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24 Aug 23

From: Commanding Officer, Naval Base San Diego
To: Mr. Dan Lawson, Branch Chief, West Coast Regional Office, National Marine Fisheries Service

Subj: NOTIFICATION OF PROJECT CHANGES FOR THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT CONSULTATION IN SUPPORT OF AN ENVIRONMENTAL ASSESSMENT FOR THE FLOATING DRY DOCK PROJECT AT NAVAL BASE SAN DIEGO

Encl: (1) Assessment of Project Design Changes: Essential Fish Habitat Assessment for the Floating Dry Dock Project at Naval Base San Diego, CA
(2) Supplemental Analysis for Ecological Functional Loss Associated with Construction of Naval Base San Diego Mole Pier Floating Dry Dock
(3) NMFS MSA EFH Assessment Concurrence Email, 14 April 2020

1. The Department of the Navy is preparing a Supplemental Environmental Assessment (SEA) to evaluate the design changes relative to the potential environmental effects of the emplacement and operation of floating dry dock facilities on Naval Base San Diego (NBSD). The SEA includes an analysis of all required dredging and sediment disposal, as well as all required demolition and construction activities necessary to provide the required dry dock space for maintenance of the Pacific Fleet at NBSD. A Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) assessment was submitted on 11 February 2020. On 14 April 2020, National Marine Fisheries Service (NMFS) issued a response concurring with the Navy's analysis.

2. Project design changes have necessitated a re-evaluation of the potential impacts to fish and EFH in the Project area. This letter serves as our notice of project changes to the proposed action at NBSD. Enclosure (1) provides an assessment of the project changes and an assessment of potential impacts. Enclosure (2) includes the updated assessment of ecological functional loss based on the revised design specifications. Enclosure (3) is NMFS' 2020 response to the initial EFHA request for concurrence for your review. We request written acknowledgement of receipt of these documents.

3. We appreciate your support of our continued effort to support our Fleet while minimizing impacts to EFH at Naval Base San Diego. The point of contact in this matter is Mr. Todd McConchie, Project Biologist, who may be reached at (619)705-5549 or email at todd.c.mcconchie.civ@us.navy.mil.

R. A. HEELY JR

Copy to:
NBSD PWD N4

ASSESSMENT OF PROJECT DESIGN CHANGES:

ESSENTIAL FISH HABITAT ASSESSMENT

for the

FLOATING DRY DOCK PROJECT

at

NAVAL BASE SAN DIEGO, SAN DIEGO, CA

July, 2023

Naval Facilities Engineering Systems Command

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1.0 Introduction

The Navy is notifying the National Marine Fisheries Service (NMFS) of minor engineering design changes for the Naval Base San Diego (NBSD) Mole Pier Floating Dry Dock (FDD) project (Project). On February 11, 2020, the Navy submitted a Magnuson-Stevens Fishery Conservation and Management Act (MSA) Essential Fish Habitat (EFH) assessment (EFHA; Navy 2019). On April 14, 2020, the Navy received a response from NMFS that concurred with our EFHA. As the project has advanced through final engineering stages, design changes to the Project have been identified that necessitate an update to the analysis as presented in the 2020 EFHA (Navy 2019). Potential impacts to EFH would be related to the FDD facilities preparation (dredging, silt curtain use, and shading) and FDD operations (regular raising and lowering of the FDD). The information below provides a summary of the 2020 EFHA (Navy 2019), the updated Project description, and the impacts of the Project design changes on EFH in the Project area.

While the 2020 EFHA (Navy 2019) provided an analysis of the Project areas for both the Mole Pier FDD and the Austal (formerly Marine Group Boat Works) FDD locations, the information below only addresses design changes to the Mole Pier FDD. The Navy is submitting this document and requests a concurrence with our analysis for the Project design changes.

As part of the 2020 EFHA (Navy 2019) for the Mole Pier Project location, the following activities were addressed: 1) Dredging; 2) Sediment disposal; 3) Demolition activities; 4) Installation of separate mooring dolphins, fender piles, and access structures; 5) Utilities modifications; 6) Security improvements; and 7) FDD emplacement. Of these activities, the installation of separate mooring dolphins and the installation of fender piles have been removed from the Project description. The Navy's assertion is that the removal of these activities have no bearing on the analysis relative to the current Project description, and no further analysis is required to address this change. Of the activities listed above, the dredging footprint is changing, the number/types of piles to be installed are changing, and shading associated with the FDD access structures is changing. All other impacts assessments in the 2020 EFHA (Navy 2019) are unchanged and valid and they will not be addressed as part of this revised EFHA. Furthermore, while the CWA permitting process is currently in-process, we anticipate that a silt curtain may likely be required during dredging activities; therefore we are providing an updated analysis for silt curtain use at the Project site.

2.0 Existing Project Description

The text below provides a summary of the 2020 EFHA (Navy 2019) that was provided to NMFS in October, 2019. It is not meant to be comprehensive, but only to provide a sketch of the potential impacts to EFH based on the original Project design. The detailed analysis is provided in the 2020 EFHA (Navy 2019).

2.1 FDD Facilities Preparation

2.1.1 Dredging and Shade Structures

Per the 2020 EFHA (Navy 2019), the Mole Pier site was initially expected to include a dredge footprint of approximately 4.79 acres (208,652 square feet [sf]), with a dredge duration of approximate 25 days. The proposed dredging area at the south berth of the Mole Pier is divided into three subareas: Turning Basin (1.40 acres [60,984 sf]), Approach (1.73 acres [75,359 sf]), and FDD Sump (1.65 acres [71,874 sf]) (Table 1; Figure 1). Dredging was to be completed to depths up to -11 meters (m; -36 feet [ft]) MLLW in

the Turning Basin, 11.3 m (-37 ft) MLLW in the Approach, and -16.7 m (-55 ft) MLLW in the FDD Sump (Table 1). The south berth of the Mole Pier was originally dredged to -16.7 m (-55 ft) MLLW to facilitate the emplacement of AFDM 14 "Steadfast" (Navy 2018a), a FDD previously used to repair Navy ships before it was relocated in 1998. Currently, the depths in the proposed dredging area range from -5.8 to -17 m (-19 ft to -55.5 ft) MLLW. As such, dredging was anticipated to involve the removal of approximately 86,121 cubic yards (cy) of sediment over a 4.79-acre area using a barge-mounted clamshell dredge.

Table 1. Dredge Areas and Dredge Depths in the 2020 EFHA.

