Draft Mitigated Negative Declaration

E Street Marsh Living Shoreline Project

UPD #MND-2018-010

Prepared for

San Diego
Unified Port District

Prepared by

Aspen Environmental Group

July 2018

DRAFT
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for the

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Technical Support Provided by
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Executive Summary

This Draft Mitigated Negative Declaration (Draft MND) has been prepared to evaluate the potential environmental effects of the E Street Marsh Living Shoreline Project (project). The project is a pilot restoration study to create native Olympia oyster (*Ostrea lurida*) reefs in a portion of south San Diego Bay (Bay).The project is designed to determine if native Olympia oysters successfully recruit on constructed reef ball elements, the effect of tidal elevation on recruitment of native and non-native oysters, the ability of constructed reefs to protect shorelines from erosion and flooding, and whether constructed reefs support higher degrees, or levels, of biodiversity than in adjacent mudflats. The project site is adjacent to the existing E Street Marsh, along the shoreline of Chula Vista, California, and within the jurisdictional boundaries of the San Diego Unified Port District (District). The project site is within Planning District 7, the Chula Vista Bayfront, of the District's certified Port Master Plan, and has a land use designation of Wetlands. The project site is a wide intertidal mudflat located adjacent to the E Street Marsh, along a portion of the southeast shoreline of the Bay, south of Sweetwater Marsh (see Figure 1).

This Draft MND has been prepared pursuant to the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.), its implementing regulations, the State CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Section 15000, et seq.), and the District's adopted CEQA Guidelines. This Draft MND meets the requirements of State CEQA Guidelines Sections 15070 (Decision to Prepare a Negative or Mitigated Negative Declaration) and 15071 (Contents), and District CEQA Guidelines Section V (Preparation of a Negative Declaration). The attached Initial Study (Attachment A) meets all of the requirements of State CEQA Guidelines Section 15063 (Initial Study) and District CEQA Guidelines Section IV (Preparation of Initial Study).

Pursuant to State CEQA Guidelines Section 15367 (Lead Agency), the District is the Lead Agency under CEQA because the District manages the land and water areas occupied by the project, and has the authority to issue a project-specific non-appealable Coastal Development Permit (CDP) subject to the provisions of the California Coastal Act of 1976, as amended.

A. Project Description

The project is a pilot restoration project intended to create a biologically rich native Olympia oyster reef in the Bay to restore an ecological niche that was historically present, to provide habitat that is ecologically functional and resilient to changing environmental conditions, and to protect Bay tidelands and shoreline.

Installation of the project's reef ball elements is anticipated to be complete within four weeks. Following installation, a 5-year monitoring program would be implemented to collect and analyze data to assess the project's success. Upon its conclusion, the project's reef ball elements would be expected to be left in place as habitat.

B. Proposed Finding

The Initial Study prepared for the project found that it would not result in significant adverse impacts requiring mitigation for the following issue areas: Aesthetics; Agriculture and Forestry Resources; Air Quality; Cultural Resources; Geology/Soils; Greenhouse Gas Emissions; Hazards and Hazardous Materials; Hydrology/ Water Quality; Land Use/Planning; Mineral Resources; Noise; Population/Housing; Public Services; Recreation; Transportation/Traffic; Tribal Cultural Resources; and Utilities/Service Systems.

The Initial Study prepared for the project found that impacts to Biological Resources are less than significant with mitigation incorporated. These mitigation measures are identified in Table MMRP-1 and discussed below in Section IV, Environmental Analysis. The mitigation measures will be conditions of the proposed CDP.

I. Introduction

A. Purpose of a Mitigated Negative Declaration

CEQA Section 21064 (Negative Declaration) defines a Negative Declaration as "a written statement briefly describing the reasons that a proposed project will not have a significant effect on the environment and does not require the preparation of an environmental impact report." CEQA Section 21064.5 (Mitigated Negative Declaration) defines a Mitigated Negative Declaration as "a negative declaration prepared for a project when the initial study has identified potentially significant effects on the environment, but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment."

CEQA Section 21068 (Significant Effect on the Environment) defines a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment."

CEQA Section 21082.2(a) (Significant Effect on Environment; Determination; Environmental Impact Report Preparation) requires that a lead agency "shall determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record."

The District, acting as Lead Agency, has prepared an Initial Study to address the potential environmental effects associated with the project, as detailed in Draft MND Section II (Project Description), pursuant to the requirements of CEQA, the State CEQA Guidelines, and the District's CEQA Guidelines. Specifically, the Initial Study meets the requirements of State CEQA Guidelines Section 15063 (Initial Study) and the District's CEQA Guidelines Section IV (Preparation of Initial Study). The Initial Study includes a discussion of the project's potential effects on the existing environment. Issue areas identified as having potential impacts are discussed further and include mitigation measures that would reduce identified adverse impacts to "Less Than Significant With Mitigation Incorporated." No issue areas have been identified where possible environmental impacts cannot be mitigated to a level of less than significant.

See Attachment A for the project's complete Initial Study.

B. Project Proponent/Applicant

The District is the Applicant.

C. Project Purpose and Need

The purpose and need of the project is to determine if native Olympia oysters (*Ostrea lurida*) successfully recruit (grow) on constructed reef ball elements, the effect of tidal elevation on recruitment of native and non-native oysters, the ability of constructed reefs to protect shorelines from erosion, and whether constructed reefs support higher degrees, or levels, of native species and biodiversity than in adjacent mudflats.

D. Project Location

The project site is located adjacent to the existing E Street Marsh, within the City of Chula Vista, California. The project site is within the jurisdictional boundaries of the District, and located within Planning District 7, the Chula Vista Bayfront, as delineated on Precise Plan Map Figure 19 of the District's certified Port Master Plan. The project site is a wide intertidal mudflat. The project site is bordered to the north by Gunpowder Point, to the south by the Marine Group Boat Works boatyard, and offshore of the San Diego Bay National Wildlife Refuge. Figure 2 provides the project site's regional setting, and Figure 3 provides its boundaries.

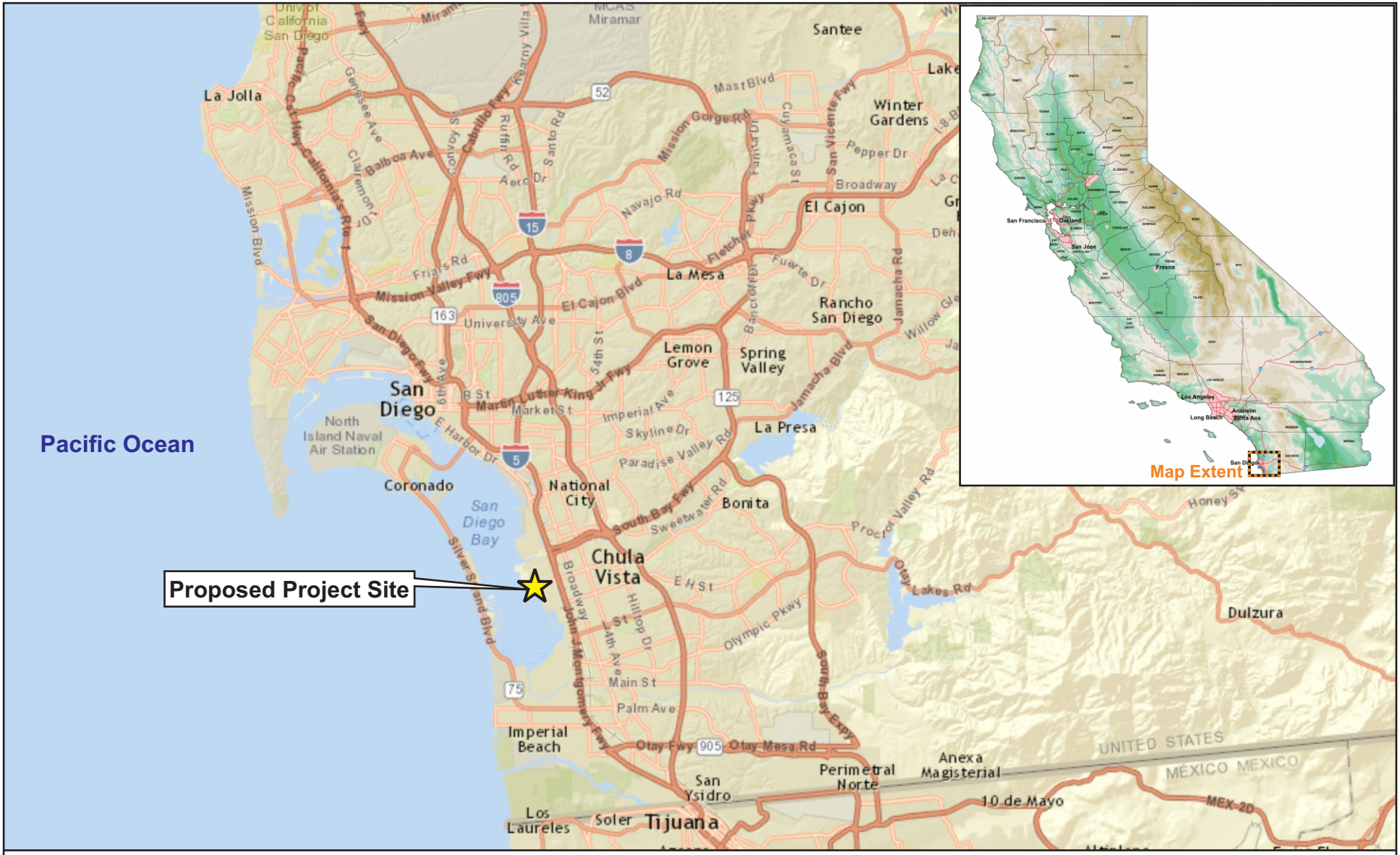


Figure 1

Regional Map

Figure 2

Proposed Project Site

II. Project Description

A. Introduction

The District, in collaboration with the California Coastal Conservancy (Coastal Conservancy), proposes to implement a restoration project to create native oyster (*Ostrea lurida*) reefs in San Diego Bay to provide habitat and protect adjacent tidelands and shorelines from erosion. The project is detailed in a Restoration Plan that discusses and includes conceptual designs for the restoration project, which is located in Chula Vista, and referred to as the E Street Marsh Living Shoreline Project (project). The project proposes placement of native Olympia oysters that would potentially protect the E Street Marsh from shoreline erosion, while providing improved intertidal and shallow subtidal habitat values.

Native oysters are particularly well suited to "living shoreline projects" as they are considered ecosystem engineers and a foundation species that create very important "reef" or structurally complex beds of habitat for other organisms. Oyster reefs create structured habitat that act as living space for a whole community of organisms (Coastal Conservancy, 2010). Additionally, healthy oyster reefs play an important role in improving water quality within the estuary environment, through active filter feeding by adult oysters. Finally, oyster reefs help to curb shoreline erosion by buffering wind waves and boat wakes (Coastal Conservancy, 2010).

Although multiple living shoreline projects are currently underway on the West Coast, no restoration projects have been implemented in San Diego Bay to date. In 2013, the District, together with the U.S. Navy, adopted the updated "San Diego Bay Integrated Natural Resources Management Plan" (INRMP). The INRMP sets forth a long-term vision and strategy to provide good stewardship for the natural resources of the Bay, while supporting the ability of the Navy and the District to achieve their missions and continue functioning within the Bay (U.S. Navy and District, 2013). The 2013 INRMP identifies sustainable shoreline structures and habitat enhancement as one of the top priority projects for implementation (U.S. Navy and District, 2013). Foreseeable projects such as build-out of the recently approved Chula Vista Bayfront Master Plan may require shoreline protection, and developing feasible and effective living shoreline projects in conjunction with future development will potentially help achieve the District's goals of protecting the shoreline, improving habitat within the Bay, softening shorelines, and improving water quality.

The project would establish oyster reefs at the E Street Marsh. Scientific data derived from the project's studies would inform the best methods and potential feasibility to develop future living shoreline projects within the Bay.

B. Project Location

The project site is located in southern San Diego Bay, along the shoreline within the City of Chula Vista, California. The site is within the District's Planning District 7, the Chula Vista Bayfront, which is delineated on Precise Plan Map Figure 19 of the certified Port Master Plan. The project site is a wide intertidal mudflat adjacent to the E Street Marsh, along a portion of the southeast shoreline of the Bay, south of Sweetwater Marsh. The project site is bordered to the north by Gunpowder Point, to the south by the Marine Group Boat Works boatyard, and offshore of the San Diego Bay National Wildlife Refuge. It is accessible by both boat and land, and contains intertidal eelgrass (*Zostera marina*) habitat. Figure 2 provides the project site's regional setting, and Figure 3 provides the project site's boundaries.

C. Local Setting

Approximately one third of the Bay consists of shallow subtidal or intertidal habitat, most of which occurs in the southern portion of the Bay (U.S. Navy and District, 2013). The tidelands within the project site are characterized by sandy beaches that transition to broad shallow mudflats below an elevation +4.0 feet mean lower low water (MLLW). MLLW refers to the average height of the lowest tide recorded at a tide station each day during a specified recording period. Eelgrass beds are present in the deeper portions of the mudflat (typically below 0 feet MLLW) and extend offshore to the margins of the navigation channel (-15 feet MLLW)

that provides access to the adjacent Marine Group Boat Works boatyard and J Street Marina to the south. Navigation aids mark the margins of the channel. Figure 3 provides a ground view of the proposed project site facing north, with Sweetwater Marsh in the background.

Elevations at the project site range from between +7 and +8 feet MLLW along a narrow shoreward berm that separates the E Street Marsh from the Bay mudflat, to approximately –2 feet MLLW along the bayward edge of the site. The total project site encompasses approximately 65.7 acres of intertidal habitat along 3,780 linear feet of shoreline; however, the actual project "footprint" would be approximately 4,410 square feet, or 0.10 acres.

The northern and southeastern portions of the project site are immediately adjacent to the Sweetwater Marsh Unit (including the F&G Street Marsh) of the San Diego Bay National Wildlife Refuge, which is owned and managed by the U.S. Fish and Wildlife Service (USFWS) (Figure 3). Planning for the Sweetwater District of the Chula Vista Bayfront Master Plan includes the potential for expanded wetlands adjacent to the southern portion of the project site, and improved tidal connection and flushing of the F&G Street Marsh. These future restoration and improvement projects would occur immediately adjacent to the project site.

The central portion of the project site is located adjacent to the District's Chula Vista Bayfront Master Plan, and plans are in development for a recreation vehicle (RV) park, a passive-use park (Sweetwater Park), and enhancement of a 400-foot wide natural buffer adjacent to the east of the project site (Merkel & Associates, Inc., 2018a). A host of recreational activities, including biking, hiking, and bird watching, are planned for the Sweetwater Park. Further, future plans for the Chula Vista Bayfront immediately adjacent to the project site include a 6-foot high fence and 400 feet of natural buffers to deter and prevent direct access to the sensitive shoreline and mudflat habitat areas.

There is the potential for the project site to be accessed by boat; however, the shallow intertidal waters along with the wide mudflat preclude the majority of boating activities. Kayaks and shallow draft fishing boats may travel along the shoreline, but these activities are not common within the project area. Boats within and adjacent to the project site are restricted to a maximum speed of 5 miles per hour (mph) outside of marked navigation channels per Section 4.30(c) of the District Code.

D. Project Design

The project is designed to determine if native Olympia oysters would successfully recruit (grow) on constructed reef ball elements, the effect of tidal elevation on recruitment of native and non-native oysters, the ability of constructed reefs to protect against shoreline erosion, and whether the constructed reefs support higher native species biodiversity than adjacent mudflats.

The project would utilize a modular approach under which constructed oyster reef ball elements would be placed in a series of six arrays at two tidal elevations along the project site's mudflat (three arrays at each of two elevations). Individual reef ball elements (baycrete reef balls, described below) would be organized

Figure 3

Ground Photograph of Project Site Facing North

into reef groups consisting of four reef ball elements placed in a square pattern; the approximate footprint of each reef group would be 7 feet by 7 feet (including some open space between each element), or 49 square feet. Reef arrays would consist of 15 reef groups arranged in a checkerboard pattern with spacing of 18 to 20 feet between the center of each group. Therefore, each reef array would consist of 60 reef ball elements. Each array would have overall dimensions of approximately 90 feet long by 55 feet wide. It is important to note that the actual footprint of the array would be significantly less than the overall dimensions assumed here, due to the open spaces between the element groups and within the elements themselves. The slightly larger square footage has been factored into the design as a conservative estimate to account for slight fluctuation in spacing when the reef balls are placed. In total, the "footprint" of the reef ball elements for all six proposed arrays to be placed along the shoreline would be approximately 4,410 square feet (0.10 acres). Figure 4 provides a typical reef array design, and Figure 5 provides the estimated locations of oyster reef arrays within the project site mudflat along elevation contours derived from the most current available digital elevation model (DEM) (November 2016).

Each oyster reef element would consist of a baycrete (concrete with shell aggregate) reef ball with a top circumference of approximately 2 feet, and a wider base which is 3 feet in circumference. The height of each element would be approximately 2 feet above the mudline. Coir bags filled with clean oyster shell, and/or removable monitoring tiles may be placed atop and on the exterior of the baycrete reef balls and latched in place to secure them, depending on the final basis of design (BOD). Reef balls may also be installed with removable tops. Native Olympia oyster is known to recruit at lower tidal elevations than non-native Pacific oyster (*Crassostrea gigas*). The ability to remove the tops of reef balls is an adaptive management measure that would allow for modification of the total height of the reef balls to allow for Olympia oyster to grow. Removal of the higher portion of reef balls may occur to prevent or eliminate habitat for non-native oysters and other non-native and invasive invertebrate species. As higher elevation structures are expected to have greater wave dampening benefits, the removal of the tops of reef balls would be conducted only if they become heavily colonized by non-native species during the 5-year post installation monitoring period.

The Restoration Plan identifies two tidal elevation treatments: +1 foot MLLW and +2 feet MLLW, corresponding to the elevation of the crest of the reef balls. Oyster reef arrays would therefore be installed at two tidal elevations. Based on the two-foot vertical relief of reef balls, the base of the reef balls would be placed at –1 foot MLLW and 0 feet MLLW. These elevations correspond to the elevations known as the highest recruitment and observed highest percent cover for native Olympia oyster, and also intersect with the tidal elevations required to measurably reduce wave energy along reef-adjacent mudflat.

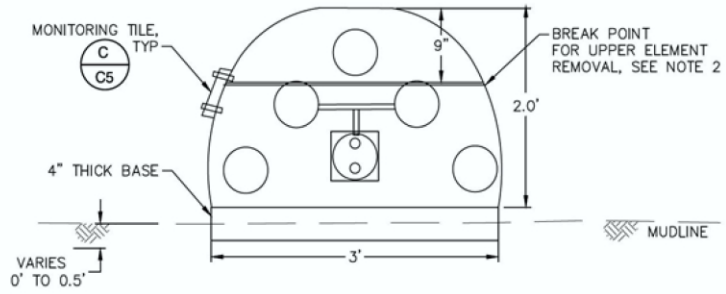
Each reef ball array would be oriented to follow the site's existing bathymetric contours. These essentially follow a northwest-to-southeast direction with some deviation due to the natural variation of the contours. The orientation of the arrays allows waves from the two predominate wave directions to be intercepted by the reef ball array (see Figure 5).

E. Project Installation

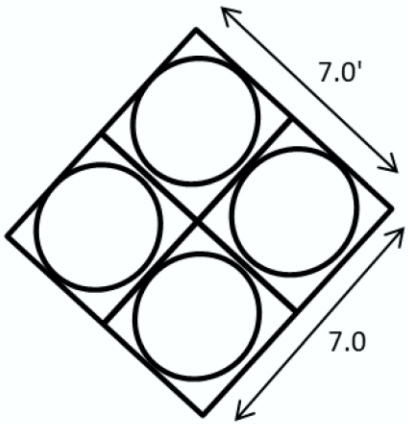
The project site is accessible by water and its wide intertidal mudflat would require materials to be transported to the project site at high tide, thereby restricting available work times and limiting installation vessels to small, shallow-draft vessels. Additionally, installation of the project would not require any dredging or substantial below grade disturbances (e.g., pile driving or digging). Boats would likely be positioned during work by spuds (narrow steel posts that are lowered vertically into the sediment to hold vessel position) and navigation safety marking buoys would be anchored by helical anchors placed into the flats to retain markers. The estimated maximum number of on-site personnel during the installation would be eight.

Site Access. It is expected that the primary installation access would be by shallow draft boats and floating equipment from existing navigation channels. The boats would cross the existing eelgrass beds to deliver and place reef materials at high tide. Installation of the project by tracked or amphibious equipment is not considered feasible based upon the adjacent eelgrass beds. Access via land (from shore) is not anticipated for project installation, and would be limited to foot traffic from existing roads and upland shoreline public access points, if needed.

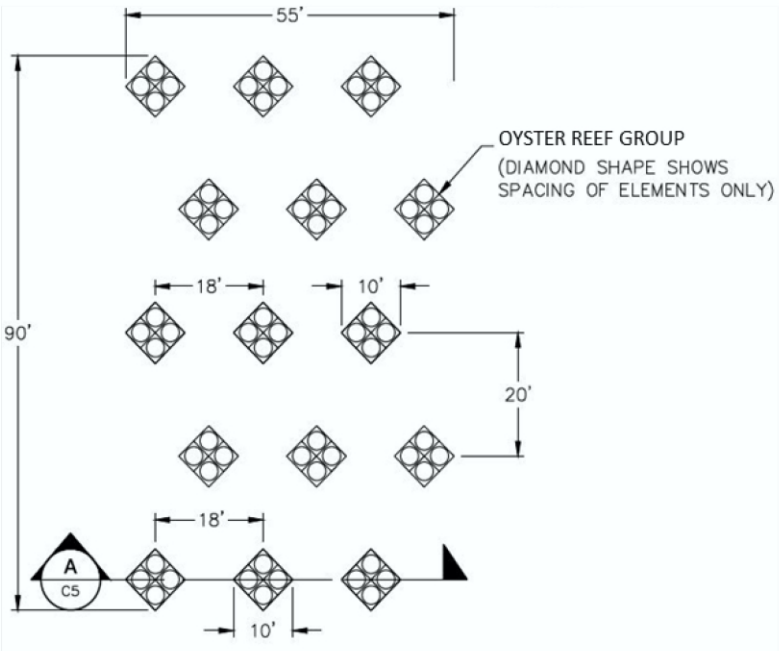
Oyster reef ball element:
Baycrete reef ball with a two foot vertical relief and a three foot wide base



Oyster reef group:
Four reef ball elements placed side by side to form a structure with an approximately seven foot x seven foot footprint



Oyster reef array:
15 reef groups (60 total reef ball elements) placed in a checkerboard pattern to cover an area 90 feet long x 55 feet wide



Source: Merkel et al, 2018.

Figure 4
Schematic of Reef Design Components

Figure 5
Conceptual Reef Locations in Relation to 2016 Digital Elevation Model (DEM) Contours

Staging Areas. It is expected that staging areas would be located at a marine loading yard or launch ramps for efficiency of handling the reef ball elements and loading them onto vessels for transport to the project site by water. Potential staging sites include District-owned facilities such as the Tenth Avenue Marine Terminal, launch ramps, or existing marine construction yards adjacent to Bay. Only previously disturbed locations would be used for staging; no new ground disturbance would occur.

Installation Methods for Reef Ball Elements. As noted above, reef ball elements would be loaded and transported to a marine staging area via truck and then placed on a shallow draft workboat or barge. The boat would transport reef ball elements to the project site, and would remain just outside the navigation channel away from the mudflat and would not impede vessel navigation through the channel. A second flat bottom shallow vessel equipped with a davit or A-frame would transport the reef ball elements from the workboat or barge to the project site. It is anticipated that all vessels would be small in size (less than 25 feet in length), powered by outboard motors and approximately two workboats would be needed per day

The reef ball elements would be gently lowered onto the mudflat at the designated locations at high tide, using a winch attached to an A-frame or davit. The reef ball elements would be guided into place at designated locations that were previously marked by temporary PVC poles or wooden stakes (these markers would be removed as elements are installed). Each reef ball element would be hand guided into place by in-water personnel to achieve proper installation and to ensure placement at target tidal elevations. In general, installation of the project would proceed with the landward-most elements first, with subsequent placement either alternating between landward and seaward rows or proceeding along the row, depending upon the tides, as well as contractor's equipment and methods.

Installation Timing. Installation of the project is anticipated to occur in early Spring 2019. The primary consideration for installation corresponds to the period just prior to seasonal recruitment for native Olympia oysters. The earliest observed seasonal recruitment of native Olympia oysters in the Bay is in late April. Seasonal timing of peak recruitment for the species varies by year, but typically occurs between mid-May and mid-July. In contrast, the earliest observed recruitment of non-native Pacific oysters in the Bay is late May, with peak recruitment typically occurring between late June and early July. Therefore, the ideal seasonal timing for installation of oyster reef ball elements and arrays at the project site would be in late March or early April of 2019 and would take approximately 4 weeks to complete. Due to the need to install the reef ball elements during high tide, work would occur during roughly 6-hour daily windows. This installation period would allow native Olympia oyster recruits access to new reef substrate prior to colonization of the reefs by non-target and/or invasive species.

Resource Protection Measures. Installation of the project would include several measures to ensure resource protection. The boundaries of sensitive habitat areas, specifically eelgrass beds, would be marked by temporary PVC posts during pre-installation surveys at the project site. In addition, a localized access corridor across the eelgrass beds would be marked to minimize the potential for vessel grounding in eelgrass during installation of the project. Further, installation of the project would be completed outside of the nesting season for California least tern (*Sternula antillarum browni*), comply with District Code Section 4.30(c) which precludes vessel speeds of greater than 5 mph outside of navigational channels, and implement a vessel positioning system that avoids the need for ground chains or other tackle that may damage eelgrass. Examples of such a system include using spuds to hold vessels in position or static line positioning from temporary moorings with elastic rods.

Navigation Hazard Buoys. To prevent collisions of boats with oyster reefs, two standard navigation hazard buoys with anchors would be installed at the north and south ends of the project site to identify the submerged hazard for boaters using the area at higher tides. Buoys would not use a traditional gravity anchor with ground rode mooring design, as this type of mooring can damage eelgrass and mudflat habitat as the chain drags in a circle with changing tides. Instead, helix or screw anchors would be placed into mudflat and a hazard buoy would then be attached to elastic lines that flex with changing tides but do not drag across the seafloor. One of two designs would be used. The helix anchor is a three-point anchor with elastic rode that uses stretching lines between three helical anchors set into the bay floor to hold the hazard buoy in position without line drag. The screw anchor is a single elastic anchor line that holds the hazard buoy over a single helical anchor. The selection of the mooring type would occur in final design and would be dependent upon commercial material limitations for single anchor systems in the shallow water within

which the hazard buoys would be placed and the tide range the elastic line must accommodate. Figure 6 provides a schematic of the navigation hazard buoy design using a helix anchor; the depth of a screw anchor design into the seafloor would be similar (3 feet).

F. Project Data Collection Phase

A 5-year post-installation monitoring program would follow the monitoring methods outlined in the Restoration Plan. Since biological systems take many years to stabilize, data collection is anticipated to occur monthly or quarterly in years one through five post-installation, with further detailed monitoring incorporated if funding allows. Each element of the monitoring program would require sampling at varying frequencies with seasonal timing. Data collection would require accessing the reef arrays and adjacent unmodified control (reference) areas of the mudflats either by shallow draft vessel or by land. Land access would be limited to foot traffic from existing roads and upland shoreline access points.

Physical data collection using deployable data loggers and probes (such as ADV and Hydrolab or YSI Sonde), would include parameters such as wave height, wave period, current velocity, current direction, temperature, dissolved oxygen, acidity/basicity (pH), and turbidity. Data loggers are electronic devices that record data over time or in relation to a location with built-in instruments or sensors, or via external instruments and sensors. The removal, download, and replacement of data loggers shall be conducted by shallow boat access at high tide. Data collection to measure sediment accretion and shoreline erosion would also be completed.

Biological data collection by foot and/or small shallow draft vessel would include quarterly sampling of fish and invertebrates by trapping and release of fish and mobile invertebrates as well as sampling by removal and reattachment of terracotta and/or baycrete tiles affixed to the reefs for laboratory analyses. Other monitoring such as monthly post-installation avian monitoring would be completed from shore and would not require direct physical access to the site.

Should monitoring identify issues of concern (e.g., establishment of a high abundance of invasive non-native species on the reef structures) further refinement of adaptive management measures would be developed and implemented, as warranted.

G. Post-Monitoring/Pilot Program

Following the conclusion of the 5-year pilot study period, it is anticipated that the reef ball elements would remain in place as habitat. Development and implementation of short- and long-term project success criteria and adaptive management measures would occur in consultation with, and approval from, applicable resource agencies, as would application of identified mitigation measures and on-going maintenance and monitoring.

H. Applicable Regulations and Approvals

The following regulations, actions, and approvals may be applicable as part of the project:

- Issuance of a Non-Appealable CDP issued by the District.
- Rivers & Harbors Act Section 10 and a Section 404 Permit under the Clean Water Act issued by the U.S. Army Corps of Engineers (USACE); USACE Nationwide Permit 1, which permits navigational buoys and USACE Nationwide Permit 54, which permits “the construction of oyster habitat over unvegetated bottom in tidal waters” may apply to the proposed project.
- Section 401 Water Quality Certification issued by the Regional Water Quality Control Board (RWQCB).
- Essential Fish Habitat (EFH) Assessment for compliance with Magnuson-Stevens Fisheries Conservation and Management Act, and USACE consultation with National Oceanic and Atmospheric Administration’s (NOAA’s) National Marine Fisheries (NMFS) for EFH.

