancement Project  
Sonoma County, California  
Marin-Sonoma Mosquito and Vector Control District

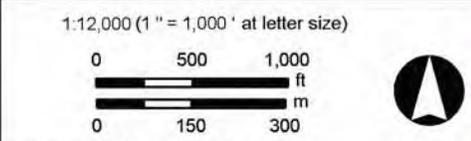
February 2013

Project No. 1123

**Figure 5**



Data Sources: Topo data (WWR, 2011); channels/levee (USFWS, 2007); photo (NAIP, 2005)



**SITE HYDROLOGY**

Sonoma Creek Marsh Enhancement Project  
Sonoma County, California  
Marin-Sonoma Mosquito and Vector Control District

Produced by WWR: February 2013  
Map File: Fig-08\_site-hydrology\_1123\_2013-0214gal

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration



Photo 1. Representative view of portion of (1) Tubbs Island perimeter levee within Project site with (2) Sonoma Creek Marsh (Project site) to left and (3) Tubbs Island to right; view toward south. (D. Bradley March 2013)



Photo 2. Representative view of relic levee berms; view to east. (D. Bradley March 2013)

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

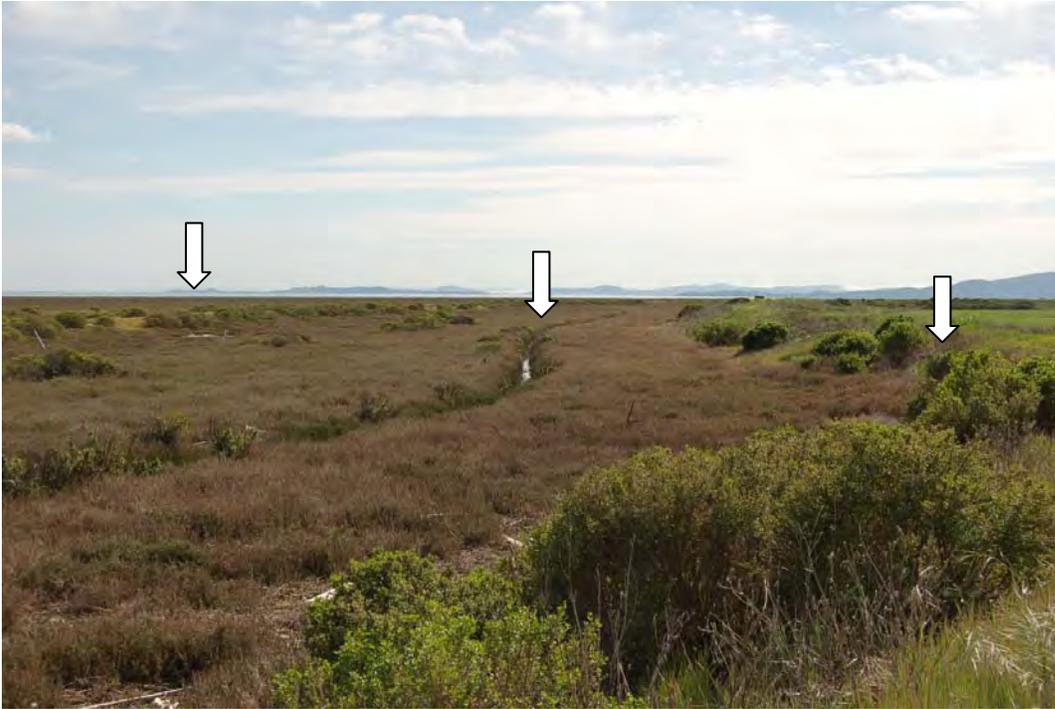


Photo 3. Representative view of relic levee berms (left), example of mosquito control ditch (center), and Tubbs Island perimeter levee (right); view to south. (D. Bradley March 2013)



Photo 4. Collapsed shed located in the western portion of the Sonoma Creek Marsh, just east of relic levee berms; view to east/southeast. (D. Bradley March 2013)



**holman & ASSOCIATES**  
Archaeological Consultants

"SINCE THE BEGINNING"

3615 FOLSOM ST. SAN FRANCISCO,  
CALIFORNIA 94110 415/550-7286

25 March 2013

Richard Grasseti  
Grasseti Environmental Consulting  
7008 Bristol Dr.  
Berkeley, CA 94705

Re: Results of an Archaeological Records Search for Sonoma Creek Enhancement Project, along Tubbs Island in Southeastern Sonoma County within and adjacent to San Pablo Bay National Wildlife Refuge

Dear Mr. Grasseti:

On 9 November 2011, I conducted a records search at the Northwest Information Center of the California Historical Resources Information System (NWIC), an adjunct to Sonoma State University in Rohnert Park (File number 12-0924). All cultural resources within one half mile were examined and reviewed, and all cultural resources investigations within one half mile were reviewed with pertinent information discussed below.

### **CULTURAL RESOURCES IDENTIFIED**

No cultural resources have been recorded within the study area (Map 1). Within a half mile of the study area, four historic-era resources have been recorded; all had been directly shaped by their proximity to San Pablo Bay, and the adjacent reclaimed marshlands. A brief description of these resources is provided.

**P-48-212/P-28-1324** refers to the Duck Clubhouse/Fleishhacker Club/Detjen Duck Club a vernacular two-story building constructed around 1900. The building was located at the border of Napa and Solano counties on Island No. 1 between State Route 37 and the Napa Slough (McKee 1995a). The resource was designated with two primary numbers to reflect its span within two counties: Napa and Solano.

**P-49-3947** denotes two pump houses, two pumping stations, and a levee associated with the reclamation of Skaggs Island and now situated within Skaggs Island's Naval Reserve (Ghabhláin and Stringer-Bowsher 2008).

**P-49-4272** was assigned to the Yenni Ranch Complex, a combination of historic-era and modern buildings and structures which includes a Craftsman-style house, outbuildings including a pump house,

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

historic-era landscaping, a historic-era dirt road, and a historic-era dump (Ballestros et al. 2010). Situated on Tubbs Island, the complex is north of State Route 37 on a western levee bank by Sonoma Creek.

**P-49-4275** consists of a concrete pier or foundation fragment, and a grove of historic-era eucalyptus trees that is situated north of State Route 37 on Tubbs Island (Elliot et al. 2010).

### **PERTINENT STUDIES**

Four projects studied the lands in the northernmost portion of the Sonoma Creek Enhancement Project or the lands abutting it. None of these identified any cultural resources within or near the current study area. In 1980, an archaeological sensitivity study was conducted for the Lakeville-Sobrante Transmission Line (Damon and Gerike 1980). A portion of that project area was situated a short distance north of the northern portion of the current study area. The geology for that location was labeled as “areas of unstable slopes in soft sedimentary rock” that was interpreted as having a low potential for Native American archaeological sites based on the range of recorded Native American sites in the area. This sensitivity study was followed by a 1983 survey for portions of that pipeline including an area that crossed onto the north side of State Route 37 near the Sonoma Creek Enhancement Project. That area is beyond the levee system that frames Tubbs Island south of the highway (Roper 1983).

Two surveys were conducted either for or by California Department of Transportation (Caltrans) consisting of lands on either side of State Route 37 including those adjacent to the northern portion of the Sonoma Creek Enhancement Project’s study area (Chavez 1997; Hayes 1995). Hayes (1995:2-3) noted that the previously recorded nearby sites were Nelson shellmounds (Native American midden sites) that were situated on higher lands overlooking the marshlands. Chavez (1997:2, 3) described his area of potential effects (APE) as fill on top of reclaimed marshlands.

Within a half mile of the current study area, five other studies have been completed, documenting the prehistoric and historic-era use of those specific lands as well as providing various historic contexts for the reclamation and use of this area. These investigations are presented from oldest to most recent. In 1996, Valentine conducted a study for the Tolay Creek Restoration Project as part of U.S. Fish and Wildlife Services. He documented that Upper Tubbs Island east and west of Tolay Creek and north of the current State Route 37 was reclaimed between 1866 and 1900, and that Lower Tubbs Island was reclaimed and a levee system constructed between 1900 and 1940. Most of his pedestrian survey was limited to the levee and railroad tracks. Although Valentine briefly discussed the levees, he did not record any of them, conduct further research to refine their initial date of construction, or present a formal evaluation, but he stated that no historic properties were present within his APE.