Project Area	*Dredge Area (acres/sf)*	*Dredge Depth (ft)*
Turning Basin	1.40 (60,984)	-36
Approach	1.73 (75,359)	-37
FDD Sump	1.65 (71,874)	-53
TOTAL[1]	**4.79** (208,652)	

Notes: [1] Total area is rounded

Because of the potential presence of munitions, and associated Explosives Safety Quantity-Distance (ESQD) arcs, dredging activities would be limited to nighttime (1800 to 0600), Monday through Friday. Therefore, based on this restriction, dredging activities were expected to take approximately 14 weeks, with an average daily dredge volume of approximately 1,231 cy[1].

Three options for sediment disposal were evaluated: 1) Nearshore Replenishment – Beneficial Reuse; 2) Ocean Disposal; and 3) Upland Disposal. To assess potential impacts during the Project timeframe, all three of the disposal options were evaluated because a determination of the final disposal site had not been made at the time of the 2020 EFHA (Navy 2019).

Per the 2020 EFHA (Navy 2019), two pedestrian bridges and a vehicle bridge were to be constructed to provide landside access and servicing to the FDD. The port-side pedestrian bridge, which would provide access to the port wing deck, would be approximately 35 m (115 ft) long supported by a landside concrete abutment. The proposed ramp wharf would be approximately 24.3 m (80 ft) wide and 16.7 m (55 ft) long and would support a 18 meter-long (60 ft) vehicle bridge that would provide vehicle access to the FDD. The ramp wharf would also support the starboard pedestrian bridge, which would provide access to the starboard wing deck. The concrete ramp wharf and vehicle bridge would cover approximately 0.12 acres (5,360 sf) and would be supported by twenty-four 24-inch octagonal concrete piles. These access structures, which are similar to those currently provided at the south berth of the Mole Pier and other Navy piers in the vicinity, would allow for construction vehicles and heavy equipment to be used during maintenance of Navy vessels. Construction materials would be delivered by truck and the piles would likely be installed using a floating crane and a diesel impact hammer as well as vibratory methods and jetting methods, as necessary.

[1] This average daily dredging volume has been rounded to the nearest cubic yard, representing a conservative total dredge volume.

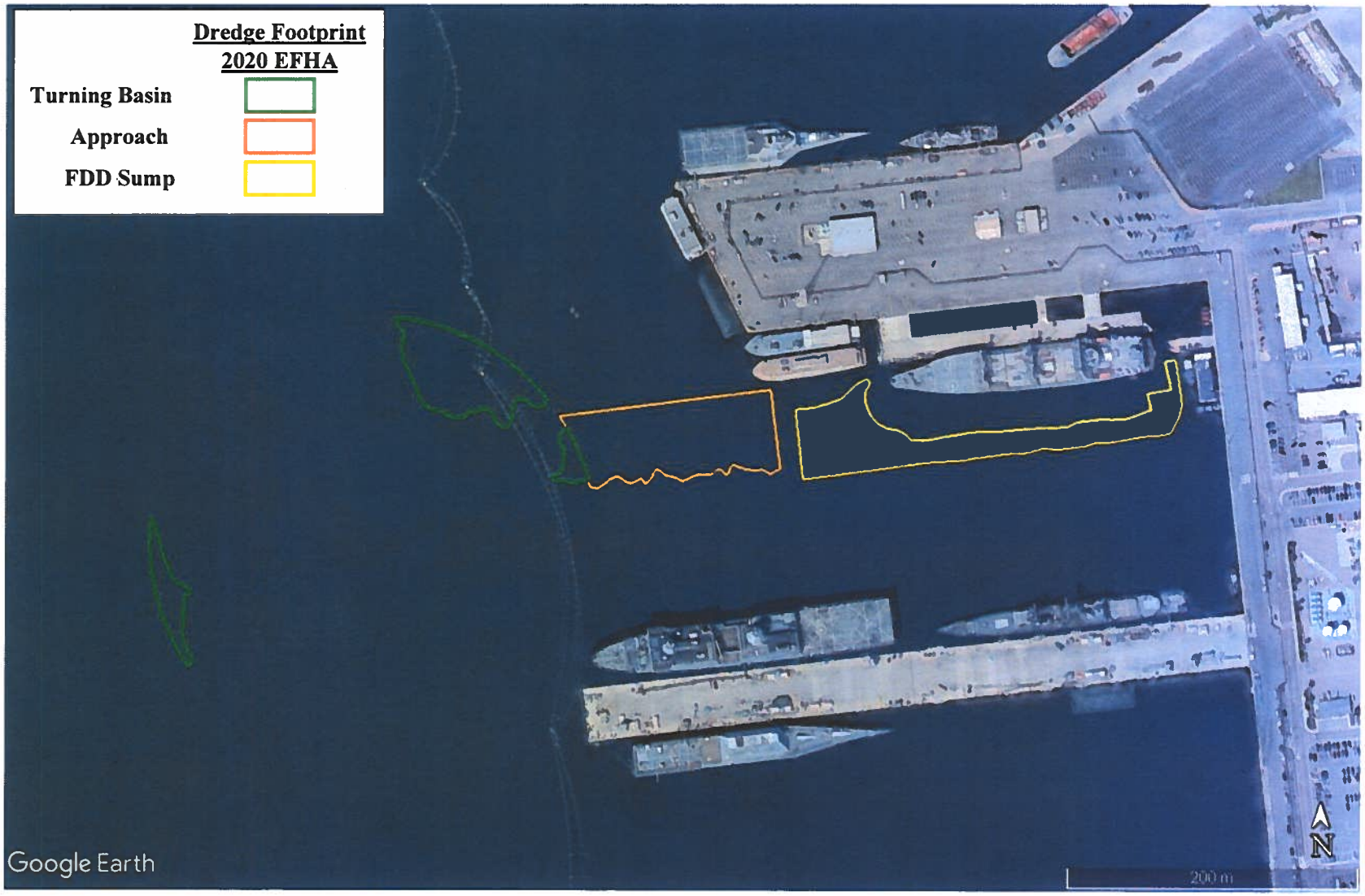

Figure 1. Dredge Footprints from the 2020 EFHA.

As part of the 2020 EFHA (Navy 2019), Merkel and Associates, Incorporated (MAI) generated a functional loss analysis that quantified changes in the environment based on factors of a depth-based habitat function loss and a loss due to shading (MAI 2020a). During EFH consultation between the Navy and NMFS, a request for an additional quantified function loss was added for water column productivity. This was done and led to a water column supplement to the original benthic analysis (MAI 2020b). The analysis included four metrics in the evaluation of potential functional loss, including:

1) Impacts to eelgrass habitat;
2) Depth-based ecological lift/loss;
3) Shading adjusted ecological lift/loss; and,
4) Water column shading loss.

Based on the analyses presented in MAI (2020a,b), the mitigation amount was quantified as 0.084 acres of eelgrass habitat equivalency to functional losses at the project site when taking into account the dredging and changes in shade structures at the Project site. No eelgrass impacts occur with the project implementation.