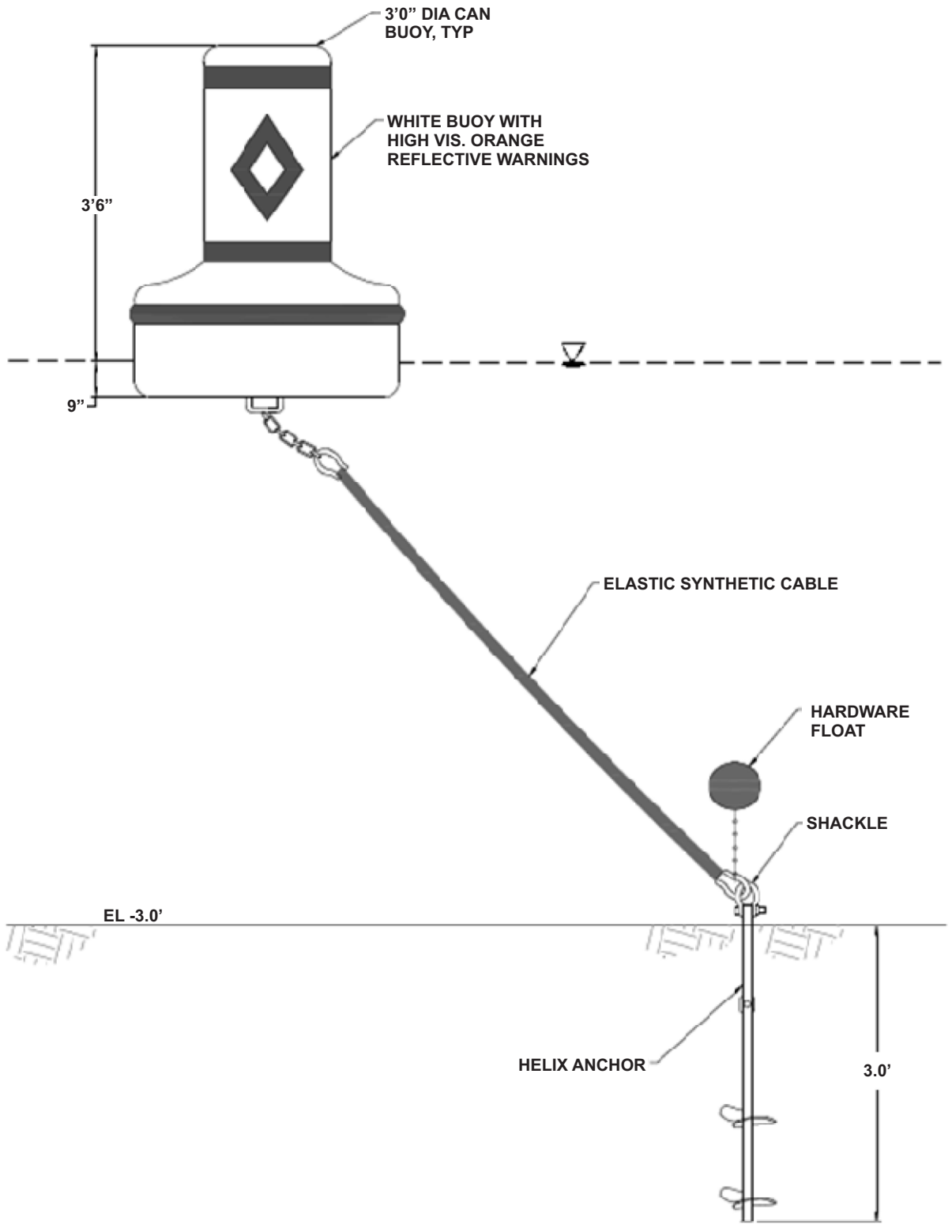


Figure 6

Navigation Buoy Design

- Potential Endangered Species Act (ESA) Section 7 consultation between the USACE and NMFS for endangered green sea turtle (*Chelonia mydas*). (Presently anticipated as informal consultation integrated into the EFH consultation process.) Pre- and post-construction eelgrass (*Zostera marina*) surveys and reporting for compliance with the California Eelgrass Mitigation Policy.
- Potential consultation between the USACE and the USFWS for California least tern (*Sternula antillarum browni*).
- Consultation and approval from the U.S. Coast Guard for the installation of safety buoys through the USACE.
- A survey for the invasive seaweed *Caulerpa taxifolia* and other nuisance species, not more than 90 days prior to the initiation of installation of the project, by a certified *Caulerpa* surveyor.

III. Environmental Setting

The project site is located adjacent to the existing E Street Marsh, along the shoreline within the City of Chula Vista, California. The project site is within the jurisdictional boundaries of the District, and contained within the boundaries of Planning District 7, the Chula Vista Bayfront, as delineated on Precise Plan Map Figure 19 of the certified Port Master Plan.

The project site is a wide intertidal mudflat. The northern and southeastern portions of the project site are immediately adjacent to the Sweetwater Marsh Unit (including the F&G Street Marsh) of the San Diego Bay National Wildlife Refuge, owned and managed by the USFWS. The central portion of the project site is located adjacent to the District's Chula Vista Bayfront Master Plan, and plans are in development for a RV Park and open parkland in the parcels east of the project site (Merkel & Associates, Inc., 2018a). Long-term planning for the Chula Vista Bayfront Master Plan includes development of 400-foot wide natural buffers, along with the potential for expanded wetlands adjacent to the Sweetwater/E Street Marsh, and improved tidal connection and flushing of the F&G Street Marsh. These future restoration and improvement projects would occur immediately adjacent to the project site. A variety of recreational activities are also planned for the Chula Vista Bayfront Sweetwater Park, located approximately 400 feet east of the District's shoreline, including biking, trails and hiking, and bird watching. However, future plans for the Chula Vista Bayfront immediately adjacent to the project site would include a 6-foot high fence in addition to the above-mentioned natural buffers to deter and prevent direct access to the shoreline and mudflat.

There is no current or planned public access to the shoreline adjacent to the project site. Future plans for the Chula Vista Bayfront immediately adjacent to the project site would include fencing and natural buffers to deter and prevent direct public access to the shoreline and mudflat. Although there is the potential for the project site to be accessed by boat, its shallow intertidal waters and wide mudflat preclude the majority of public boating activities. Kayaks and shallow draft fishing boats may travel along the shoreline, but these activities are not common.

IV. Environmental Analysis

The Initial Study (Attachment A) evaluated the potential environmental impacts of the project, and concluded that its implementation would not result in any impacts that cannot be mitigated to a level of less than significant.

A. Environmental Factors Potentially Affected

The Initial Study (Attachment A) concluded that the one environmental factor affected by the project would be biological resources, as addressed below.

Biological Resources

Existing Conditions

The Bay is a natural embayment formed from the alluvial floodplains of the Otay, Sweetwater, and San Diego Rivers, and was historically shallow. Multiple dredging and channel deepening projects have resulted in deep waters (up to 59 feet) in the northern and central portion of the Bay, transitioning to shallow waters (less than 3 feet) at the south end of the Bay. The various habitats of the Bay are reflective of water depth and the presence or absence of shoreline structures. More than 70 percent of the shoreline (45.4 miles out of a total 64.4 miles) of the Bay is currently armored. The largest unarmored areas occur in the southern portion of the Bay, including the project site. Habitats in the southern portion of the Bay include southern coastal salt marsh, intertidal sand and mudflats, salt flats, southern coastal foredune, and open water.

Several sensitive species are known to occur in the southern part of the Bay and in the marshes adjacent to the Bay; however, few species are known to regularly occur within or immediately adjacent to the project site. The southern Bay supports a population of eastern Pacific green sea turtles (*Chelonia mydas*) estimated to include between 16 and 61 individuals. As detailed in this Draft MND's Initial Study, this population spends the majority (an estimated 95 percent) of its time south of the Sweetwater River Channel, and is highly likely to forage within the eelgrass beds located along the E Street Marsh shoreline, including the project site. The species is a threatened species under the federal Endangered Species Act.

Of the sensitive avian species with potential to occur within or adjacent to the project site, six are listed as federally or California endangered or threatened, or California Department of Fish and Wildlife (CDFW) fully protected. These include California brown pelican (*Pelecanus occidentalis californicus*), American peregrine falcon (*Falco peregrinus anatum*), light-footed Ridgway's rail (*Rallus obsoletus levipes*), western snowy plover (*Charadrius alexandrinus nivosus*), California least tern (*Sternula antillarum browni*), and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

Several species of marine mammals also utilize the Bay including two which are uncommonly observed in the project region. These include California sea lion (*Zalophus californianus californianus*) and, to a lesser extent, Pacific harbor seal (*Phoca vitulina richardsi*). Neither species breeds within the Bay. California sea lion may occasionally be observed adjacent to the project site, but Pacific harbor seal are not expected to be present as this species is uncommon in the south Bay. There are no established haul-out, foraging, or breeding areas used by these or other marine mammals within the project vicinity.

As of 2017 the Bay supported approximately 1,700 acres of eelgrass (Merkel & Associates 2018b). Approximately 100 acres of contiguous eelgrass habitat is present in the deeper portions of the project site and extending to the north and south. This eelgrass is typically below 0 feet MLLW and extending offshore to the margins of the deeper navigation channel that provide access to the Marine Group Boat Works boatyard and J Street Marina to the south. Oyster reef ball elements would be placed at elevations that fall within the seasonally variable intertidal range for eelgrass within the Bay.

The nearest adjacent designated wetlands to the project site are the marshes of the San Diego Bay Wildlife Refuge. These wetlands are located shoreward and outside of the boundaries of the project site. The project site is located within the Pacific flyway, but does not provide any specific terrestrial movement corridors. Additionally, no marine mammal, reptile, or fish migratory corridors occur within the project site or its vicinity.

Thresholds for Determining Significance

The following significance criteria are based on Appendix G of the State CEQA Guidelines (14 California Code of Regulations Section 15000 et seq.), and were used to determine the significance of potential impacts related to biological resources. Impacts associated with biological resources would be significant if the project would:

BIO-1: Cause 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.

BIO-2: Cause 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 Wildlife or U.S. Fish and Wildlife Service.

BIO-3: Cause 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.

BIO-4: 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.

BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

BIO-6: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

Potential Impacts

Impact BIO-1. Previous Baywide eelgrass surveys that have been utilized as a baseline for this Draft MND's analysis indicate that all of the reef ball elements that would be installed at the project site are within persistent to seasonally fluctuating intertidal and shallow subtidal eelgrass habitat. During installation, an estimated maximum 4,410-square-foot (0.10-acre) direct impact to eelgrass is anticipated to occur, although it is noted that the final impact acreage that could occur due to project installation would be determined through pre-installation surveys as dictated by the California Eelgrass Mitigation Policy (CEMP). Further impacts to eelgrass or tidal flats beyond the direct footprint of the reef ball elements is not anticipated due to the planned installation methods described in Section II (Project Description). Access for monitoring is not expected to result in additional eelgrass losses. Implementation of Mitigation Measure **MM-BIO-1**, which would require that all effects to eelgrass be mitigated according to the CEMP, would reduce impacts to less than significant.

Per District Code Section 4.30(c), all project-related vessels would be required to adhere to a speed limit of 5 miles per hour (mph) in the project area, which would reduce the likelihood of striking and injuring turtles. Therefore, project-related impacts to eastern Pacific green sea turtle would be less than significant.

Project implementation would not create any other impacts to biological resources per the above-referenced significance criteria that would occur require mitigation. No other impacts or less than significant impacts would occur.

Mitigation Measures

MM-BIO-1: **Conformance with the California Eelgrass Mitigation Policy.** Pursuant to the California Eelgrass Mitigation Policy (CEMP), pre- and post-installation surveys shall determine the exact amount of eelgrass affected by project activities. Prior to the commencement of project installation, the District shall retain a qualified biologist to conduct a pre-installation eelgrass survey, per the CEMP, to quantify the amount of existing eelgrass within the project area. Additionally, three post-installation eelgrass surveys at the impact site and appropriate reference site(s) will also be performed per the CEMP. The first post-installation eelgrass survey will be completed within 30 days following completion of project installation to evaluate any immediate effects to eelgrass habitat. The second post-installation survey will be performed approximately one year after the first post-installation survey during the appropriate growing season. The third post-installation survey will be performed approximately two years after the first post-installation survey during the appropriate growing season. The second and third post-installation surveys will be used to evaluate if indirect effects resulted, later in time, due to altered physical conditions. A final determination regarding the actual impact and amount of mitigation needed at the above-stated ratio, if any, to offset impacts shall be made based upon the results of two annual post-installation surveys, which document the changes in the eelgrass habitat (areal extent,

bottom coverage, and shoot density within eelgrass) in the vicinity of the project, compared to eelgrass habitat change at the reference site(s).Impacts to eelgrass shall be mitigated according to the CEMP, with a 1:1 replacement ratio relying on previously-established transplanted eelgrass within the District-managed borrow pit site in South San Diego Bay. While not contemplated at this time, should an alternative option for eelgrass mitigation be undertaken by planting new eelgrass, the impacts shall be at a 1.38:1 ratio (netting 1.2:1 at establishment) under the CEMP at the intake channel for the former South San Diego Bay Power Plant site. Approval of the use of the surplus eelgrass within the borrow pit site shall be subject to review and concurrence of National Marine Fisheries Service following Section II(E)(3) approval requirements of the CEMP.

B. Effects Found Not to be Significant

Based on the Initial Study conducted for the project (see Attachment A), the following environmental effects were found not to be significant and no mitigation is required: Aesthetics; Agriculture and Forestry Resources; Air Quality; Cultural Resources; Geology/Soils; Greenhouse Gas Emissions; Hazards and Hazardous Materials; Hydrology/Water Quality; Land Use/Planning; Mineral Resources; Noise; Population/Housing; Public Services; Recreation; Transportation/Traffic; Tribal Cultural Resources; and, Utilities/Service Systems. A full analysis and discussion of these issue areas is provided in the attached Initial Study.

V. Mitigation Monitoring and Reporting Program

Potential adverse impacts associated with biological resources were identified in the project's Mitigated Negative Declaration and supporting Initial Study, but were found to be reduced to less than significant levels through the application of the mitigation measure described above and in Table MMRP-1, below.

Table MMRP-1. Mitigation Monitoring and Reporting Program

Mitigation Measure	Responsible Party	Mitigation Timing	Monitoring and Reporting Procedures
Biological Resources			
MM-BIO-1 Conformance with the California Eelgrass Mitigation Policy. Pursuant to the California Eelgrass Mitigation Policy (CEMP), pre- and post-installation surveys shall determine the exact amount of eelgrass affected by project activities. Prior to the commencement of project installation, the District shall retain a qualified biologist to conduct a pre-installation eelgrass survey, per the CEMP, to quantify the amount of existing eelgrass within the project area. Additionally, three post-installation eelgrass surveys at the impact site and appropriate reference site(s) will also be performed per the CEMP. The first post-installation eelgrass survey will be completed within 30 days following completion of project installation to evaluate any immediate effects to eelgrass habitat. The second post-installation survey will be performed approximately one year after the first post-installation survey during the appropriate growing season. The third post-installation survey will be performed approximately two years after the first post-installation survey during the appropriate growing season. The second and third post-installation surveys will be used to evaluate if indirect effects resulted, later in time, due to altered physical conditions. A final determination regarding the actual impact and amount of mitigation needed at the above-stated ratio, if any, to offset impacts shall be made based upon the results of two annual post-installation surveys, which document the changes in the eelgrass habitat (areal extent, bottom coverage, and shoot density within eelgrass) in the vicinity of the project, compared to eelgrass habitat change at the reference site(s). Impacts to eelgrass shall be mitigated according to the CEMP, with a 1:1 replacement ratio relying on previously-established transplanted eelgrass within the District-managed borrow pit site in South San Diego Bay. While not contemplated at this time, should an alternative option for eelgrass mitigation be undertaken by planting new eelgrass, the impacts shall be at a 1.38:1 ratio (netting 1.2:1 at establishment) under the CEMP at the intake channel for the former South San Diego Bay Power Plant site. Approval of the use of the surplus eelgrass within the borrow pit site shall be subject to review and concurrence of National Marine Fisheries Service following Section II(E)(3) approval requirements of the CEMP	District	Prior to and following installation-related activities.	District shall conduct surveys and maintain all survey reports in project files.

VI. Findings

The project, with the incorporation of its Mitigation Monitoring and Reporting Program (MMRP), will have no significant impact on the environment with respect to biological resources. Further, the project will have no significant impact on the environment requiring mitigation regarding: Aesthetics, Agriculture and Forestry Resources, Air Quality, Cultural Resources, Geology/Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology/Water Quality, Land Use/Planning, Mineral Resources, Noise; Population/Housing, Public Services, Recreation, Transportation/Traffic, Tribal Cultural Resources, or Utilities/Service Systems.

VII. Documentation

The attached Initial Study (Attachment A) and its appendix document the reasons in support of the above findings.

VIII. Results of Environmental Review of Draft Mitigated Negative Declaration

☐ No comments were received during the public review period.

☐ Comments were received, but did not address the proposed Mitigated Negative Declaration findings or the accuracy/completeness of the Initial Study. No response is necessary. The letters are attached.

☐ Comments addressing the proposed findings of the Draft Mitigated Negative Declaration and/or accuracy or completeness of the Initial Study were received during the public review period. Responses to these comments follow, and the letters of comment are attached.

[TO BE UPDATED FOLLOWING PUBLIC REVIEW]

IX. Certification

The Draft Mitigated Negative Declaration and supporting documents are on file with and may be reviewed during regular business hours in the Office of the District Clerk of the San Diego Unified Port District, 3165 Pacific Highway, San Diego, California 92101. The District administration offices are open Monday through Thursday and every other Friday from 8:00 a.m. to 5:00 p.m.

Prepared by: Aspen Environmental Group

Draft Report: 7/18/18 (Date) — Lesley Nishihira, Director, Planning Department

Final Report: _____ (Date) — Lesley Nishihira, Director, Planning Department

X. Citations

California State Coastal Conservancy (Coastal Conservancy). 2010. San Francisco Bay Subtidal Habitat Goals Report: Conservation Planning for the Submerged Areas of the Bay. [Online]: http://www.sfbaysubtidal.org/PDFS/Full%20Report.pdf

Environmental Science Associates (ESA). 2017. San Diego Bay Native Oyster Restoration – 60% Design Draft. Prepared for the Coastal Conservancy. September 2017.

Merkel & Associates, Inc. 2017. Restoration and Enhancement Alternatives for the Chula Vista Bayfront. Final Report prepared for the San Diego Unified Port District. April 2017.

Merkel & Associates, Inc., Environmental Science Associates (ESA), and California State University Fullerton (Merkel et al.). 2015. San Diego Bay Native Oyster Restoration Plan. Prepared for California State Coastal Conservancy and San Diego Unified Port District Environmental Services Department. May 2015.

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_____. 2018b. 2017 San Diego Bay Eelgrass Inventory. Prepared for the U.S. Navy Region Southwest Naval Facilities Engineering Command and San Diego Unified Port District. March 2018.

National Marine Fisheries Service Southwest Region (NMFS).1998. Essential fish habitat: new marine fish habitat conservation mandate for federal agencies. National Marine Fisheries Service Southwest Regional Office.

_____. 2004. Caulerpa Control Protocol (Version 1.2b).

_____. 2014. California Eelgrass Mitigation Policy and Implementing Guidelines. October 2014. 45 pages.

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Attachment A

Initial Study

Initial Study/Environmental Checklist

for the

E Street Marsh Living Shoreline Project

Prepared for
San Diego Unified Port District

Technical Support Provided by
Aspen Environmental Group

July 2018

Contents

Tables

Appendices

Acronyms and Abbreviations

AB	Assembly Bill
CAP	Climate Action Plan
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEMP	California Eelgrass Mitigation Policy
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CO	Carbon Monoxide
CO2e	Carbon Dioxide Equivalent
CVBMP	Chula Vista Bay Master Plan
CWA	Clean Water Act
CY	Cubic Yard
dBA	A-Weighted Sound Level
District	San Diego Unified Port District
DOC	Department of Conservation
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
ESA	Endangered Species Act
GHG	Greenhouse Gas
GPS	Global Positioning System
HAPC	Habitat Area of Particular Concern
HPD	Harbor Police Department
INRMP	Integrated Natural Resources Management Plan
Leq	Equivalent Noise Level
MHPA	Multi-Habitat Planning Area
MLLW	Mean Lower Low Water
MM	Mitigation Measure
MND	Mitigated Negative Declaration
MPH	Miles per Hour
MSCP	Multiple Species Conservation Program
MT	Metric Ton
MTCO2e	Metric Tons of Carbon Dioxide Equivalent
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOX	Nitrogen Oxides
NWR	National Wildlife Reserve
PM10	Respirable Particulate Matter (10 Micrometers or Smaller)
PM2.5	Fine Particulate Matter (2.5 Micrometers of Smaller)
PMP	Port Master Plan
SDAPCD	San Diego Air Pollution Control District
SIP	State Implementation Plan
SLR	Sea Level Rise
SLT	Screening-Level Threshold
SOX	Sulfur Oxides
TAC	Toxic Air Contaminant
TCR	Tribal Cultural Resource
TRNERR	Tijuana River National Estuary Research Reserve
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compounds

Environmental Checklist

1. Project Title:	E Street Marsh Living Shoreline Project
2. Lead Agency Name and Address:	San Diego Unified Port District Post Office Box 120488 San Diego, CA 92112-0488
3. Contact Person and Phone Number:	Ashley Wright, Senior Planner (619) 686-6549
4. Project Location:	The project site is located in South San Diego Bay, adjacent to the City of Chula Vista, San Diego County, California.
5. Project Sponsor's Name and Address:	San Diego Unified Port District PO Box 120488 San Diego, CA 92112-0488
6. Port Master Plan Designation:	Planning District 7, Chula Vista Bayfront (Precise Plan Map Figure 19): Wetlands
7. Description of Project:	The project site is located adjacent to the existing E Street Marsh, along the shoreline bordering the City of Chula Vista, California, and within the jurisdictional boundaries of the San Diego Unified Port District. It is a wide intertidal mudflat that is bordered to the north by Gunpowder Point, to the south by the Marine Group Boatworks boatyard and J Street Marina, and offshore of the San Diego Unified Port District, San Diego Bay National Wildlife Refuge and City of Chula Vista. The project is a pilot restoration project intending to create a biologically rich native Olympia oyster (*Ostrea lurida*) reef in San Diego Bay to restore an ecological niche that was historically present, to provide habitat that is ecologically functional and resilient to changing environmental conditions, and protect San Diego Bay tidelands and shoreline. Installation of the project's reef ball elements would be completed within an estimated 4-week period. Following project installation, a 5-year monitoring program would be implemented to collect and analyze data to assess the project's success. Upon its conclusion, the project's reef ball elements would be expected to be left in place as habitat.

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" and requiring implementation of mitigation as indicated by the checklist on the following pages.

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

Determination

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 pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

Signature: _____ Date: 7/18/2018

Lesley Nishihira
Director, Planning Department
Planning and Green Port

Evaluation of Environmental Impacts

The following discussion addresses impacts to various environmental resources, per the Environmental Checklist Form contained in Appendix G of the State CEQA Guidelines.

I. Aesthetics

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

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

a. Have a substantial adverse effect on a scenic vista?

No Impact. The Port Master Plan (PMP) identifies vista areas within the San Diego Unified Port District (District), which are defined as points of natural beauty, photo vantage points, and other panoramas (SDUPD, 2017a). The project would be located in the District's Planning District 7, which includes several vista areas that are oriented northwest and southwest towards the Gunpowder Point Shoreline Subarea, the Outer South Bay Subarea, and the Chula Vista Harbor Subarea. Vista areas are also identified along Bay Boulevard West, which are oriented southwest towards the San Diego Bay (Bay).

As the project would be constructed in intertidal habitat that is submerged at high tide, the oyster reef arrays would not alter the scenic vistas identified in Planning District 7. Project staging would occur at the project site and nearby areas, such as public launch ramps (for in-water vessel needs). Staging activities would be compatible with the existing conditions and operations of the District and would not affect site-specific or area aesthetic qualities and characteristics. No impacts to scenic vistas would occur, and no further analysis is warranted.

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

No Impact. The project site is located in wetlands as designated in the PMP. There are no scenic resources such as trees, rock outcroppings, and historic buildings within the project site. As described in Initial Study Section I (a), above, the oyster reef arrays would be submerged during high tide and therefore would not affect scenic vantages along the Bay; during low tide they would be visible only from nearby vantage points in areas that are not accessible to the public. Project staging would occur only at the project site and nearby areas, such as public launch ramps (for in-water vessel needs). Staging activities would be compatible with existing conditions and operations of the District and would not affect site-specific or area aesthetic qualities and characteristics. No impacts would occur.

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

No Impact. The project would include the installation of six reef group arrays in designated wetlands. Each of the oyster reef ball elements would consist of a reef ball that is made of concrete with shell aggregate. This surface material is designed to blend in with the surrounding intertidal mudflat. The reef balls would extend approximately two feet in height above the mudline, and the reef balls would be submerged during high tide. The design of the project, including the surface materials and placement of the reef group arrays, would be compatible with the surrounding wetlands habitat. No impacts to the visual character or quality of the site would occur.

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's oyster reef ball elements would not be constructed from materials that could create a source of glare. It is not anticipated nighttime project installation activities would be required as part of the project, and no new sources of light are proposed. The project would have no impacts associated with light or glare.

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

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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?

No Impact. According to Important Farmland maps prepared by the California Department of Conservation (DOC), no designated Farmland is located within the project site (DOC, 2015). A designated area of Farmland of Local Importance is located within the Sweetwater District Subarea of PMP Planning District 7, north

of Lagoon Drive, and north and south of Gunpowder Point Drive. According to the PMP, the Sweetwater District Subarea consists predominately of fallow fields, and this undeveloped land is to be used as a buffer/setback to preserve and protect the adjacent wildlife refuge (SDUPD, 2017a). Project activities would not affect land uses within the Sweetwater District subarea either directly or indirectly.

Neither installation nor operation of the project would impact Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. No impacts would occur.

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. According to Williamson Act maps prepared by the DOC, the project would not be located on land enrolled in a Williamson Act contract (DOC, 2013). Furthermore, the project site is designated as wetlands within the PMP (SDUPD, 2017a), and no agricultural zoning would be affected by project activities. No impacts would occur.

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. The project would be located within Planning District 7 of the PMP, with a land use designation of wetlands. (SDUPD, 2017a). Neither the project site nor the surrounding vicinity is zoned for forest land or timberland. No impacts to forest land or timberland would occur.

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

No Impact. No forest land is located within the project site or within Planning District 7 of the PMP. The project would not result in the loss of forest land or convert forest land to non-forest use. No impacts would occur.

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

No Impact. The project would be located within Planning District 7 of the PMP, with a land use designation of wetlands. The area surrounding the project site is characterized by conservation lands to the north, wetlands and open space/undeveloped lands to the east, and urban development to the south. Restoration activities included as part of the project would neither convert Farmland to non-agricultural use, nor would it convert forest land to non-forest use. No impacts would occur.

III. Air Quality

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:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
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 which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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

No Impact. The primary test to assess potential inconsistencies, or conflicts, with the applicable air quality plan is to determine if the project proposes development that is consistent with the growth anticipated by the relevant land use plans that were used for the State Implementation Plan (SIP), which is the applicable air quality plan. The San Diego Air Pollution Control District's (SDAPCD's) 2002 and 2012 ozone maintenance plans represent SDAPCD's portion of the SIP. The PMP is the governing land use document for physical development under the jurisdiction of the District (SDUPD, 2017a). The PMP includes the Chula Vista Bayfront Precise Plan, which incorporates the Chula Vista Bay Master Plan (CVBMP). The Restoration and Enhancement Alternatives for the Chula Vista Bayfront Final Report (SDUPD, 2017b), which was prepared to help implement the CVBMP, discusses opportunities for habitat restoration and enhancement projects, such as the installation of oyster reef restoration efforts in tidal flats to protect adjacent marshes and intertidal habitats from coastal erosion and sea level rise (SLR). Additionally, the PMP identifies Planning Subarea 71 (the D Street Fill Area) and Planning Subarea 72 (the Gunpowder Point Shoreline) as locations for habitat replacement and wetlands and estuary preservation and protection. Projects that propose development consistent with growth anticipated by the current PMP and its Chula Vista Bayfront Precise Plan are considered consistent with the SIP. No changes in land uses would occur, and therefore, the project would not result in land use designations that would be incompatible with existing project site PMP land use designations, nor would it result in unanticipated growth.

In addition, the project would be consistent with the District's Green Port and Clean Air Programs which aim to reduce air pollution, including criteria pollutants, and greenhouse gas (GHG) emissions from its largest sources. The project does not have specific emissions sources that are addressed in the emissions reduction strategies under these programs. However, the project is consistent with the Climate Action Plan's (CAP's) miscellaneous measure to create living shorelines to promote carbon sequestration.

The project does not include any stationary sources that are subject to SDAPCD permitting or rule compliance. However, the project would comply with the few potentially applicable general SDAPCD rules, such as Rule 50 (Visible Emissions) and Rule 51 (Nuisance).

In summary, the project would be consistent with current land use designations of the PMP, would be consistent with the goals of the Chula Vista Bayfront Precise Plan, would not result in changes in land use or population, and would be consistent with the Statewide and local strategies to reduce emissions. Therefore, the project would not hinder, conflict with, or obstruct the implementation of the applicable air quality plan. No impacts would occur.

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

Less Than Significant Impact. The project's installation and post-installation air pollutant emissions are well below the magnitude needed to cause an air quality standard violation or contribute substantially to an existing or projected air quality standard violation. Therefore, the project would not significantly impact ambient air quality. Please refer to Initial Study Section III (c) and (d), below, for the project's regional and localized criteria pollutant emissions analyses. Impacts would be less than significant, and no further analysis is required.

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 which exceed quantitative thresholds for ozone precursors)?

Less Than Significant Impact. Pollutant emissions for the project have not been estimated. The total fuel use during project installation for vehicle traffic and small shallow draft vessels, has been conservatively estimated to be 400 gallons of gasoline and 200 gallons of diesel over the four week project schedule. This is comparatively a very small amount of fuel use, both in terms of total fuel use and daily fuel use. Table III-1 provides the San Diego County recommended emissions significance thresholds.

Table III-1. San Diego County Screening-Level Thresholds

	Emission Rate		
Air Contaminant	**Pounds per Hour**	**Pounds per Day**	**Tons per Year**
Respirable Particulate Matter (PM10)	—	100	15
Fine Particulate Matter (PM2.5)	—	55	10
Nitrogen Oxides (NO_X)	25	250	40
Sulfur Oxides (SO_X)	25	250	40
Carbon Monoxide (CO)	100	550	100
Volatile Organic Compounds (VOC)	—	75	13.7

Source: County of San Diego, 2007.
Note: According to San Diego County, the daily Screening-Level Thresholds (SLTs) are most appropriate when assessing impacts from standard construction and operational emissions. Therefore, daily SLTs are used to evaluate project significance, while hourly and annual SLTs are provided for informational purposes only.