Beard (2005, 2010) conducted two studies of Dickson Ranch which lies west of Tolay Creek and south of Sears Point Road. A cultural resources survey identified nine historic-era resources consisting of an early 20<sup>th</sup> century ranch complex, segments of a 1880s railroad grade and three related features, and a levee system. The second study consisted of an evaluation of these historical features, buildings, structures, and complexes. Her research into the Dickson Ranch Water System documented the initial levee constructed in the 1870s with improvements continuing to the 1940s. The recorded system consisted of levee, ditches, pumps, sheds, footbridge, house pumps, and other machinery. None of the resources appeared eligible to the National Register of Historic Places.

An historic resources survey and evaluation of the Naval Security Group Activity at Skaggs Island identified P-49-3947 described above, and many other building and structures (Ghabhláin and Stringer-Bowsher 2009). These resources date from the early 1910s farming of the area through the late

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

1930s, followed by a small number constructed during World War II, and several more associated with Cold War activities dating before 1958.

As part of Caltrans fieldwork, an historic architectural survey report was prepared that recorded several buildings and structures from a former duck club including the above described clubhouse designated P-48-212/P-28-1324 (McKee 1995b). Like Beard's studies, McKee's overview included the reclamation of this area along with other research issues consisting of transportation, ranches, duck clubs, and salt ponds.

California Office of Historic Preservation's *Historic Property Data File* combines several state and federal inventories, including the *National Register of Historic Places* and the *California Register of Historical Resources, California Historic Landmarks*, and most *Points of Historic Interest*. This inventory and the *California Inventory of Historic Resources* list no resources within or directly adjacent to the Project APE (CA-DPR 1976; CA-OHP 2012).

Historic-era maps pertaining to the Sonoma Creek Enhancement study area depict the changes in the bay, marshlands, and dry lands of this area over time. An 1856 map shows the area as marshy wetlands prior to infilling of the bay from mining debris washed downstream from hydraulic mining in the Sierras and deposited throughout San Francisco Bay (Nichols and Wright 1971 citing, U.S. Coast and Geodetic Survey 1856). By 1876, a levee had been constructed on the west side of Sonoma Creek encircling much of San Pablo Bay (Bowers 1867, Thompson 1876). By 1902, the levee is clearly depicted encompassing dry land called Tubbs Island (U.S. Coast and Geodetic Survey 1902, 1916).

If you have any questions, please contact me or Miley Holman,

Sincerely,



Sunshine Psota, M.A., RPA  
Senior Historical Archaeologist

## Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

### REFERENCES

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

McKee, Elizabeth (*cont.*)

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1916 Mare Island 15' topographic quadrangle.

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Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

## Appendix E

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Soil Sampling and Analytical Results Report (SES 2013)



2198 SIXTH STREET, SUITE 201-BERKELEY, CA 94710  
TEL: (510)644-3123 · FAX: (510)644-3859  
GEOSCIENCE & ENGINEERING CONSULTING

June 5, 2013

Mr. Daniel Gillenwater  
Environmental Scientist/GIS Analyst  
Wetlands and Water Resources, Inc.  
818 Fifth Ave, Suite 208,  
San Rafael, CA 94901

Subject: Soil Sampling and Analytical Results  
Sonoma Creek Enhancement Project, Sonoma County, California

Dear Mr. Gillenwater:

## INTRODUCTION

Stellar Environmental Solutions, Inc. (Stellar Environmental) was retained by the Wetlands and Water Resources, Inc. (Wetlands) to develop and implement the soil sampling and analysis scope of work tasks described in the Sonoma Creek Marsh Enhancement Project Quality Assurance Project Plan (QAPP) Version 2.0 (EPA Grant #: EPA-R9WTR3-12-001, dated effective May 1, 2013).

The project is being implemented with Audubon California (Audubon), in collaboration with the U.S. Fish and Wildlife Service San Pablo Bay National Wildlife Refuge (Refuge) and the Marin-Sonoma Mosquito and Vector Control District (District) – together known as the “Project Partners”, to enhance drainage conditions in the fringing tidal marsh (the Marsh) along the western bank of Sonoma Creek, south of Highway 37 in Sonoma County, California. The District routinely monitors and treats the Marsh with approved chemicals to manage the mosquito populations that develop following high tides and storm events. The District is seeking a longer term solution for managing mosquito populations by improving drainage conditions within the Marsh. Wetlands is developing plans to cut a drainage channel across a 100 acre area of a 400 acre wetland tract bordering San Pablo Bay as part of a Habitat Enhancement project. The large central tidal channel will be approximately 30 feet wide by 7 feet deep constructed through the central basin of the Marsh and connected to San Pablo Bay via lower Sonoma Creek. This channel will provide tidal drainage to the large central basin and will improve marsh hydrology. The project objectives are to reduce mosquito

production in the marsh, thus reducing surveillance and treatment efforts by the District and to improve marsh ecosystem functions to benefit fish and wildlife species

Stellar Environmental developed the soil sampling scope of work based on conversations with Mr. Daniel Gillenwater of Wetlands. The objective of this initial limited soil sampling is to collect two vertical samples within the zone of the proposed central tidal channel excavation in order to establish a baseline understanding of the chemical compounds associated with the soil that might affect wetland habitat reuse.

All soil excavated in construction of the various channel features, that is not reused in on-marsh enhancement elements (e.g., refuge islands, habitat transition berm), will be used as maintenance fill on the Tubbs Island perimeter levee. The dredge spoils are estimated to have a volume somewhere in the 50,000 to 60,000 cubic yard range.

The project location is shown on Figure 1. Figure 2 shows the location of the soil sample within the proposed central tidal drainage channel.

## **PROJECT PLANNING AND SAMPLE COLLECTION**

### **Project Planning**

Stellar Environmental prepared for the project as follows:

- Obtained competitive bids from pre-qualified analytical laboratories
- Coordinate sampling with Wetlands and the U.S. Fish and Wildlife Service (USFWS)
- Meet with USFWS for orientation to marsh and obtain Special Use Permit, a copy of which is contained in Attachment D
- Assemble field sampling equipment

### **SOIL SAMPLING FIELD IMPLEMENTATION**

Mr. Henry Pietropaoli of Stellar Environmental conducted the soil sampling on May 14, 2013 with the assistance of Ms. Ariana an intern with the USFWS. The two pre-designated sampling points Point 1 and Point 2 were located in the field by the USFWS, who navigated to them using a global positioning device supplied by the USFWS. The coordinates of the sampling locations are: Point-1 at 38<sup>0</sup> 08' 08.470"N, 122<sup>0</sup> 24' 37.686"W; and Point-2 at 38<sup>0</sup> 08' 48.786"N, 122<sup>0</sup> 24'

09.392°W. The sampling locations within the marsh were observed flat with no discernible slope and the ground covered with pickleweed.

A photodocumentation of the field activity is contained in Attachment A.

### **Sampling Location Rationale**

Four soil samples were collected from two locations in the marsh shown within the proposed excavation footprint of the central tidal channel as designated by the Wetlands client. One sample location was located near the confluence with Sonoma Creek and the other was at the distal end of the channel, thus providing data along the long axis of the Project area. At each sample location, one sample was collected from 0 to 2 feet below ground surface (BGS) and another was collected from 2 to 4 feet BGS, thus providing data on near-surface and deeper soil conditions.