2.1.2 Silt Curtain Use

In the 2020 EFHA (Navy 2019), the use of a silt curtain during pile extraction and installation was evaluated, with the conclusion being that the activities associated with pile extraction and installation would not warrant a silt curtain because: 1) weak currents at the Mole Pier site (from 2 to 6 inches [5 to 15 centimeters] per second; Navy 1999) would not spread sediment; and 2) re-suspended sediments would likely settle out around the nearby Navy piers, where sediment and marine water quality conditions are similar to those at the south berth of the Mole Pier (i.e., industrial marine facilities where water and sediments are not pristine). However, silt curtain use during dredging activities was not evaluated.

2.1.3 Demolition Activities

The pile-supported concrete mooring wharf at the south berth of the Mole Pier is approximately 16 by 179 m (53 by 588 ft) and covers approximately 0.7 acre (31,164 sf). Demolition activities associated with the Project were anticipated to include demolition of twenty-four 24-inch octagonal concrete piles (Table 2) and approximately 0.002 acres (100 sf) of deck. Partial demolition was anticipated at the eastern end of the wharf to allow for construction of the forward dolphin. This work would have included demolition of fourteen 24-inch square concrete piles and approximately 0.05 acres (2,245 sf) of pier deck. The anticipated demolition of the existing mooring dolphin at the eastern end of the wharf would have included the removal of seven 24-inch octagonal concrete piles along with approximately 0.01 acres (450 sf) of deck (Navy 2018a). All piles were to have been extracted via vibratory extraction. Table 2 provides a summary of the anticipated piles to be extracted as well as the number of expected days for removal. In total, demolition activities were expected to occur over a period of approximately 4 weeks.

Throughout the demolition phase, the following equipment would likely have been used to remove, collect, and transport demolition debris: a spud-anchored barge, barge and wharf cranes, one tugboat, mobile construction equipment, transport trucks, and scows (Navy 2016).

Several types of debris would result from the demolition activities, including concrete, steel, and asphalt. The Navy would comply with the Low-Impact Development Initiative requiring that all demolition projects that take place after 2011 to recycle and divert materials from local landfills to the maximum extent practicable. Materials appropriate for recycling, including concrete, steel, and asphalt, would be recycled. Materials that could not be recycled would be transported to a permitted landfill.

Table 2. Proposed Pile Extraction Activities for the Mole Pier FDD from the 2020 EFHA.

Pile Location	*Pile Size/Type*	*Pile Extraction Method*	*Piles/ Day*	*Number of Piles*	*Total Estimated Days*
West end of wharf, wharf extension	24-inch octagonal concrete	-Vibratory Extraction	1	3	3
Eastern end of wharf	24-inch square concrete	-Vibratory Extraction	1	14	14
Eastern end of wharf, mooring dolphin	24-inch octagonal concrete	-Vibratory Extraction	1	7	7
			Total Piles Extracted	**24**	**24**

2.1.4 Pile Installation Activities

The 2020 EFHA (Navy 2019) identified that two additional mooring dolphins were needed to secure the FDD in the Project area. These mooring dolphins would have been installed on the east and west ends of the mooring wharf. The aft and fore mooring dolphins at both locations would each be supported by thirty-two 24-inch octagonal concrete piles and two 24-inch steel round pipe piles, with 18 piles at each mooring dolphin (Navy 2018a) (Table 3). Also, two fender piles were proposed to be installed along the face of the Mole Pier mooring wharf. The piles were anticipated to be steel piles of 16-inch diameter or less in size. These piles were anticipated to be installed using a diesel impact hammer and vibratory methods, potentially aided by jetting methods (Table 3).

Both the new mooring dolphins and fender piles have been removed from the current design plans and will have no impact on the results of the 2020 EFHA (Navy 2019). Therefore, they are not analyzed further here.

Table 3. Proposed Pile Installation Activities for the Mole Pier FDD from the 2020 EFHA.

Pile Location	*Pile Size/Type*	*Pile Installation Method*	*Piles/ Day*	*Number of Piles*	*Total Estimated Days*
Proposed forward and aft mooring dolphins east and west of existing wharf	24-inch octagonal concrete	-Impact Hammer	1	32	32
Proposed aft mooring dolphin batter piles	24-inch steel round pipe	-Impact Hammer	1	2	2
		-Vibratory Hammer	1		
Proposed new fender piles	16-inch steel round pipe	-Impact Hammer	1	2	2
		-Vibratory Hammer	1		
			Total Piles Installed	**36**	**36**

2.2 FDD Operations

Per the 2020 EFHA (Navy 2019), FDD Operations were addressed in a limited capacity based on the available information when that the 2020 EFHA (Navy 2019) was generated. As the Project design has progressed, we are providing updated information with regards to the operation of the FDD, and potential impacts from the raising or lowering of the FDD.

2.2.1 Raising/Lowering of the FDD

In the 2020 EFHA (Navy 2019), potential impacts to fish species and EFH during raising and lowering of the FDD were not specifically evaluated. Therefore we are providing details to better assess the potential for impacts to fish species and EFH in the Project area.

3.0 Updated Project Description

The current Project design has been updated based on revised engineering specifications and a more thorough design plan. The updated designs call for changes to the dredge footprint, as well as modification to the original pier upgrades and structure locations. For the pier upgrades, the refined design calls for the potential installation or removal of piles in two separate generalized areas within the Project footprint: 1) at the south berth of the mooring wharf; and 2) at the Ramp Pier along the quaywall to the east of the mooring wharf. More specifically, the Project design now incorporates: 1) use of "bump outs" that will extend portions of the face of the mooring wharf away from the main wharf; 2) removal of the ramp pier and replacement with a smaller pier with an intermediate support structure; and 3) use of 24-inch octagonal concrete piles in strategic places around the FDD for a Test Pile Program (TPP). The sections below provide updated details on the pile extraction and installation activities associated with the Project. Figure 2 and Figure 3 identify the locations of these structures relative to the existing mooring wharf.

3.1 FDD Facilities Preparation

3.1.1 Dredging and Shade Structures

The Mole Pier dredge footprint has been enlarged to approximately 9.98 acres (Table 4, Figure 4), with a dredge duration of approximately 90 days. The dredging area at the south berth of the Mole Pier remains divided into three subareas: Turning Basin (1.43 acres), Approach (2.76 acres), and FDD Sump (5.79 acres). The change in the spatial scale of the dredge footprint is driven almost entirely by changes in dredge depths to accommodate submergence of the FDD, to accommodate 2 feet (0.6 m) of over depth in the analyzed design, and to address changes in extent of sediment accretion between the prior analysis conducted on 2014 bathymetry and new analysis conducted using 2022 bathymetry that have expanded the footprint as a result of lowering the floor elevation in the FDD Sump through the current bottom elevation plane. Analysis has been based on existing surface to design surface with 2-foot over depth, rather than an assumed maintained surface following recurrent maintenance dredging.