The project's daily air pollutant emissions, consisting of a maximum of a dozen hours of small gasoline outboard engine use, eight commuting trips, and one or two truck delivery trips would be a small fraction of the daily emissions thresholds listed in Table III-1. The project's post-installation maximum daily air pollutant emissions, which would consist of inspections/surveys and monitoring, would be much lower than the maximum daily installation emissions. Therefore, the project's maximum daily air pollutant emissions would not exceed the Screening-Level Emissions Thresholds. Therefore, impacts would be less than significant.

d. Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. The project would have minimal air pollutant emissions during the four week installation period, and negligible emissions during its post-installation life. Additionally, sensitive

receptors are located an estimated 0.55-mile to the east of the project site, on the east side of Interstate 5 (I-5). There are two specific impact issues that have been analyzed in regards to the project's potential to expose sensitive receptors to substantial pollutant concentrations, as follows:

- Localized short-term criteria pollutant concentration impacts
- Health-risk impacts from toxic air contaminant (TAC) emissions

The project's localized criteria pollutant emissions would be primarily comprised of emissions from gasoline outboard engines. These engines would be small and their emissions, with the highest pollutant type emissions being carbon monoxide and hydrocarbons, would not have the potential expose the nearest sensitive receptors, which are more than an estimated one-half of a mile from the project site to substantial short-term concentrations.

Emissions of TACs are limited to the four week installation period for the project. From a health risk perspective, the localized emissions are assumed to be primarily associated with the emissions from gasoline outboard engines. The project's small amount of diesel particulate emissions are from the transportation the project's reef ball element forms and other materials, and these emissions would occur over a wide area making their local health risk impacts negligible. Therefore, due to the minimal amount of TAC emissions that would result from the project's installation, and the short-term nature of these installation emissions, it is concluded that the project's TAC emissions would cause less than significant health risk impacts.

In summary, the project would have minimal emissions that would not expose sensitive receptors to substantial pollutant concentrations. Therefore, impacts would be less than significant.

e. Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. According to California Air Resources Board's (CARB's) Air Quality and Land Use Handbook, odors can cause health symptoms, such as headaches and nausea, and odors and dust from commercial activities are the most common sources of air pollution complaints and concerns from the public. Land uses associated with odor complaints include sewage treatment plants, landfills, recycling facilities, rendering plants, and livestock operations. Common sources of odors emitted by facilities are sulfur compounds, organic solvents, and the decomposition/digestion of biological materials (CARB, 2005).

Odor impacts on residential areas and other sensitive receptors, such as hospitals, daycare centers, and schools, warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, work sites and commercial areas. The project area is located in the tidal zone west of the E Street Marsh. The nearest sensitive receptors are located east of the I-5 Freeway over one-half mile from the project site. The nearest worker location is the Marine Group Boatworks boatyard, located just south of the project site.

Odor emissions sources during installation activities include diesel exhaust from intermittent truck deliveries and the exhaust from the shallow-draft vessel gasoline outboard engines, both of which are not overly offensive odor sources. Activity during project operation would be comprised of occasional biological data collection and monitoring. Additionally, the project would add living organisms in the tidal zone that would eventually die and decompose. Although there is the potential for mass die-offs with elevated short-term decomposition odors, these odors would dissipate quickly downwind of the project site. While the potential decomposition odors may be considered adverse, due to their distance from sensitive receptors, they would not affect a substantial number of people and odor-related impacts would be less than significant.

IV. Biological Resources

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
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?	☐	☐	☐	☒
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

A biological technical report entitled "Biological Technical Study and Essential Fish Habitat for the E Street Marsh Living Shoreline Project" has been prepared for the project (Merkel & Associates, 2018), and is included as Appendix A to this Initial Study/Environmental Checklist.

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 Impact. Several sensitive species are known to occur in south San Diego Bay and in the marshes adjacent to the Bay; however, few species are known to regularly occur within or immediately adjacent to the project site, as detailed in Appendix A. Species with the potential to be affected by the project include marine turtles, sensitive birds, and marine mammals.

Reptiles

The green sea turtle (*Chelonia mydas*) is a threatened species under the federal Endangered Species Act (ESA) and take of turtles is jointly regulated by the U.S. Fish and Wildlife Service (USFWS) when turtles leave the water to nest in terrestrial environments or where import and export of turtles or parts and products is involved. The National Marine Fisheries Service (NMFS) has jurisdiction within marine environments and in administering the Sea Turtle Stranding and Salvage Network. Roles of the agencies are outlined in a September 2015 Memorandum of Understanding between the two agencies (NMFS and USFWS, 2015). Within the Bay, turtles are strictly a marine species and the project would affect only turtles in the marine environment, as such NMFS is the lead under the ESA for this species.

The south Bay supports a population of eastern Pacific green sea turtles estimated to include between 16 and 61 individuals. The turtles primarily remain in the warm waters of the south Bay, though some are known to leave the Bay to nest on the beaches of offshore islands of Mexico (Eguchi et al., 2010). Long-term acoustic tagging and global positioning system (GPS) tracking studies by NMFS indicate that the population has historically congregated in the warm waters of the cooling water discharge channel at the now closed South Bay Power Plant. The shutdown of the South Bay Power Plant has made movements of turtles harder to predict. Recent tracking studies have noted turtles utilizing areas of the Bay much farther north than their historically recognized foraging areas, but still primarily located south of the Sweetwater River Channel; recent tracking data indicates that green sea turtles in the Bay spend 95 percent of their time south of the Sweetwater River Channel (Bredvick et al., 2015). Based on these studies, it is highly likely that turtles forage within the eelgrass (*Zostera marina*) beds along the E Street Marsh shoreline within or adjacent to the project site.

Eelgrass is a major food source for green sea turtles in the Bay and the project would result in minor impacts to eelgrass that would be offset by replacement eelgrass. The south Bay is not limited in the availability of eelgrass foraging resources and as such, the impacts to eelgrass are not considered to translate directly to impacts to turtles as a result of resource loss. However, the presence of eelgrass at the project site and within areas of access for project installation increases the potential for turtle encounter during installation of the project. Turtles swimming or feeding at or just beneath the surface of the water are particularly vulnerable to vessel strikes, which can result in serious propeller injuries and death. Potential impacts to green sea turtle from the project are primarily related to installation activities. Turtles could be struck by vessel or vessel motors as oyster reefs are placed at the site. The project would not result in increased long-term vessel traffic, or increased human use of the area. The oyster reef balls would not be not likely to cause entanglement or entrapment of turtles. Therefore, once the reef ball elements are in place, no further potential impact to turtles from the presence of the structures would be anticipated, although vessel traffic from monitoring would continue to result in risk of turtle collision. The existing District speed limit of 5 miles per hour (mph) in the project area, per District Code Section 4.30(c), would reduce the likelihood of striking and injuring turtles. Therefore, impacts to eastern Pacific green sea turtle would be less than significant.

Birds

Of the sensitive avian species with potential to occur within or adjacent to the project site, six are listed as federally or California endangered or threatened, or California Department of Fish and Wildlife (CDFW) fully protected. These include California brown pelican (*Pelecanus occidentalis californicus*), American peregrine falcon (*Falco peregrinus anatum*), light-footed Ridgway's rail (*Rallus obsoletus levipes*), western snowy plover (*Charadrius alexandrinus nivosus*), California least tern (*Sternula antillarum browni*), and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

Two of these species, Ridgway's rail and Belding's savannah sparrow, nest and forage in marshes, including the adjacent E Street Marsh, within the San Diego Bay National Wildlife Refuge. Belding's savannah sparrow may occasionally forage along the high intertidal flats of the project site adjacent to the marsh, but neither of these two species is expected to occur in the low intertidal and shallow subtidal habitat where the oyster reef ball elements would be placed, and impacts to these species from the project are not anticipated.

The California brown pelican is protected at nesting colonies and communal roosting areas. The American peregrine falcon is also protected at nesting locations. These two species have a similarly low likelihood of occurrence within the project site. California brown pelicans roost in small groups throughout the Bay, particularly along Zuniga jetty, rip rap shorelines, and docks and piers in the northern portion of the Bay; however, the species does not nest in the Bay. Peregrine falcon has historically nested in Point Loma, on downtown San Diego buildings, and on the Coronado Bridge, but nesting sites in south San Diego Bay are not documented. Based on this low likelihood of occurrence of these species at the project site, no impacts are anticipated.

The California least tern is as an endangered species under the purview of the USFWS through the federal ESA and the CDFW under the California Endangered Species Act (CESA). California least terns are seasonal residents of San Diego Bay, typically arriving in mid- to late April to nest at several colonies adjacent to San Diego Bay, and are generally present through August, with September 15 marking the formal end of the season. California least terns nest at multiple sites along the Bay including D Street Fill, the Chula Vista Wildlife Reserve, and along the South Bay Salt Works levees and are managed by the District and USFWS. These three sites are located approximately 0.5-mile, 1.3 miles and 2.3 miles from the project site, respectively. California least terns actively forage for fish in the waters adjacent to nesting colonies in the Bay, as well as in nearshore coastal waters outside of the Bay. Least terns forage extensively along the shoreline shallows within which the project would be placed. In this area, terns forage by typical plunge diving in the shallow waters where they capture silverside fish prey. In addition terns swoop forage in pools on the mudflats where fish (typically gobies) are trapped during receding tides.

California least terns have been observed foraging within the project site during baseline avian studies conducted for the project (R. Patton, unpublished data). Project installation would occur in March or early April to coincide with the known peak seasonal recruitment of native oyster. This timing for project installation is outside of the nesting season for California least tern and no impacts to this species would be anticipated.

In the Bay, nesting for western snowy plover occurs from March through July along the beach at NAS North Island (7 miles from the project site), at NAB Coronado (3.3 miles from the project site), and further south along the Silver Strand Training Complex and the beaches of the Tijuana River National Estuary Research Reserve (TRNERR) (2.5 miles from the project site). This species has not nested at the D Street Fill/Sweetwater Marsh National Wildlife Reserve (NWR) since 2000 (R. Patton, personal communication). This species may occasionally forage along the tidal flats at the project site, but has a low likelihood to occur based on the distance of the project site from active nesting colonies, and no impacts to this species would be anticipated.

Other sensitive avian species with low or moderate potential to occur in the vicinity of the project include double crested cormorant (*Phalacrocorax auritus*), elegant tern (*Thalasseus elegans*), Caspian tern (*Hydroprogne caspia*), and black skimmer (*Rynchops niger*) (Unitt, 2004), all of which nest within San Diego Bay at the South Bay Salt Works. Sensitive raptors include osprey (*Pandion haliaetus*), and northern harrier (*Circus cyaneus*). Osprey are known to nest within the Bay, with recent nests located at NAS North Island, the National City shoreline, and at the Chula Vista Wildlife Reserve. Northern harrier nests on the ground, within marshes and grasslands. This species has been known to nest in the south Bay, within the TRNERR, and the Sweetwater Marsh NWR (Unitt, 2004). While all of these species may be occasional visitors to the project area, none nest within the project site and no impacts to these avian species would be anticipated.

Marine Mammals

Several species of marine mammals utilize the Bay including two which are uncommonly observed in the project region. These include California sea lion (*Zalophus californianus californianus*) and, to a lesser extent, Pacific harbor seal (*Phoca vitulina richardsi*). Neither species breeds within the Bay. Both are only occasional visitors to the south Bay. California sea lion may occasionally be observed adjacent to the project site, but Pacific harbor seal are not expected to be present as this species is uncommon in the south Bay. There are no established haul-out, foraging, or breeding areas used by these or other marine mammals within the project vicinity, although animals may make occasional transient use of the area. Project installation is anticipated to be of a short duration and any marine mammals would be expected to leave the site for adjacent waters if disturbed by project installation.

The Marine Mammal Protection Act (Act) prohibits the "take" of marine mammals. The definition of take under the Act, like that of the ESA, includes "harassment." For this reason, a potentially significant impact to marine mammals could occur if animals are disturbed during installation activities, even if they are not harmed by the activities. Similar to sea turtles, potential impacts to marine mammals from the proposed project are primarily related to installation activities. Marine mammals could be struck by vessels or vessel motors as oyster reefs are placed at the project site. The project would not result in increased long-term vessel traffic, or increased human use of the area. Further, the oyster reef ball elements are not likely to cause entanglement or entrapment of marine mammals. Therefore, once the reef balls elements are in place, no further impacts to marine mammals would be anticipated and impacts to marine mammals would be less than significant.

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 Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant Impact with Mitigation Incorporated. Eelgrass beds are present in the deeper portions of the mudflat (typically below 0 feet mean lower low water (MLLW)) and extend offshore to the margins of the deep navigation channel that provides access to the adjacent Marine Group Boatworks boatyard and J Street Marina to the south. During winter months, as desiccation stress declines, eelgrass may spread higher into intertidal areas. Eelgrass then recedes away from the shore and into deeper waters as warmer summer weather increases likelihood of desiccation. The oyster reef ball elements would be placed at –1 foot MLLW and 0 feet MLLW at the base of the reef ball elements. These elevations fall within the seasonally variable intertidal range for eelgrass within the Bay.

Pre-installation and post-installation eelgrass surveys would be required as part of the permit process for the project. A cumulative baseline eelgrass map specifically associated with the project has been prepared to evaluate eelgrass persistence on a spatial scale as a frequency value derived by dividing the number of times eelgrass was present at a particular location by the total number of surveys conducted (a total of seven bay-wide surveys between 1993 and 2017) (Merkel & Associates, Inc., 2018, in review). The results of this mapping effort indicate that the oyster reefs placed at the low elevation treatment (along the –1.0-foot MLLW contour) fall within the 100 percent frequency of occurrence eelgrass band. Oyster reefs placed at the higher elevation treatment (along 0.0-foot MLLW contour) fall in the transition from 100 percent frequency of eelgrass occurrence to lower frequencies of occurrence ranging from around 33 percent to 71 percent frequency of occurrence. As a result, it is anticipated that the project would result in impacts to eelgrass habitat totaling approximately 0.10 acre, requiring mitigation through habitat replacement as governed by the California Eelgrass Mitigation Policy (CEMP) (NMFS, 2014). With incorporation of mitigation, impacts would be considered less than significant.

Eelgrass is considered to be a sensitive habitat and "special aquatic site" under the federal Clean Water Act (CWA), and is considered a Habitat Area of Particular Concern (HAPC) within the Essential Fish Habitat (EFH) designation under the Magnuson Stevens Fisheries Conservation and Management Act. Impacts to eelgrass habitat are considered to be significant and require mitigation. Eelgrass impacts are quantified by surveys conducted before and after project implementation and are subject to mitigation as determined under the CEMP (NMFS, 2014).

The primary element of the project includes placement of 360 baycrete reef ball elements into the intertidal habitat, including both intertidal flats and eelgrass habitat, adjacent to the E Street Marsh. The total project site encompasses 65.7 acres of intertidal habitat along 3,780 linear feet of shoreline. However, as described in Section II (Project Description) of this MND, each reef group would be comprised of a checkerboard pattern of oyster reef ball elements, with bare space in between. As a result, the footprint of the baycrete reef ball elements would be substantially lower that the total area within each reef array. Based on the size of the baycrete reef ball elements, which have a base diameter of 3 feet, each reef group (cluster of four reef ball elements) would have an approximate footprint of 7 feet by 7 feet, or 49 square feet. Therefore, the total "footprint" of the reef ball elements for all six proposed reef arrays to be placed along the shoreline is 4,410 square feet (0.10 acre).

Previous Baywide eelgrass surveys that are utilized as a baseline for this analysis indicate that all of the oyster reef arrays to be constructed at the project site are within persistent to seasonally fluctuating intertidal

and shallow subtidal eelgrass. Therefore, a 4,410-square-foot (0.10-acre) direct impact to eelgrass is anticipated to occur. The final impact would be determined through pre- and post-installation surveys as dictated by the CEMP. Further impacts to eelgrass or tidal flats beyond the direct footprint of the reef ball elements are not anticipated due to the planned installation methods and the proposed mitigation measure described in this MND. Project installation would occur from the water at high tide via shallow draft vessels. Vessels would travel at low speeds to avoid prop wash or drag that could damage eelgrass, and would not anchor within eelgrass habitat. Reef ball elements would be lowered from in-water vessels using an A-frame and/or davit, and would be hand placed by biologists to ensure that reef balls are not dragged along the mudflat. Access for monitoring is not expected to result in additional eelgrass losses.

The project would be required to conform with the CEMP, which includes pre- and post-installation eelgrass surveys, and implementation of eelgrass mitigation as required based on project-specific survey results. Any significant impacts to eelgrass, as determined by these surveys, would be mitigated using the guidance from the CEMP (NMFS, 2014). Implementation of Mitigation Measure **MM-BIO-1**, which would require impacts to eelgrass be mitigated according to the CEMP, would reduce impacts to eelgrass to less than significant. The U.S. Army Corps of Engineers required the District to create an eelgrass mitigation area within a former borrow site in the south Bay as mitigation for impacts associated with the National City Wharf Extension Project. The mitigation area was sized to develop substantially more eelgrass than required to meet the wharf extension project, with the residual area being established for eelgrass banking purposes. The required eelgrass mitigation ultimately determined necessary for the project would be derived from surplus eelgrass habitat developed within the borrow site. Mitigation for shoreline project impacts would be achieved through a 1:1 crediting against the previously established eelgrass surplus within the borrow site.

MM-BIO-1 **Conformance with the California Eelgrass Mitigation Policy.** Pursuant to the California Eelgrass Mitigation Policy (CEMP), pre- and post-installation surveys shall determine the exact amount of eelgrass affected by project activities. Prior to the commencement of project installation, the District shall retain a qualified biologist to conduct a pre-installation eelgrass survey, per the CEMP, to quantify the amount of existing eelgrass within the project area. Additionally, three post-installation eelgrass surveys at the impact site and appropriate reference site(s) will also be performed per the CEMP. The first post-installation eelgrass survey will be completed within 30 days following completion of project installation to evaluate any immediate effects to eelgrass habitat. The second post-installation survey will be performed approximately one year after the first post-installation survey during the appropriate growing season. The third post-installation survey will be performed approximately two years after the first post-installation survey during the appropriate growing season. The second and third post-installation surveys will be used to evaluate if indirect effects resulted, later in time, due to altered physical conditions. A final determination regarding the actual impact and amount of mitigation needed at the above-stated ratio, if any, to offset impacts shall be made based upon the results of two annual post-installation surveys, which document the changes in the eelgrass habitat (areal extent, bottom coverage, and shoot density within eelgrass) in the vicinity of the project, compared to eelgrass habitat change at the reference site(s).Impacts to eelgrass shall be mitigated according to the CEMP, with a 1:1 replacement ratio relying on previously-established transplanted eelgrass within the District-managed borrow pit site in South San Diego Bay. While not contemplated at this time, should an alternative option for eelgrass mitigation be undertaken by planting new eelgrass, the impacts shall be at a 1.38:1 ratio (netting 1.2:1 at establishment) under the CEMP at the intake channel for the former South San Diego Bay Power Plant site. Approval of the use of the surplus eelgrass within the borrow pit site shall be subject to review and concurrence of National Marine Fisheries Service following Section II(E)(3) approval requirements of the CEMP.

Project installation would not be anticipated to impact marshes or uplands adjacent to, or outside of, the project site. Project installation activities would include minimal Bay bottom disturbing activities and would not generate substantial turbidity. Any turbidity generated when reef ball elements are placed onto the mudflats and shallows would be considered localized and temporary. Permanent navigation buoys planned to be placed to notify any boats of the presence of oyster reef balls would be designed to avoid anchor/chain

drag that could impact eelgrass by using elastic anchor lines and helical anchors with buoys being positioned in waters deep enough to ensure buoys do not drag at low tides.

With implementation of Mitigation Measure **MM-BIO-1** impacts to eelgrass would be considered less than significant. Based on this measure and proposed installation methods, other impacts to marine habitats would be less than significant.

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?

No Impact. As described above, the nearest adjacent wetlands to the project site are the marshes of the San Diego Bay Wildlife Refuge. These wetlands are located shoreward of the project site and would not be impacted by project installation. The project would not substantively alter water flow or water quality to marsh habitat, and is not anticipated to degrade marshlands in any way (please refer to Initial Study Section XIV (Hydrology and Water Quality)). Further, the project is designed to determine if native Olympia oysters successfully recruit on reef ball elements, the effect of tidal elevation on recruitment of native and non-native oysters, the ability of constructed reefs to protect from shoreline erosion, and whether the constructed reefs support higher native species biodiversity than adjacent mudflats.

These are considered potential benefits to adjacent marshlands. As a result, no impacts to wetlands would occur from the implementation of the project.

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?

No Impact. The project site is located within the Pacific flyway but does not provide any specific terrestrial movement corridors; additionally, no marine mammal, reptile, or fish migratory corridors occur within the project area or vicinity. Project installation would be approximately four weeks, and it would not be anticipated to result in any substantive loud noises, vibrations or shock waves that could cause animals to flee or be deterred from local habitat use. The oyster reefs would not impede movement along the tidal flats, or within the water column. It is not anticipated that project installation activities and the resulting oyster reef arrays would result in long-term alteration of migratory patterns or abandonment of nesting sites. Consequently, impacts of the project on wildlife corridors, movement of resident and migratory species, and usage of nursery sites would be less than significant.

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

No Impact. The project involves implementation of a pilot project intended to evaluate the implementation of elements under the 2013 San Diego Bay Integrated Natural Resources Management Plan (INRMP). There are no adopted local policies or ordinances that apply to the area and resources within the project impact area. As a result, the project would not conflict with any local policies or ordinances. No impacts would occur.

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 site is not within the City of San Diego Multiple Species Conservation Program (MSCP) boundaries and is several miles outside of the boundary of the City of San Diego Multi-Habitat Planning Area (MHPA).Further, the MSCP and MHPA do not apply to projects within the jurisdiction of the District, including the project. In addition, the project site is not inside the jurisdiction of any other adopted Habitat Conservation Plan. As such, no conflict or impacts would occur, and no further discussion is warranted.

V. Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c. Directly or indirectly destroy a unique paleonto-logical resource or site or unique geologic feature?	☐	☐	☐	☒
d. Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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

No Impact. No known historical resources were identified within the project area, which is located in a wide intertidal mudflat. Reef ball elements would be loaded and transported to a staging area via truck and then placed on a shallow draft vessel at a developed dock. The reef ball elements would be gently lowered to the mudflat at designated locations at high tide, using a winch attached to an A-frame or davit from the shallow draft vessel. The navigational safety buoys would be kept in position using helical screw anchors that would be augured into the Bay floor at a maximum depth of 3 feet. No excavation or sediment recovery would be necessary. Therefore, project activities would not cause disturbances below 3 feet to terrestrial or marine sediments. Therefore, no impacts would occur.

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

No Impact. No known unique archaeological resources are present within the project area. As noted in Initial Study Section V (a), above, installation activities would not require soil, ground, or marine sediment disturbances due to dredging or other excavation, and the placement of navigational safety buoys would not require auguring at depths of greater than 3 feet. Therefore, no impacts would occur.

c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact. The project area rests on the Bay Point Formation, which is a nearshore marine sedimentary deposit that dates from the late to middle Pleistocene, roughly 10,000 to 600,000 years ago. A tremendous variety of invertebrate and vertebrate fossils have been found in this deposit, including both marine and terrestrial animals, with mammoth and whale remains being some of the most significant. The City of Chula Vista, which is adjacent to the project site, does not have adopted thresholds of significance for CEQA, nor does the Environmental Element (Chapter 9) of its General Plan contain guidelines for formation-specific paleontological sensitivities (City of Chula Vista, 2015). The District does not have adopted thresholds of significance for paleontological resources either. However, the formation is assigned high resource sensitivity by the City of San Diego, and its CEQA Significance Determination Thresholds state that potential significant impacts on the Bay Point Formation could occur if a project's proposed earth disturbing activities reach depths greater than 10 feet and remove more than 1,000 cubic yards (cy) of soil (City of San Diego, 2011). As previously noted in Initial Study Section V (a), above, installation activities would not

result in the disturbance of terrestrial or marine sediments below 3 feet from the bay floor. Therefore, no impacts would occur.

d. Disturb any human remains, including those interred outside of dedicated cemeteries?

No Impact. No human remains or cemeteries are known to be located within the project area. Furthermore, as noted in Initial Study Section V (a), above, installation activities would not result in the disturbance of terrestrial or marine sediments below 3 feet from the bay floor. As a result, there is minimal likelihood that buried human remains or cemeteries would be encountered during project installation. In the highly unlikely event that human remains are discovered during installation, all activities would be required to immediately comply with State Health and Safety Code Section 7050.5 This section requires that no further disturbance may occur until the County Coroner has made the necessary findings as to the origin and disposition of the remains, pursuant to Public Resources Code 5097.98. If the remains are determined to be of Native American descent, the County Coroner has 24 hours to notify the Native American Heritage Commission. The Native American Heritage Commission would then contact the most likely descendent of the deceased, who would then serve as a consultant on how to proceed. Therefore, no impacts would occur.

VI. Geology and Soils

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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.	☐	☐	☐	☒
ii. Strong seismic groundshaking?	☐	☐	☐	☒
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv. Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒
d. Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial risks to life or property?*	☐	☐	☐	☒
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

*Geology and Soils question (d) reflects the current 2013 California Building Code (CBC), effective January 1, 2014, which is based on the International Building Code (2009).
Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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.

No Impact. The project does not involve any habitable structures or structures of a scale that may result in hazards to the public or environment as a result of earthquake faults or seismic activities. No impacts would occur.

ii) Strong seismic groundshaking?

No Impact. The project does not involve any habitable structures or structures of a scale that may result in hazards to the public or environment as a result of earthquake faults or seismic activities. No impacts would occur.

iii) Seismic-related ground failure, including liquefaction?

No Impact. The project may be subject to destabilization and loss of crown elevation as a result of liquefaction under seismic influence. However, such change has no environmental consequence. No impacts would occur.

iv) Landslides?

No Impact. The project site has no substantial slope and is not subject to landslide risks. No impacts would occur, and no further analysis is warranted.

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

Less Than Significant Impact. The project is intended to alter sediment erosion and accretion characteristics by creating areas of increased and decreased wind wave energy along the shoreline. As a result, it is expected that the project would exacerbate erosion locally around the structures and result in deposition of suspended sediment on the leeward side (shoreward) of the individual reefs. The erosion and accretion, while expected, is the intended consequence of the project and would occur over a period of time. The result of breaking wave energy in deeper water over the mudflats would result in a reduced energy impacting the more vertical shoreline. As a result the anticipated increase in erosion and accretion on the flats would be offset by a reduction of erosion along the shoreline and transport of sediments to the flats. Impacts would be less than significant.

c. Be located on geologic units 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?

No Impact. The project site has no substantial slope and is not subject to landslide risks. No impacts would occur.

d. Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial risks to life or property?

No Impact. The project is located on permanently saturated silty sand and sandy clay. The sediment is not expansive due to a lack of variability in moisture content. The stability or instability of the structures would not create substantial risk to life or property. No impacts would occur, and no further analysis is warranted.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The project has no septic tank or wastewater disposal needs. No impacts would occur.

VII. Greenhouse Gas Emissions

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

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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

Less Than Significant Impact. The project would result in a small amount of direct GHG emissions during project installation from employee commute trips, truck deliveries, and small, shallow draft vessel gasoline outboard engines, and a small amount of carbon dioxide emissions from the preparation of the oyster reef ball element baycrete (concrete with shell aggregate) forms. The project would also result in the long-term sequestration of carbon in the form of the oyster shell's calcium carbonate. Additionally, the project would help meet climate change adaptation measure goals for ecosystem and coastline preservation, which would reduce the need to implement other types of ecosystem and coastline preservation measures that may have greater direct GHG emissions than the project.

Given the project's 60 percent design plans and anticipated implementation, as provided in Section II (Project Description) of this MND, it is reasonably estimated that emissions would come the following conservative traffic and equipment assumptions:

- A maximum of eight worker commute trips per day, five days per week for four weeks.
- Up to a total of three dozen medium sized truck haul trips to deliver the oyster reef ball element baycrete (concrete with shell aggregate) forms and other project materials.
- Up to one shallow draft vessel and three small vessel trips per day from a nearby staging location to place the reef ball elements five days a week for four weeks.

Over the four week installation period, total fuel use would be approximately 400 gallons of gasoline and 200 gallons of diesel fuel. The total GHG emissions occurring during project installation from this amount of fuel use would be well less than 10 metric tons (MT) of carbon dioxide equivalent (CO_2e).

The project's operational GHG emissions would be negligible, consisting of occasional, monthly or quarterly, monitoring and data collection activities. The oyster reef structures are not planned to be removed; consequently, there would be no decommissioning emissions.

This is a very small project that would have minimal GHG emissions that would be well below any of the currently used quantitative thresholds noted, and long-term GHG emissions reductions. Additionally, the project has been designed to address climate change adaptation ecosystem and coastline protection needs. Therefore, it is concluded that the GHG emissions from the project would be less than significant.

b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact. Climate change is a global phenomenon, and the regulatory background and scientific data are changing rapidly. In 2006, the California state legislature adopted AB 32, the California Global Warming Solutions Act of 2006. The latest update to the AB 32 Scoping Plan was completed

in 2017 (CARB, 2017). The AB 32 Scoping Plan describes how global climate change would affect the environment in California. The impacts described in the AB 32 Scoping Plan include changing sea levels, changes in snow pack and availability of potable water, changes in storm flows and flood inundation zones, and other impacts. The AB 32 Scoping Plan also identifies GHG emissions reductions measures and goals for the State. The direct GHG emissions for the project would be generated from small marine vessels and on-road vehicle trips during project installation and would be minimal (less than 10 MT CO2e). Operational GHG emissions, as noted above, would be negligible. The project's emissions sources would comply with all of the indirect regulations, fuel and engine efficiency regulations, related to GHG emissions reduction.

The project would be consistent with other GHG emissions reduction plans and policies and climate change adaptation policies related to habitat restoration, the installation of living shorelines, and coastline protection. The following State and local plans identify the installation of living shorelines and/or habitat restoration projects as suggested GHG emissions reduction or climate change adaptation measures:

- California Coastal Commission (CCC) Sea Level Rise Policy Guidance (CCC, 2015a)
- California's 2017 Climate Change Scoping Plan (CARB, 2017)
- San Diego Unified Port District's Climate Action Plan (SDUPD, 2013)

In summary, the project would be consistent with applicable plans and policies that have been adopted by agencies for the purpose of reducing the emissions of greenhouse gases. As such, project impacts would be less than significant.

VIII. Hazards and Hazardous Materials

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

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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

Less Than Significant Impact. The project does not involve any hazardous material transport or discharge in association with installation or the long-term presence of the reef ball elements in the environment. During installation activities and project monitoring, vessels using diesel, gasoline, and lubricating fluids would be used in transport and placement of the reef ball elements. While there is little risk of discharge of hazardous materials from vessels, discharges cannot be fully ruled out. The potential for discharge is low and not more

substantial than that of standard automobile or small vessel traffic. In addition, implementation of the project would be required to comply with and fully adhere to all applicable federal, State and local ordinances related to the use of hazardous materials. Impacts would be less than significant.