### **Augering and Sample Collection**

A 4-inch diameter stainless-steel auger was used to bore and collect the 0 – 2 foot BGS soil at each sample location. The soil was collected on a plastic sheet and composited by hand. Nitrile gloves were used during the compositing process. A second composite sample from the same bore was made from soil collected from 2 to 4 feet BGS. This soil was collected using a 2-inch diameter auger that could be inserted through the upper 4-inch diameter bore to the 2-4 foot deep collection depth without contacting the upper 2 foot soil interval. This soil collection and compositing procedure was repeated at the second sampling location. Soil was placed into a new laboratory supplied container upon completion of soil compositing.

### **Sample Handling**

The soil samples retained for analysis were labeled, transferred to a cooler and subsequently transported by courier under chain-of-custody documentation to the analytical laboratory.

### **Decontamination**

The auger and sampling device was decontaminated before sampling and between sampling points by wiping down with paper towels and rinsing with de-ionized water as needed until there was no visible soil remaining on the auger.

### **Soil Column Description at Sample Locations**

The soil at both sample location consisted of organic clay of medium to high plasticity. The upper clay was olive-gray with abundant red brown fibrous rootlet organics. This clay graded

downward to a dark grey to black organic-rich clay that appeared to occur coincident with groundwater level. At Point-1 the upper olive-gray clay extended from the surface to approximately 2.5 feet BGS and at Point-2 (nearest to Sonoma Creek) the olive-gray clay extended to about 1 foot BGS.

### **Site Restoration**

The boreholes were backfilled with soil removed during the sampling procedure.

### **Field Variances**

The QAPP prescribed sampling was implemented with the following modifications:

- 1) Due to the soft soil material, a hand-driven drive sampler was not utilized as the soft marsh soil would spread laterally rather than be collected up into the sample tube. As an alternative, the soil was collected using a combination of two stainless-steel augers. Soil was hand-picked from the auger and placed into the laboratory supplied container.
- 2) A phosphate-free detergent was not used. To minimize the potential of introducing detergent into the marsh, decontamination was accomplished by wiping down the sampling augers followed by a rinsing with deionized water and repeating the procedure until no soil was visible on the sampling tool.

### **Laboratory Analytical Methods**

The analytical methods incorporated the Regional Water Quality Control Board (Water Board) Screening Guidelines <sup>1</sup> (included as Table 3 at the end of Attachment A) and our discussions with McCampbell Analytical Laboratory. In conformance with the approved QAPP, the samples were analyzed for the following constituents by the specified analytical methods:

- Metals; arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), selenium (Se), silver (Ag), and zinc (Zn) by EPA Method SW6020.
- Mercury (Hg) by EPA Method SW7471A.
- Poly Aromatic Hydrocarbons (PAHs) by EPA Method SW270C, SIM Mode.
- Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs) by EPA Method 8081A/8082EPA.

<sup>1</sup> San Francisco Bay Regional Water Quality Control Board. 2000. Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines. Draft Staff Report. May25. Available online at: [http://www.waterboards.ca.gov/sanfranciscobay/water\\_issues/available\\_documents/benreuse.pdf](http://www.waterboards.ca.gov/sanfranciscobay/water_issues/available_documents/benreuse.pdf)

This analytical suite was developed based on:

- Historical land use and general contaminants of concern to a wetland environment (although not specifically known or suspected to be associated with this land)—i.e., key metals, SVOCs, PAHs, and long-chain hydrocarbons.
- Water Board Recommended Sediment Chemistry Screening Guidelines.<sup>1</sup> Stellar Environmental and McCampbell Analytical laboratory interpret the following analyte quantifications in addition to the standard analytical method reporting as follows:
  - “DDTS sum” will include 2,4 DDD, DDE, and DDT.
  - “Chlordane sum” will include chlordane technical which includes alpha and beta.
  - “Hexachlorocyclohexane sum” will include alpha, beta, delta and gamma.
  - “PCBs sum will include 7 arochlors.
  - “Low molecular weight PAHs sum” will include 2-3 ring groups of PAHs..
  - “High molecular weight PAHs sum” will include 4-7 ring groups of PAHs.

The analytical laboratory was instructed to include these quantifications in their analytical reports for the methods listed above.

## **ANALYTICAL RESULTS**

The samples were analyzed by McCampbell Analytical Laboratory of Pittsburgh, California, a California Environmental Laboratory Accreditation Program (ELAP) certified laboratory. The certified laboratory reports and chain of custody records are contained in Attachment C.

Tables 1 and 2 summarize the analytical results of the detected metals and compounds for the 4 composite samples, respectfully. The analytical results are compared to the published Water Board screening guideline concentrations attached as Table 3.<sup>1</sup>

## **Detected Analytes**

### Metals

All of the target list metals except Cd, Se and Ag were detected in all of the samples, as summarized in attached Table 1. None of the metals were detected at concentrations above the applicable Water Board guidelines for wetlands surface material reuse.<sup>1</sup>

### Poly Aromatic Hydrocarbons

Trace amounts of the pesticide pyrene were detected in all of the samples ranging from 0.010 – 0.019 ug/kg but below the applicable Water Board guidelines.<sup>1</sup> Flouranthene was detected only in the deeper composite soil sample from 2-4 feet BGS at Point-1 but below the applicable guidelines.<sup>1</sup>

## **Analytes Not Detected**

The following analytes were not detected in any of the four samples above their respective method detection limits:

### Organochlorine Pesticides and PCBs

None of these compounds were detected above method reporting limits in any of the samples.

## **DISTRIBUTION OF ANALYTICAL COMPOUNDS**

The analytical results indicate no vertical or lateral distribution pattern for the trace levels of pesticides detected other than the ubiquitous occurrence of pyrene. The concentrations of metals with the exception of slightly elevated Cr are within natural ranges and do not reflect any significant anthropogenic influence, however disposal of soils to an offsite landfill would require additional testing. The detection of flouranthene in deeper soil at sample Point-1 may reflect local influence of lower groundwater at this sampling point.

The distribution of pyrene and flouranthene is presented on Figure 2.

## CONCLUSIONS AND OPINION

None of the four soil samples showed concentrations of target analytes in excess of the applicable wetlands criteria for beneficial reuse. All detected constituents analyzed for were reported at concentrations below levels of concern for both wetlands reuse as well as Water Board criteria used for assessing potential impact to water quality.

The sampling results suggest no vertical or lateral distribution patterns of detected analytes that indicate the need for additional sampling. The results from the four samples appear to be representative of the area of coverage.

Stellar Environmental appreciates the opportunity to have provided Wetlands with the requested services, and we trust that this submittal meets your needs. Please call us if you have any questions.

Sincerely,



Henry Pietropaoli, P.G.  
Senior Geologist and Project Manager



Richard S. Makdisi, P.G.  
Principal Geochemist & President



Attachments:

Figures 1 and 2  
Tables (Analytical Results)  
Photodocumentation  
Certified Analytical Laboratory Report and Chain-of-Custody Documentation