Dredging depths, including 2-foot (0.6 m) of over depth, would change slightly at the Turning Basin with a slight increase in dredge depth from -11.0 m to -11.3 to (-36 to -37 ft) MLLW, the Approach dredge depth would increase by the 2-foot (0.6 m) over depth to 11.9 m (-39 ft), and dredge depths would increase at the FDD Sump from -16.1 to -17.7 m (-53 to -58 ft) MLLW (Table 4). As a result of the general deepening, the revised dredging is anticipated to remove approximately 110,960 cy of sediment over the 9.98-acre area using a barge-mounted clamshell dredge. The is an increase of 24,839 cy from the original amount of 86,121 cy in the 2020 EFHA (Navy 2019).

Table 4. Comparison of Dredge Area and Depths Relative to the 2020 EFHA and the Current Design.

Project Area	*Dredge Area (acres)*			*Dredge Depth (MLLW) (ft)*		
	2020 EFHA	*Current Design*	*Difference*	*2020 EFHA*	*Current Design*[2]	*Difference*
Turning Basin	1.40	1.43	+0.03	-36	-37	1 ft deeper
Approach	1.73	2.76	+1.03	-37	-39	2 ft deeper
FDD Sump	1.65	5.73	+4.08	-53	-58	5 ft deeper
TOTAL[1]	**4.79**	**9.92**[3]	**+5.14**			

Note: [1] Total areas are rounded; [2] Includes 2-foot over-depth dredging; [3]There is a 0.06 acre overlap between the Approach and FDD Sump, with a total of approximately 9.98 acres of actual dredge area.

Some shade structures will be removed while others will be added based on the current design specifications. Shading impacts diminish with depth based on light extinction such that below -8.8 m (-29 ft) MLLW, shading no longer results in functional loss at the bottom because light no longer contributes to benthic productivity. With the additional overwater structures, there would be an additional 0.014 to 0.027 acres (610 to 1,176 sf) of shading effects (Table 5). There are currently two mooring points on the western and eastern ends of the mooring wharf. Based on current designs specifications, these are to remain in place, but there is an option to remove them along with the other structures.

Table 5. Comparison of Shading Structures Relative to the 2020 EFHA and the Current Design.

Location		*Shaded Areas (acres)*[1]		
		2020 EFHA	*Current Design*	*Net Change*
Ramp Pier	Ramp Pier	-0.065	+0.033	-0.033
	Intermediate Support	0.000	+0.004	+0.004
	Vehicle Access Bridge	0.000	+0.035	+0.035
Mole Pier Mooring Wharf	Gripper Bump Outs	0.000	+0.021	+0.021
	FDD	+3.000	+3.000	0.000
	Subtotal	**+2.935**	**+3.093**	**+0.027**
Mole Pier Mooring Wharf	West Mooring Point[2]	0.000	-0.004	-0.004
	East Mooring Point[2]	0.000	-0.009	-0.009
	Subtotal	0.000	**-0.013**	**-0.013**
	TOTAL	**+2.935**	**+3.080**	**+0.014**

Notes: [1]All values are rounded to the nearest 1000th; [2]Per the current design specifications, these two structures are to remain in place; however, the option remains to remove them.

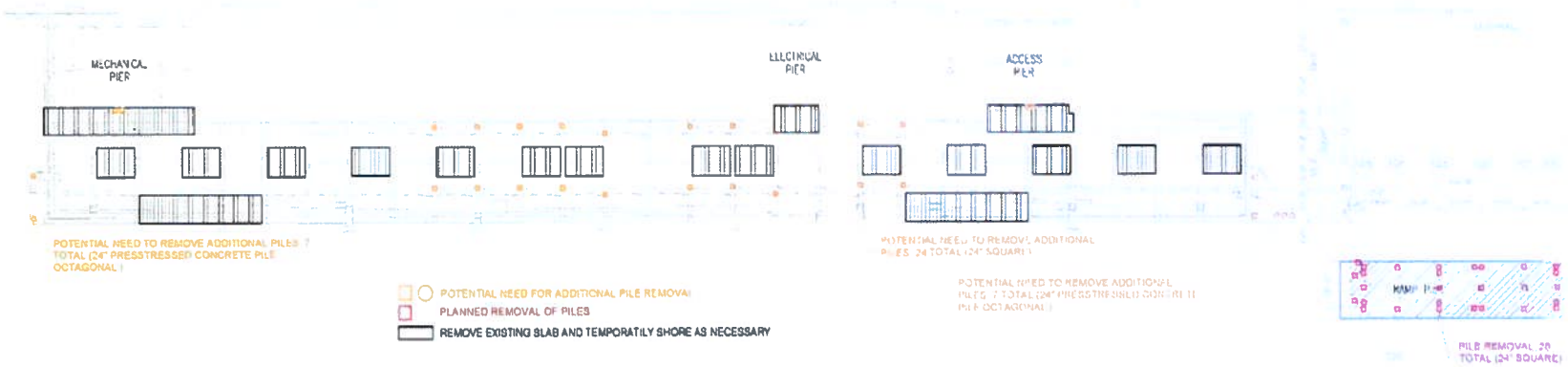

Figure 2. Piles to be Potentially Extracted as Part of the Project-related Activities.

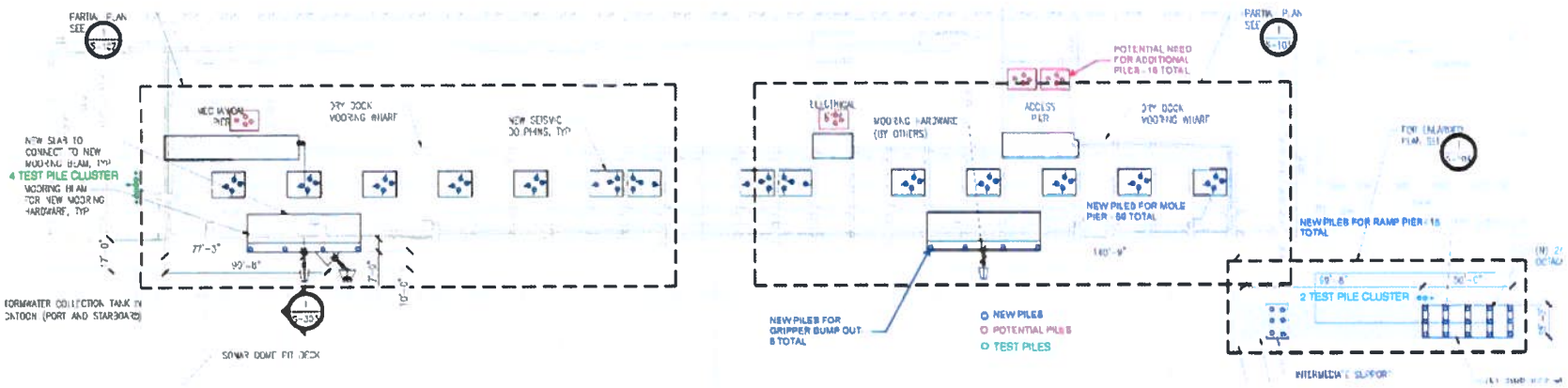

Figure 3. Piles to be Installed as Part of the Project-related Activities.