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 is located within navigable waters of the Bay that are located outside of demarcated navigation channels, but are still subject to low intensity recreational boating uses. The project includes the placement of small structures into intertidal areas subject to complete inundation during high tides. The design of the project includes navigational hazard markers to be placed at either end of the project to warn mariners of the presence of the structures. However, there remains some potential for object collision with reef structures by small vessels operating in the project area at high tide. Should a collision occur, it is unlikely that the collision would result in a release of petroleum products such as fuel or lubricating oils. Because the project (1) is located away from the navigation channel, (2) is in very shallow water, and (3) would be marked with navigational hazard buoys as an element of project design (4) is located in an area that has a maximum speed limit of 5 mph per Section 4.30(c) of the District's Code, the potential for a collision impact and subsequent release of hazardous materials is considered to be low. Impacts would be less than significant.

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. As addressed in Initial Study Section VIII (a), above, the project is not expected to release hazardous materials. Additionally, as noted in Initial Study Section III (e) (Air Quality), there are no existing or proposed schools within one-quarter mile of the project site. No Impacts would occur.

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 is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. No Impacts would occur.

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. As addressed in Initial Study Section VII (e) (Noise), the project is not located within an airport land use plan or within two miles of a public airport or public use airport. The nearest public airport to the project site is the San Diego International Airport, located 7.25 miles to the north. No Impacts would occur.

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. As addressed in Initial Study Section VII (f) (Noise), the project is not located within the vicinity of a private airstrip. The nearest private airport to the project site is Naval Outlying Landing Field Imperial Beach (a United States Navy facility for helicopters), situated 4.5 miles to the south. No Impacts would occur.

g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. As addressed in Initial Study Section XVI (e) (Transportation and Traffic), installation and operation of the project would not restrict or impede terrestrial or marine emergency access to the project area. As such, the project would not impair implementation or physically interfere with an adopted emergency response plan or emergency evacuation plan. No Impacts would occur.

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 does not involve the construction of habitable structures, or structures designed for human occupancy. Additionally, the project would not cause any permanent in-migration of people into the project area, and its location and surroundings are made up of wetlands and nearshore/shoreline areas, which are not prone to wildland fires. Consequently, the project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. No Impacts would occur.

XIV. Hydrology and Water Quality

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b. Substantially deplete groundwater supplies or interfere substantially with groundwater discharge such that there would be a net deficit in the aquifer volume or a lowering of the local ground-water table level (i.e., 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)?	☐	☐	☐	☒
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on- or off- site?	☐	☐	☒	☐
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
f. Otherwise substantially degrade water quality?	☐	☐	☒	☐
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 hazard delineation map?	☐	☐	☐	☒
h. Place within 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☒	☐
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.	☐	☐	☐	☒
j. Cause inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

a. Violate any water quality standards or waste discharge requirements?

No Impact. The project is intended to result in a reduced energy environment along the shoreward margin of the site while exacerbating the energy environment due to wind waves around the reef ball elements. The project is expected to have a net positive reduction in suspended sediment, turbidity, and shoreline erosion if successful, although it may have a net neutral influence in water quality conditions if it is less effective than desired. Consequently, the project is not anticipated to result in any violation of water quality standards or waste discharge requirements. No impacts would occur.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater discharge such that there would be a net deficit in the aquifer volume or a lowering of the local groundwater table level (i.e., 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)?

No Impact. The project would not have an effect on groundwater supply and would not interfere with groundwater discharge. No impacts would occur.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on or off site?

Less Than Significant Impact. The project is intended to result in a reduced energy environment along the shoreward margin of the site while exacerbating the energy environment due to wind waves around the structures themselves. In general sediment erosion and accretion is expected to be mediated by short period wind wave conditions. The extent of influence in erosion and accretion patterns is not anticipated to substantially alter existing drainage or flow patterns in the area. Tidal circulation and fluvial influences from the Sweetwater River or local storm drainage systems would be expected to be unaltered by installation of the project or the effects that the reef ball elements have on sediment redistribution patterns. As a result, less than significant impacts would occur.

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?

No Impact. The project would not be expected to alter existing drainage patterns in a manner that would increase the rate or amount of surface runoff in a manner that would result in flooding on or off site. No impacts would occur.

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?

No Impact. The project would be installed in tidal waters and would not contribute runoff water that discharges to any existing or planned stormwater drainage systems. Additionally, the project does not involve the introduction of any liquid or solid waste materials that could act as a new source of pollution, including runoff. No impacts would occur.

f. Otherwise substantially degrade water quality?

Less Than Significant Impact. The project would be expected to result in minimal short-term localized increases in turbidity around the structures during and immediately following placement of the reef ball elements, while contributing to a long-term reduction in turbidity as a result of sediment trapping, reduction in wind wave sediment resuspension, and potential reduction in shoreline erosion as a result of reduced wave energy in the shoreward shallows protected by energy dissipation around the reef ball elements. The short-term exacerbation of wave scour around the structures, however, would be less than significant and would be offset by a net increased deposition behind structures. No other water quality changes would be expected from the project. As a result, impacts to water quality would be less than significant.

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 hazard delineation map?

No Impact. As addressed in Initial Study Section VIII (h) (Hazards and Hazardous Materials), the project does not include construction of habitable structures (housing), or structures designed for human occupancy. No impacts would occur.

h. Place within 100-year flood hazard area structures that would impede or redirect flood flows?

Less Than Significant Impact. The project would include the placement of structures within the 100-year flood hazard are of the Bay; however the reef ball elements would not be expected to impede or redirect flood flows, nor would they be suitable for human occupancy. The reef ball elements may affect wave run-up and wind-wave generated energy at the shoreline margin in a positive manner; however, the project would have no anticipated effect on tidal or riverine flood flow patterns. Impacts would be less than significant.

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. The project does not include any activities that may potentially influence failure of a levee or dam. Further, the project does not involve the construction of any habitable structures. No impacts would occur.

j. Cause inundation by seiche, tsunami, or mudflow?

No Impact. According to the DOC's "Tsunami Inundation Map for Emergency Planning," National City Quadrangle, portions of the project site fall within the boundaries of a tsunami inundation area (DOC, 2009). The project site is located along the on the eastern shoreline the Bay, slightly less than two miles from the Pacific Ocean. Additionally, the project site is characterized by salt marsh and sand beaches that transition to broad shallow mudflats below an elevation +4.0 feet MLLW. Considering the project site's distance from the ocean and the buffering it is provided by landmass (Silver Strand), the potential for hazards associated with direct wave action in the event of a storm surge, tsunami, or seiche is low. Additionally, the project would not directly cause any wave action capable causing inundation by seiche, tsunami. As noted in Initial Study Section VIII (a) (iv) (Geology and Soils), the topography of the project site is flat, and the potential for large-scale slope instability that could lead to mudflow is not present. As such, no impacts would occur.

X. Land Use and Planning

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. 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?	☐	☐	☒	☐
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

a. Physically divide an established community?

No Impact. The project would be located entirely on lands within the District's jurisdiction, and would be limited to restoration activities and has a wetlands land use designation in the PMP. Neither installation nor operation of the project would physically divide an established community. No impacts would occur.

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?

Less Than Significant Impact. The project would be located on District-managed lands within PMP Planning District 7, and would involve installation and maintenance of reef ball elements in a designated wetland conservation area. Staging activities would also occur on District-owned property, and these activities would be compatible with existing District operations and designated uses. All project activities would be consistent with the goals and policies of the PMP (SDUPD, 2017a), which is the guiding management document for the project area. Furthermore, the project would facilitate the District's compliance with the 2013 INRMP, which includes a provision of habitat for native organisms in the Bay as one of its implementation initiatives (U.S. Navy and SDUPD, 2013).

As described in MND Section II (Project Description), the project would be located in an intertidal mudflat. The oyster reef ball elements would be placed at –1 foot MLLW and 0 feet MLLW within the broader study area. Sea level rise would not adversely affect the success of the artificial habitat and shoreline erosion from SLR may be avoided as a result of the project.

The project is located in Planning District 7, Chula Vista Bayfront, which is delineated on Precise Plan Map Figure 19 of the certified Port Master Plan. The Port Mater Plan land use designation of the project is Wetlands. The project conforms to the certified Port Master Plan because it involves the placement of native oysters that would potentially protect and restore the E Street Marsh in Chula Vista from erosion, while providing improved intertidal and shallow subtidal habitat values. The project generally conforms with the certified Port Master Plan because it is consistent with and furthers Goals VIII and XI of the Port Master Plan. Goal VIII identifies that the District will enhance and maintain the bay as an attractive physical and biological entity. Goal XI identifies that the District will protect, preserve, and enhance natural resources, including plant and animal life in the Bay as a desirable amenity and ecological necessity, and a valuable and useable resource. Further, activities included under the proposed project would not change the uses of the sites where activities may take place, nor would they interrupt or expand the existing conforming uses of those sites.

No conflicts or inconsistencies with applicable land use plans, policies, or regulations would occur from installation or maintenance of the project. Therefore, less than significant impacts would occur.

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

No Impact. As discussed in the Initial Study Section IV (f) (Biological Resources), the City of San Diego's MSCP and MHPA do not apply to projects within the jurisdiction of the District. Therefore, the project would not be in conflict with a Habitat Conservation Plan or Natural Community Conservation Plan. No impacts would occur

XI. Mineral Resources

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

Significance criteria established by CEQA Guidelines, Appendix G.

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?

No Impact. This project area generally consists of salt marsh and sand beaches which transition into broad shallow mudflats. The project site and its surrounding areas are not designated or zoned as land with the availability of mineral resources (City of Chula Vista 2005; SDUPD, 2017a). In addition, the project site does not contain aggregate resources, and is not located in a mineral resource zone that contains important resources, as designated by the California DOC, Division of Mines and Geology (City of Chula Vista, 2005). Therefore, the project would not result in any loss of known mineral resources that would be of value regionally or to the State. As such, no impacts would occur.

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. The project site does not contain any known aggregate or other mineral resources, and no mining or mineral excavation occurs either within or in close proximity to it. Neither the PMP nor the City of Chula Vista General Plan (and its related Community Plans) identify any mineral resources in the project area; similarly, none of these land use plans designate the project site for mineral resource extraction (City of Chula Vista 2005; SDUPD, 2017a). The project site and its surrounding areas do not contain locally important mineral resources (City of Chula Vista, 2005). Therefore, no impacts to locally important mineral resource recovery would occur.

XII. Noise

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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.

Applicable Regulations

The District does not have any published noise impact planning guidelines or a noise compliance ordinance. As such, it is the District's practice to use the noise standards of the municipality in which a project is located. The project site is located on property falling under the jurisdiction of the District, and adjacent to lands falling under the jurisdiction of the City of Chula Vista. Chapter 19.68 of the City of Chula Vista's Municipal Code, as adopted on January 9, 2018, contains the performance standards and control provisions and limits for noise (City of Chula Vista, 2018a). Table III of Chapter 19.68 contains the exterior noise limits for all land use categories on both weekdays and weekends, as summarized in Initial Study Table XII-1.

Table XII-1. City of Chula Vista Exterior Noise Limits

Receiving Land Use Category	Day/Time and Noise Level (dBA)*	
	10 p.m. to 7 a.m. (Weekdays) 10 p.m. to 8 a.m. (Weekends)	7 a.m. to 10 p.m. (Weekdays) 8 a.m. to 10 p.m. (Weekends)
All Residential (Except Multiple Dwelling)	45	55
Multiple Dwelling Residential	50	60
Commercial	60	65
Light Industry (I-R and I-L Zones)	70	70
Heavy Industry (I Zone)	80	80

Source: City of Chula Vista, 2018a.
*dBA = A Weighted Sound Level (Decibels)

Municipal Code Chapter 19.68 is supplemented by Municipal Code Chapter 17.24, which contains provisions for noisy and disorderly conduct. Municipal Code Section 17.24.040 (C) (8) specifies that activities involving power machinery, tools and equipment, including construction, in residential zones between the hours of 10:00 p.m. and 7:00 a.m., Monday through Friday, and 10:00 p.m. and 8:00 a.m., Saturday and Sunday, are prohibited except when the work is necessary for emergency repairs required for the health and safety of any member of the community. However, Municipal Code Section 17.24.040 (A) specifies that such restrictions do not apply to either activities falling under the jurisdiction of the District or to scientific endeavors, as follows: "…This section [Section 17.24.040] shall not in any way affect, restrict, or prohibit any activities incidental to scientific or industrial activities carried out in a reasonable manner according to the usual customs of scientific or industrial activities, conducted in areas zoned for such purposes, or upon lands which are under the jurisdiction of the board of commissioners of the San Diego Unified Port District" (City of Chula Vista, 2018b).

Installation Analysis

Reef ball elements would be loaded and transported to a marine staging area via truck and then placed on a shallow draft vessel. The shallow draft vessel would transport reef ball elements to the project site. A second vessel equipped with a davit or A-frame would then move the reef balls to the project site. It is anticipated that all vessels would be small in size (less than 15 feet in length), powered by outboard motors. The reef ball elements would be gently lowered to the mudflat at designated locations at high tide. Each element would be hand guided into place by in-water personnel to achieve proper installation and to ensure placement at target tidal elevations.

At the project site, temporary noise from installation activities would primarily be from operating equipment onboard vessels, such as generators, mechanical crane arms/hoists, and engines. Operation of this type of equipment is expected to generate peak temporary noise levels that range between 80 to 82 A Weighted Sound Levels (decibels) (dBA) at 50 feet from the operating equipment (FHWA, 2006). Noise levels typically attenuate approximately 7 dBA with every doubling of distance in an open area (FHWA, 2006). Given the distance of the nearest residential receptors to the project site (approximately 3,000 feet, or 0.55 mile) and considering the extent of intervening features that would further attenuate noise levels (e.g., the I-5 freeway, and commercial and industrial buildings), temporary and periodic noise from installation activities would attenuate to below ambient conditions at the nearest sensitive receptor locations. While most installation activities would occur within the allowable days and hours, it may be necessary to conduct some installation activities prior to 7:00 a.m. or after 10:00 p.m. to account for installation activities that must occur during high tide. However, any installation activities occurring outside of the allowable hours would be minimal and intermittent. Even with the potential for installation activities to occur outside of the hours allowed by the City of Chula Vista's noise standards, any potential noise associated with installation activities would be dissipated enough that it wouldn't reach the nearest sensitive receptors. Additionally, as noted above under "Applicable Regulations," the City's exterior noise limits for any land use category, including residential uses, would not apply. Therefore, impacts would be less than.

Operational Analysis

Once installed, operational noise associated with the project would be limited to temporary and periodic routine biological data collection by foot and/or shallow draft vessels. Other monitoring, such as monthly or quarterly post-installation avian monitoring would be completed from shore and would not require direct physical access to the site. These activities would not generate any permanent noise that would extend beyond the immediate project area. As such, operations of the project would not exceed any of the noise limitations specified under Table III of the City's Municipal Code Chapter 19.68 (see Initial Study Table XII-1).

In addition to the above, as noted in Initial Study Section IV (d) (Biological Resources), project installation would be of short duration (4 weeks), and it would not be anticipated to result in any substantive loud noises, vibrations or shock waves that could cause animals to flee the site or be deterred from local habitat use.

Impacts would be less than significant.

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

Less Than Significant Impact. During project installation, minor localized vibration may occur proximate to work areas. The primary vibration activity would be along the immediate shoreline area during placement of reef ball elements from small shallow draft vessels. However, no residential or other sensitive land uses are located in this area. Any temporary groundborne vibration would not extend beyond the immediate work area. Once operational, no vibration sources would occur from routine biological data collection or any necessary planned maintenance or surveys. Therefore, impacts would be less than significant.

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

Less Than Significant Impact. Biological data collection by foot and/or small shallow draft vessel would include quarterly sampling of fish and invertebrates by the trapping and release of fish and mobile invertebrates as well as sampling by removal and reattachment of terracotta and/or baycrete tiles affixed to the reefs for laboratory analyses. Other activities such as monthly or quarterly post-installation avian monitoring would be completed from shore and would not require direct physical access to the site. These operations would not generate any permanent noise that would extend beyond the immediate project area and would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. As such, impacts would be less than significant.

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 under Initial Study Section XII (a), above, ambient noise levels are expected to range between 60 and 65 dBA during daytime hours at the nearest residential receptors. Project installation activities are expected to generate temporary peak noise levels that range between 80 and 82 dBA at a distance of 50 feet from operating equipment (FHWA, 2006). While installation activity noise would temporarily increase ambient noise levels near the project site, it would attenuate to below ambient conditions at the nearest sensitive receptors (0.55 miles east of the project). As such, impacts would be less than significant.

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 nearest public airport to the project site is the San Diego International Airport, located 7.25 miles to the north. At this distance, people working in the project area during installation and operation would not be exposed to excessive noise levels attributable to operation of this public airport. As such, no impacts 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 nearest private airport to the project site is Naval Outlying Landing Field Imperial Beach (a United States Navy facility for helicopters), situated 4.5 miles to the south. At this distance, people working in the project area during installation and operation would not be exposed to excessive noise levels attributable to a private airstrip. As such, no impacts would occur.

XIII. Population and Housing

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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)?	☐	☐	☐	☒
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

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)?

No Impact. The project does not involve the construction of new housing. During installation, the project would be expected to employ up to eight workers per 6-hour installation window during high tides, as outlined in MND Section IIE (Project Installation). Operation of the project would require no permanent workforce, and only occasional site visits by monitoring staff. Both permanent and temporary installation employees would be drawn from the local San Diego workforce. As such, the project would not induce in-migration or population growth locally or regionally. Therefore, no impacts would occur.

The project would install a baycrete reef ball elements, and would not involve the receipt, storage, creation, or distribution of any goods or commercial services to the greater San Diego region area that could indirectly cause new development or population growth in and of itself, or as a result of its installation. Therefore, no impacts would occur, and no further analysis is warranted.

b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The project is located in a wide intertidal mudflat within the District. There are no residential uses associated with the site or its surroundings. Therefore, installation of the project would not directly or indirectly cause the displacement of housing or people. The properties surrounding the project would remain fully operational during installation and operation of the project; no businesses would be temporarily or permanently displaced by the project either directly or indirectly. As such, no impacts would occur.

c. Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?

No Impact. The project is located in a wide intertidal mudflat within the District, adjacent to the E Street Marsh in Chula Vista, along a portion of the southeast shoreline of the Bay, and south of the Sweetwater Marsh. There are no residential uses associated with the site or its surroundings. Therefore, installation of the project would not directly or indirectly cause the displacement of housing or people. As such, no impacts would occur.

XIV. Public Services

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:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Fire protection?	☐	☐	☐	☒
b. Police protection?	☐	☐	☐	☒
c. Schools?	☐	☐	☐	☒
d. Parks?	☐	☐	☐	☒
e. Other public facilities?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

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:

a. Fire protection?

No Impact. The project site is serviced by the San Diego Harbor Police Department (HPD) for fireboat operations and the City of Chula Vista for land side operations. Fire Station 1, located at 447 F Street is the closest City of Chula Vista responder to the project site (City of Chula Vista, 2018c). The installation of native oyster habitat would not introduce any construction or operational activities that would generate any new or increased long-term demands on fire protection. As outlined in Initial Study Section XVI (e) (Transportation and Traffic), project installation and operation would result in a minor amount of vehicle trips over an estimated four weeks, which would not affect overall traffic congestion in the area or the emergency response times of fire protection services. Consequently, no impacts to fire protection would occur.

b. Police protection?

No Impact. The HPD is the primary law enforcement presence within the Bay and its tidelands. The HPD monitors all land activity surrounding the Bay, and provides law enforcement, vehicle patrols, marine and onshore firefighting, traffic enforcement, bicycle patrols, vessel patrols and maritime response, dive response, and incident investigations. The City of Chula Vista Police Department is located at 315 4th Avenue, approximately 1.5 miles from the project site (City of Chula Vista, 2018d). The City of Chula Vista Police Department includes a traffic unit, family protection unit, property and evidence services, and police support services (City of Chula Vista, 2018d). As discussed in Initial Study Section XVIII (a) (Population and Housing), implementation of the project would not induce either a short- or long-term increase in population, and therefore would not affect existing police protection service ratios for the Chula Vista Police Department. Similarly, implementation of the project would not add any new facilities or operations to the District that would require new HPD activity or personnel. Further, as outlined in Initial Study Section XVI (e) (Transportation and Traffic), project installation and operation would result in a minor amount of vehicle trips, which would not affect overall traffic congestion in the area or the emergency response times of police protection services. Consequently, no impacts to police protection would occur.

c. Schools?

No Impact. No school facilities are located within or immediately adjacent to the project site that would be physically affected by project implementation. As discussed in Initial Study Section XIII (a) (Population and Housing), the project would not increase population. Jobs generated during installation and operation of the project would be drawn from the local workforce, which is already served under existing school capacities. Therefore, the project would not increase demand for new schools and no impacts would occur.

d. Parks?

No Impact. No park facilities are located within or immediately adjacent to the project site. As discussed in Initial Study Section XIII (a) (Population and Housing), the project would not increase population. Jobs generated during project installation and operation would be drawn from the local workforce already served by existing park facilities. Therefore, the project would not increase demand for new or existing parks, as further discussed in Initial Study Section XV (a) (Recreation). As such, no impacts would occur.

e. Other public facilities?

No Impact. No other public facilities or services in addition to those discussed above (libraries, community centers, etc.) are located within or immediately adjacent to the project site that would be physically impacted by project implementation. As discussed in Initial Study Section XIII (a) (Population and Housing), the project would not increase population. Jobs generated during project installation and operation would be drawn from the local workforce already served by existing public facilities. Therefore, the project would not increase demand for new public facilities of this type. As such, no impacts would occur.

XV. Recreation

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

Significance criteria established by CEQA Guidelines, Appendix G.

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. An increase in the use of existing parks and recreation facilities typically results from an increase in the number of housing units or residents in an area. The project would not involve the construction of new housing, nor would it increase the demand for local housing. Additionally, future plans for the Chula Vista Bayfront District adjacent to the project site include fencing and natural buffers to deter and prevent direct public access to the shoreline and mudflat. Given that the project would not create public access to the shoreline or mudflats within the project area, it would not result in greater recreational use. None of the proposed restoration activities would increase public use of, or demand for, adjacent recreation facilities. No impacts to existing parks or recreational facilities would occur.

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. The project would involve the installation and monitoring of oyster reef ball elements that would contribute to the restoration of the Bay. The project would not require the construction or expansion of recreational facilities, and no impacts associated with recreational facilities would occur.

XVI. Transportation and Traffic

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
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?	☐	☐	☐	☒
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e. Result in inadequate emergency access?	☐	☐	☐	☒
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and 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. As discussed in Initial Study Sections XVI (b) through (f) (Transportation and Traffic), all project-related activities associated with transportation and traffic would result in either no impacts or less than significant impacts during installation and operation. No significantly adverse or permanent physical effects would occur related to the performance of either local or regional circulation systems, including major and minor roadways, highways, rail lines, public/mass transit routes, pedestrian and bicycle routes, or Federal Aviation Administration-designated air traffic routes. Additionally, as addressed in this Mitigated Negative Declaration's Project Description, and Initial Study Section XVI (d), below, and Initial Study Section VIII (b) (Hazards and Hazardous Materials), implementation of the project would not cause significant impacts related to the District's established navigational system or codes for maritime operations and safety. Therefore, no conflicts or minimal conflicts related to applicable plans,

policies and ordinances established for the performance of any type of circulation system would occur due to project implementation. As such, impacts would be less than significant.

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

Less Than Significant Impact. The project would not permanently disrupt any travel lanes or roadways. Therefore, the only potential for impact would be from increased vehicle trips during project installation activities and operation. During installation, the project is expected result in a maximum of 24 total daily trips (eight worker commute round trips and four delivery truck round trips). This maximum daily traffic is expected to occur briefly within the total four-week installation period. Truck trips associated with material delivery to staging areas would likely be distributed throughout the workday. Worker commute trips are all assumed occur in the morning and afternoon hours. The addition of a maximum of 24 daily trips on roads utilized to access installation staging areas (District-owned properties, launch ramps, or existing marine construction yards adjacent to Bay waters) for a four-week period would not significantly decrease overall capacity levels in comparison to existing conditions on any utilized roadways.

Once operational, maintenance and surveying of the project would generate negligible daily trips (periodically occurring from biological data collection by foot and/or small shallow draft vessels). These infrequent and nominal trip volumes would not significantly decrease overall capacity levels in comparison to existing conditions on any utilized roadways. Therefore, installation and operational activities of the project would not generate any daily vehicle trip volumes that could be considered inconsistent with any congestion management plans for San Diego freeways. As such, less than significant impacts would occur.

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 nearest public airport to the project site is the San Diego International Airport, located 7.25 miles to the north. The nearest private airport to the project site is Naval Outlying Landing Field Imperial Beach (a United States Navy facility for helicopters), situated 4.5 miles to the south. The project (installation of reef ball elements) does not include any structures or activities that could generate a hazard to air navigation. As such, no impacts would occur.

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. The project would not disrupt any travel lanes or roadways. Furthermore, the project does not include any new roadways, and would utilize existing ingress/egress points to staging areas with adequate line-of-sight in all directions. No impacts would occur with respect to terrestrial transportation.

With respect to marine vehicle safety, the project site is located within a low-speed (5 mph) boating area, outside of marked navigation channels. Further, future plans for the Chula Vista Bayfront District adjacent to the project site include fencing and natural buffers to deter and prevent direct public access to the shoreline and mudflat. Kayaks and shallow draft fishing boats may travel along the shoreline, but these activities are not common. Vessels utilized during installation would be highly visible to other marine vehicles and would not create a hazard. Once installed, oyster reef arrays would be located in intertidal habitat, and would be submerged at high tides, thereby creating potential navigation hazards for any vessels that do happen to travel into the project site. To prevent collisions of boats with oyster reefs, two standard navigation hazard buoys with anchors would be installed at the north and south ends of the project site to identify the submerged hazard for boaters using the area at higher tides. As such, less than significant marine transportation hazard impacts would occur.

e. Result in inadequate emergency access?

No Impact. Installation and operation of the project would not restrict or impede terrestrial or marine emergency access to the project area. As discussed above in Initial Study Section XVI (d), above, the

project would not disrupt any travel lanes or roadways or impede movement by boat. As such, no impacts would occur.

f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact. The project would not disrupt any local or regional travel lanes, roadways, public transit routes or schedules, pedestrian sidewalks or routes, or bicycle routes or lanes. Therefore, it would not directly or indirectly conflict with any adopted plans, policies or programs related to the performance or safety standards. No impacts would occur.

XVII. Tribal Cultural Resources

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

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

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

No Impact. Tribal Cultural Resources (TCRs) are a defined class of resources under Section 1 of Assembly Bill 52 (AB 52). TCRs include sites, features, places, cultural landscapes, and sacred places or objects that have cultural value or significance to a Tribe (Public Resources Code Sections 21074(a)(1) and 21074(b)). As noted in Initial Study Sections V (a) and (b) (Cultural Resources), the project site does not contain any known historical or archaeological resources. In addition, the project would not cause the disturbance of terrestrial or marine sediments below 3 feet soil from the ocean floor. No tribes have contacted the District to request notification of projects under AB 52; therefore, tribal consultation was not conducted, and no tribal cultural resources were identified as the result of an AB 52 consultation process. Due to the nature of the project site, installation activities, and the lack of requested notification of tribes under AB 52, it is unlikely that significant tribal cultural resources would be encountered during installation of the project. However, any potential tribal cultural resources inadvertently discovered during installation of the project would be evaluated and protected in compliance with AB 52. As such, no impacts would occur.

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

No Impact. As addressed above, the project site does not contain any known historical or cultural resources. In addition, the project would not cause the disturbance of terrestrial or marine sediments below 3 feet soil from the ocean floor. No tribes have contacted the District to request notification of projects under AB 52; therefore, tribal consultation was not conducted, and no tribal cultural resources were identified as the result

of an AB 52 consultation process. Due to the nature of the project site, installation activities, and the lack of requested notification of tribes under AB 52, it is unlikely that significant tribal cultural resources would be encountered during installation of the project. However, any potential tribal cultural resources inadvertently discovered during installation of the project would be evaluated and protected in compliance with AB 52. As such, no impacts would occur.

XVIII. Utilities and Service Systems

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☒	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
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?	☐	☐	☐	☒
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g. Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

Would the project:

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

No Impact. As discussed in Initial Study Section XIII (a) (Population and Housing), the project would not increase population; the jobs generated during installation and monitoring activities of the project would be drawn from the local workforce that is currently served by existing wastewater treatment plant capacities. The project would have no full-time operational staff, and an installation workforce of only eight employees for a limited period of time (four weeks). No permanent or short-term facilities for any type of water supply requiring wastewater treatment are proposed. Therefore, no direct or indirect demand on any wastewater treatment facilities would occur. No impacts to wastewater treatment requirements would occur.

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?

No Impact. The project is a pilot habitat restoration study and would not require the use or construction of any new water supply or wastewater treatment facilities, or the expansion of any existing facilities. No impacts to water supply or wastewater providers and facilities would occur.

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?

Less Than Significant Impact. As discussed in Initial Study Sections XIV (c),(d), and (e) (Hydrology and Water Quality), the project would not result in a change to drainage patterns, or result in other storm water discharges during project installation and operation that require new or upgraded storm water drainage facilities. The project would be located in an undeveloped intertidal mudflat area that would be subject to periodic flooding associated with tides. While the project would slightly increase the amount of impervious surfaces within the intertidal zone, any associated runoff would be easily absorbed by the surrounding hydrologic system, and would not cause a significant impact. As such, less than significant impacts to drainage patterns and surface runoff would occur.

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

No Impact. The project would not require an on-site water supply during installation of the project or during operations. As the project would be installed within an intertidal area during high tide, no water would be needed for dust control during project installation. All necessary potable water would be brought on site by construction or operational personnel for personal use. No project-related demand on existing water supply infrastructure or entitlements would occur and hence, no impacts would occur.

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. As discussed in Initial Study Sections XVIII (a) and (b), above, the project would not generate a need for wastewater treatment from either installation activities or operation. Therefore, the project would not increase the amount of wastewater requiring treatment and would not require the need for new or improved wastewater treatment facilities. No impacts to wastewater providers would occur.

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

No Impact. Installation of the project would generate minimal amounts of waste requiring disposal at a landfill. Once operational, the project would generate negligible waste (primarily from the occasional disposal of removable coir bags or monitoring tiles). Per District policy, landfill demands would be minimized by recycling all possible materials during installation of the project and during operations. Because the project would generate negligible waste during installation and operation, any solid waste generation would be considered well within the permitted capacities of landfills providing solid waste disposal needs to the area. No impacts to landfills would occur, and no further analysis is warranted.