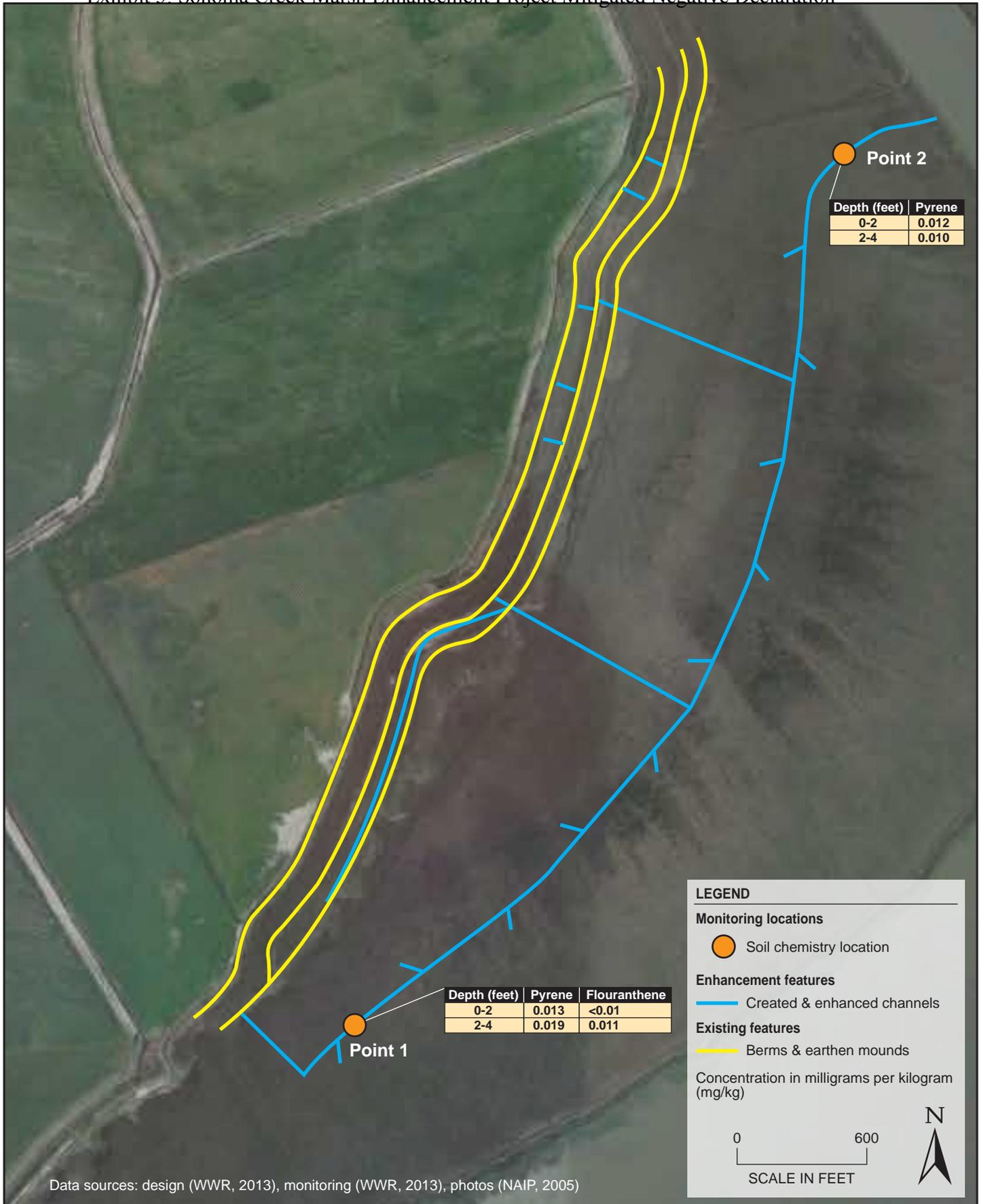
## **ATTACHMENT A**

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### **Figures and Tables**

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration





**TIDAL MARSH SOIL SAMPLING LOCATIONS AND DETECTED PESTICIDES**

Sonoma Creek Marsh Enhancement Project, Sonoma County, CA

By: MJC

JUNE 2013

**Figure 2**



**Table 1**  
**Composite Soil Sample Results – May 14, 2013**  
**Summary of Target Metals Analysis**  
**Sonoma Creek Enhancement Project, Sonoma County, California**

Metal	Sample ID (depth interval in feet)				SL
	Point 1 (0 - 2')	Point 1 (2 - 4')	Point 2 (0 - 2')	Point 2 (2 - 4')	
Arsenic	8.3	6.5	5.5	5.7	15.3
Cadmium	< 0.25	< 0.25	< 0.25	< 0.25	0.33
Chromium	74	46	51	40	112
Copper	50	32	34	31	68.1
Lead	24	15	17	15	43.2
Mercury	0.38	0.24	0.30	0.25	0.43
Nickel	90	59	57	49	112
Selenium	< 0.5	< 0.5	< 0.5	< 0.5	0.64
Silver	< 0.5	< 0.5	< 0.5	< 0.5	0.58
Zinc	110	69	73	63	158

Notes:

Depth interval measured in feet below ground surface

All concentrations preceded with < indicate a non-detection or less than the laboratory reporting limit.

SL = Wetland Surface Material Screening Limits Water Board 2000. Recommended Sediment Chemistry Screening Guidelines for Beneficial Reuse of Dredged Material, Table 4. May 25, 2000.

Results shown in **bold-face type** exceed the SL

All concentrations are in milligrams per kilogram (mg/kg)

**Table 2**  
**Composite Soil Sample Results – May 14, 2013**  
**Summary of Detected Poly Aromatic Hydrocarbons**  
**Sonoma Creek Enhancement Project, Sonoma County, California**

Analyte	Sample ID (depth interval in feet)				SL
	Point 1 (0 - 2')	Point 1 (2 - 4')	Point 2 (0 - 2')	Point 2 (2 - 4')	
Pyrene	0.013	0.019	0.012	0.010	0.665
Flouranthene	< 0.01	0.011	< 0.01	< 0.01	0.514

Notes:

No PAHs were found above the laboratory detection limit other than those listed in the table above.

All results are reported in milligrams per kilogram (mg/kg).

Depth interval measured in feet below ground surface

All concentrations preceded with < indicate a non-detection or less than the laboratory reporting limit.

SL = Wetland Surface Material Screening Limits Water Board 2000. Recommended Sediment Chemistry Screening Guidelines for Beneficial Reuse of Dredged Material, Table 4. May 25, 2000.

Results shown in **bold-face type** exceed the SL

All concentrations are in milligrams per kilogram (mg/kg)

**Table 3**  
**Recommended Sediment Chemistry Screening Guidelines for Beneficial Reuse of Dredged Material**

ANALYTE	Wetland Surface Material	
	Concentration	Decision Basis
<b><i>METALS (mg/kg)</i></b>		
Arsenic	15.3	Ambient Values
Cadmium	0.33	Ambient Values
Chromium	112	Ambient Values
Copper	68.1	Ambient Values
Lead	43.2	Ambient Values
Mercury	0.43	Ambient Values
Nickel	112	Ambient Values
Selenium	0.64	Ambient Values
Silver	0.58	Ambient Values
Zinc	158	Ambient Values
<b><i>ORGANOCHLORINE PESTICIDES/PCBS (µg/kg)</i></b>		
DDTS, sum	7.0	Ambient Values
Chlordanes, sum	2.3	TEL
Dieldrin	0.72	TEL
Hexachlorocyclohexane, sum	0.78	Ambient Values
Hexachlorobenzene	0.485	Ambient Values
PCBs, sum	22.7	ER-L
<b><i>POLYCYCLIC AROMATIC HYDROCARBONS (µg/kg)</i></b>		
PAHs, total	3,390	Ambient Values
Low molecular weight PAHs, sum	434	Ambient Values
High molecular weight PAHs, sum	3,060	Ambient Values
1-Methylnaphthalene	12.1	Ambient Values
1-Methylphenanthrene	31.7	Ambient Values
2,3,5-Trimethylnaphthalene	9.8	Ambient Values
2,6-Dimethylnaphthalene	12.1	Ambient Values
2-Methylnaphthalene	19.4	Ambient Values
Acenaphthene	26.0	Ambient Values
Acenaphthylene	88.0	Ambient Values
Anthracene	88.0	Ambient Values
Benz(a)anthracene	412	Ambient Values
Benzo(a)pyrene	371	Ambient Values
Benzo(e)pyrene	294	Ambient Values
Benzo(b)fluoranthene	371	Ambient Values
Benzo(g,h,i)perylene	310	Ambient Values
Benzo(k)fluoranthene	258	Ambient Values
Biphenyl	12.9	Ambient Values
Chrysene	289	Ambient Values
Dibenz(a,h)anthracene	32.7	Ambient Values
Fluoranthene	514	Ambient Values
Fluorene	25.3	Ambient Values
Indeno(1,2,3-c,d)pyrene	382	Ambient Values
Naphthalene	55.8	Ambient Values
Perylene	145	Ambient Values
Phenanthrene	237	Ambient Values
Pyrene	665	Ambient Values