Figure 4. Comparison of Dredge Footprints Relative to the 2020 EFHA and the Current Design.

3.1.2 Silt Curtain Use

There is an expectation that a silt curtain may be required during dredging activities as part of the Clean Water Act (CWA), Section 401 Water Quality Certification. If required, the silt curtain would be deployed in such a manner as to not touch the sediment during dredging. Because it will be open at the bottom, any fish inside of the barrier would be expected to escape, with only temporary and short-term impacts. Furthermore, because the currents are weak in the Project area (Navy 1999), potential impacts from turbidity would expected to be less than significant. As a result, potential adverse impacts to EFH are not expected, and silt curtain use will not be assessed further in this document.

3.1.3 Demolition Activities

Based on the current design, a total of 65 24-inch octagonal and square concrete piles would be extracted as part of the structural modifications at the mooring wharf and the ramp pier (Table 6). This is an increase of 41 piles from the 2020 EFHA (Navy 2019). However, while there are more piles being extracted, the anticipated number of days of pile extraction only increases by five days from 19 to 24 days. This is based on adjusted pile extraction rates from the construction contractor. While the types of piles have changed relative to the 2020 EFHA (Navy 2019), the analysis of potential noise impacts for the concrete piles is still valid. Therefore, no new noise analyses are required as part of the updated EFHA. See Figure 2 for the locations of the piles planned for extraction at the mooring wharf and the ramp pier.

Table 6. Updated Pile Extraction Activities for the Mole Pier FDD.

Pile Location	*Pile Size/Type*	*Pile Extraction Method*[1]	*Piles/ Day*	*# of Piles*	*Total Estimated Days*
Mooring Wharf	24-inch Square Concrete	-Hydraulic Pile Clipper -Vibratory Extraction -High-pressure Water Jetting	5	24	5
	24-inch Octagonal Concrete			7	2
Ramp Pier	24-inch Square Concrete			28	6
TPP[2]	24-inch Octagonal Concrete		1	6	6
			Total Piles Extracted	**65**	**19**

Notes: [1]While other methods of pile extraction are possible, vibratory extraction is the most likely method that will be used to extract piles. Other pile extraction methods are not expected to exceed regulatory thresholds;
[2]The TPP piles will be installed via an impact hammer prior to the production piles, re-struck for testing approximately one week later, and then extracted prior to the start of production pile installation. Piles will likely be extracted via a vibratory pile extractor or dead-pulled.

3.1.4 Pile Installation Activities

Based on the current design, a total of 107 24-inch octagonal concrete piles would be installed as part of the structural modifications at the mooring wharf and the ramp pier (Table 6). This is an increase of 71 piles from the 2020 EFHA (Navy 2019). However, while there are more piles being installed, the anticipated number of days of pile installation only increases by four days from 36 to 40 days. This is based on adjusted pile installation rates from the construction contractor. While the types of piles have changed relative to the 2020 EFHA (Navy 2019), the analysis of potential noise impacts for the concrete piles is still valid; Therefore, no new noise analyses are required as part of the updated EFHA. See Figure 3 for the locations of the piles planned for installation at the mooring wharf and the ramp pier.

Table 7. Updated Pile Installation Activities for the Mole Pier FDD.

Pile Location	*Pile Size/Type*	*Pile Installation Method*[1]	*Piles/ Day*	*# of Piles*	*Total Estimated Days*
TPP[2]	24-inch Octagonal Concrete	-Impact Hammer -High-pressure Water Jetting	1	6	6
Mooring Wharf			3	80	27
Ramp Pier & Intermediate Support Structure				21	7
			Total Piles Installed	**107**	**40**

Notes: [1]Impact pile installation is the most likely method that will be used to install piles. High-pressure water jetting may be used either separately from, or at the same time as, impact pile installation;
[2]The TPP piles will be installed via an impact hammer prior to the production piles, re-struck for testing approximately one week later, and then extracted prior to the start of production pile installation. Piles will likely be extracted via a vibratory pile extractor or dead-pulled.

3.2 FDD Operations

3.2.1 Raising/Lowering of the FDD

The FDD would be constructed entirely of steel and have an 18,000-ton vessel-lifting capacity designed to meet the Navy's requirements and American Bureau of Shipping Standards. The dimensions for the FDD are 213 by 50 m (700 by 163 ft) with a wing wall height of 13 m (44 ft) above the deck. The FDD is open at both ends (Figure 5 provides an example of the type of FDD that is proposed for the Project). The FDD would be berthed after all in-water and shore-based activities have been completed.

Figure 5. Figure Showing an Example of the Open-ended Design of Proposed FDD.

Dry docking evolutions (i.e., lowering and raising the floating dry dock) would be accomplished with integrated ballast tanks. Gravity would flood seawater into the ballast tanks to submerge the FDD, and electric pumps would remove water from the ballast tanks to float the FDD. When the FDD is either raised or lowered during docking operations the water in the FDD freely flows out either end of the open FDD. Ballast water pumps would be powered from existing land-side electrical power sources and operated in compliance with Uniform National Discharge Standards. The Navy will obtain any necessary permits to ensure water quality standards are met. Dry docking evolutions would typically occur between four and six times per year, but up to a maximum of eight times, with each lowering or raising event lasting approximately six hours. The duration of each evolution would depend on the objective(s) of the specific dry docking event. When the FDD is not being used or while maintenance and repair work is undertaken on a dry-docked vessel, the dry dock ballast tanks are filled with air, and the FDD would remain stationary in the floating position. During the lifetime of the FDD, there would be an expected maximum use of the FDD eight times per year, but typical use would be from four to six times per year.