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

No Impact. As discussed in Initial Study Section XVIII (f), above, the project would generate minimal waste during installation activities and operation, with any solid waste generation considered well within the permitted capacities of all landfills providing solid waste disposal needs. Landfill demands would also be minimized by recycling all possible materials during project installation and operation. Therefore, the project would be considered consistent with procedures and policies related to solid waste disposal. No impacts related to solid waste disposal would occur.

XIX. Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
c. Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Significance criteria established by CEQA Guidelines, Appendix G.

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 Impact with Mitigation Incorporated. Several sensitive species are known to occur in the south Bay and in the marshes adjacent to the Bay; however, few species are known to regularly occur within or immediately adjacent to the project site, as detailed in Initial Study Section IV (a) (Biological Resources). Species with the potential to be affected by the project include marine turtles. Implementation of the District's existing speed limit of 5 mph in the project area per District Code Section 4.30(c), would reduce the likelihood of striking and injuring green sea turtles. With adherence to District Code Section 4.30(c), potential impacts to the green sea turtle would be less than significant.

As addressed in Initial Study Section IV (b) and (c) (Biological Resources), implementation of the project would not be anticipated to impact marshes or uplands adjacent to, but outside of, the project site. Project installation related activities would include minimal offshore bottom disturbances that would generate substantial turbidity affecting habitat. Effects would be localized and temporary. Additionally, the nearest adjacent wetlands to the project site are the marshes of the San Diego Bay Wildlife Refuge. These wetlands are located shoreward of the project site and would not be impacted by project installation. As the project is a pilot study that would test the ability of the constructed reefs to attenuate wave energy, prevent shoreline and mudflat erosion, and protect the adjacent marshlands from the effects of storm surges and sea level rise, potential project impacts are considered potential benefits to adjacent marshland habitat.

Eelgrass beds are present in the deeper portions of the mudflat (typically below 0 feet MLLW), and extend offshore to the margins of the deep navigation channel adjacent to the project site. During winter months, as desiccation stress declines, eelgrass spreads higher into intertidal areas. Eelgrass then recedes away from the shore and into deeper waters as warmer summer weather increases likelihood of desiccation. The

planned treatment elevations for the project would result in oyster reef ball elements placed at –1 foot MLLW and 0 feet MLLW. These elevations fall within the seasonally variable intertidal range for eelgrass habitat within the Bay. With implementation of the Mitigation Measure **MM-BIO-1**, which would provide for replacement eelgrass per the standards of the CEMP, impacts to eelgrass and eelgrass habitat would be less than significant.

As addressed in Initial Study Section IV (d) (Biological Resources), the project site is located within the Pacific flyway but does not provide any specific terrestrial movement corridors; additionally, no marine mammal, reptile, or fish migratory corridors occur within the project area or vicinity. Project installation would be of short duration (approximately 4 weeks), and would not be anticipated to result in any substantive loud noises, vibrations or shock waves that could cause animals to flee or be deterred from local habitat use. Consequently, impacts of the project on wildlife corridors, wildlife and plant populations, the movement and range of animal and plant species, and the use of habitat, including nursery sites, would be less than significant.

As noted in Initial Study Sections V (a) and (b) (Cultural Resources), the project site does not contain any known historical or archaeological resources. In addition, the project would not cause the disturbance of terrestrial or marine sediments below 3 feet soil from the ocean floor. As such, buried archaeological or historical resources in the project area would not be subject to destruction or disturbance resulting from project installation activities. No impacts to any, including important, examples of major periods of the State's history or prehistory would occur.

The project would result in no impacts or less than significant impacts to the quality of the environment, habitat of a fish or wildlife species and communities, fish or wildlife population self-sustaining levels, the number and range of rare or endangered plants and animals, and examples of major periods of California's history or prehistory. Therefore, no further analysis is warranted.

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. State CEQA Guidelines Section 15130 (b) states that either of the following approaches to addressing cumulative impacts is acceptable: (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or (B) A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency. The analysis below uses the list of cumulative projects approach.

Table XIX-1 provides a list of all the past, present, and probable future projects within the vicinity of the project known to the District and the U.S. Navy as of June 2018.

Table XIX-1. Cumulative Projects Listing

Project No.	Project Name	Location	Description	Status
1	Naval Base Point Loma Fuel Pier (P151) Replacement and Dredging	Naval Station Point Loma and Alternative Bait Barge locations within State lands, San Diego, CA	Construct temporary Space and Naval Warfare Systems Center (SSC) marine mammal facilities at Naval Main and Anti-Submarine Warfare Command (NMAWC) and then relocate the program to NMAWC; demolish existing Naval Base Point Loma Fuel Pier in phases so as to leave pier operational throughout project; construct 71,180-square-foot double-deck replacement pier and perform associated dredging; return SSC marine mammal program to original location.	Completed
2	San Diego Bay Shipyards Sediment Remediation Project	British Aerospace Engineering (BAE) Systems San Diego Ship Repair facility at 2205 and 400 East Belt Street and General Dynamics NASSCO facility at 2798 Harbor Drive	The San Diego Bay Shipyard Sediment Remediation Project was a contaminated sediment remediation project undertaken to remove legacy contaminated sediments along the industrial shoreline of San Diego Bay. The work had multiple responsible parties, but was conducted within the leased water areas of BAE Systems and NASSCO shipyards. The work resulted in eelgrass impacts within both the north and south shipyard. The mitigation for eelgrass was conducted under the CEMP and is in the monitoring phases.	Contaminants remediation is completed, eelgrass mitigation is presently being monitored under CEMP requirements
3	Pier 1 North Drydock	Sampson and Dewey Streets	This project is the construction of a new drydock facility on the north side of Pier 1 at the British Aerospace Engineering (BAE) facility at 2205 and 400 East Belt Street. The project also involves removal of subsurface cooling tunnels and associated real estate agreements.	Completed

Table XIX-1. Cumulative Projects Listing

Project No.	Project Name	Location	Description	Status
4	Shelter Island Boat Launch Facility	2210 Shelter Island Drive, San Diego, CA 92106	The project involves repair, maintenance, and replacement of the boat launch ramp, jetties (including public walkways), gangways, and floating docks, as well as minor improvements to the kayak launching area, restrooms, and parking.	In construction; anticipated to be completed by Summer 2018
5	Harbor Island West Marina Redevelopment Project	2040 Harbor Island Drive, San Diego, CA 92101	The project is to replace the existing aged dock structure, existing landside buildings, and infrastructure to accommodate a wider range of vessel sizes.	Planning phase – MND under preparation
6	Naval Training Center Small Boat Channel Remediation	NTC Channel above Harbor Island Bridge	The project is a sediment remediation project completed in early 2017. The work included dredging 7 polygons identified as having contaminant levels above action levels. Material was dredged, taken by scow to NBSD where it was trucked to upland disposal. The work included minor impacts to eelgrass that were mitigated at the Navy Eelgrass Mitigation Bank (NEMS).	Completed
7	Smuggler's Cove Beach and Habitat Restoration Project	Naval Base Point Loma at Ballast Point	The project is a beach restoration that is intended to replace eroded beach against an exposed intertidal seawall and revetment to soften the shoreline, develop approximately 0.4 acre of eelgrass habitat as a Navy Eelgrass Mitigation Site (NEMS), and construct a fish enhancement reef. The work would make beneficial reuse of demolition material from the Navy Fuel Pier and maintenance dredging sand.	Planning phase – Construction planned FY2019

Table XIX-1. Cumulative Projects Listing

Project No.	Project Name	Location	Description	Status
8	Glorietta Bay Marina Dock C and Glorietta Bay Launch Ramp Replacement	Glorietta Bay, City of Coronado	The project was the replacement and reconfiguration of Dock C within the Glorietta Bay Marina and the replace-ment of the public launch ramp and boarding dock within Glorietta Bay. Eelgrass impacts were mitigated within the previously constructed eelgrass mitigation site for the first phase of the Glorietta Bay Marina and Shoreline Improvements.	Work was Completed in 2017
9	SDG&E San Diego Bay Pipeline Crossing Cover Project	Foot of E Avenue City of Coronado	The project is a gas pipeline crossing scour protection project to place articulated concrete matting over a 400 foot long 8 foot wide section of the utility near the location where the pipeline transitions out of the bay in Coronado. This work would impact eelgrass at the mat placement location.	Work will be completed in 2018

A cumulative impact could occur for a given resource area if the project were to result in an incrementally considerable contribution to a significant cumulative impact resulting from past, present, and reasonably foreseeable future projects. As addressed in this Initial Study, implementation of the project would not, in itself, result in any potentially direct or indirect significant unavoidable impacts. The project would result in no impacts, or less than significant impacts with the exception of biological resources.

As addressed in Initial Study Section IV (b) (Biological Resources), installation of the project would result in an estimated 4,410-square-foot (0.10-acre) area of direct eelgrass habitat loss. Although the final area of impact would not be determined until such time that pre-construction surveys for eelgrass are completed, the project would be required to comply with the CEMP to mitigate for lost habitat. With implementation of Mitigation Measure **MM-BIO-1**, in conjunction with District Code Section 4.30(c), which would minimize temporary damage to eelgrass habitat during project installation, impacts would be less than significant. Furthermore, any impacts to marine biological resources, including eelgrass, caused by the cumulative implementation of projects identified above would be required to be mitigated on a project by project basis. Mitigation for eelgrass impacts would be required to be in conformance with the CEMP, which dictates mitigation ratios, timing of work, and milestones and requirements for success. Individual impacts to non-eelgrass marine habitat would be subject to appropriate mitigation requirements as dictated by EFH consultations under the Magnuson-Stevens Fisheries Conservation and Management Act and permits under Section 10 of the Rivers & Harbors Act and Section 404 of the Clean Water Act. Mitigation of potential impacts, where they may occur, is managed on a project by project basis through Endangered Species Act and Marine Mammal Act consultations as applicable. Because every project is evaluated individually through the regulatory approval programs and there are no de minimis criteria for non-permit actions, cumulative impacts would be expected to be addressed by the individual project review and approval actions such that no residual cumulative impacts would exist. The eelgrass mitigation area identified for the project was previously established for the National City Wharf Extension Project, and was sized for the

development of substantially more eelgrass habitat than was needed for that project's implementation. Therefore, the project's use of this area for eelgrass mitigation would not interfere or conflict with the area's long-term use for habitat mitigation banking.

Based upon the above, the project would not be anticipated to incrementally contribute to any impacts related to biological resources in a cumulatively significant manner. The project's incremental contribution to cumulative impacts would be less than significant.

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

Less Than Significant Impact. As addressed in this Initial Study, implementation of the project would not result in any project installation or operational activities that would cause direct or indirect environmental effects that are potentially significant. The project would result in no impacts or less than significant impacts to all issue areas considered, with the exception of biological resources. As detailed in Initial Study Sections IV (a) and (b) (Biological Resources) the project's potential impacts related to eelgrass habitat can be mitigated to a level of less than significant with implementation of Mitigation Measure **MM-BIO-1**. As noted in Initial Study Section XIX (b), above, if implementation of the project is successful, it would prevent or lessen shoreline erosion and the effects of storm surges and sea level rise, which would result in net beneficial impacts to human beings and the environment. As such, less than significant impacts or no impacts would occur, and no further analysis is warranted.

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Document Preparation

Consistent with State CEQA Guidelines Section 15063 (d) (6), the following Table 1 provides a listing of the persons who prepared this Initial Study, and Table 2 provides a listing of those persons who participated in its review.

Table 1. List of Initial Study Preparers and Contributors

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Appendix A

Biological Technical Study and Essential Fish Habitat
for E Street Marsh Living Shoreline Project

BIOLOGICAL TECHNICAL STUDY AND ESSENTIAL FISH HABITAT FOR THE E STREET MARSH LIVING SHORELINE PROJECT SAN DIEGO, CA

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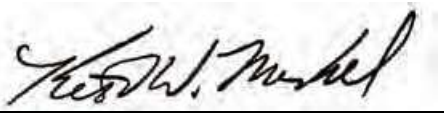
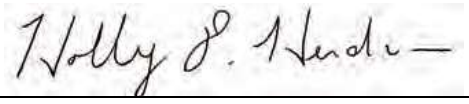
April 2018



Keith Merkel, Principal Consultant



Holly Henderson, Senior Biologist

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April 2018

1.0 INTRODUCTION

Natural resource managers and scientists are increasingly aware of the threats of shoreline erosion, sea level rise, and climate change. In an effort to prevent large scale armoring of shorelines through placement of engineered riprap, seawalls, and bulkheads that do not provide maximum ecological values, natural resource managers are implementing a number of pilot coastal "living shoreline" programs through public and private partnerships. Living shorelines utilize natural habitat elements to protect shorelines from erosion while providing important habitat for fish, wetland and aquatic plants, and other wildlife. Living shorelines provide additional benefits including supporting the settlement of filter-feeding organisms that improve water quality by settling sediments and filtering pollution, providing functional habitat for ecologically and commercially important wildlife, and increasing connectivity of wetlands and deeper intertidal and subtidal habitat.

Oyster reefs are particularly suited to living shoreline projects as they are considered ecosystem engineers and foundation species that create very important "reef," or structurally complex beds of habitat, for other organisms. Multiple projects are underway in West Coast wetlands to restore native Olympia oysters (*Ostrea lurida*); however, no such restoration projects have been implemented in the San Diego Bay (Bay). The E Street Marsh Living Shoreline Project (project) is the first of its kind in the Bay and seeks to restore native Olympia oyster (native oyster) reefs to provide habitat and to protect adjacent tidelands and shorelines from erosion.

The San Diego Unified Port District (District) is in the process of preparing a Mitigated Negative Declaration under the California Environmental Quality Act (CEQA) for restoration of oyster reefs in the Bay. This report documents biological conditions at the project site and provides an analysis of potential impacts to habitats and sensitive species. It additionally provides an Essential Fish Habitat Assessment (EFH) for the project.

The project is a pilot-scale study to establish native oyster reefs in south San Diego Bay. Data derived from the project would inform the best methods to develop future living shoreline projects within the Bay. The District, in conjunction with the California State Coastal Conservancy (Conservancy), is the project's sponsor.

2.0 PROJECT GOAL AND OBJECTIVES

The goal of the project is to create a biologically rich native oyster reef in the Bay as part of a complete marsh system, which restores an ecological niche that was historically present, is ecologically functional and resilient to changing environmental conditions, and also protects Bay tidelands and shoreline.

In order to meet this goal, the following project objectives have been identified:

1. Evaluate existing and historical distribution of native oysters and non-native Pacific oysters (*Crassostrea gigas*) (non-native oysters) in the Bay.

2. Determine suitable locations for native oyster reef restoration, using existing and new data.

3. Identify appropriate energy environments and sites in the Bay that could benefit the most (in terms of erosion control and ecological function) from native oyster reef creation.

4. Use a pilot-scale approach to establish demonstration native oyster reefs.

5. Determine the extent to which native oyster reefs enhance habitat for invertebrates, fish, and birds, relative to areas lacking structure and relative to pre-project conditions.

6. Evaluate the potential for native oyster reefs to reduce water flow velocities, attenuate waves, reduce erosion, and promote sediment capture shoreward of the reefs.

The first three objectives were met through initial studies and preparation of the San Diego Bay Native Oyster Restoration Plan (Merkel & Associates, Inc. et al., 2015). The remaining objectives will be met in subsequent phases of work that include final design and engineering, project construction, and post-construction monitoring.

In order to address these objectives, the project has been designed to answer the following study questions:

1. Do native oysters recruit (settle, survive and grow) on constructed oyster reefs?

2. Does the tidal elevation of constructed oyster reefs affect recruitment of native oysters and non-native oysters and other species that compete for space with native oysters?

3. Do constructed oyster reefs reduce water flow velocities, attenuate waves, and reduce rates of erosion/increase rates of deposition shoreward of the reefs? Does this result in a measurable change in shoreline morphology?

4. Do constructed oyster reefs and mudflat habitat between the reef structures support increased diversity and abundance of native organisms (including invertebrates, fish, and birds) over adjacent mudflat habitat?

3.0 PROJECT DESCRIPTION AND LOCATION

3.1 PROJECT LOCATION

The project site is located along the shoreline of the E Street Marsh in south San Diego Bay, Chula Vista, California (Figure 1). This site was selected from among several potential restoration sites in

south San Diego Bay upon completion of the San Diego Bay Native Oyster Restoration Plan (Merkel & Associates, Inc., et al., 2015). This study analyzed several factors for project site selection including:

- Areas known to currently support native oysters and with sufficient native oyster settlement and growth rates to naturally colonize a restored reef.
- Areas along eroding shorelines and/or exposed to high wind-generated wave energies.
- Areas with sufficient water quality and sediment conditions to support restoration of native oysters.
- Areas adjacent to unarmored shoreline, preferably adjacent to marsh habitat.
- Areas with sufficient intertidal and shallow subtidal habitat.
- Areas with sufficient shoreline length.

The E Street Marsh project site is located along a portion of the southeast shoreline of the Bay on tidelands owned by the District (Figure 1). The northern and southern portions of the project site are immediately adjacent to the Sweetwater Marsh Unit (including the F&G Street Marsh) of the San Diego Bay National Wildlife Refuge managed by the U.S. Fish and Wildlife Service (USFWS). The central portion of the project site is located adjacent to the Chula Vista Bayfront planning area (Planning District 7 of the Port Master Plan), and plans are in development to create an RV Park and open parkland (Signature Park) in the parcels immediately shoreward of the project site (Merkel & Associates, Inc., 2017). Long-term planning for the Chula Vista Bayfront includes development of approximately 400 feet of natural buffers, along with the potential for expanded wetlands adjacent to the Sweetwater/E Street Marsh, and improved tidal connection and flushing of the F&G Street Marsh. These future restoration and improvement projects would occur immediately adjacent to the project site.

Elevations at the project site range from between +7 and +8 feet mean lower low water (MLLW) along the shoreward berm that separates the marsh from the mudflat, to approximately -2 feet MLLW along the bayward edge. A deepwater channel occurs offshore of the project site to allow for navigation to the Marine Group Boatworks boatyard and the District's J Street Marina. The total project site encompasses 65.7 acres of intertidal habitat along 3,780 linear feet of shoreline.

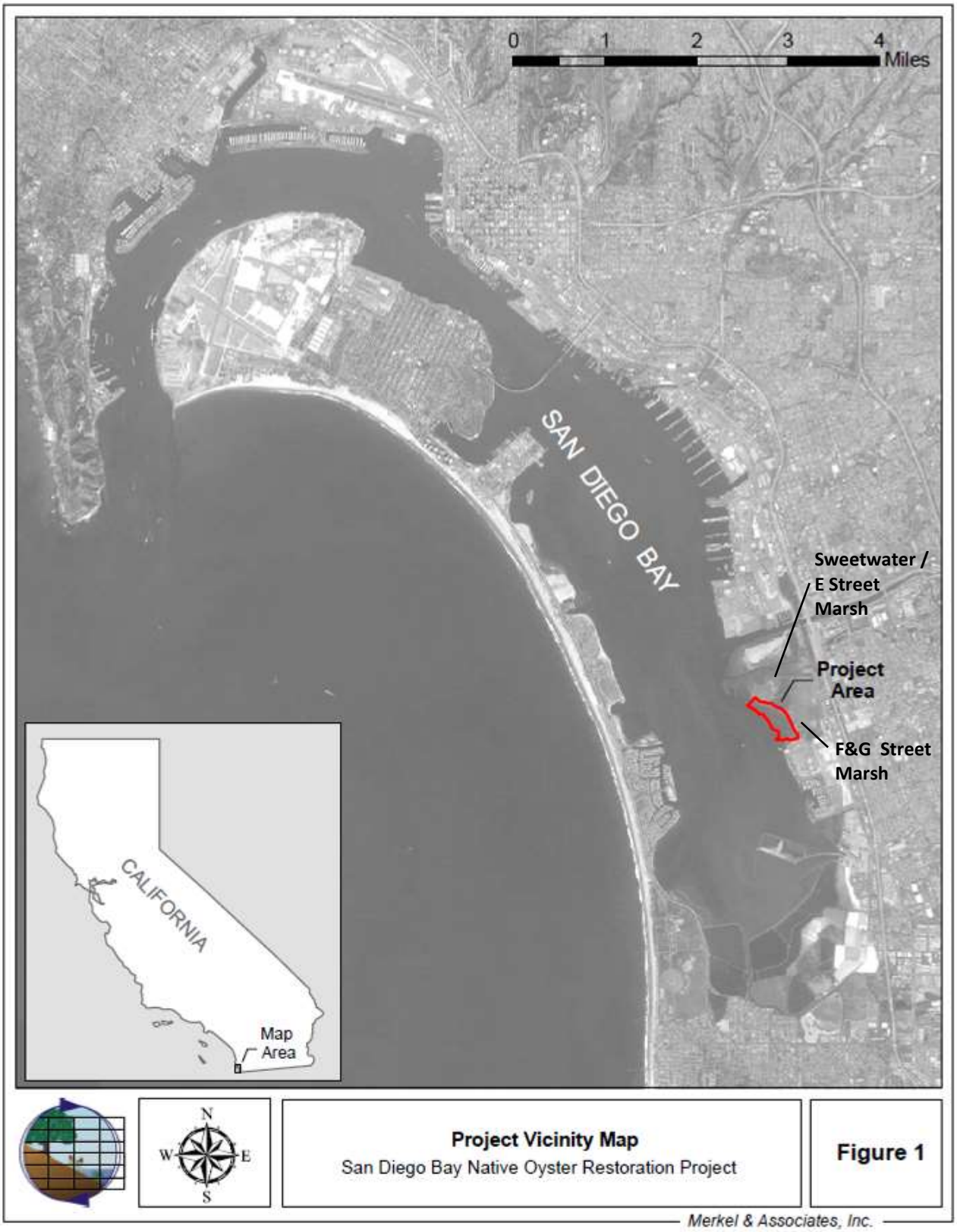

Figure 1. Project Vicinity

3.2 PROJECT DESCRIPTION

The following text defines the features of the proposed oyster reefs, and then describes the study design to be implemented at the project site.

Definitions

The oyster reef features are defined as follows:

- **Oyster reef ball elements**: are constructed with baycrete (concrete with shell aggregate). A reef ball element has a top diameter of approximately two feet, and a wider three-foot diameter base (Figure 2). The height of each reef ball element would be approximately two feet above the mudline. Shell and coir bags, and/or removable monitoring tiles could be placed atop the reef ball elements and lashed in place to secure them, depending on the needs of the final design. Reef ball elements may also be constructed with removable tops. Native oysters are known to recruit at lower tidal elevations than non-native oysters. Therefore, the higher portion of reef ball elements might eventually support higher densities of non-native oysters and other non-native and/or invasive invertebrate species. The ability to remove the tops of reef ball elements is an adaptive management measure that would allow for modification of the total height of the reef ball elements to preserve densities of native oysters lower on the reef ball elements while eliminating presence of non-native organisms higher on the structures. This adaptive measure would only be implemented should the tops of reef ball elements become fouled with primarily non-native species to the exclusion of native oysters.
- **Oyster reef group**: a series of four reef ball elements placed side by side to achieve an approximate seven feet by seven feet square footprint.
- **Oyster reef array**: a checkerboard arrangement of 15 reef groups placed in a checkerboard pattern along the mudflat with spacing of 18 to 20 feet between the center of adjacent reef groups. Each reef array would measure approximately 90 feet long (parallel to shoreline) by 55 feet wide (perpendicular to shoreline). Each reef array would consist of 60 reef ball elements (15 reef groups times four reef ball elements per group).
- **Tidal elevation treatment**: a reef array placed along the shoreline so that the crests of the reef ball elements are at a specific tidal elevation. The two tidal elevation treatments selected for this project are +1 foot MLLW and +2 feet MLLW, as described below.
- **Control area**: an area along the shoreline consisting of mudflat that is the same size as a reef array.
- **Study block**: an area along the shoreline of the project site consisting of replicate reef arrays and paired control areas.

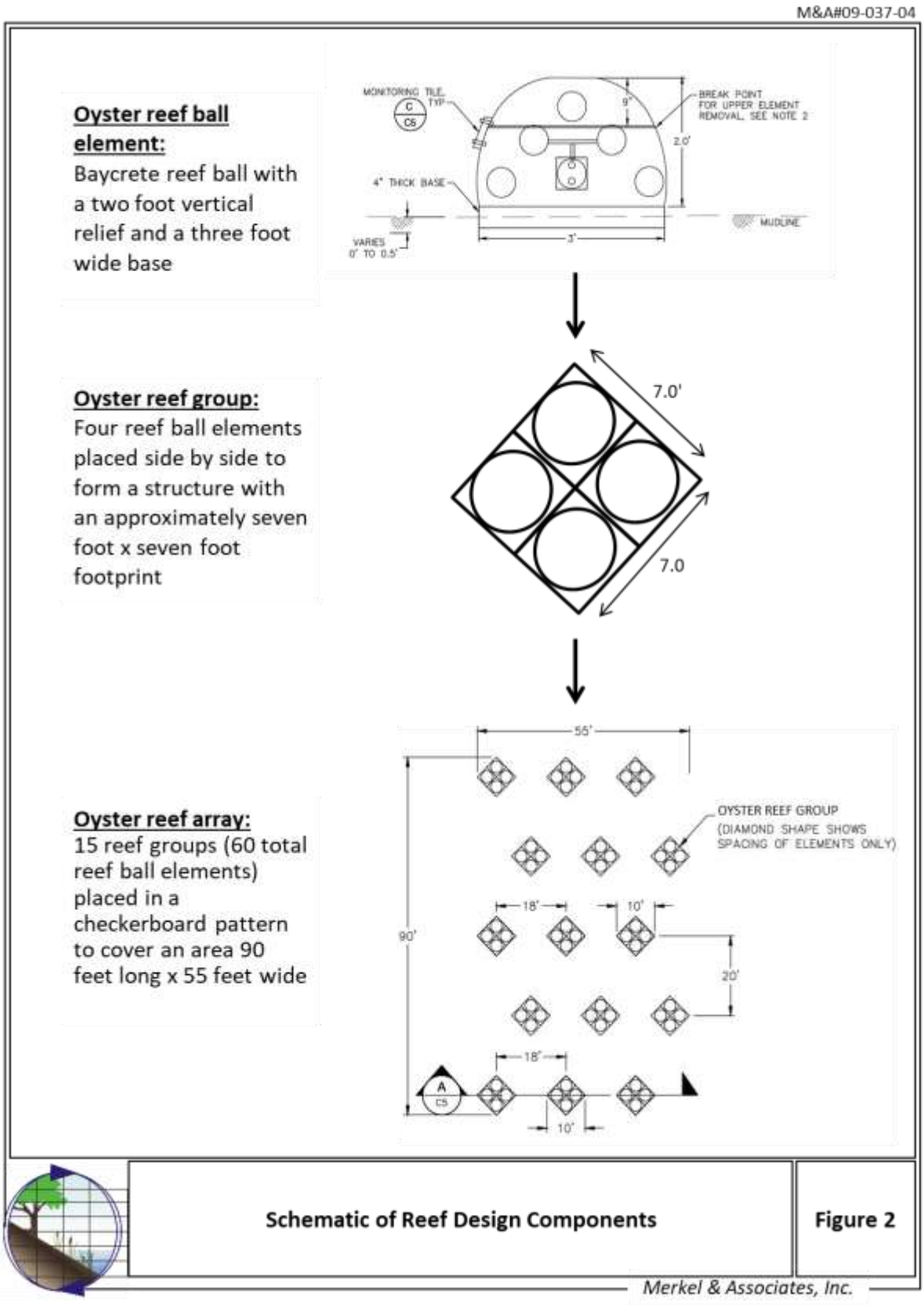

Figure 2. Schematic Design of Reef Components

Study Design

The project would utilize a modular approach. Reef ball elements would be placed side by side into groups of four (Figure 2). These reef groups would be arranged in a checkerboard pattern of 15 reef groups to form a reef array as described in the definitions provided above (Figure 2). The purpose of this design is to maximize wave attenuation across the reef, as wind-generated waves would encounter multiple reef groups as they travel from the Bay toward the shoreline.

Each reef array would be placed at one of two tidal elevation treatments: +1 foot MLLW (with the base of reef elements at -1 foot MLLW and the crest at +1 feet MLLW), or +2 feet MLLW (with the base of reef elements at 0 foot MLLW and the crest at +2 feet MLLW). Each reef array would be oriented to follow the existing bathymetric contours. These follow a northwest-to-southeast direction with some deviation due to the natural variation of the tidal flats. The orientation of the reef arrays allows wind-generated waves from the two predominant wind directions to be intercepted by the reef arrays.

Reef arrays would be placed in a blocked design. The purpose of this blocked design is to provide replication and to account for variation of physical characteristics (such as wind-generated wave exposure and sediment type) and biological characteristics (such as shorebird usage) along the shoreline of the project site. A total of three study blocks would extend along the shoreline within the project site. Each study block would consist of one randomly placed +2 feet MLLW treatment oyster reef array and a paired control area of similar size, and one randomly placed +1 foot MLLW treatment oyster reef array and a paired control area of similar size. Blocks would be spaced to ensure that blocks are outside of the zones of influence of other blocks. This zone of influence was determined based on results of preliminary wave attenuation modeling completed for the San Diego Bay Native Oyster Restoration Plan (Merkel & Associates, Inc. et al., 2015). A total of three study blocks would extend along the shoreline within the project site (Figure 3). The reef arrays, including control areas, would be separated by a minimum distance of 80 feet along the shoreline; the study blocks would be separated by a minimum distance of 200 feet along the shoreline. In total, six reef arrays (three replicates at each of two tidal elevation treatments) would require the placement of 360 reef ball elements (six reef arrays times 15 reef groups per array times four reef ball elements per group).