“Recommended Sediment Chemistry Screening Guidelines for Beneficial Reuse of Dredged Material” Water Board, May 25, 2000

**ATTACHMENT B**

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**Photodocumentation**



Subject: Sonoma Creek Enhancement Project, Soil Sampling Point 1

Site: Sonoma County, California

Date Taken: May 14, 2013

Project No.: SES 2013-27

Photographer: H. Pietropaoli

Photo No.: 01



Subject: Sonoma Creek Enhancement Project, Soil Sampling Point 2

Site: Sonoma County, California

Date Taken: May 14, 2013

Project No.: SES 2013-27

Photographer: Ariana with USFWS

Photo No.: 02

**ATTACHMENT C**

---

**Certified Analytical Laboratory Report &  
Chain-of-Custody Documentation**



McC Campbell Analytical, Inc.  
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269  
<http://www.mcccampbell.com> / E-mail: [main@mcccampbell.com](mailto:main@mcccampbell.com)

## Analytical Report

Stellar Environmental Solutions  2198 Sixth St. #201  Berkeley, CA 94710	Client Project ID: #2013-27; Sonoma Creek Marsh	Date Sampled: 05/14/13
		Date Received: 05/15/13
	Client Contact: Richard Makdisi	Date Reported: 05/30/13
	Client P.O.:	Date Completed: 05/30/13

**WorkOrder: 1305475**

May 30, 2013

Dear Richard:

Enclosed within are:

- 1) The results of the **4** analyzed samples from your project: **#2013-27; Sonoma Creek Marsh,**
- 2) QC data for the above samples, and
- 3) A copy of the chain of custody.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing

McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius  
Laboratory Manager  
McC Campbell Analytical, Inc.

*The analytical results relate only to the items tested.*

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

Chain of Custody Record

Laboratory McC Campbell Analytical Inc Method of Shipment courier  
 Address 1534 Willow Pass Road Shipment No. \_\_\_\_\_  
Pittsburg, CA 94565-1701 Airbill No. \_\_\_\_\_  
877-252-9262 Cooler No. \_\_\_\_\_  
 Project Owner Wetlands and Water Resources Project Manager Richard Makdisi  
 Site Address 2100 Hwy 37 Telephone No. (510) 644-3123  
Sonoma County, CA Fax No. (510) 644-3859  
 Project Name Sonoma Creek Marsh Samplers: (Signature) [Signature]  
 Project Number 2013-27

Lab job no. \_\_\_\_\_  
 Date \_\_\_\_\_  
 Page 1 of 1

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Filtered	No. of Containers	Analysis Required	Remarks				
						Cooler	Chemical								
Point 1A	0-2'	5/14/13	1308	Soil	802 jar	yes	no	No	1	X	X	X	X		
Point 1B	2-4'		1310												
Point 2A	0-2'		1400												
Point 2B	2-4'		1410												

ICE: 24  
 GOOD CONDITION \_\_\_\_\_  
 HEAD SPACE ABSENT \_\_\_\_\_  
 DECHLORINATED IN LAB \_\_\_\_\_  
 PRESERVATION: VOAS | O&G | METALS | OTHER

As Cd Cr Cu Pb  
 Ni Se Ag Zn  
 Hg 7471A  
 PAHs/PNAs + mix  
 SW 8081A / 8082  
 SIM 8270  
 OC Pestic PCBs + mix

Relinquished by: <u>[Signature]</u> Signature Printed: <u>Id. Petropah</u> Company: <u>Stellar Environmental</u>	Date: <u>5/15/13</u> Time: <u>1340</u>	Received by: <u>[Signature]</u> Signature Printed: _____ Company: <u>McC Campbell</u>	Date: <u>5/15/13</u> Time: <u>1340</u>	Relinquished by: <u>[Signature]</u> Signature Printed: <u>Rob King</u> Company: <u>McC Campbell</u>	Date: <u>5/15/13</u> Time: <u>1630</u>	Received by: <u>[Signature]</u> Signature Printed: <u>Jena Whitney</u> Company: <u>MAI</u>	Date: <u>5/15/13</u> Time: <u>1630</u>
Turnaround Time: <u>standard turn around</u>				Relinquished by: _____ Date: _____			
Comments: <u>samples on ice</u>				Received by: _____ Date: _____			
Ensure methods and reporting as specified on Mac quote #2951 <u>[Signature]</u>				Printed: _____ Time: _____			
Company: _____				Company: _____			

★ Stellar Environmental Solutions

Attached

2198 Sixth Street #201, Berkeley, CA 94710



**McC Campbell Analytical, Inc.**  
 "When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
 Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269  
 http://www.mcccampbell.com / E-mail: main@mcccampbell.com

## QUOTATION for ANALYTICAL SERVICES

Requested By: Henry Pietropaoli  
 Stellar Environmental Solutions (SESB)  
 2198 Sixth St. #201  
 Berkeley, CA 94710  
 (510) 644-3123  
 (510) 644-3859 (Fax)

<b>Quote ID:</b>	<b>2951</b>
------------------	-------------

Prepared DATE: *April 19, 2013*  
 Expiration DATE: *July 17, 2013*

Project: Table 4-Screening Guidelines

Prepared By: Melissa Valles

Test Name	Test Method	TAT	Matrix	Qty	Unit Price	Test Total
SW6020 (Metals) As, Cd, Cr, Cu, Pb, Ni, Se, Ag, Zn	SW6020	5 days	Soil	1	\$95.00	\$95.00
SW7471A (Mercury)	SW7471A	5 days	Soil	1	\$25.00	\$25.00
SW8270C (PAHs/PNAs+Misc. Compounds) (SIM Mode)	SW8270C-SIM	5 days	Soil	1	\$160.00	\$160.00
SW8081A/8082 (OC Pesticides+PCBs+Misc. Compounds)	SW8081A/8082	5 days	Soil	1	\$175.00	\$175.00

**TOTAL: \$455.00**

**Comments:** Price quote includes all relevant sampling containers and local sample pickup.

Quote ID MUST be indicated on the chain of custody at the time of sample submission to ensure appropriate methodology & fees are applied.

Misc. compounds for 8270 PAH includes: 1-Methylphenanthrene, 2,3,5-Trimethylnapthalene, 2,6-Dimethylnapthalene, Benzo(e)pyrene, and Perylene

Misc. compounds for 8081/PCB includes 2,4 DDD, DDE, and DDT

PCB sum means 7 Aroclors

Chlordane sum means Chlordane Technical

Hexachlorocyclohexane sum means alpha, beta, delta, and gamma BHC

The lower molecular weight PAHs means 2 to 3 ring groups of PAHs

The high molecular weight PAHs means 4 to 7 ring

MAI offers same day, 24hr, 48hr, 72hr TAT at 150%, 100%, 50%, 25% markup from standard TAT, respectively. All rush TATs must be arranged in advance. Sample Reception is from Monday thru Friday between 8:00AM- 9:00PM.

If you have any questions or concerns, please contact Melissa Valles at (925) 252-9262 Ext. 51 or by email at melissa@mcccampbell.com. We look forward to working with you and thank you for the opportunity to present our analytical capabilities.

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

McC Campbell Analytical, Inc.