4.0 Impacts Analysis

4.1 FDD Facilities Preparation

4.1.1 Dredging and Shade Structures

While the dredge area is increasing from 4.79 acres to approximately 9.98 acres, same basic principles behind the analysis of potential effects to habitat in the Project area identified in the 2020 EFHA (Navy 2019) still apply. Per the 2020 EFHA, given the depth and lack of recent dredging in this area, the community of invertebrates is presumed to be more diverse and productive than that which occurs in surrounding dredged areas. Impacts to the community of invertebrates are considered adverse effects to EFH under the MSA and require consultation with NMFS. The benthic community would be expected to recover fairly rapidly based on studies conducted in association with deepening of the San Diego Bay channel. Specifically, in this study conducted 2.5 miles north of the proposed FDD project, demersal fish took between 14 and 22 months to recover. Benthic infauna recovered within 5 months relative to density and biomass, but examination of community indices indicated that full benthic recovery required 17 to 24 months. Epibenthic invertebrates recovered within 29 to 35 months in terms of density and biomass and were still recovering community composition at the end of the 3 year study (Merkel & Associates 2010).

The proposed dredge area in the Approach Area, the Turning Basin, and the Sump is, and would remain, deep subtidal habitat at depths greater than -6 m (-20 ft) MLLW at the south berth of the Mole Pier. As such, no permanent change in habitat type would result from the proposed dredging activities.

Similar to habitat impacts during dredging, the analysis that identified impacts to fish from dredging (i.e., due to sediment re-suspension) would remain the same, albeit for a longer duration. Fish species occurring in the immediate area would be displaced during project activities, either directly by equipment and noise associated with these activities or indirectly by short-term changes in suspended sediments, turbidity, dissolved oxygen, and light diffusion.

Noise levels during dredging would not change relative to what was previously presented in the 2020 EFHA (Navy 2019). The noise levels identified in Dickinson et al. (2001) would still apply. Extrapolating back to the source (assuming the same rate of transmission loss as discussed previously for pile driving) suggests a 33-foot (10-meter) source level of approximately 142 dB, well below the hypothetical 150 dB disturbance threshold. Impacts to fish from underwater noise would have a limited geographic and temporal scale, and fish species would be displaced, if at all, only a very short distance during dredging

activities. While the dredge equipment would be used for a longer duration that was previously analyzed, the impacts from noise would not change from what was previously analyzed.

To evaluate the changes in the Project design, MAI used the same methods and criteria as was used in MAI (2020a,b), but with updated information for bathymetry, dredging, and shade structures (MAI 2023). The dredge footprint would increase from 4.79 acres to approximately 9.98 acres, and the over-water structures in the updated design specifications would increase shading in the Project area from 0.014 to 0.027 acres (610 to 1,176 sf), depending on whether certain structures are kept or removed (see Table 5). Based on the updated analysis (MAI 2023), the changes in dredge depth would not have a significant impact on the eelgrass equivalency mitigation amount. Furthermore, though the current design contemplates increased coverage from that analyzed in the EFHA (see Table 5), these cover changes also would be in waters deeper than -8.8 m (-29 ft) and thus no additional benthic functional loss is anticipated. The water column functional loss rises very slightly due to the expanded shading. Based on the MAI (2023) analysis, the eelgrass equivalency of the Project would increase from 0.084 acres (3,659 sf) to 0.137 acres (5,968 sf), or an additional 0.053 acres (2,309 sf; Table 8). Navy Region Southwest has agreed to let the Project use the Navy's San Diego Bay Eelgrass Mitigation Bank to offset the additional impacts associated with the conversion of shallow water habitat to deeper water, and shading impacts from the new FDD and the associated structures.

Table 8. Comparison of Functional Habitat Loss Relative to the 2020 EFHA and the Current Design.

Quantified Functional Loss Component	*2020 EFHA*		*Current Design*	
	Soft bottom Equivalency (ac)	*Eelgrass Equivalency (ac)*	*Soft bottom Equivalency (ac)*	*Eelgrass Equivalency (ac)*
Impacts to eelgrass habitat	-	0.000	-	0.000
Depth-based ecological lift/loss	0.700	0.068	1.200	0.118
Shading adjusted ecological lift/loss	0.000	0.000	0.000	0.000
Water column shading loss	-	0.016	-	0.019
TOTAL	**0.700**	**0.084**	**1.200**	**0.137**

Given that water depths in the Project area are generally greater than -35 ft MLLW, the Navy does not believe that eelgrass surveys are required for the Project area. However, given that sediment will be disturbed as part of the Project-related activities, a pre-construction survey for invasive algal species in the genus *Caulerpa* will occur prior to the start of sediment-disturbing activities. All applicable surveys will follow procedures identified in *Caulerpa* Control Protocol (NOAA 2021).

4.1.2 Demolition Activities

With more piles being extracted, there is a potential for impacts to the sediment as the piles would leave more voids once they are extracted; however, similar to dredging impacts, while these are considered adverse effects to EFH under the MSA, the benthic community would gradually be colonized by the same organisms that inhabit the surrounding deep subtidal habitat. This process would be slow, probably requiring several years, because of the low productivity of deep subtidal habitat and poor circulation in the southern part of San Diego Bay (Navy and POSD 2013).

During the removal of the deck, all appropriate best management practices (BMPs) would be implemented during demolition activities (Table 11). For example, a system of rafts would be used under the demolition locations to capture any debris (Navy 2016). Additionally, concrete slurry from the cut operation would be vacuumed as saw cutting occurs (Navy 2016).

The potential noise impacts identified in the 2020 EFHA (Navy 2019) for pile extraction are still valid. While more piles will be extracted, the noise associated with pile extraction methods would not change relative to the previous analysis (Table 9). Depending on the activity the onset of mortality or injury would stay at 1 meter (3.3 ft) or less, the potential for temporary threshold shift would occur at from 10 to 15 m (33 to 49 ft) and the behavioral threshold of 150 dB would be crossed at from 34 to 54 m (112 to 177 ft). Based on these distances, acoustic effects on EFH would be relatively minor in terms of behavior, hearing impairment, or the potential for injury or mortality, and temporary, being limited to the duration of sound-generating activities.

Table 9. Mortality, Injury, TTS, and Behavior Impact Ranges for Fish from Non-impulsive Underwater Noise Pile Extraction Methods.

Pile Size and Type	*Pile Extraction Method*[1]	*Onset of Mortality (meters)*		*Onset of Injury (meters)*		*TTS (meters)*	*Behavior (150 dB RMS) (meters)*
		SEL_{cum}	*SPL_{peak}*	*SEL_{cum}*	*SPL_{peak}*	*SEL_{cum}*	
24-inch Square/Octagonal Concrete piles	Hydraulic Pile Clipper	NA	NA	NA	NA	15	54
	Vibratory Pile Extractor	<1	NA	<1	NA	13	46
	High-pressure Water Jetting	0	NA	1	NA	10	34

Notes: [1]While other methods of pile extraction are possible, the use of a pile clipper, vibratory extractor, or water jetting are the most likely methods that will be used to extract piles. Other pile extraction methods are not expected to exceed regulatory thresholds.