Project Construction

The project site is readily accessible from the J Street Marina and public launch ramp, and the Pier 32 Marina and public launch ramp at Pepper Park, as well as from the adjacent shoreline. However, its wide intertidal mudflat would require materials to be transported to the site via boat at high tide, thereby restricting available work times and limiting construction vessels to small, shallow-draft boats. Construction would not require any dredging or below grade disturbances (e.g., pile driving or digging). The estimated maximum number of on-site construction personnel would be eight (8). The estimated number of personnel provides for two, four-person boat crews — each of which would include a boat operator, boat tender, and two biologists/marine technicians. The following text further describes construction methods:

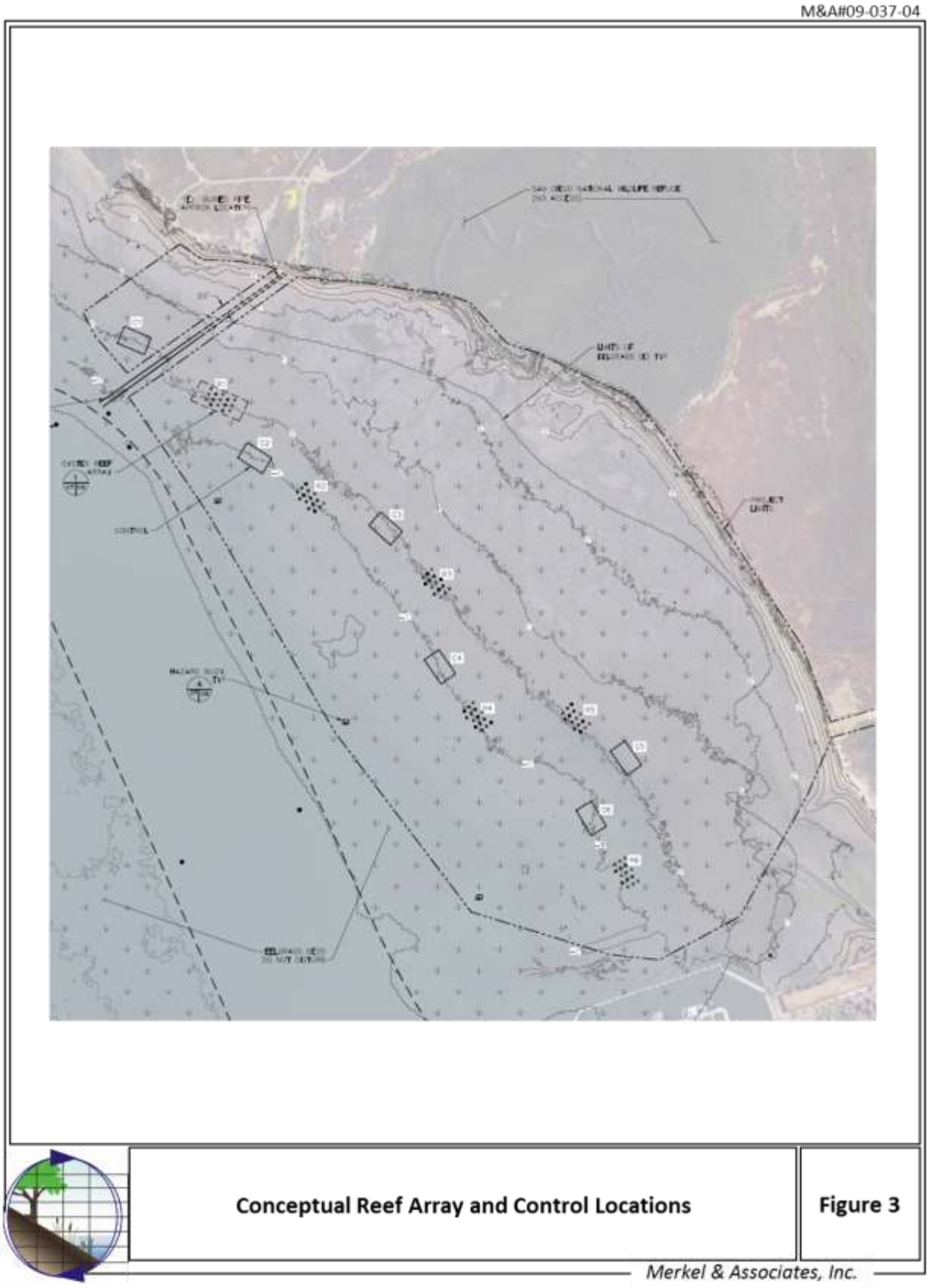

Figure 3. Conceptual Reef Array and Control Locations

- **Construction Timing**: The primary consideration for construction timing corresponds to the period just prior to seasonal recruitment for native oysters. The earliest observed recruitment of native oysters in the Bay is in late April. Seasonal timing of peak recruitment for the species in the Bay varies by year, but typically occurs between mid-May and mid-July. In contrast, the earliest observed recruitment of non-native Pacific oysters in the Bay is late May, with peak recruitment for this species typically occurring between late June and early July. Based on this data, the ideal seasonal timing for installation of the reef ball elements at the project site would be in late March or early April. This would be just prior to the peak spring recruitment for native oysters. Furthermore, this timing would allow native oyster recruits access to new reef substrate prior to colonization of the reefs by non-native and/or invasive species. Therefore, construction is anticipated to begin in March 2019 and it is expected that four weeks would be required to complete the reef installations. The planned timing for construction would be outside of the nesting season for the California least tern (*Sternula antillarum browni*) and would allow for completion of a pre-construction eelgrass (*Zostera marina*) survey within the active growing season for this species, prior to initiation of construction. This is discussed further in the following sections of this document.

- **Site Access**: It is expected that the primary construction access would be by shallow draft vessels from existing navigation channels. Construction vessels would cross the existing mudflat to deliver and place the reef ball elements at high tide. Construction using tracked or amphibious equipment is not considered feasible based upon the sediment conditions and adjacent eelgrass beds. Access via land (from shore) is not anticipated for construction and would be limited to foot traffic from existing roads and upland shoreline access points if needed.

- **Staging Areas**: Specific upland staging areas are expected to be located at a marine loading yard for efficiency of handling the reef elements and loading them onto marine vessels for transport to the site by water. Potential loading sites include public launch ramps, District-owned sites in Chula Vista or existing marine construction yards in the Bay. Only previously disturbed locations would be used for staging; no new ground disturbance would be required.

- **Construction Methods for Reef Installation**: Reef ball elements would be loaded and transported to a marine staging area via truck and then placed on shallow draft barge, and/or workboat vessel. The barge/vessel would transport reef ball elements to the project site but would remain close to the navigation channel away from the mudflat. A second flat bottom boat equipped with a davit or A-frame would transport the reef ball elements from the barge/vessel to the project site. It is anticipated that all workboats would be small in size (less than 25 feet in length), powered by outboard motors. The size and number of vessels would depend upon the marine contractor's available equipment and construction schedule, but an estimated two work boats are planned for the construction effort.

  The reef ball elements would be gently lowered into the water at high tide at previously marked locations using a winch attached to an A-frame or davit. Elements would be guided

into place at designated mudflat locations that would be marked by temporary PVC poles or wooden stakes (these markers would be removed as elements are installed). Each reef ball element would be hand guided into place by in-water biologists/marine technicians to achieve proper installation and to ensure placement at target tidal elevations. In general, construction sequencing would proceed with the landward-most elements first, with subsequent placement either alternating between landward and seaward rows or proceeding along the shoreline, depending upon the contractor's equipment and methods. Reef ball elements would be gently lowered to the mudflat at designated locations at high tide installed from floating vessels; therefore, work would occur during a roughly 6-hour daily work window at high tide.

Navigation and Safety

The project site is located within a 5 mile per hour (mph) boating area, per Section 4.30(c) of the District's Port Code, outside of a marked navigation channel. Future plans for the Chula Vista Bayfront District adjacent to the project site include fencing and approximately 400 feet of natural buffers to deter and prevent direct access to the shoreline and mudflat. Kayaks and shallow draft fishing boats may travel along the shoreline, but these activities are not common. Constructed reef arrays would be located in intertidal habitat, and would be submerged at high tides, thereby creating potential navigation hazards for any vessels that do happen to travel into the project site.

To prevent collisions of boats with oyster reefs, two standard navigation hazard buoys with anchors would be installed slightly channelward of the north and south ends of the project site to identify the submerged hazard for boaters using the area at higher tides. Buoys would not use a traditional swing (block and chain rode) mooring, as this type of mooring with ground tackle can damage eelgrass and mudflat habitat as the chain and line swing with changing tides. Instead, a helix or screw anchor would be placed into the mudflat and a hazard buoy would then be attached to elastic line that flexes with changing tides but does not drag on the seafloor (Figure 4).

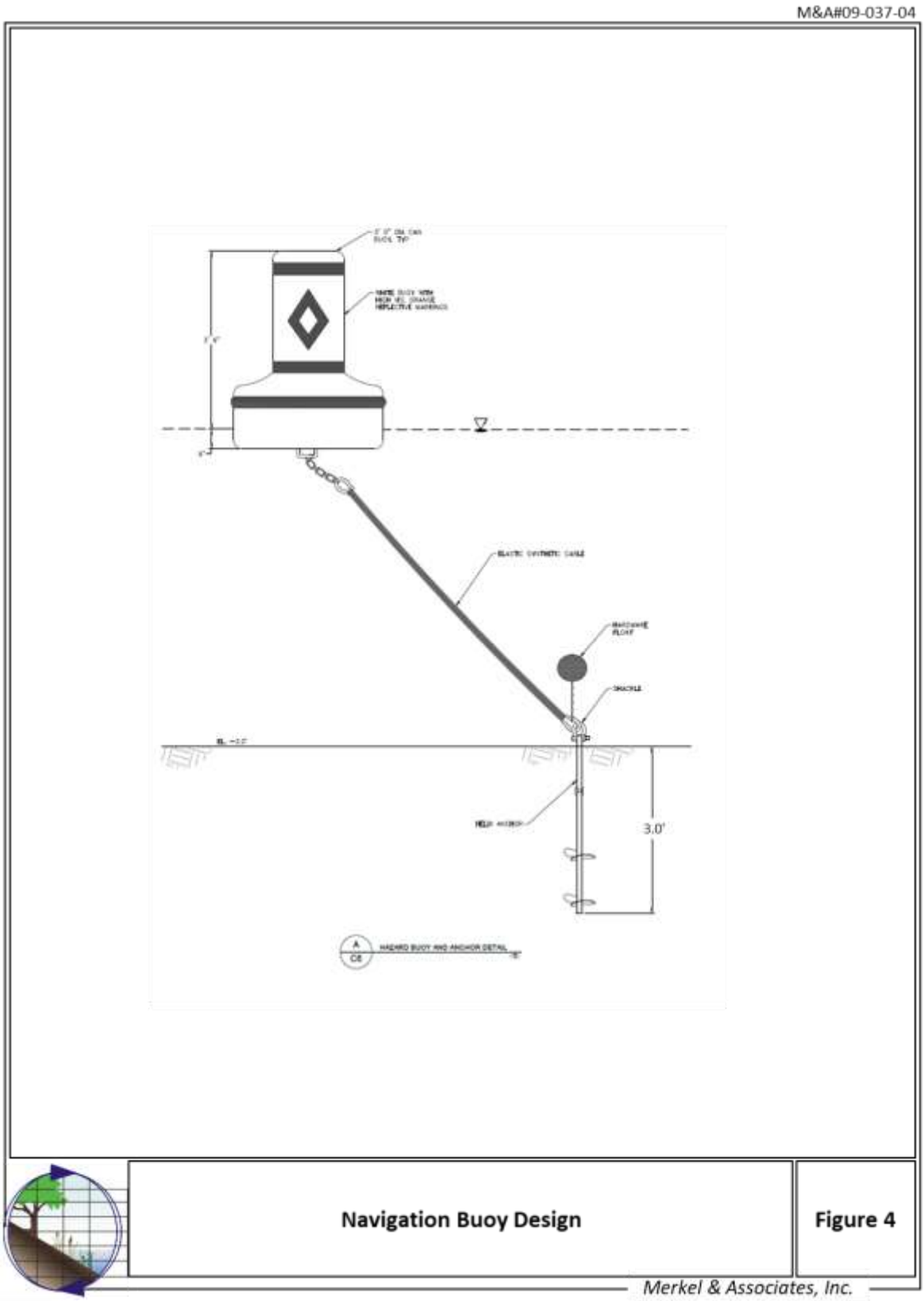

Figure 4. Navigation Buoy Design

4.0 PROJECT REGULATORY REQUIREMENTS

The project involves the installation of oyster reefs along an intertidal shoreline of south San Diego Bay. The sections below summarize the federal, State and local regulations that would apply to the project.

4.1 FEDERAL REGULATIONS

Clean Water Act

The federal Water Pollution Control Act Amendments of 1972 (33 United States Code [USC] 1251 through 1376), as amended by the Water Quality Act of 1987, and better known as the CWA, is the major federal legislation governing water quality. The purpose of the federal CWA is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Discharges into waters of the United States are regulated under CWA Section 404. Waters of the United States include: 1) all navigable waters (including all waters subject to the ebb and flow of the tide); 2) all interstate waters and wetlands; 3) all other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, or natural ponds; 4) all impoundments of waters mentioned above; 5) all tributaries to waters mentioned above; 6) the territorial seas; and, 7) all wetlands adjacent to waters mentioned above. Important applicable sections of the CWA are discussed below:

- Section 401 requires an applicant for any federal permit that proposes an activity that may result in a discharge to waters of the United States to obtain certification from the state that the discharge would comply with other provisions of the CWA. Certification is provided by the respective Regional Water Quality Control Board (RWQCB). A Section 401 permit from the State Water Resources Control Board (SWRCB) or RWQCB-San Diego Region (SDR) would be required for issuance of a permit by the United States Army Corps of Engineers (USACE).
- Section 404 regulates the discharge of dredged or fill materials to waters of the U.S. and provides for issuance of permits by the USACE.

Rivers and Harbors Appropriation Act

The Rivers and Harbors Appropriation Act of 1899 (33 USC Section 403), commonly known as the Rivers and Harbors Act, prohibits the construction of any bridge, dam, dike, or causeway over or in navigable waterways of the United States without congressional approval. Under Rivers and Harbors Act Section 10, the USACE is authorized to permit structures in or over navigable waters. Building or modifying wharves, piers, jetties, and other structures in or over the waters of the San Diego coastline requires USACE approval through the Section 10 permit process.

Endangered Species Act

The federal Endangered Species Act (ESA) protects plants and wildlife that are listed as endangered or threatened by the USFWS and National Marine Fisheries Service (NMFS). ESA Section 9 prohibits

the taking of endangered wildlife, where taking is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] Section 17.3). The term *harm* is defined as an "act which actually kills or injures wildlife," including through "significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife." The terms "harass" means an act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, including breeding, feeding or sheltering (50 CFR Section 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land, as well as removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law. Under ESA Section 7, lead federal agencies are required to consult with the USFWS or NMFS if the lead agency determines that its actions, including permit approvals or funding, may adversely affect an endangered species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS or NMFS may issue an incidental take statement allowing take of the species that is incidental to another authorized activity, provided the action would not jeopardize the continued existence of the species. In cases where the federal agency determines its action may affect, but would be unlikely to adversely affect, a federally listed species, the agency may choose to informally consult with the USFWS and/or NMFS. This informal consultation typically involves incorporating measures intended to ensure effects would not be adverse. Concurrence from the USFWS and/or NMFS concludes the informal process. Without such concurrence, the federal agency may formally consult to ensure full compliance with the ESA.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA) prohibits, with certain exceptions, the take of marine mammals in United States waters and by United States citizens on the high seas and the importation of marine mammals and marine mammal products into the United States. Under the MMPA, "Take" is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal" (16 USC Section 1362) and further defined by regulation (50 CFR Section 216.3) as "to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal". NMFS administers the MMPA. Under the 1994 Amendments to the MMPA, harassment is statutorily defined as, any act of pursuit, torment, or annoyance which:

- ***(Level A Harassment)*** has the potential to injure a marine mammal or marine mammal stock in the wild; or,
- ***(Level B Harassment)*** has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits take of nearly all birds where members of the bird's taxonomic family are considered to be migratory. This results in the inclusion of most species of birds afforded protection. Under the MBTA, take means only to kill, directly harm, or destroy individuals, eggs, or nests, or to otherwise cause failure of an ongoing nesting effort.

4.2 STATE REGULATIONS

California Coastal Act

The California Coastal Act (CCA) is intended to provide protection of the unique nature and public interest values of the State's coastal fringe. The CCA is implemented by the District for the land and water within its jurisdiction, subject to oversight by California Coastal Commission (CCC). The CCA recognizes California ports and harbors as primary economic elements of the national maritime industry. Within the Port of San Diego, the District administers the CCA under an adopted Port Master Plan; the Port Master Plan and all updates to it require approval and certification by the CCC.

California Endangered Species Act

The California ESA (CESA) authorizes the California Fish and Game Commission to designate endangered, threatened, and rare species and to regulate the taking of these species (California Fish and Game Code (FGC) Sections 2050 through 2098). The CESA defines endangered species as those whose continued existence in California is jeopardized. State-listed threatened species are those not presently facing extinction, but that may become endangered in the foreseeable future. FGC Section 2080 prohibits the taking of State-listed plants and animals. Unlike the federal ESA, the CESA does not include harassment within its take definition and as such, has a statutorily higher threshold standard for take than does the federal ESA. The California Department of Fish and Wildlife (CDFW) also designates fully protected or protected species as those that may not be taken or possessed without a permit from the California Fish and Game Commission and/or CDFW. Species designated as fully protected or protected may or may not be listed as endangered or threatened.

When a species is both State- and federally listed, an expedited request for consistency with the USFWS biological opinion may be issued through a request for Section 2080.1 consistency determination, if take authorization under the CESA is required.

California Fish and Game Code

The FGC is implemented by the California Fish and Game Commission, as authorized by Article IV, Section 20, of the Constitution of the State of California. FGC Sections 3503, 3503.5, 3505, 3800, and 3801.6 protect all native birds, birds of prey, and nongame birds, including their eggs and nests, that are not already listed as fully protected and that occur naturally within the State. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (e.g., hawks, owls, eagles, and falcons), including their nests or eggs. As defined in the FGC, take means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (FGC Section 86). The CDFW is the State agency that manages native fish, wildlife, plant species, and natural communities for their ecological value and their benefits to people. The CDFW oversees the management of marine species through several programs, some in coordination with NMFS and other agencies. The California Eelgrass Mitigation Policy (CEMP) is administered by the USFWS, NMFS, and CDFW. In addition, the CDFW jointly manages (with NMFS) the implementation of the *Caulerpa* Control Protocol (CCP), which calls for conducting a survey for *Caulerpa* before any bottom-disturbing activities.

4.3 LOCAL REGULATIONS

San Diego Unified Port District Port Master Plan

Through implementation of the Port Master Plan, the District maintains authority over tidelands and submerged lands conveyed in trust to the District by the California legislature. Any amendments to the Port Master Plan must be reviewed and certified by the CCC. Under the certified Port Master Plan, the District has the authority to issue non-appealable Coastal Development Permits (CDPs) for discretionary projects within its jurisdiction.

San Diego Bay Integrated Natural Resources Management Plan

The District and U.S. Navy jointly implement the Integrated Natural Resources Management Plan (INRMP). This long-term collaborative strategy for managing the Bay's natural resources provides planning guidance for good stewardship of the natural resources within the Bay. The INRMP does not carry regulatory authority, but rather establishes a baywide plan for natural resource management that has been vetted by the regulatory agencies with land use authority over the Bay and a broad spectrum of stakeholders.

5.0 ENVIRONMENTAL SETTING

The description of the environmental setting of the project presented below is based on existing biological information for the Bay, including the San Diego Bay INRMP (U.S. Navy, 2013), and physical and biological surveys completed for the project (Merkel & Associates, Inc., et al., 2015 and 2017, unpublished data in review). The project also draws from the 2017 baywide eelgrass inventory (Merkel & Associates, Inc., 2018, draft data in review) and biological studies completed as part of the Chula Vista Bayfront planning process (Merkel & Associates, Inc., 2017).

5.1 SAN DIEGO BAY SETTING

The Bay is a nearly enclosed, naturally formed embayment (Figure 1). The Bay was formed from the alluvial floodplains of the Otay, Sweetwater, and San Diego Rivers and was historically shallow. The re-direction and channelization of the San Diego River beginning in the 1940s along with multiple dredging and channel deepening projects have resulted in deep waters in the northern and central portion of the Bay (with deepest waters of 59 feet occurring at the mouth of the Bay), transitioning to shallow waters (less than 3 feet) at the south end of the Bay (U.S. Navy, 2013). The INRMP divides the Bay into multiple depth categories including: deep (greater than (>) -20 feet MLLW), moderately deep (-12 to -20 feet MLLW), shallow subtidal (-2.2 to -12 feet MLLW), and intertidal (-2.2 to +7.8 feet MLLW) (Figure 5). Currently, deep and moderately deep waters account for more than 50% of total Bay surface area (U.S. Navy, 2013). In contrast, shallow subtidal habitat accounts for approximately 28% of Bay surface area, primarily in south San Diego Bay. Intertidal habitat currently accounts for only 7% of the Bay surface area.

The habitats of the Bay are reflective of water depth and presence or absence of shoreline structures. More than 70% of the shoreline (45.4 miles out of a total 64.4 miles) of the Bay is currently armored (U.S. Navy, 2013). Armoring is primarily rock rip rap, but also includes vertical

bulkhead walls, boat launch ramps, earthen dikes, and wharves. Additionally, there are over 130 acres of surface structures (piers, docks, etc.) within the Bay that currently shade intertidal and subtidal waters. The majority of the lands in the northern and central portion of the Bay are developed with a mix of commercial, recreational, and military use.

The largest unarmored areas occur in the southern portion of the Bay. As such, the majority of undeveloped habitat also occurs in the southern portion of the Bay. Habitats in the southern portion of the Bay include southern coastal salt marsh, intertidal sand and mudflats, salt flats, and southern coastal foredune (Figure 5). The dominant vegetated subtidal habitat in the Bay is eelgrass (*Zostera marina*); the most recent baywide eelgrass survey, completed in 2017, found 1,693 acres of eelgrass (Merkel & Associates, Inc., 2018, in review). This accounts for approximately 10.3% of the Bay surface area, with a majority of the total occurring in the shallow waters of the southern portion of the Bay. Salt marshes currently cover approximately 800 acres of the Bay, and with a majority of this habitat comprised of a network of marshes that form a non-contiguous patchwork in the south Bay (Figure 5). The marine habitats of the Bay currently support several sensitive avian species, marine mammals, and reptiles.

5.2 HABITATS WITHIN THE PROJECT SITE

Habitats within the project site consist of intertidal flats, eelgrass, and open water. Adjacent habitats located outside of the project site along the shoreline include Southern Coastal Salt Marsh and Upland Transitional Areas.

Intertidal Flats

Intertidal flats consist of mudflats, sand flats, and salt flats that occur intertidally, typically along the unarmored shorelines of south San Diego Bay. Within the project site, intertidal flats are comprised of a broad, gradually sloping mudflat. This habitat provides an interface with open waters of the Bay, bringing tidal exchange to adjacent salt marsh, and serving as outlets for storm water runoff, nutrients, and sediment supply to the Bay. The mudflat is dominated by invertebrates that inhabit the sediments, providing an ample low-tide foraging area for shorebirds. As tides rise the flats become forage habitat for fish, dabbling waterfowl, and piscivorous birds.

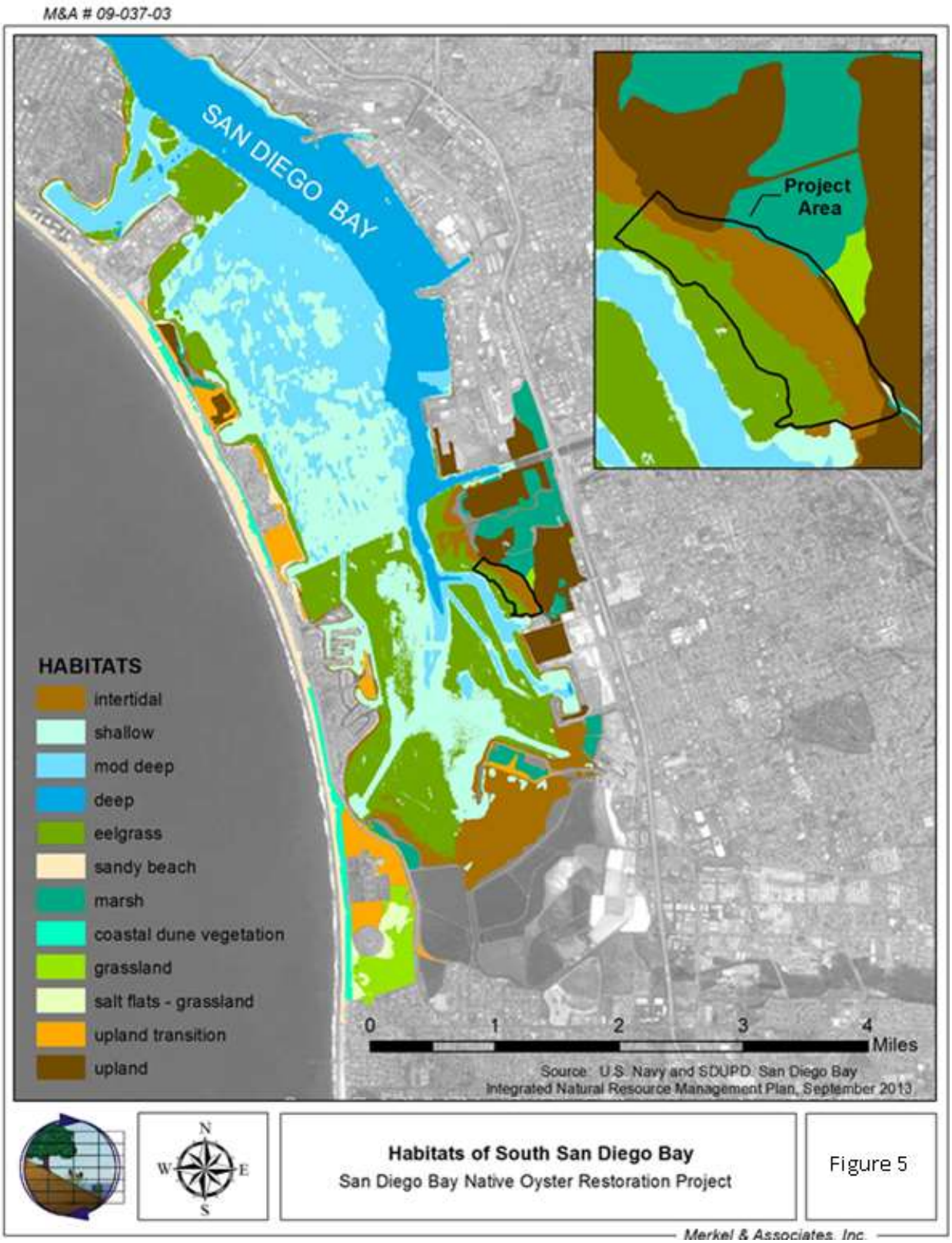

Figure 5. Habitats of South San Diego Bay

View of Project Site Facing North

Recent baseline avian surveys at the project site were completed on a monthly basis from May 2016 through April 2017. Results indicate that the most common avian species within the project site's mudflat are sandpipers (*Calidris* spp.), willet (*Tringa semipalmata*), marbled godwit (*Limosa fedoa*), dowitchers (*Limnodromus* spp.) and plovers (Family Charadriidae). These species were observed regularly throughout the year and were primarily observed foraging at low tide (R. Patton, 2017, unpublished data). During high tide, the project site was dominated by dabbling waterfowl including brant (*Branta bernicla*) and American wigeon (*Anas americana*). These waterfowl were most commonly observed during fall and winter survey periods. Several species of tern, including the California least tern were observed foraging along the mudflats during summer months (May and June survey periods).

View of Project Site at Low Tide, Facing West

Recent baseline fish surveys conducted for the project in July 2017 indicate that the most abundant fish species captured were Topsmelt (*Atherinops affinis*), California Halfbeak (*Hyporhamphus rosae*), Spotted Sand Bass (*Paralabrax maculatofasciatus*) and Round Stingray (*Urobatis halleri*) (Merkel & Associates, Inc., 2017, unpublished data). Large numbers of Bay Pipefish (*Syngnathus leptorhynchus*) were also captured in adjacent eelgrass habitat. Other fish species not captured during July 2017 surveys, but that typically forage on tidal flats of south San Diego Bay during high tides include Striped Mullet (*Mugil cephalus*), California Halibut (*Paralichthys californicus*), Bat Ray (*Myliobatis californica*), and Gray Smoothhound (*Mustelus californicus*) (U.S. Navy, 2013).

Subtidal Vegetated Habitat - Eelgrass

Eelgrass is a rooted aquatic plant that inhabits shallow soft bottom habitats in quiet waters of bays and estuaries as well as sheltered coastal areas. It can form dense beds that provide substrate, food, and shelter for a variety of marine organisms. The majority of eelgrass beds in the Bay are found in water less than 12 feet deep, with light availability being the primary limiting factor for distribution and growth. Eelgrass is not a wetland but rather is a Submerged Aquatic Vegetation (SAV). Eelgrass beds are considered "special aquatic sites" under the CWA. Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), eelgrass is designated as a Habitat Area of Particular Concern (HAPC) within EFH for various federally-managed fish species within the Pacific Coast Groundfish Fisheries Management Plans (FMP) (NMFS, 2008).

The vegetated, shallow subtidal habitat of the project site is dominated by eelgrass. Vegetated subtidal habitats are an essential component of southern California's coastal marine environment. Eelgrass beds function as important habitat for a variety of invertebrate, fish, and avian species. For many species, eelgrass beds are an essential biological habitat component for at least a portion of their life cycle, providing resting and feeding sites along the Pacific Flyway for avian species, and nursery sites for numerous species of fish. Eelgrass within the project site is interspersed with red algae, such as *Gracilaria verrucosa*, and green algae, such as *Ulva* spp. Typical fish species associated with eelgrass include pipefish (*Syngnathus* spp.), kelpfish (Family Clinidae), surfperch (Family Embiotocidae) as well as schooling fish such as Topsmelt and anchovy (*Anchoa* spp.).

Eelgrass is typically restricted to tidal depths of 0 foot MLLW or lower. However, during winter months, as desiccation stress declines, eelgrass may spread into intertidal areas. Eelgrass then recedes away from the shore and into deeper waters as warmer summer weather increases likelihood of desiccation. The planned treatment elevations for the project would result in oyster reef elements placed at -1 foot MLLW and 0 foot MLLW (these elevations correspond to the base of reef elements). These elevations fall within the seasonally variable intertidal range for eelgrass within the Bay.

Pre-construction and post-construction eelgrass surveys would be required as part of the permit process for the project, and eelgrass mitigation would be required if impacts to eelgrass occur. However, a baseline eelgrass map specifically associated with the project site has been prepared (Figure 6). This map evaluates eelgrass persistence on a spatial scale as a frequency value derived by dividing the number of times eelgrass was present at a particular location by the total number of surveys conducted (a total of seven baywide surveys between 1993 and 2017 (Merkel & Associates, Inc., 2018, in review).

The results of this mapping effort indicate that the proposed oyster reefs placed at the low elevation treatment (along the -1.0 foot MLLW contour) fall within the 100% frequency of occurrence eelgrass band. Oyster reefs placed at the higher elevation treatment (along 0 foot MLLW contour) fall in the transition from 100% frequency of eelgrass occurrence to lower frequencies of occurrence of (ranging from around 33% to 71% frequency of occurrence).