CHAIN-OF-CUSTODY RECORD



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

WorkOrder: 1305475

ClientCode: SESB

- WaterTrax  
  WriteOn  
  EDF  
  Excel  
  EQUIS  
 Email  
 HardCopy  
 ThirdParty  
 J-flag

**Report to:**  
 Richard Makdisi  
 Stellar Environmental Solutions  
 2198 Sixth St. #201  
 Berkeley, CA 94710  
 (510) 644-3123    FAX: (510) 644-3859

**Email:**    rmakdisi@stellar-environmental.com;hpietr  
**cc:**  
**PO:**  
**ProjectNo:** #2013-27; Sonoma Creek Marsh

**Bill to:**  
 Accounts Payable  
 Stellar Environmental Solutions  
 2198 Sixth St. #201  
 Berkeley, CA 94710  
 lwheeler@stellar-environmental.com

**Requested TAT:**            **5 days**

**Date Received:**        **05/15/2013**

**Date Printed:**         **05/16/2013**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1305475-001	Point 1A	Soil	5/14/2013 13:00	<input type="checkbox"/>	A	A	A	A									
1305475-002	Point 1B	Soil	5/14/2013 13:10	<input type="checkbox"/>	A	A	A	A									
1305475-003	Point 2A	Soil	5/14/2013 14:00	<input type="checkbox"/>	A	A	A	A									
1305475-004	Point 2B	Soil	5/14/2013 14:10	<input type="checkbox"/>	A	A	A	A									

**Test Legend:**

1	8081PCBEXT_S	2	8270D-PNAEXT_S	3	HG_S	4	METALSMS_S	5	
6		7		8		9		10	
11		12							

**Prepared by: Jena Alfaro**

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days). Hazardous samples will be returned to client or disposed of at client expense.

**Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration**



**McC Campbell Analytical, Inc.**  
*"When Quality Counts"*

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
 Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269  
 http://www.mcccampbell.com / E-mail: main@mcccampbell.com

**Sample Receipt Checklist**

Client Name: **Stellar Environmental Solutions** Date and Time Received: **5/15/2013 8:20:36 PM**  
 Project Name: **#2013-27; Sonoma Creek Marsh** LogIn Reviewed by: **Jena Alfaro**  
 WorkOrder N°: **1305475** Matrix: Soil Carrier: Rob Pringle (MAI Courier)

**Chain of Custody (COC) Information**

Chain of custody present? Yes  No   
 Chain of custody signed when relinquished and received? Yes  No   
 Chain of custody agrees with sample labels? Yes  No   
 Sample IDs noted by Client on COC? Yes  No   
 Date and Time of collection noted by Client on COC? Yes  No   
 Sampler's name noted on COC? Yes  No

**Sample Receipt Information**

Custody seals intact on shipping container/cooler? Yes  No  NA   
 Shipping container/cooler in good condition? Yes  No   
 Samples in proper containers/bottles? Yes  No   
 Sample containers intact? Yes  No   
 Sufficient sample volume for indicated test? Yes  No

**Sample Preservation and Hold Time (HT) Information**

All samples received within holding time? Yes  No   
 Container/Temp Blank temperature Cooler Temp: 2.4°C NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  No VOA vials submitted   
 Sample labels checked for correct preservation? Yes  No   
 Metal - pH acceptable upon receipt (pH<2)? Yes  No  NA   
 Samples Received on Ice? Yes  No

(Ice Type: WET ICE )

\* NOTE: If the "No" box is checked, see comments below.

-----  
 Comments:



Stellar Environmental Solutions  2198 Sixth St. #201  Berkeley, CA 94710	Client Project ID: #2013-27; Sonoma Creek Marsh	Date Sampled: 05/14/13
	Client Contact: Richard Makdisi	Date Received: 05/15/13
	Client P.O.:	Date Extracted: 05/15/13
		Date Analyzed: 05/23/13-05/24/13

**Organochlorine Pesticides by GC-ECD (8080 Basic Target List) + PCBs + Misc. Compounds\***

Extraction Method: SW3550B

Analytical Method: SW8081A/8082

Work Order: 1305475

Lab ID	1305475-001A	1305475-002A	1305475-003A	1305475-004A	Reporting Limit for DF = 1	
Client ID	Point 1A	Point 1B	Point 2A	Point 2B	S	W
Matrix	S	S	S	S		
DF	1	1	1	1		

Compound	Concentration				mg/kg	µg/L
Aldrin	ND	ND	ND	ND	0.001	NA
a-BHC	ND	ND	ND	ND	0.001	NA
b-BHC	ND	ND	ND	ND	0.001	NA
d-BHC	ND	ND	ND	ND	0.001	NA
g-BHC	ND	ND	ND	ND	0.001	NA
Chlordane (Technical)	ND	ND	ND	ND	0.025	NA
a-Chlordane	ND	ND	ND	ND	0.001	NA
g-Chlordane	ND	ND	ND	ND	0.001	NA
o,p-DDD	ND	ND	ND	ND	0.001	NA
p,p-DDD	ND	ND	ND	ND	0.001	NA
o,p-DDE	ND	ND	ND	ND	0.001	NA
o,p-DDT	ND	ND	ND	ND	0.001	NA
p,p-DDE	ND	ND	ND	ND	0.001	NA
p,p-DDT	ND	ND	ND	ND	0.001	NA
Dieldrin	ND	ND	ND	ND	0.001	NA
Endosulfan I	ND	ND	ND	ND	0.001	NA
Endosulfan II	ND	ND	ND	ND	0.001	NA
Endosulfan sulfate	ND	ND	ND	ND	0.001	NA
Endrin	ND	ND	ND	ND	0.001	NA
Endrin aldehyde	ND	ND	ND	ND	0.001	NA
Endrin ketone	ND	ND	ND	ND	0.001	NA
Heptachlor	ND	ND	ND	ND	0.001	NA
Heptachlor epoxide	ND	ND	ND	ND	0.001	NA
Hexachlorobenzene	ND	ND	ND	ND	0.01	NA
Hexachlorocyclopentadiene	ND	ND	ND	ND	0.02	NA
Methoxychlor	ND	ND	ND	ND	0.001	NA
Toxaphene	ND	ND	ND	ND	0.05	NA
Aroclor1016	ND	ND	ND	ND	0.05	NA
Aroclor1221	ND	ND	ND	ND	0.05	NA
Aroclor1232	ND	ND	ND	ND	0.05	NA
Aroclor1242	ND	ND	ND	ND	0.05	NA
Aroclor1248	ND	ND	ND	ND	0.05	NA
Aroclor1254	ND	ND	ND	ND	0.05	NA
Aroclor1260	ND	ND	ND	ND	0.05	NA
PCBs, total	ND	ND	ND	ND	0.05	NA

**Surrogate Recoveries (%)**

%SS:	109	92	97	97	
<b>Comments</b>					

\* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

# surrogate diluted out of range or surrogate coelutes with another peak.

*OR for*



Stellar Environmental Solutions  2198 Sixth St. #201  Berkeley, CA 94710	Client Project ID: #2013-27; Sonoma Creek Marsh	Date Sampled: 05/14/13
	Client Contact: Richard Makdisi	Date Received: 05/15/13
	Client P.O.:	Date Extracted: 05/29/13
		Date Analyzed: 05/29/13-05/30/13

**Polynuclear Aromatic Hydrocarbons (PAHs / PNAs) using SIM Mode by GC/MS\***

Extraction Method: SW3550B

Analytical Method: SW8270C-SIM

Work Order: 1305475

Lab ID	1305475-001A	1305475-002A	1305475-003A	1305475-004A	Reporting Limit for DF = 1	
Client ID	Point 1A	Point 1B	Point 2A	Point 2B	S	W
Matrix	S	S	S	S		
DF	1	1	1	1		

Compound	Concentration				mg/kg	µg/L
Acenaphthene	ND	ND	ND	ND	0.01	NA
Acenaphthylene	ND	ND	ND	ND	0.01	NA
Anthracene	ND	ND	ND	ND	0.01	NA
Benzo (a) anthracene	ND	ND	ND	ND	0.01	NA
Benzo (b) fluoranthene	ND	ND	ND	ND	0.01	NA
Benzo (k) fluoranthene	ND	ND	ND	ND	0.01	NA
Benzo (g,h,i) perylene	ND	ND	ND	ND	0.01	NA
Benzo(e)pyrene	ND	ND	ND	ND	0.01	NA
Benzo (a) pyrene	ND	ND	ND	ND	0.01	NA
Chrysene	ND	ND	ND	ND	0.01	NA
Dibenzo (a,h) anthracene	ND	ND	ND	ND	0.01	NA
2,6-Dimethylnaphthalene	ND	ND	ND	ND	0.01	NA
Fluoranthene	ND	0.011	ND	ND	0.01	NA
Fluorene	ND	ND	ND	ND	0.01	NA
Indeno (1,2,3-cd) pyrene	ND	ND	ND	ND	0.01	NA
1-Methylnaphthalene	ND	ND	ND	ND	0.01	NA
2-Methylnaphthalene	ND	ND	ND	ND	0.01	NA
1-Methylphenanthrene	ND	ND	ND	ND	0.01	NA
2-Methylphenanthrene	ND	ND	ND	ND	0.01	NA
Naphthalene	ND	ND	ND	ND	0.01	NA
Phenanthrene	ND	ND	ND	ND	0.01	NA
Perylene	ND	ND	ND	ND	0.01	NA
Pyrene	0.013	0.019	0.012	0.010	0.01	NA
2,3,5-Trimethylnaphthalene	ND	ND	ND	ND	0.01	NA

**Surrogate Recoveries (%)**

%SS1:	111	121	118	121	
%SS4:	107	112	109	113	
<b>Comments</b>					

\* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected at or above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

#) surrogate diluted out of range or surrogate coelutes with another peak.; &) low or no surrogate due to matrix interference.