4.1.3 Pile Installation Activities

Piles being driven into the sediment may generate a turbidity plume that could have a minor impacts to fish species; however, fish are mobile and would likely temporarily leave the area during any pile installation activities. Furthermore, avoidance and minimization measures may include turbidity monitoring or other alternative measures developed during the CWA permitting process. A turbidity threshold would be adopted, or alternative measures identified during the project-specific CWA permitting process would be completed. Regardless of the CWA permit requirements, BMPs identified in Table 11 would be adopted.

The potential noise impacts identified in the 2020 EFHA (Navy 2019) for pile installation are still valid. While more piles will be installed than were previously analyzed, the noise associated with the use of an impact hammer would not change relative to the previous analysis (Table 10). Depending on the activity the onset of mortality or injury would stay at 2 m (6.6 ft) or less, the potential for temporary threshold shift would occur from 10 to 33 m (33 to 108 ft) and the behavioral threshold of 150 dB would be crossed at 34 to 541 m (112 to 1,775 ft). Based on these distances, acoustic effects on EFH would be relatively minor in terms of behavior, hearing impairment, or the potential for injury or mortality, and temporary, being limited to the duration of sound-generating activities.

Table 10. Mortality, Injury, TTS, and Behavior Impact Ranges for Fish from Impulsive and Non-Impulsive Underwater Noise Pile Installation Methods.

Pile Size and Type	*Pile Installation Method*[1]	*Onset of Mortality (meters)*		*Onset of Injury (meters)*		*TTS (meters)*	*Behavior (150 dB RMS) (meters)*
		SEL_{cum}	*SPL_{peak}*	*SEL_{cum}*	*SPL_{peak}*	*SEL_{cum}*	
24-inch Octagonal Concrete	Impact Hammer	1	<1	2	< 1	33	541
	High-pressure Water Jetting	0	NA	1	NA	10	34

4.2 FDD Operations

4.2.1 Raising/Lowering of the FDD

The FDD is built to accommodate multiple classes of ships with multiple hull designs. For ships with sonar domes that may strike the deck of the FDD after it is raised, there is one depressed location in the FDD that is lower than the rest of the FDD. While it is expected to be rare, there is a potential for pelagic fish to become trapped in this area after it has been lowered to accommodate a ship entering the FDD and then raised. However, dry docking evolutions would typically occur between four and six times per year, but up to a maximum of eight times, with each event lasting approximately six hours. Furthermore, the FDD is open on both ends, and water would leave the FDD via the open ends and any fish that may be in the FDD during this process would be expected to be "flushed" out with the water as it leaves the FDD. While some fish may be caught in the FDD, the numbers would not be expected to harm the populations in San Diego Bay. To further reduce the potential for impacts to fish and EFH, BMPs identified in Table 11 will be implemented.

5.0 Best Management Practices

The BMPs below were identified in the 2020 EFHA (Navy 2019) for Project-related activities; however, based on the changes in the Project description and the assessments provided above, the Navy has added in one BMP regarding the FDD operations (see last line in Table 11 below).

Table 11. Best Management Practices Associated with FDD Facilities Preparation and Operations.

BMP	*Description*	*Impacts Reduced/Avoided*
Dredge Material Screening	Dredge materials requiring upland disposal and considered to be potentially hazardous will be screened for munitions and explosives of concern and radiological commodities, as necessary.	Potential safety issues associated with upland dredge material disposal.
Nighttime Dredging	Dredging operations will take place between 6:00 p.m. and 6:00 a.m., Monday through Friday.	Potential impacts associated with munitions and ESQD arcs.
Dredge Depth Limit and Area Limits	The contractor will not be allowed to excavate beyond the overdredge depth or outside of the project area limits.	Potential water quality impacts associated with dredge and transport of materials outside the project area.

BMP	*Description*	*Impacts Reduced/Avoided*
Dredge Bucket Swing Limit	The dredge bucket will be swung directly to the barge after it breaks the water surface using the minimal swing distance.	Potential water quality impacts associated with sediment release at dredge site due to prolonged transit of dredge bucket to barge/scow.
Bottom Stockpiling and Dredging Limit	No bottom stockpiling or multiple bites of the clamshell bucket will be allowed.	Potential water quality impacts associated with unnecessary sediment disturbance at dredge site.
Overdredge Limit	The contractor will not be allowed to overdredge beyond the designed side slopes.	Potential water quality impacts associated with over-steepening of the slope resulting in unnecessary sediment movement/sliding or impacts on adjacent structural stability.
Dredge Bucket Fill Limit	The dredge bucket will not be overfilled.	Potential water quality impacts associated with sediment spillage from overfilled dredge bucket.
Barge/Scow Maximum Capacity	The barge/scow will not be filled beyond 85 percent capacity.	Potential water quality impacts associated with sediment spillage outside selected disposal sites.
Dredge Material Control	Material will not be allowed to leak from the bins or overtop the walls of the barge/scow.	Potential water quality impacts associated with unintended sediment release outside of selected disposal sites.
Offloading Spill Control	During offloading, metal spill aprons, upland spill control curbing and collection systems, and other spill control measures will be implemented. If a bucket is used, a dribble apron will be used.	Potential water quality impacts associated with uncontrolled deposition of sediment during offloading operations.
Spill/Sheen Response Materials	Surface booms, oil-absorbent pads, and similar materials will be maintained onsite to contain any sheen that may occur on the surface of the water during dredging.	Potential water quality impacts associated with spill/sheen.
Clean Materials	Only clean construction materials suitable for use in the oceanic environment will be used.	Potential water quality impacts associated with construction materials.
Debris Control	A cable net and floating boom will be used to capture floating debris that falls into the water during demolition activities and debris will be collected and disposed of onshore.	Potential water quality impacts associated with uncontrolled construction and demolition debris.
Reduction of impacts to fish and EFH	As practicable, work will be conducted during calm sea states with work stoppages during high surf, winds, and currents. In the event of approaching inclement weather, equipment will be either removed from the project site or adequately secured.	Potential impacts to fish and EFH associated with FDD operations.

BMP	*Description*	*Impacts Reduced/Avoided*
Reduction of impacts to fish and EFH	Dry dock raising will be conducted in a manner that allows gravity evacuation of water from within the FDD without constraining netting or barriers that would entrain fish	Potential impacts to fish and EFH associated with FDD operations.

6.0 References

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United States Navy and Port of San Diego (Navy and POSD). 2013. San Diego Bay Integrated Natural Resources Management Plan.