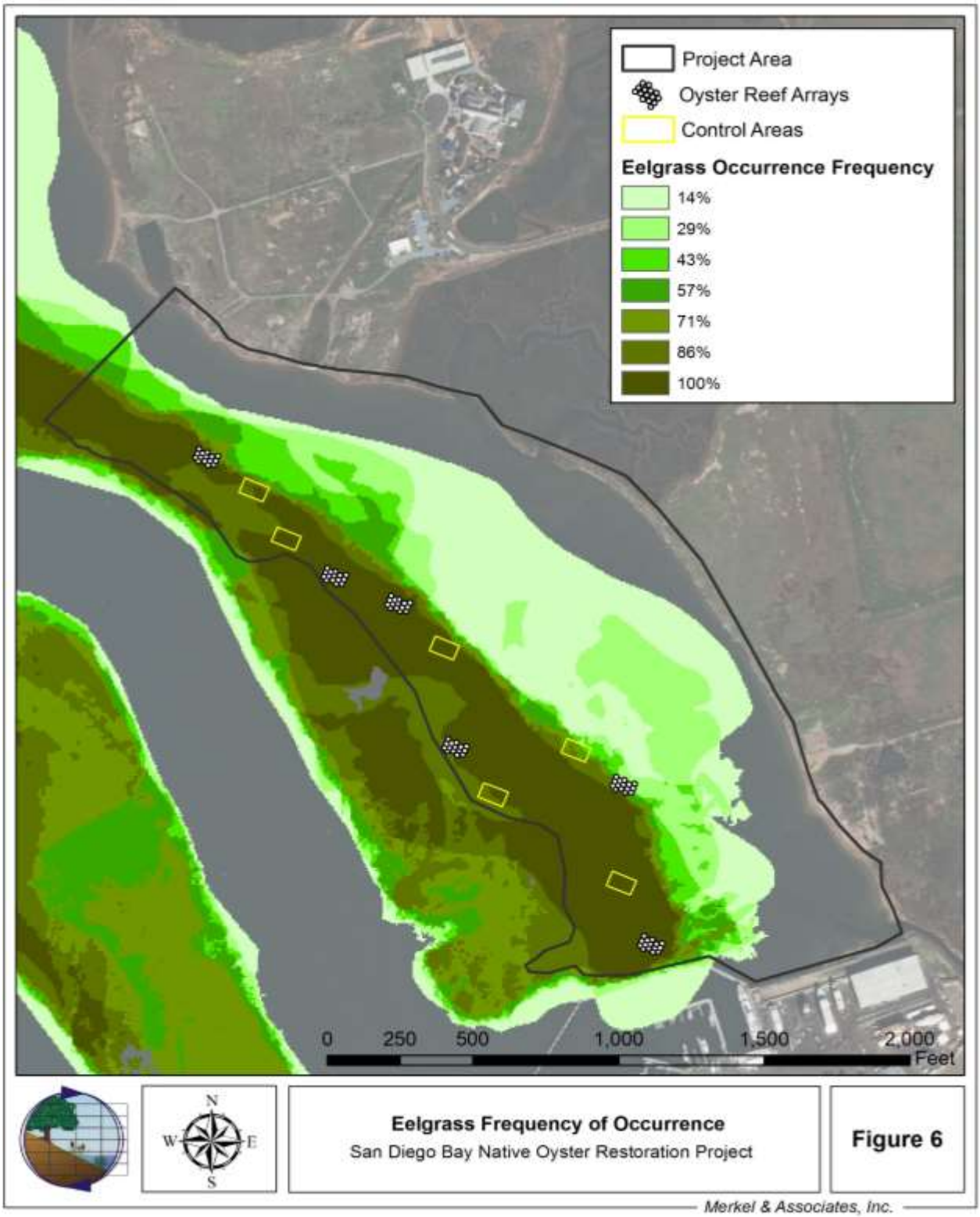

Figure 6. Eelgrass Frequency of Occurrence

Open Water

The water column represents the largest habitat of the Bay and the nearshore coastal area. This habitat is dominated by schooling fish species including topsmelt Northern Anchovy (*Engraulis mordax*), and Deepbody Anchovy (*Anchoa compressa*). The occurrence of these species in open water is important to several species of piscivorous birds including pelicans, terns, loons, grebes, cormorants, and mergansers. These fish also provide an important forage base for numerous species of marine mammals. The project site is located in intertidal waters, with water coverage occurring only during high tides.

Marshes

Coastal salt marsh habitat primarily occurs in south San Diego Bay as a series of noncontiguous remnants of once broader estuarine environments and restored wetlands. This fragmentation, along with channelization and re-direction of rivers and creeks that historically drained into marshlands, and the threat of sea level rise, puts the remaining marshes at risk of decline. Many of the marshes in south San Diego Bay occur along unarmored shorelines, the largest of which is the E Street and Sweetwater Marsh complex located immediately adjacent to the project site, just south of the Sweetwater River Channel along the southeastern shoreline of the Bay within the South San Diego Bay National Wildlife Refuge.

Marsh habitat provides important biological, water quality, and shoreline protection functions. Coastal salt marsh habitat is dominated by salt-tolerant vegetation including pickleweed (*Sarcocornia* and *Salicornia* spp.) and cordgrass (*Spartina foliosa*) that provides foraging habitat for numerous birds, and nesting habitat for several sensitive avian species, particularly the federal and State-listed light-footed Ridgway's rail (*Rallus obsoletus levipes*) and the State-listed Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*).

Upland Transition and Upland Areas

The upland transition area adjacent to the project site consists primarily of disturbed and previously graded lands. Small patches of broom baccharis scrub and isocoma scrub occur primarily around the perimeter of the F&G Street Marsh and adjacent Seasonal Wetlands, and adjacent to roadways (Merkel & Associates, Inc., 2017). A revegetated berm of coastal sage scrub runs along the center of the undeveloped parcel just east of the project site, and a grove of eucalyptus woodland occurs along the shoreline to the northwest of F&G Street Marsh.

5.3 WETLANDS AND SENSITIVE HABITATS

Wetlands, as defined by the USACE, are present as coastal salt marshes, the largest of which are located along the unarmored shorelines of south San Diego Bay, including within the South San Diego Bay National Wildlife Refuge. These larger coastal salt marsh habitats represent a combination of remnants of historic wetlands, and recently restored areas. This habitat is considered to have high biological, physical, and chemical functions and values. The marshes perform a high level of nutrient transformation, as rivers and creeks of the Bay drain into marsh vegetation. Coastal salt

marshes within the Bay support complex biological communities and provide breeding habitat for several sensitive avian species.

5.4 WILDLIFE CORRIDORS

The project site does not provide any terrestrial movement corridors, and no marine mammal, reptile, or fish migratory corridors occur within it. However, some marine fish species, such as anchovies, sardines, and Topsmelt, likely move into and out of the Bay, utilizing it for spawning, nursery habitat, and foraging. The southern portions of the Bay, including the South San Diego Bay National Wildlife Refuge and South Bay Salt Ponds further to the south, provide stopover habitat for migrating waterfowl and shorebirds. The Bay, like all of California, is located within the Pacific Flyway.

Several whale species migrate along the coast of California, including the California gray whale (*Eschrichtius robustus*). The peak northward migration of male gray whales occurs in mid-March, followed two months later by the second migration wave, which is composed of cows and calves. Whales typically do not occur within the very shallow intertidal waters of south San Diego Bay adjacent to the project site.

5.5 SENSITIVE WILDLIFE

Table 1 identifies sensitive animal species known to occur in south San Diego Bay, and identifies the likelihood of these species to occur within the project site. Likelihood of occurrence was determined based upon presence of species at the project site during recent baseline avian surveys (R. Patton, unpublished data), locations of nearest sightings of species during 2016-2017 baywide avian surveys (Tierra Data, Inc., 2018), locations of marine reptiles observed in recent tracking studies (Bredvick et al., 2015), and the life history requirements of individual species in relation to the habitats present within the project site. All avian species included in Table 1 were observed within or adjacent to the project site in the above referenced studies. While several sensitive species are known to occur in south San Diego Bay and in the marshes adjacent to the Bay, few species are known to regularly occur within or immediately adjacent to the project site. Only two species listed by USFWS and/or CDFW as federally or State endangered or threatened have a high potential to occur within the project site: the federally threatened green sea turtle (*Chelonia mydas*), and the federally and State endangered California least tern (*Sternula antillarum browni*).

South San Diego Bay supports a population of eastern Pacific green sea turtles of between 16 and 61 individuals that primarily remain in the warm waters of south San Diego Bay, though some are known to leave the Bay to nest on the beaches of offshore islands of Mexico (Eguchi et al., 2010). Long-term acoustic tagging and GPS tracking studies by NMFS indicate that the population has historically congregated in the warm waters of the former South Bay Power Plant cooling water discharge channel at the now closed South Bay Power Plant in south San Diego Bay.

Table 1. Sensitive Species with Potential to Occur within the Project Site

Common Name	Scientific Name	Status	Occurrence in Project Site
Reptiles Green Sea Turtle	*Chelonia mydas*	FT	High Potential – Resident population is known from south San Diego Bay
Birds Brant (wintering/staging)	*Branta bernicla*	CDFW SSC	High Potential - Winters in south San Diego Bay
California Brown Pelican (nesting and communal roosts)	*Pelecanus occidentalis californicus*	CDFW FP	Moderate Potential - No nesting, roosts on rip rap, docks, pilings, etc. at project site
Double-crested Cormorant (nesting)	*Phalacrocorax auritus*	CDFW WL	High Potential - Nests in South Bay Salt Works
Northern harrier (nesting)	*Circus cyaneus*	CDFW SSC	Moderate Potential - Nests in marshes in south Bay, occasionally forages along project site
Osprey (nesting)	*Pandion haliaetus*	CDFW WL	High Potential – Nests in south San Diego Bay at the Chula Vista Wildlife Reserve
American peregrine falcon (nesting)	*Falco peregrinus anatum*	CDFW FP, FWS BCC	Low Potential - May nest along bayfront
Light-footed Ridgway's rail	*Rallus obsoletus levipes*	FE, SE	Low Potential - Nests in marshes of south San Diego Bay, but rarely seen outside of marsh along open mudflats
Western snowy plover (nesting)	*Charadrius alexandrinus nivosus*	ST	Low Potential - Nests on sand flats of San Diego Bay, but not within project site
California Least tern (nesting)*	*Sternula antillarum browni*	SE, FE	High Potential - Nests on sand flats of San Diego Bay and forages along but not within project site
Caspian tern (nesting)	*Hydroprogne caspia*	FWS BCC	High Potential – Nests in South Bay Salt Works and forages along project site
Black skimmer (nesting)	*Rynchops niger*	CDFW SSC	High Potential – Nests in South Bay Salt Works and forages along project site
Elegant tern (nesting)	*Thalasseus elegans*	CDFW WL	High Potential – Nests in South Bay Salt Works and forages along project site
Belding's Savannah sparrow	*Passerculus sandwichensis beldingi*	SE	Moderate Potential - Nests in marshes of south San Diego Bay, and occasionally forages on mudflats adjacent to marsh.
Mammals Pacific harbor seal	*Phoca vitulina richardsi*	MMPA	Low Potential – Forage in north Bay and is uncommon in the south Bay
California sea lion	*Zalophus californianus*	MMPA	Low Potential – Forage and loafs in the north Bay with uncommon occurrences in the south Bay
Coastal bottlenose dolphin	*Tursiops truncatus*	MMPA	Low Potential – Uncommon forager in deep channels of the north Bay. Rarely seen in south San Diego Bay.
California gray whale	*Eschrichtius robustus*	MMPA	Very Low Potential –Regular migrant in offshore waters, but uncommon in Bay and nearshore waters. Rarely seen in south San Diego Bay

SE – State Endangered; **FE**- Federally Endangered; **FT** – Federally Threatened; **CDFW SSC**- CDFW Species of Special Concern; **CDFW-FP** - CDFW Fully Protected Species; **CDFW-WL**- CDFG Watch List; FWS-BCC – USFWS Bird of Conservation Concern; **MMPA** – species protected by the Marine Mammal Protection Act
*Least terns are a migratory species found in the area from approximately April 1 through September 1 of each year.

The shutdown of the South Bay Power Plant has made movements of turtles harder to predict. Recent tracking studies have noted turtles utilizing areas of the South Bay much farther north than their historically recognized foraging areas, but still primarily located south of the Sweetwater River Channel; recent tracking data indicates that green sea turtles in the Bay spend 95% of their time south of the Sweetwater River Channel (Bredvick et al., 2015).

The California least tern nests along the west coast of North America, from Baja California, Mexico, north to the San Francisco Bay area. California least terns are seasonal residents of the Bay, typically arriving in mid- to late-April to nest at several colonies on the shore of the Bay, and are generally present through August, with September 15 marking the end of the season. Along the shores of the Bay, California least terns nest at multiple sites. The closest nesting sites to the project site are the D Street Fill, the Chula Vista Wildlife Reserve, and along the South Bay Salt Works levees managed by the District and USFWS. These three sites are located approximately 0.5 mile, 1.3 miles, and 2.3 miles from the project site, respectively. California least terns actively forage for fish in the waters adjacent to nesting colonies in the Bay as well as in nearshore coastal waters outside of the Bay. During the baseline avian studies completed in support of this project, California least terns were observed foraging within the project site during May, June, and July surveys (R. Patton, unpublished data). It is anticipated that project construction would occur in March or early April to coincide with the known peak seasonal recruitment of native oysters. This timing for project construction is outside of the nesting season for California least tern and no impacts to this species are anticipated.

Finally, several species of marine mammals utilize the Bay (Table 1). California sea lion (*Zalophus californianus californianus*) and, to a lesser extent, Pacific harbor seal (*Phoca vitulina richards*i) are the two most common species of marine mammals that occur in the Bay and adjacent coastal waters. Both are only occasional visitors to the south Bay and neither species breeds within the Bay. California sea lion may occasionally be observed adjacent to the project site, but Pacific harbor seals are not expected to occur. Dolphins and whales are rarely observed in the Bay and are not anticipated to be present within the project site.

6.0 CEQA IMPACTS ANALYSIS

The following impact analysis focuses on the potential effects of the placement of oyster reefs into the project site in south San Diego Bay. Impacts to habitats and wildlife can be measured as direct and/or indirect. Direct impacts are those that have a direct impact on habitats or wildlife and occur contemporaneously with the action. Direct impacts of in-water construction to wildlife include immediate physical and physiological impacts such as abrupt changes in behavior, flight response, diving, evading, flushing, cessation of feeding, and physical impairment or mortality of wildlife. Direct impacts to habitats can include damage from construction activities, as well as permanent habitat loss due to project construction. In contrast, indirect impacts are effects that are caused by or would result from the proposed action at a later time, but are still reasonably certain to occur.

6.1 IMPACTS TO MARINE HABITATS

The primary element of the project includes placement of 360 baycrete reef ball elements into the intertidal habitat, including both intertidal flats and eelgrass habitat, adjacent to the E Street Marsh. Construction of the six reef arrays would cover a construction area of 29,700 square feet (0.68

acre). However, as described in the project description, each array would be comprised of a checkerboard pattern of reef groups with bare space between each group. As a result, the footprint of the baycrete reef ball elements that form each reef group would be substantially lower than the total area within each reef array. Based on the size of the reef ball elements, which have a base diameter of three feet, each reef group (cluster of four reef ball elements) would have an approximate footprint of seven feet by seven feet, or 49 square feet. Therefore, the total footprint of the reef ball elements for all six proposed arrays to be placed along the shoreline is 4,410 square feet (49 square feet per reef group times 15 reef groups times 6 reef arrays, equaling 4,410 square feet) or 0.10 acre.

As indicated in Figure 6, the baywide eelgrass survey utilized as a baseline for this analysis indicates that all of the reef arrays to be constructed at the project site are within persistent intertidal and shallow subtidal eelgrass. Therefore, a 4,410 square- foot (0.10 acre) direct impact to eelgrass is anticipated for this project. The project would conform to the requirements of the CEMP, which include pre- and post-construction eelgrass surveys, and implementation of eelgrass mitigation as required based on survey results.

Further impacts to eelgrass or tidal flats beyond the direct footprint of the reef ball elements are not anticipated due to the planned construction methods described above. Construction would occur from the water at high tide via shallow draft vessels. Vessels would travel at low speeds to avoid prop wash or drag that could damage eelgrass, and would not anchor within eelgrass habitat. Reef ball elements would be lowered from in-water vessels using an A-frame and/or davit, and would be hand-placed by biologists. This would ensure that reef ball elements are not dragged along the mudflat, which could cause further damage.

Project construction is not anticipated to impact marshes or uplands adjacent to, but outside of the project site. Work would not include any bottom disturbing activities and would not generate substantial turbidity. Any turbidity generated when reef ball elements are placed onto the mudflat would be considered to be localized and temporary. Permanent navigation buoys would be placed to notify any boats of the presence of oyster reef ball elements and would be designed to avoid anchor/chain drag that could impact eelgrass.

Prior to commencing any in-water work, a survey for the invasive algae, *Caulerpa taxifolia* and other nuisance species, would be conducted in accordance with the Caulerpa Control Protocols (NMFS, 2004).

Direct impacts to eelgrass are considered to be significant. However, with implementation of Mitigation and Resource Protection Measures 1, 2, 3 and 5, as described in Section 7.0, below, impacts to marine habitats, including eelgrass, would be less than significant.

6.2 Impacts to Wetlands and Sensitive Habitats

As described above, the nearest adjacent wetlands to the project site are the marshes of the San Diego Bay Wildlife Refuge. These wetlands are located shoreward of the project and would not be impacted by project construction. The project would not alter water flow or water quality to marsh habitat, and is not anticipated to degrade wetlands in any way. Further, the project is a pilot study

that would test the ability of the constructed reefs to attenuate wave-generated wave energy, prevent shoreline and mudflat erosion, and potentially protect the adjacent wetlands from the effects of storm surges and sea level rise. These are considered potential benefits to adjacent wetlands.

As described above, eelgrass is considered to be a sensitive habitat and "special aquatic site" under the CWA and is designated as Essential Fish Habitat (EFH). Impacts to eelgrass habitat are considered to be significant as described above. However, with implementation of Mitigation and Resource Protection Measures 1, 2, 3, and 5, as described in Section 7.0 below, impacts to eelgrass would be less than significant.

6.3 Impacts to Wildlife Corridors

The project site is located within the Pacific Flyway but does not provide any specific terrestrial movement corridors, and no marine mammal, reptile, or fish migratory corridors occur within it. Project construction would be of short duration and is not anticipated to result in any loud noises, vibrations, or shock waves that could cause animals to flee. The resulting oyster reefs would not impede movement along the tidal flats or within the water column. It is not anticipated that project construction and the resulting oyster reefs arrays would result in long-term alteration of migratory patterns or abandonment of nesting sites. Consequently, impacts of the project on wildlife corridors, movement of resident and migratory species, and usage of nursery sites would be less than significant.

6.4 Impacts to Sensitive Species

Table 1 provides a summary of sensitive animal species that have potential to occur within the project site. The following text expands on the likelihood of occurrence for these species and describes potential impacts to sensitive species that may result from project implementation.

Reptiles

As described previously, south San Diego Bay supports a resident population of federally threatened eastern Pacific green sea turtles. Historically, this population resided primarily within the warm water discharge channel for the former South Bay Power Plant. The closure of the plant in 2010 resulted in turtles utilizing areas of the south Bay much farther north; however, tracking studies indicate that turtles still spend 95% of their time south of the Sweetwater River Channel (Bredvick et al., 2015). Based on these studies, it is highly likely that turtles forage within the eelgrass beds along the E Street Marsh shoreline within the project site.

Environmental threats to turtle populations include contamination from coastal runoff, fueling facilities, marina and dock construction, dredging, aquaculture, oil and gas exploration and extraction, and increased underwater noise and boat traffic that can degrade marine habitats used by turtles. Turtles swimming or feeding at or just beneath the surface of the water are particularly vulnerable to boat and vessel strikes, which can result in serious propeller injuries and death. Potential impacts to turtles from the project are primarily related to construction activities. Turtles could be struck by boats or boat motors as oyster reefs are placed at the project site. The project

would not result in increased long-term boat traffic or increased human use of the area. Further, project construction would not result in increased turbidity, nor does it involve pile driving, dredging, or bottom disturbing activity. The oyster reef ball elements are not likely to cause entanglement or entrapment of turtles. Therefore, once reef ball elements are in place, no further impacts to turtles would be anticipated.

Mitigation measures included in the project to minimize impacts to turtles include maintenance of no wake boat speeds within and adjacent to the project site (Mitigation and Resource Protection Measure 4). Further, high engine thrust, prop wash, and prop drag would be prohibited within and adjacent to the project site (Mitigation and Resource Protection Measure 2). These measures would reduce the likelihood of striking and injuring turtles. The same measures would be required during monitoring activities following construction. With implementation of Mitigation and Resource Protection Measures 2 and 4, as described in Section 7.0, below, impacts to turtles would be less than significant.

Birds

Of the sensitive avian species with potential to occur within or adjacent to the project site, six are listed as federally or California State endangered or threatened, or California Department of Fish and Game fully protected. These include the California brown pelican (*Pelecanus occidentalis californicus*), American peregrine falcon (*Falco peregrinus anatum*), Ridgway's rail (*Rallus obsoletus levipes*), western snowy plover (*Charadrius alexandrinus nivosus*), California least tern (*Sternula antillarum browni*), and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

Two of these species, the Ridgway's rail and Belding's savannah sparrow, nest and forage in marshes including the E Street Marsh within the San Diego Bay National Wildlife Refuge. During 2016-2017 baywide avian surveys, a single Ridgway's rail was observed at the marsh edge adjacent to the project site, and over the course of the monitoring year, 18 Belding's savannah sparrows were observed foraging along the marsh edge adjacent to the project site (Tierra Data, Inc., 2018). Neither of these species was observed during 2016-2017 baseline surveys for this project (R. Patton, unpublished data). Belding's savannah sparrow may occasionally forage along the high intertidal flats of the project site adjacent to the marsh, but neither of these two species is expected to occur in the low intertidal and shallow subtidal habitat where the oyster reef elements would be placed. Impacts to these species from the project are not anticipated.

California Brown pelican is protected at nesting colonies and communal roosting areas. American peregrine falcon is also protected at nesting locations. These two species have a similarly low likelihood of occurrence within the project site. California brown pelicans roost in small groups throughout the Bay, particularly along Zuniga jetty, rip rap shorelines, and docks and piers in the northern portion of the Bay but do not nest in the Bay. During 2016-2017 baywide avian surveys, five individual California brown pelican were observed adjacent to the project site, and seven California brown pelican were observed foraging in shallow water at the project site during baseline avian studies conducted for the project (Tierra Data, Inc., 2018, and R. Patton, unpublished data). Peregrine falcons have historically nested in Point Loma, on downtown San Diego buildings, and on the Coronado Bridge, but nesting sites in south San Diego Bay are not documented. One flying individual was observed during 2016-2017 baywide avian surveys adjacent to the project site (Tierra

Data Inc., 2018). Based on the low likelihood of occurrence of these two species at the project site impacts to these species are not anticipated.

Western snowy plovers and California least terns both nest seasonally within the Bay. During its breeding season, from April to September, the California least tern is observed in the Bay, nesting at Lindbergh Field, North Island Naval Station, the Naval Amphibious Base Delta Beach, D Street Fill, the Chula Vista Wildlife Reserve, and the South Bay Saltworks in the South San Diego Bay Unit of the San Diego National Wildlife Refuge. The nesting colonies nearest to the project site are located at D Street Fill, the Chula Vista Wildlife Reserve, and along the South Bay Salt Works levees and in Pond 11 that are managed by the District, San Diego Regional Airport Authority, and USFWS. These three sites are located approximately 0.5 miles, 1.3 miles and 2.3 miles from the project site, respectively. California least terns actively forage for fish in the waters adjacent to nesting colonies in the Bay as well as in nearshore coastal waters outside of the Bay. California least terns were observed foraging within the project site during baseline avian studies for the project (R. Patton unpublished data). Project construction would not generate substantial or prolonged turbidity that could impact aerial foraging behaviors. Further, project construction is planned to occur in March or early April to coincide with the known peak seasonal recruitment of native oysters. This timing for project construction is outside of the nesting season for California least terns. For these reasons, no impacts to California least terns are anticipated.

In the Bay, nesting for western snowy plover occurs from March through July along the beach at NAS North Island (7 miles from the project site), at NAB Coronado (3.3 miles from the project site), at the South Bay Saltworks (1.3 miles from the project site), and further south along the Silver Strand Training Complex and the beaches of the Tijuana River National Estuary Research Reserve (TRNERR) (2.5 miles from the project site). This species has not nested at the D Street Fill/Sweetwater Marsh NWR since 2000 (R. Patton, pers. comm). This species may occasionally forage along the tidal flats at the project site, but has a low likelihood to occur based on the distance of the project site from active nesting colonies, and no impacts to western snowy plovers are anticipated.

Other sensitive avian species with low or high potential to occur in the vicinity of the project site include double crested cormorant (*Phalacrocorax auritus*), elegant tern (*Thalasseus elegans*), Caspian tern (*Hydroprogne caspia*), and black skimmer (*Rynchops niger*) (Unitt, 2004), all of which nest within the Bay at the South Bay Salt Works. These species were all observed in small numbers during 2016-2017 baywide avian surveys and baseline avian surveys for the project (Tierra Data, Inc., 2018, and R. Patton, unpublished data). Sensitive raptors include osprey (*Pandion haliaetus*), and northern harrier (*Circus cyaneus*). Osprey are known to nest within the Bay with recent nests located at NAS North Island, the National City shoreline, and at the Chula Vista Wildlife Reserve. Northern harriers nest on the ground within marshes and grasslands. This species has been known to nest in south San Diego Bay, within the TRNERR, and the Sweetwater Marsh NWR (Unitt, 2004). Two individuals were observed adjacent to the project site during 2016-2017 baywide avian surveys (Tierra Data, Inc., 2018). While all of these species may be occasional visitors to the project site, none nest within the project site and therefore, impacts to these avian species are not anticipated.

Marine Mammals

Harbor seals and California sea lions are observed commonly in northern San Diego Bay and less commonly in central and southern portions of the Bay where the project site is located. There are no established haul-out, foraging, or breeding areas used by these or other marine mammals within the project site or vicinity, although, they may make occasional transient use of the area. Project construction is anticipated to be short in duration and any marine mammals would be expected to leave the site for adjacent waters if disturbed by project construction. However, the Marine Mammal Protection Act prohibits "take" of marine mammals. The definition of take under the Act, like that of the Endangered Species Act, includes "harassment". For this reason, a potentially significant impact to marine mammals could occur if animals are disturbed during construction activities even if they are not harmed by the activities.

Similar to sea turtles, potential impacts to marine mammals from the project are primarily related to construction activities. Marine mammals could be struck by boats or boat motors as oyster reefs are placed at the project site. The project would not result in increased long-term boat traffic or increased human use of the area. Furthermore, project construction would not result in increased turbidity, nor does it involve pile driving, dredging, or bottom disturbing activity. The oyster reef ball elements are not likely to cause entanglement or entrapment of marine mammals. Therefore, once reef ball elements are in place, no further impacts to marine mammals are anticipated.

Mitigation measures included in the project to minimize impacts to marine mammals include maintenance of no wake boat speeds within and adjacent to the project site (Mitigation and Resource Protection Measure 4). Further, high engine thrust, prop wash, and prop drag would be prohibited within and adjacent to the project site (Mitigation and Resource Protection Measure 2). These measures would reduce the likelihood of striking and injuring marine mammals. The same measures would be required during monitoring activities following construction. With implementation of Mitigation and Resource Protection Measures 2 and 4, as described in Section 7.0 below, impacts to marine mammals, including California sea lions, would be less than significant.

6.5 CUMULATIVE IMPACTS

Cumulative effects are defined by CEQA as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Cumulative impacts can be derived from a single project or a number of separate projects, and is further defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions." The INRMP identifies specific concerns related to cumulative effects of all types of activities within the Bay. These include piecemeal habitat loss and fragmentation within the Bay despite the intent of cumulative effects analysis under CEQA and the National Environmental Policy Act (NEPA). Based on the definitions provided under CEQA and the issues identified in the INRMP, the following analysis assumes that a significant adverse cumulative biological resources impact would occur where the construction or operation of the cumulative projects would encroach into areas containing sensitive biological resources, affect the movement of wildlife species, result in loss or fragmentation of sensitive habitats, or affect the functionality of a planned conservation area.

As discussed above, the potentially significant biological resources impacts of the project include direct impacts to eelgrass, as well as potential impacts to eastern Pacific green sea turtles and marine mammals if disturbed during construction activities. Impacts to sensitive animals would be less than significant with incorporation of protective measures during project construction. Additionally, the project would conform to the conditions of the CEMP, which include mitigation for any loss of eelgrass. (See Section 7 for a full listing and discussion of the project's mitigation and resource protection measures.) Therefore, the project is not anticipated to result in a net loss of this habitat.

The only other non-restoration based development project planned for the project vicinity is the development of the Chula Vista Bayfront. This includes development of the upland parcel immediately shoreward of the project site into an RV park and parkland (Merkel and Associates, 2017). Without proper controls, this development has potential to result in an increase in polluted storm water runoff during construction and operation. Polluted storm water could have a negative effect on species living in the Bay or relying on the bay for their subsistence and has potential to impact the growth of eelgrass. The construction along the Chula Vista Bayfront is required to implement stormwater Best Management Practices (BMPs) to control construction runoff and long-term flow of storm water into the Bay. The project would include design measures such as the installation of stormwater treatment basins that would tie into existing and created wetlands, preventing runoff of polluted waters into the Bay.

For the Chula Vista Bayfront project, implementation of design measures, BMPs, and monitoring for deleterious effects of runoff, along with oversight by regulatory permitting agencies, including the San Diego Regional Water Quality Control Board and the US Army Corps of Engineers would all reduce water quality impacts on habitats to less than significant. For the project, compliance with the CEMP and protective measures for turtles, avian species, and marine mammals would reduce impacts to these habitats and species to less than significant. Assuming compliance with all mitigation and resource protection measures identified in Section 7, the project would not result in significant cumulative impacts.

7.0 PROJECT MITIGATION AND RESOURCE PROTECTION MEASURES

The following mitigation and resource protection measures are proposed to prevent and/or minimize impacts to sensitive habitats, marine reptiles, birds, and marine mammals. The majority of these measures are recommended to protect multiple resources. As such, all measures are included together and apply to the entire project.