### QC SUMMARY REPORT FOR SW8081A/8082

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 77368

WorkOrder: 1305475

EPA Method: SW8081A/8082		Extraction: SW3550B					Spiked Sample ID: 1305374-054A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)			
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS	
Aldrin	ND	0.050	107	104	2.46	92.8	70 - 130	30	70 - 130	
g-BHC	ND	0.050	128	128	0	112	70 - 130	30	70 - 130	
p,p-DDT	ND	0.050	109	109	0	97.5	70 - 130	30	70 - 130	
Dieldrin	ND	0.050	127	124	2.09	113	70 - 130	30	70 - 130	
Endrin	ND	0.050	126	124	1.96	111	70 - 130	30	70 - 130	
Heptachlor	ND	0.050	125	125	0	110	70 - 130	30	70 - 130	
%SS:	88	0.050	86	87	1.26	97	70 - 130	30	70 - 130	

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

#### BATCH 77368 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1305475-001A	05/14/13 1:00 PM	05/15/13	05/23/13 9:35 PM	1305475-002A	05/14/13 1:10 PM	05/15/13	05/23/13 10:30 PM
1305475-003A	05/14/13 2:00 PM	05/15/13	05/23/13 11:25 PM	1305475-004A	05/14/13 2:10 PM	05/15/13	05/24/13 12:20 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS} - \text{Sample}) / (\text{Amount Spiked})$ ;  $\text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2)$ .  
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

*OC for*  
 \_\_\_\_\_ QA/QC Officer



### QC SUMMARY REPORT FOR SW8270C

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 77760

WorkOrder: 1305475

EPA Method: SW8270C-SIM		Extraction: SW3550B					Spiked Sample ID: 1305762-001A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)			
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS	
Benzo (a) pyrene	ND	0.20	65.6	67	2.20	54.9	30 - 130	30	30 - 130	
Chrysene	ND	0.20	85.3	85.8	0.572	71	30 - 130	30	30 - 130	
1-Methylnaphthalene	ND	0.20	91.7	91.9	0.186	77	30 - 130	30	30 - 130	
2-Methylnaphthalene	ND	0.20	77.1	76.7	0.503	65.7	30 - 130	30	30 - 130	
Phenanthrene	ND	0.20	89.4	89.9	0.476	74.1	30 - 130	30	30 - 130	
Pyrene	ND	0.20	94.2	92.5	1.73	72.7	30 - 130	30	30 - 130	
%SS1:	114	0.50	113	114	0.437	100	30 - 130	30	30 - 130	
%SS2:	109	0.50	112	113	0.837	98	30 - 130	30	30 - 130	

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

#### BATCH 77760 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1305475-001A	05/14/13 1:00 PM	05/29/13	05/30/13 12:11 AM	1305475-001A	05/14/13 1:00 PM	05/29/13	05/30/13 1:51 AM
1305475-002A	05/14/13 1:10 PM	05/29/13	05/29/13 11:21 PM	1305475-002A	05/14/13 1:10 PM	05/29/13	05/30/13 1:01 AM
1305475-003A	05/14/13 2:00 PM	05/29/13	05/29/13 10:55 PM	1305475-003A	05/14/13 2:00 PM	05/29/13	05/30/13 12:36 AM
1305475-004A	05/14/13 2:10 PM	05/29/13	05/29/13 11:46 PM	1305475-004A	05/14/13 2:10 PM	05/29/13	05/30/13 1:26 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS-Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2).$   
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.  
 Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.



### QC SUMMARY REPORT FOR SW7471A

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 77383

WorkOrder: 1305475

EPA Method: SW7471A		Extraction: SW7471A					Spiked Sample ID: 1305475-001A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)			
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS	
Mercury	0.38	0.25	NR	NR	NR	119	N/A	N/A	80 - 120	

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

#### BATCH 77383 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1305475-001A	05/14/13 1:00 PM	05/15/13	05/21/13 3:08 PM	1305475-002A	05/14/13 1:10 PM	05/15/13	05/21/13 3:17 PM
1305475-003A	05/14/13 2:00 PM	05/15/13	05/21/13 3:20 PM	1305475-004A	05/14/13 2:10 PM	05/15/13	05/21/13 3:23 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS} - \text{Sample}) / (\text{Amount Spiked})$ ;  $\text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2)$ .  
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not applicable to this method.  
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS ELAP Certification 1644

*OC for*  
 \_\_\_\_\_ QA/QC Officer



### QC SUMMARY REPORT FOR SW6020

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 77367

WorkOrder: 1305475

EPA Method: SW6020		Extraction: SW3050B					Spiked Sample ID: 1305374-044A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)			
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS	
Arsenic	3.8	50	107	108	0.452	102	75 - 125	20	75 - 125	
Cadmium	ND	50	108	102	5.55	96.1	75 - 125	20	75 - 125	
Chromium	77	50	NR	NR	NR	100	N/A	N/A	75 - 125	
Copper	15	50	105	101	3.04	101	75 - 125	20	75 - 125	
Lead	25	50	108	98.4	6.54	97.8	75 - 125	20	75 - 125	
Nickel	29	50	109	103	3.91	101	75 - 125	20	75 - 125	
Selenium	ND	50	108	103	4.91	102	75 - 125	20	75 - 125	
Silver	ND	50	111	104	5.97	99.1	75 - 125	20	75 - 125	
Zinc	40	500	107	102	3.79	101	75 - 125	20	75 - 125	
%SS:	118	500	114	108	5.84	90	70 - 130	20	70 - 130	

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

#### BATCH 77367 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1305475-001A	05/14/13 1:00 PM	05/15/13	05/19/13 2:39 AM	1305475-002A	05/14/13 1:10 PM	05/15/13	05/19/13 2:45 AM
1305475-003A	05/14/13 2:00 PM	05/15/13	05/19/13 3:08 AM	1305475-004A	05/14/13 2:10 PM	05/15/13	05/19/13 3:14 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 % Recovery =  $100 * (MS - Sample) / (Amount Spiked)$ ;  $RPD = 100 * (MS - MSD) / ((MS + MSD) / 2)$ .  
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not applicable to this method.  
 NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

*OC for*  
 \_\_\_\_\_ QA/QC Officer

**ATTACHMENT D**

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**USFWS Special Use Permit**



UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE

San Pablo Bay National Wildlife Refuge  
7715 Lakeville Highway  
Petaluma, CA 94954  
707-769-4200

**SPECIAL USE PERMIT**

**81644 - 2-2013**

Date **May 13, 2013**

Period of Use (inclusive)

From **May 13, 2013**

To **May 13, 2014**

Permittee Name

Dan Gillenwater, Henry Pietropaoli

Permittee Address

Dan Gillenwater  
818 Fifth Ave., Suite 208, San Rafael, CA  
94901  
dan@swamphing.org

Purpose (specify in detail privilege requested, or units of products involved)

The purpose is to monitor surface water hydrology, and soil chemistry throughout the Sonoma Creek Enhancement Project site. This is being done as part of the Sonoma Creek Enhancement Project to enhance drainage conditions, and ecosystem function. This study may be extended for additional years beyond this initial period of use.