1) **Comply with the CEMP.** Impacts to eelgrass shall be assessed and mitigated according to the California Eelgrass Mitigation Policy (CEMP) (NMFS, 2014a). Pursuant to the CEMP, pre- and post-construction surveys shall be completed to determine the exact amount of eelgrass impacted by project construction. Prior to the commencement of construction, the Project Applicant shall retain a qualified biologist to conduct a pre-construction eelgrass survey per the CEMP to quantify the amount of existing eelgrass within the project area. The name of the retained contractor and proposed survey plan, including a schedule, shall be submitted to the District before initiation of survey work.

A monitoring program consisting of a pre-construction eelgrass survey and three post-construction eelgrass surveys at the project site and appropriate reference site(s) will be performed (NMFS, 2014a). The first post-construction eelgrass survey will be completed within 30 days following completion of construction to evaluate any immediate effects to eelgrass habitat. The second post-construction survey will be performed approximately one year after the first post-construction survey during the active eelgrass growing season. The third post-construction survey will be performed approximately two years after the first post-construction survey during the active eelgrass growing season. The second and third post-construction surveys will be used to evaluate if indirect effects resulted later in time due to altered physical conditions; the time frames identified above are aligned with growing season (attempting a survey outside of the growing season would show inaccurate results). A final determination regarding the actual impact and amount of mitigation needed, if any, to offset impacts should be made based upon the results of all post-construction surveys, which document the changes in the eelgrass habitat (areal extent, bottom coverage, and shoot density within eelgrass) in the vicinity of the project site, compared to eelgrass habitat change at the reference site(s). Any impacts determined by these monitoring surveys would be mitigated at a 1:1 mitigation ratio using credits derived from excess eelgrass planted as part of the District's mitigation for the National City Wharf Extension Project. Before implementation of the mitigation, the Project Applicant shall submit a mitigation plan to the District's Planning and Green Port department and resource agencies for review and approval.

2) **Prevent high engine thrust, prop wash, and prop drag**. Construction vessels shall be restricted from utilizing high engine thrusts. Further, in-water construction shall take place within a high tide window, with a minimum of one foot of clearance between construction vessel props and bay bottom to eliminate prop drag.

3) **No anchoring of construction vessels at the project site**. Anchoring using conventional anchors in shallow water is known to damage eelgrass, particularly if anchors drag along the bottom or if intensive repetitive anchoring is required. Alternative anchoring and positioning techniques shall include either establishment of temporary moorings that would be removed following construction, or use of spuds (vertical steel shafts driven into the sediment). These methods eliminate anchor drag through sensitive habitats.

4) **Maintain no wake boat speeds**. To prevent impacts to marine reptiles and mammals, all construction vessels shall maintain no wake speeds within the project site.

5) **Install Navigation Hazard Buoys**. To prevent collisions of boats with oyster reefs, two standard navigation hazard buoys with anchors shall be installed slightly channelward of the north and south ends of the project site to identify the submerged hazard for boaters using the area at higher tides. Buoys shall not use a traditional swing (block and chain rode) mooring, as this type of mooring with ground tackle can damage eelgrass and mudflat habitat as the chain and line swing with changing tides. Instead, a helix or screw anchor would be placed into the mudflat and a hazard buoy would then be attached to elastic line that flexes with changing tides but does not drag on the seafloor.

8.0 ESSENTIAL FISH HABITAT ASSESSMENT

The following sections provide the EFH Assessment for the project. The analysis draws from the project description and environmental setting provided at the beginning of this document.

8.1 ESSENTIAL FISH HABITAT BACKGROUND INFORMATION

The Magnuson-Stevens Act requires federal action agencies to consult with the National Oceanic and Atmospheric Administration's (NOAA's) NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH. The EFH Guidelines (50 CFR Sections 600.05 through 600.930) outline the process for federal agencies, NMFS and the Fishery Management Councils to satisfy the EFH consultation requirement under Section 305(b(2)-(4)) of the Magnuson-Stevens Act. As part of the EFH Consultation process, the guidelines require federal action agencies to prepare a written EFH Assessment describing the effects of that action on EFH (50 CFR Section 600.920(e)(1)). The EFH Assessment is a necessary component for efficient and effective consultations between a federal action agency and NMFS.

Definitions

EFH consist of those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC Section 1802(10)). The following definitions apply to the sections of this document that address potential project impacts and protective measures:

- Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate (50 CFR Section 600.10).
- Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities (50 CFR Section 600.10).
- Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem (50 CFR Section 600.10).
- Healthy ecosystem means an ecosystem where ecological productive capacity is maintained, diversity of the flora and fauna is preserved, and the ecosystem retains the ability to regulate itself. Such an ecosystem should be similar to comparable, undisturbed ecosystems with regard to standing crop, productivity, nutrient dynamics, trophic structure, species richness, stability, resilience, contamination levels, and the frequency of diseased organisms (50 CFR Section 600.810(a)).
- Adverse effect means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR Section 600.810(a)).

Habitat Areas of Particular Concern

EFH guidelines published in federal regulations identify habitat areas of particular concern (HAPC) as types or areas of habitat within EFH that are identified based on one or more of the following considerations:

- The importance of the ecological function provided by the habitat.
- The extent to which the habitat is sensitive to human-induced environmental degradation.
- Whether, and to what extent, development activities are or would be stressing the habitat type.
- The rarity of the habitat type. (50 CFR Section 600.815(a)(8))

Applicable designated HAPCs for the project site include estuarine and seagrass habitat (NMFS, 1999). Estuaries are protected nearshore areas such as bays, sounds, inlets, and river mouths influenced by ocean and freshwater. Because of tidal cycles and freshwater runoff, salinity varies within estuaries and results in great diversity, offering freshwater, brackish and marine habitats within close proximity (NMFS, 1999). Given the large scale of the Bay combined with the limited freshwater influence associated with creeks and drainage, the region of the Bay within which the project is located is strongly dominated by marine influences and does not meet the estuary definition. Seagrasses are vascular plants, not seaweeds, forming dense beds of leafy shoots year-round in the lower intertidal and subtidal areas. Eelgrass is seagrass found on soft-bottom substrates in intertidal and shallow subtidal areas of bays and estuaries as well as some coastal nearshore areas. Studies have shown seagrass beds to be among the areas of highest primary productivity in the world (NMFS, 1999). Eelgrass is present along the shoreline of the project site.

NMFS Managed Ichthyofauna Present in San Diego Bay

The ichthyofauna in the Bay has been previously studied (Merkel & Associates, Inc., 2000; Allen, 1999; Hoffman, 2006). The first truly baywide seasonal study of fishes was published in April 1999, after five years of sampling (Allen, 1996, 1997, 1998, 1999). In subsequent years, multiple follow-up studies to Allen's have been performed by the Vantuna Research Group (Vantuna Research Group, 2006, 2009, 2012, 2015), using identical methods. The most recent survey was completed in 2016 with a specific focus to assess potential impacts of El Niño conditions on fisheries of San Diego Bay (Vantuna Research Group, 2016). To date, these studies have identified a minimum of 115 species of fish in the Bay (U.S. Navy, 2013; Vantuna Research Group 2006, 2009, 2012, 2015, 2016). The following analysis makes extensive use of Allen's and Vantuna Research Group's baywide survey data sets because they are both recent and comprehensive (surveys were completed quarterly, at four stations throughout the Bay, utilizing six sampling gear types). The other studies reviewed for this analysis are utilized primarily to confirm the presence of fish species and to identify any additional species not captured during the baywide surveys.

The NMFS currently manages pelagic and groundfish stock under FMPs, two of which – the Coastal Pelagics FMP and the Pacific Coast Groundfish FMP – specifically relate to species found in San Diego Bay (NMFS, 2011, 2014b). Six fish species and two invertebrate stocks (squid and krill) are managed under the Coastal Pelagics Fishery Management Plan. Of the 115 fish species known to

occur in the Bay, six are managed under the Coastal Pelagics FMP, including Northern Anchovy (*Engraulis mordax*), Pacific Sardine (*Sardinops sagax*), Pacific Mackerel (*Scomber japonicus*), Jack Mackerel (*Trachurus symmetricus*), Pacific Herring (*Clupea pallasii pallasii*), and Jacksmelt (*Atherinopsis californiensis*). The Northern Anchovy and Pacific Sardine are the most abundant pelagic species identified by Allen, ranking 1st and 4th in abundance, and 3rd and 10th in biomass, respectively (Table 2). Together, these two species accounted for 46.3% of the total abundance and 11.6% of the total fish biomass enumerated by Allen (1999). Northern Anchovy has remained numerically dominant within the Bay, ranking 2nd and 4th in abundance and 3rd and 2nd in biomass during 2015 and 2016 surveys, respectively (Vantuna Research Group, 2015, 2016). However, Pacific Sardine has declined in recent studies, and this species ranked 22nd and 30th in abundance, and 32nd and 37th in biomass during 2015 and 2016 surveys, respectively.

The Pacific Mackerel, Jack Mackerel, Pacific Herring, and Jacksmelt are the other four coastal pelagic species to potentially occur within the project site. All of these species are much less abundant than the Northern Anchovy and Pacific Sardine within the Bay. Jacksmelt has been captured during two of the last three survey years, ranking 15th and 18th in abundance, and 33rd and 12th in biomass during 2015 and 2016, respectively (Vantuna Research Group, 2016). A single Pacific Mackerel was captured during 2012 surveys, and subsequently, Pacific Mackerel and Jack Mackerel were not captured during 2015 or 2016 survey efforts. These two species have historically been captured infrequently in the bay, and were ranked by Allen as 32nd and 52nd in total abundance and 24th and 73rd in total biomass, respectively (Allen, 1999). Together these two species accounted for less than 1% of total abundance and fish biomass captured in Allen's study. Finally, there is a record of occurrence for Pacific Herring in the Bay (U.S. Navy, 2013), but this species was not captured in Allen's fish surveys, or any of the subsequent Vantuna Research Group surveys.

Of the 89 species managed under the Pacific Coast Groundfish FMP (NMFS, 2014b), nine have a record of occurrence within the Bay (Hoffman, 2006; Merkel and Associates, Inc., 2000; U.S. Navy, 2013; Allen 1999; Vantuna Research Group, 2006, 2009, 2012, 2015, 2016) (Table 2). Two species, California Scorpionfish (*Scorpaena guttata*) and English Sole (*Parophrys vetulus*) were captured in Allen's baywide fish surveys. However, these species were observed only rarely in the Bay during the five and a half years of Allen's study, ranking 41st and 76th by abundance and 24th and 73rd in biomass, respectively. Together these species accounted for less than 0.5% of the total abundance and fish biomass captured (Allen, 1999). In eighteen years of sampling in the Bay, Hoffman (2006) never captured English Sole and captured only four California Scorpionfish, though the habitat sampled was not typical for these species. English Sole has not been captured in any of the recent Vantuna Research Group surveys; however, California Scorpionfish has been captured in small numbers in 2012 (eight individuals), 2015 (one individual), and 2016 (two individuals). Other rarely captured covered groundfish species include Grass Rockfish (*Sebastes rastrelliger*) (a single individual captured in 2005), Olive Rockfish (*Sebastes serranoides*) (a single individual captured in 2016), and Curlfin Sole (*Pleuronichthys decurrens*) (a single individual captured in 2012).

Finally, in addition to the species captured during Allen's study and the more recent Vantuna Research Group Studies, three shark species (Leopard Shark (*Triakis semifasciata*), Soupfin Shark (*Galeorhinus galeus*), and Spiny Dogfish (*Squalus acanthias*)) and Cabezon (*Scorpaenichthys marmoratus*) have also been reported for the Bay (U.S. Navy, 2013). These species are also rarely captured and have been reported primarily as species taken by recreational fisherman.

Table 2. NMFS Managed Fish Species Previously Found in San Diego Bay*

Common Name	**Scientific Name**
Coastal Pelagics FMP	
Northern Anchovy	*Engraulis mordax*
Pacific Sardine	*Sardinops sagax*
Pacific Mackerel	*Scomber japonicus*
Jack Mackerel	*Trachurus symmetricus*
Jacksmelt	*Atherinopsis californiensis*
Pacific Herring	*Clupea pallasii*
Pacific Groundfish FMP	
California Scorpionfish	*Scorpaena gutatta*
English Sole	*Parophrys vetulus*
Leopard Shark	*Triakis semifasciata*
Soupfin Shark	*Galeorhinus zyopterus*
Spiny Dogfish	*Squalus acanthias*
Cabezon	*Scorpaenichthys marmoratus*
Grass Rockfish	*Sebastes rastrelliger*
Olive Rockfish	*Sebastes serranoides*
Curlfin Sole	*Pleuronichthys decurrens*

* Data compiled from Allen (1999), Hoffman (2006), Merkel and Associates, Inc. (2000), Vantuna Research Group (2006, 2009, 2012, 2015, 2016).

Biological Descriptions for Managed Species

The following descriptions of the life histories of the fifteen managed species listed above provide the background information required to make a determination of the suitability of the project area to support and provide essential habitat for these species.

Northern Anchovy

Northern Anchovy historically ranged from the Queen Charlotte Islands, British Columbia south to Cape San Lucas, Baja California. More recently, populations have moved into the Gulf of California, Mexico. Larvae and juveniles are often abundant in nearshore areas and estuaries with adults being more oceanic. However, adults can be abundant in shallow nearshore areas and estuaries and eggs and larvae have been found offshore. Northern Anchovies are non-migratory but do make extensive inshore-offshore movements and along-shore movements. In southern California, spawning occurs between January and May. Northern Anchovy is one of the most abundant fish species in the California current and is an important prey for a variety of fish, birds, and marine mammals (Emmett et al., 1991).

Pacific sardine

Pacific Sardine is a small pelagic species found in estuaries and more commonly in open coastal habitats and offshore. The Pacific Sardine is wide ranging and found in the Alguhas, Benguela, California, Kuroshio, and Peru currents and off New Zealand and Australia. Changes in distribution are common and primarily linked to environmental conditions. In California, Pacific Sardines are highly mobile and move seasonally. Older adults move from southern California and northern Baja spawning grounds to feeding grounds off the Pacific Northwest and Canada. Younger individuals

(two to four years old) migrate to feeding grounds in central and northern California. Juveniles occur in nearshore habitats off northern Baja and southern California. In southern populations spawning occurs year-round with a peak from April to August between Point Conception and Magdalena Bay. Eggs and larva are found everywhere adults are found. Pacific Sardines are planktivores and consume both phytoplankton and zooplankton. They are an important forage fish for a variety fish, birds, and mammals. Eggs and larvae are consumed by numerous planktivores with juvenile and adults being consumed by a variety of fish, birds, and mammals (NMFS, 2011).

Pacific Mackerel

Pacific Mackerel is a schooling pelagic species. In the northeastern Pacific, Pacific Mackerel range from Banderas Bay, Mexico to southeastern Alaska and usually occur within 20 miles of shore and inhabit shallow, sandy bottom habitats as juveniles. Local populations spawn from Eureka, California south to Cabo San Lucas, Baja California with peak spawning occurring between late April and July. Fecundity is more closely tied to sufficient food and environmental conditions than to season. Pacific Mackerel larvae are preyed on by numerous invertebrate and vertebrate planktivores. Juveniles and adults are important prey for many large fish species, marine mammals, and birds. Due to their larger size, Pacific Mackerel is likely less important as forage fish than Pacific Sardine or Northern Anchovy (NMFS, 2011).

Jack Mackerel

Jack Mackerel is a schooling fish species that ranges widely throughout the northeastern Pacific. Individuals are found along the mainland coasts from Cabo San Lucas, Baja California, to the eastern Aleutian Islands, Alaska. Typically, small Jack Mackerel (less than (<) 6 years of age) are most abundant near the mainland coast and islands in the Southern California Bight. Older individuals fill out the geographic range and are generally found offshore in deep water and along the coastline north of Point Conception, California. Jack mackerel spawn between February and October in California, with peak spawning activity between March and July. Larvae eat primarily copepods with the small Jack Mackerel found off southern California consuming large zooplankton, juvenile squid, and anchovy. Jack Mackerel are prey items for large predators such as tunas and billfish. They are likely only of minor significance as prey for marine birds because of the large size of adults and deep schooling behavior (NMFS, 2011).

Jacksmelt

Jacksmelt is a pelagic species found from Santa Maria Bay, Mexico to Yaquina Bay, Oregon. It is a schooling species that can be found in California bays and ocean waters throughout the year, typically co-occurring with other silversides such as Topsmelt. Jacksmelt is commonly found in bays and estuaries, and prefer to congregate in shallow waters between five and 50 feet deep. Jacksmelt spawns in California between October and March, but this season is extended to year-round in southern California waters (Emmett et al., 1991). Spawning occurs in shallow coastal waters including bays and estuaries, with eggs deposited on marine vegetation and hard substrate. Jacksmelt are omnivorous and feed on algae and crustaceans. The species is not commercially important, but is an important food source for larger fish, as well as birds.

Pacific Herring

Pacific Herring is a commercially important schooling fish species, with fisheries for both adults and roe (eggs). The species is found throughout the North Pacific Ocean, including from Baja California north to Alaska. Pacific Herring congregate in large schools and are found at depths of between one and 3,000 feet. Adults migrate inshore to bays and estuaries to spawn once per year, between

November and August. Peak spawning in California estuaries is in December and January (Emmett et al., 1991). Eggs are laid on kelp, eelgrass, and other benthic structures. After spawning, adults return to their summer feeding areas, while juveniles remain in protected estuary waters for up to a year. Pacific Herring are planktivorous. The adults and eggs of Pacific Herring are consumed by a wide range of fish, marine mammals, and birds.

California Scorpionfish

California Scorpionfish ranges from Santa Cruz, California south to Uncle Sam Bank, Baja California. It is a benthic species found in both sandy and rocky habitats. Individuals are predominantly solitary but are known to aggregate near prominent features both natural and human-made. Young fish live in shallow habitats typically hidden within dense algae and bottom-encrusting organisms. Spawning occurs between May and September and peaks in July. Eggs are laid in a gelatinous mass that floats near the surface. The primary food items include juvenile crabs, small fishes (e.g. Northern Anchovy), octopus, isopods, and shrimps (Core Team, 1998).

English Sole

English Sole is a demersal flatfish species that lives on sandy and muddy bottoms of shallow coastal areas and estuaries. English Sole range from central Baja California to Unimak Island, Alaska. They occur in greatest numbers north of Point Conception, California. Juveniles are found in all Pacific coast estuaries from San Pedro Bay, California to Puget Sound with Elkhorn Slough, California being the southernmost estuary where they are abundant. Adults make limited movements with a northward migration in the spring to summer feeding grounds, returning in the fall. Spawning occurs over soft-bottom substrates at depths of 50 to70 meters. Spawning occurs between December and April for southern stocks. Eggs are buoyant and larvae are pelagic. Adults and juveniles prefer soft sand and mud bottoms generally in less than 12 m of water. Larvae are likely eaten by fishes, with juveniles falling prey to larger fishes, marine mammals, and birds. Adults may be eaten by marine mammals, sharks, and other large fishes.

Leopard Shark

Leopard Sharks range from southern Oregon to Baja California, Mexico including the Gulf of California. They are most common in northern California bays and estuaries and along southern California beaches. They are also common in enclosed, muddy bays, and also reside in flat, sandy areas, mud flats, sandy and muddy bottoms, near rocky reefs, eelgrass beds, quiescent shallows, and kelp beds. Leopard sharks are most common on or near the bottom in waters less than 13 feet deep, but have been caught as deep as 300 feet. They spawn and pup in shallow water. Seasonally, pups are found along sandy beaches and in protected bays. A large grouping of Leopard Sharks is known to occur during summer months at La Jolla Shores Beach, north of the Bay. The maximum recorded length of a leopard shark is six feet but most do not exceed five feet in length. Females take approximately 10 to 15 years to reach maturity, while males take approximately 7 to 13 years. The maximum age is reported to be 30 years. This species feeds on a variety of prey including crabs, clams, fish, and octopus. Leopard sharks are likely more common in the Bay than capture data would suggest. An aggregation of adult leopard sharks was observed along the Coronado First Avenue shoreline in 2005 (Merkel, pers. obs.).

Soupfin Shark

Soupfin Sharks range from northern British Columbia to Abreojos Point, Baja California and the Gulf of California. This shark is an abundant coastal-pelagic species of temperate continental and insular waters. They are often associated with bottom habitat, inhabiting bays and muddy shallows. Males

and females segregate by gender with adult males typically occurring in deeper water and adult females occurring closer inshore. Females and young tend to be more common in southern California waters. Primary nursery grounds are in southern California inshore areas south of Point Conception, with females moving in to bays to bear live young. Soupfin Sharks are opportunistic carnivores and prey on moderate-sized bony fishes, echinoderms, shrimp, invertebrates, and squid. This species is in the Bay (U.S. Navy, 2013).

Spiny Dogfish

Spiny Dogfish are found in temperate and subarctic latitudes in both the northern and southern hemispheres. In the northern and central Pacific Ocean, they occur from the Bering Sea to Baja California. Spiny dogfish typically inhabit waters less than 350 m deep and occur from the surface and intertidal areas to greater depths. The species is commonly found in inland seas, such as San Francisco Bay and Puget Sound, and in shallow bays from Alaska to central California. Mating occurs on the ocean bottom between September and January. Adult females move inshore to shallow waters during the spring to birth their young. Spiny Dogfish are predators on many commercial fishery species and invertebrates. Their diet consists primarily of fish, especially sandlance, herring, smelts, cods, capelin, hake, and ratfish; and of invertebrates, particularly shrimp, crabs, worms, krill, squid, octopus, jellyfish, sardines, anchovies, and sea cucumbers.

Cabezon

Cabezon are found in southeast Alaska to as far south as Punta Abreojos in central Baja California. They dwell primarily on hard bottoms in shallow water from intertidal pools to depths of 76 meters. Cabezon are abundant all year in estuarine and subtidal areas, as well as in coastal waters up to 200 feet (O'Connell, 1953). All life stages is this species can be found in estuaries of the West Coast. Juveniles appear from April to June in kelp canopies, tide pools, and other shallow rocky habitats such as breakwaters. Cabezon are highly territorial and are primarily found in reef crevices, tidepools, or on kelp blades beneath the canopy. In shallow water they move with the tide to feed. Their territorial behavior makes them an easy target for recreational spear fishers. The spawning season for Cabezon occurs from late October to March and peaks in January in southern California. Juveniles and adults are carnivorous, feeding opportunistically. Small juveniles depend mainly on amphipods, shrimp, crabs, and other small crustaceans while adults consume crabs, small lobsters, mollusks (abalone, squid, octopus), small fish (including rockfishes), and fish eggs.

Grass Rockfish

Grass Rockfish is a common, shallow-water rockfish found from Playa Maria Bay, Baja California to Yaquina Bay, Oregon. It is most common south of southern Oregon. Grass Rockfish are an important component of the commercial live-fish fishery. Among rockfishes, Grass Rockfish have one of the shallowest and narrowest depth ranges and occur primarily from 20 to 184 feet deep and occasionally as high as the intertidal. Grass Rockfish are common in nearshore rocky areas, along jetties, in kelp forests, and eelgrass beds. Adults are occasionally found hiding in crevices on rocky reefs. Larvae are released from January to March, with the peak release occurring in January. This species is expected to be rare in the Bay.

Olive Rockfish

Olive Rockfish is shallow-water rockfish species that occurs from the San Benito Islands, Baja California, to Redding Rock, California (CDFW, 2013). While this species has been captured in waters as deep as 480 feet, Olive Rockfish typically occur in nearshore waters less than 150 feet deep, along

reefs and kelp beds. Olive Rockfish eat primarily fish, but also consume crab, shrimp, and squid. This species is most often captured by recreational fishers along the kelp beds and nearshore rock reefs.

Curlfin Sole

Curlfin Sole is a right-eyed flatfish species with a range from Prince William Sound, Alaska in the north to San Quintín, Baja California in the south (Washington Department of Fish and Game, 2010). Curlfin Sole are demersal living on soft bottom habitat in waters that are typically less than 300 feet deep. They eat benthic invertebrates such as polychaete worms, crustacean eggs, and brittlestars. This species is most often captured as bycatch by trawlers, rather than as a targeted commercial species.

8.2 Potential Impacts to EFH and Managed Fish Species

The project site consists of intertidal and shallow subtidal flats and eelgrass habitat. This analysis focuses on stressors associated with the project elements and their potential impact to EFH (i.e. tidal flats, eelgrass, and open water) within the project site. Pursuant to 50 CFR 600.910(a), an "adverse effect" on EFH is defined as any impact that reduces the quality and/or quantity of EFH. Factors that were considered in this analysis include the duration, frequency, intensity, and spatial extent of the impact; the sensitivity/vulnerability of the habitat; the habitat functions that might be altered by the impact; and the timing of the impact relative to when the species or life stages may use or need the habitat.

Habitat Impacts

The primary element of the project includes placement of 360 baycrete reef ball elements into the intertidal habitat, including vegetated (eelgrass) and unvegetated (mudflat) habitat, adjacent to the E Street Marsh. Construction of the six treatment reef arrays would cover a construction area of 29,700 square feet (0.68 acre). However, as described in the project description, each reef array would be comprised of a checkerboard pattern of reef groups, with bare space between each group. As a result, the footprint of the reef ball elements would be substantially lower that the total area within each reef array. Based on the size of the reef ball elements, which have a base diameter of three feet, each reef group (cluster of four reef ball elements) would have an approximate foot-print of seven feet by seven feet, or forty-nine (49) square feet. Therefore, the total footprint of the reef ball elements for all six proposed arrays to be placed along the shoreline is 4,410 square feet (49 square feet per reef group times 15 reef groups times 6 reef arrays, equaling 4,410 square feet) or 0.10 acre.

As indicated in Figure 6, the baywide eelgrass survey utilized as a baseline for this analysis indicates that all of the reef arrays to be constructed at the project site are within persistent intertidal and shallow subtidal eelgrass. Therefore, a 4,410 square foot (0.10 acre) direct impact to eelgrass is anticipated for this project. The project would conform to the requirements of the CEMP, which include pre- and post-construction eelgrass surveys, and implementation of eelgrass mitigation as required based on survey results.

Further impacts to eelgrass or tidal flats beyond the direct footprint of the reef ball elements are not anticipated due to the planned construction methods described above. Construction would

occur from the water at high tide via shallow draft vessels. Vessels would travel at low speeds to avoid prop wash or drag that could damage eelgrass, and would not anchor within eelgrass habitat. Reef ball elements would be lowered from in-water vessels using an A-frame and/or davit, and would be hand-placed by biologists. This would ensure that reef ball elements are not dragged along the mudflat, which could cause further damage. Work would not include any bottom disturbing activities and would not generate substantial turbidity. Any turbidity generated when reef ball elements are placed onto the mudflat is considered to be localized and temporary. Permanent navigation buoys planned to be placed to notify any boats of the presence of oyster reef ball elements would be designed to avoid anchor/chain drag that could impact eelgrass.

Direct impacts to eelgrass are considered to be significant. However, with implementation of Mitigation and Resource Protection Measures 1, 2, and 3, as described in Section 7.0 above, impacts to marine habitats, including eelgrass, would be less than significant.

Proposed Mitigation and Resource Protection Measures

Mitigation and resource protection measures to prevent and/or minimize impacts to eelgrass and marine habitats are described in Section 7, above.

Impacts to eelgrass would be mitigated according to Mitigation and Resource Protection Measure 1. The project would conform to the requirements of the CEMP. Impacts to eelgrass would be based on the results of pre-construction to post-construction surveys to determine the extent of eelgrass impacts. As described previously, it is anticipated that impacts would be limited to the direct footprint of reef ball elements. Any impacts determined by these monitoring surveys would be mitigated at a 1:1 mitigation ratio using credits derived from excess eelgrass planted as part of the District's mitigation for the National City Wharf Extension Project. B Further impacts to eelgrass and marine habitats would be avoided through implementation of Mitigation and Resource Protection Measures 2, 3, and 5. These measures restrict high engine thrust, prop wash, and prop drag, restrict anchoring at the project site, and mandate design of navigation buoys that do not drag on the bottom or damage eelgrass. With implementation of Mitigation and Resource Protection Measures 1, 2, 3, and 5, as described in Section 7.0, above, impacts to eelgrass would be less than significant.

In addition to the above, prior to commencing any in-water work, a survey for the invasive algae, *Caulerpa taxifolia* and other nuisance species, would be conducted in accordance with the Caulerpa Control Protocols (NMFS, 2004).

9.0 CONCLUSIONS

This study analyzes the potential impacts of placing baycrete reef ball elements, as habitat for native oyster, along the tidal flats of the E Street Marsh shoreline in south San Diego Bay. Potential impacts of the project on marine habitats, sensitive habitats, and wetlands include direct impacts to eelgrass within the footprint of the reef ball elements. Further impacts to tidal flats and eelgrass could occur during construction as a result of propeller scour, vessel grounding, or other construction related damage as well as scouring occurring as a result of the project. These impacts are principally avoided or minimized by implementation of design features.

- Impacts to marine habitats related to construction activities would generally be less than significant with implementation of specific construction methods, and adherence to the project's mitigation and resource protection measures. These include: Compliance with the California Eelgrass Mitigation Policy
- Prevention of high engine thrust, prop wash, and prop drag at the project site.
- Prevention of anchoring of construction vessels at the project site through use of temporary moorings and/or spud barges.
- Maintenance of no wake boat speeds at the project site.
- Installation of Navigation Hazard Buoys that utilize a non-dragging mooring system that includes a helix or screw anchor that would be placed into mudflat and a hazard buoy that would then be attached to elastic line that flexes with changing tides but does not come into contact with the seafloor.
- Completion of construction during high tides, with reef ball elements floated in on shallow draft vessels, lowered into place using a davit or A-frame, and hand placed by biologists in the water or similar method.

However, even with the incorporated protective measures in place approximately 4,410 square feet (0.10 acre) of impact to eelgrass is anticipated to occur. These impacts to eelgrass are considered to be significant and would require compensatory mitigation in the form of replacement eelgrass habitat in according to the provisions of the CEMP.

Potential impacts to marine reptiles (e.g. turtles), birds, and marine mammals could occur as a result of the project. Potential impacts to turtles could result from construction activities. Turtles could be struck by boats or boat motors as oyster reefs are placed at the project site. These impacts would be less than significant through incorporation of the mitigation and resource protection measures listed above. Turbidity generated by project construction would be temporary and minimal and no impacts to avian species are anticipated. Further, the project would be constructed in March to early April, outside of the nesting season for California least tern. Impacts to marine mammals (e.g. California sea lion and harbor seal) would be similar to those anticipated for turtles. While it is unlikely that marine mammals would occur in the project vicinity, incorporation of the mitigation and resource protection measures listed above would reduce any impacts to less than significant.

No other impacts to wetlands or to wildlife migration or corridors are anticipated. Cumulative impacts would be less than significant.

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