Description (specify unit numbers: metes and bounds, or other recognizable designations)

Permittees will install surface water monitoring wells on the marsh plain in three locations within the project area. Permittees will then place vented pressure sensors within these wells. After initial installation, permittees will service these sensors once a month between May 2013 and September 2013. In addition, permittees will collect four sub-surface soil samples from two locations within the central tidal channel footprint for chemical analysis.

Amount of fee **\$0** if not a fixed payment, specify rate and unit of charge:

- Payment Exempt - Justification: Research
- Full Payment
- Partial Payment - Balance of payments to be made as follows:

Record of Payments

N/A

Special Conditions

Read, and abide by, the "Walking in the Marsh" protocol before accessing the Sonoma Creek Marsh.  
All equipment and apparel used in the marsh will be decontaminated and weed free before entry in to the marsh.  
In addition to the General Conditions below, review Special Conditions continuation page.

This permit is issued by the U.S. Fish and Wildlife Service and accepted by the undersigned, subject to the terms, covenants, obligations, and reservations, expressed or implied herein, and to the conditions and requirements appearing on the reverse side.

Permittee Signature

*Henry Pietropaoli*

Issuing Officer Signature and Title

*Morgan A. [Signature]* 14 May 13  
WILDLIFE BIOLOGIST

**General Conditions**  
Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

**1. Payments**

All payments shall be made on or before the due date to the local representative of the U.S. Fish and Wildlife Service (Service) by a postal money order or check made payable to the U.S. Fish and Wildlife Service.

**2. Use limitations**

The permittee's use of the described premises is limited to the purposes herein specified; does not unless provided for in this permit allow the permittee to restrict other authorized entry on to the permittee's area; and permits the Service to carry on whatever activities are necessary for (1) protection and maintenance of the premises and adjacent lands administered by the Service and (2) the management of wildlife and fish using the premises and other Service lands.

**3. Damages**

The United States shall not be responsible for any loss or damage to property including but not limited to growing crops, animals, and machinery; or injury to the permittee, or the permittee's relatives, or to the officers, agents, employees, or any others who are on the premises from instructions or by the sufferance of wildlife or employees or representatives of the Government carrying out their official responsibilities. The permittee agrees to save the United States or any of its agencies harmless from any and all claims for damages or losses that may arise or be incident to the flooding of the premises resulting from any associated Government river and harbor, flood control, reclamation, or Tennessee Valley Authority activity.

**4. Operating Rules and Laws**

The permittee shall keep the premises in a neat and orderly condition at all times, and shall comply with all municipal, county and State laws applicable to the operations under the permit as well as all Federal laws, rules and regulations governing Service lands and the area described in this permit. The permittee shall comply with all instructions applicable to this permit issued by the Service officer in charge. The permittee shall take all reasonable precautions to prevent the escape of fires and to suppress fires and shall render all reasonable assistance in the suppression of fires.

**5. Responsibility of Permittee**

The permittee, by operating on the premises, shall be considered to have accepted these premises with all facilities, fixtures, or improvements in their existing condition as of the date of this permit. At the end of the period specified or upon earlier termination, the permittee shall give up the premises in as good an order and condition as when received except for reasonable wear, tear, or damage occurring without fault or negligence. The permittee will fully repay the Service for any and all damage directly or indirectly resulting from negligence or failure on his/her part, or the part of anyone of the permittee's associates.

**6. Revocation Policy**

This permit may be revoked by a Service Regional Director without notice for noncompliance with the terms hereof or for violation of general and/or specific laws or regulations governing Service lands or for nonuse.

**7. Compliance**

Failure of the Service to insist upon a strict compliance with any of this permit's terms, conditions, and requirements shall not constitute a waiver or be considered as a giving up of the Service's right to thereafter enforce any of the permit's terms, conditions, or requirements.

**8. Termination Policy**

At the termination of this permit the permittee shall immediately give up possession to the Service representative, reserving, however, the rights specified in paragraph 9. If the permittee fails to do so, the permittee will pay the Government, as liquidated damages, an amount double the rate specified in this permit for the entire time possession is withheld. Upon yielding possession, the permittee will still be allowed to reenter as needed to remove his/her property as stated in paragraph 9. The acceptance of any fee for liquidated damages or any other act of administration relating to the continued tenancy is not to be considered as an affirmation of the permittee's action nor shall it operate as a waiver of the Government's right to terminate or cancel the permit for the breach of any specified condition or requirement.

**9. Removal of Permittee's Property**

Upon the expiration or termination of this permit, if all rental charges and/or damage claims due to the Government have been paid, the permittee may, within a reasonable period as stated in the permit or as determined by the Service officer in charge but not to exceed 60 days, remove all structures, machinery, and/or other equipment, etc., from the premises for which the permittee is responsible. Within this period the permittee must also remove any other of the permittee's property including his/her acknowledged share of products or crops grown, cut, harvested, stored, or stacked on the premises. Upon failure to remove any of the above items within the aforesaid period, they shall become the property of the United States.

**10. Transfer of Privileges**

This permit is not transferable, and no privileges herein mentioned may be sublet or made available to any person or interest not mentioned in this permit. No interest hereunder may accrue through lien or be transferred to a third party without the approval of a Service Regional Director and the permit shall not be used for speculative purposes.

**11. Conditions of Permit not Fulfilled**

If the permittee fails to fulfill any of the conditions and requirements set forth herein, all money paid under this permit shall be retained by the Government to be used to satisfy as much of the permittee's obligation as possible.

**12. Officials Barred from Participating**

No Members of Congress or Resident Commissioner shall participate in any part of this contract or to any benefit that may arise from it, but this provision

**Privacy Act Statement - Special Use Permit**

**NOTICE:** In accordance with the Privacy Act of 1974, 5 U.S.C. 552a, please be advised that:

1. The issuance of a permit and collection of fees on lands of the National Wildlife Refuge System is authorized by the National Wildlife Refuge System Administration Act (16 U.S.C. 668dd - 668ee), and the Refuge Recreation Act, (16 U.S.C. 460k-3); implemented by regulations in 50 CFR 25-36.
2. Information collected in issuing a permit may be used to evaluate and conclude the eligibility of, or merely document, permit applicants.
3. Routine use disclosures may also be made (1) to the U.S. Department of Justice when related to litigation or anticipated litigation; (2) of information indicating a violation or potential violation of a statute, regulation, rule, order or license, to appropriate Federal, State, local or foreign agencies responsible for investigating or prosecuting the violation or for enforcing or implementing the statute, rule, regulation, order, or license; (3) from the record of the individual in response to an inquiry from a Congressional office made at the request of that individual; (4) to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal Claim against the debtor, or to consumer reporting agencies to prepare a commercial credit report for use by the Department (48FR 54716; December 6, 1983).
4. Any information requested is required to receive this permit. Failure to answer questions may jeopardize the eligibility of individuals to receive permits.

Exhibit 5: Sonoma Creek Marsh Enhancement Project Mitigated Negative Declaration

**Special Conditions (continued) - Permit # 81644-2-2013**

**Resulting data collected under this permit, and all reports generated from this data will be reported/sent to the Refuge.**

**Access to the Sonoma Creek Marsh is only allowed from dawn to dusk. Permittee and designated agents will phone into the refuge office (707)769-4200 each time the Marsh is accessed for this study. Permittee and designated agents must carry a copy of this permit while on the unit.**

**If you sense a potential threat on refuge property, like suspicious persons, open doors, vehicles, vandalism, etc. especially after hours, call U.S. Park Police Dispatch at (415) 561-5510. In a serious threat (immediate threat to persons and property) call 911 and then the U.S. Park Police Dispatch.**