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May 8, 2023
M&A #20-039-11

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RE: Supplemental Analysis for Ecological Functional Loss Associated with Construction of Naval Base San Diego Mole Pier Floating Dry Dock

Dear Todd,

Purpose

This letter provides a brief supplement to two prior documents prepared to quantify the reduced ecological function and appropriate scale of mitigation through eelgrass habitat for the Naval Base San Diego (NBSD) Mole Pier Floating Dry Dock (Mole Pier FDD) (Merkel & Associates 2020a and 2020b). These documents quantified the benthic and water column ecological functional losses associated with the implementation of the Mole Pier FDD project and provided a conversion analysis to translate losses to an equivalency of persistent eelgrass habitat that supported EFH consultation on the project. Since this analysis, minor project changes have occurred that warrant reevaluation to assess the magnitude of effects changes and appropriate mitigation scaling. You have asked that we evaluate the project design changes made since completion of the original analysis. This document provides analysis relying on the initial analysis methodologies applied and only revising proposed dredging and bay coverage conditions to rerun numeric analyses.

Relevant Project Revisions

The revised design calls for dredging to be increased to occur over 9.98 acres compared to the previously analyzed 4.79 acres of dredging (Table 1). The dredging area at the south berth of the Mole Pier remains divided into three subareas: turning basin (1.43 acres), approach (2.76 acres), and FDD sump (5.79 acres). Dredging depths would change slightly at the turning basin with a reduction in dredge depth from -36 to -35 ft MLLW, the approach dredge depth would remain the same, and dredge depths would increase at the FDD Sump from -53 to -56 ft MLLW with 2 foot of over depth dredging in the design (Table 1, Figure 1).

The expansion in footprint area is predominantly driven by an increase in dredge depth in the FDD sump within which the dry dock would be submerged. This results in much of the existing dry dock sump floor at a floor depth of -54 to -55 feet being dredged under the refined design. The design depth would increase from -53 feet MLLW to -56 feet MLLW (a 2-foot over depth dredging would further lower the sump to -58 feet MLLW). Concurrent with the deepening of the FDD sump, the dredge modification also shortens the sump such that the western end of the sump would not be dredged to sump depth, but rather would be dredged to approach depths. It is understood that the bay coverage associated with the dry dock support elements are expected to increase slightly from that of the project analyzed in the 2020 EFHA. This will increase the coverage by an area

between 0.014 to 0.027 acres. This reflects a 0.5% to 0.9% increase in cover from the analyzed project bay coverage of 2.935 acres.

Table 1. Comparison of Dredge Area and Depths Relative to the EFHA and the Current Design.

Project Area	*Dredge Area (acres)*			*Dredge Depth (ft)*		
	EFHA	*Current Design*	*Difference*	*EFHA*	*Current Design*	*Difference*
Turning Basin	1.40	1.43	+0.03	-36	-37[2]	+2
Approach	1.73	2.76	+1.03	-37	-39[2]	+2
FDD Sump	1.65	5.73	+4.08	-53	-58[2]	-5
TOTAL[1]	**4.79**	**9.92**	**+5.14**			

[1] Total areas are rounded.
[2] The basin dredge depth was analyzed at -58 feet to account for a 2-foot over-depth dredging in the design

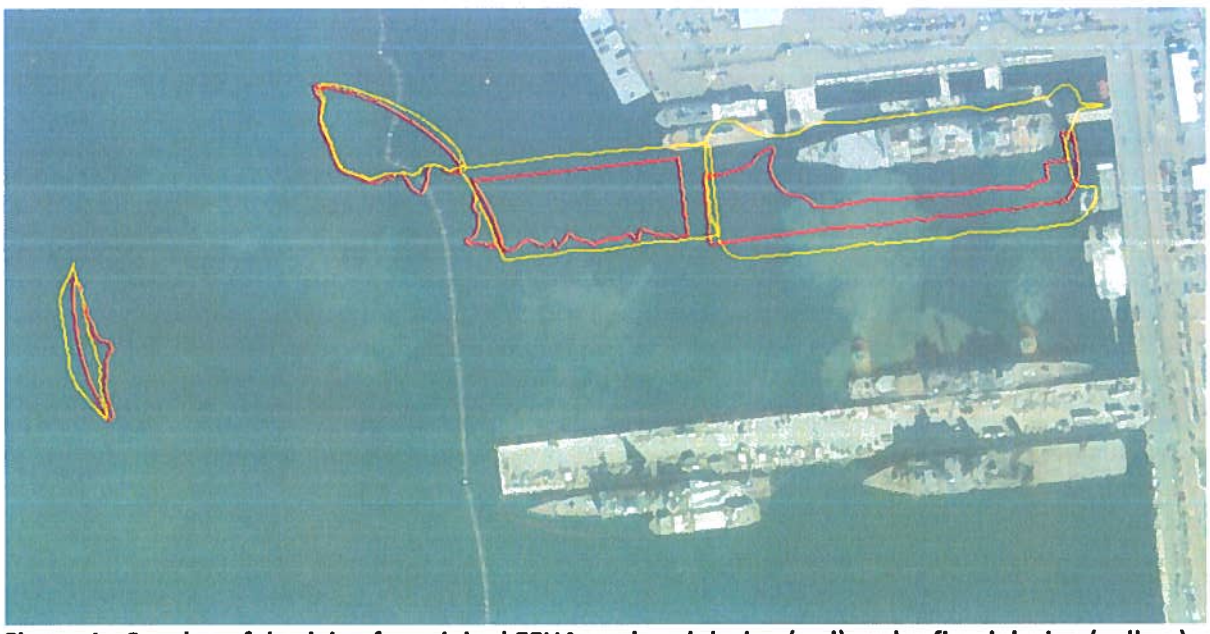


Figure 1. Overlay of dredging for original EFHA analyzed design (red) and refined design (yellow)

Background on Analysis

The original EFHA included a functional loss analysis that quantified changes in the environment based on factors of a depth-based habitat function loss and a loss due to shading (Merkel & Associates 2020a). The analysis methodology applied focuses on the loss of habitat value with increasing depth within the shallow bay and incorporates bay coverage effects on reduction of benthic productivity based on diminished light levels. During EFH consultation between the Navy and NMFS, a request for an additional quantified function loss was added for water column productivity. This was done and led to a water column supplement to the original benthic analysis (Merkel & Associates 2020b). These investigations resulted in calculation of a functional loss of unvegetated soft bottom habitat that was then converted to an eelgrass habitat equivalency value in order to quantify the area of eelgrass that would need to be drawn from the eelgrass mitigation bank in order to offset the losses associated with the project development. In the EFHA for the project at the time of the analysis the mitigation need was quantified as 0.084 acre of eelgrass.

The refined project design broadly expands the footprint of dredging as a result of changing dredge depth targets within the FDD basin and adding slopes to daylight around the original proposed dredging for the FDD basin, turning basin, and approach. What is most important about the changes in dredging footprint is that the work is principally to occur at deeper harbor depths and because the change in value diminishes with depth, these changes would not lead to substantial overall change in impact scale or mitigation need.

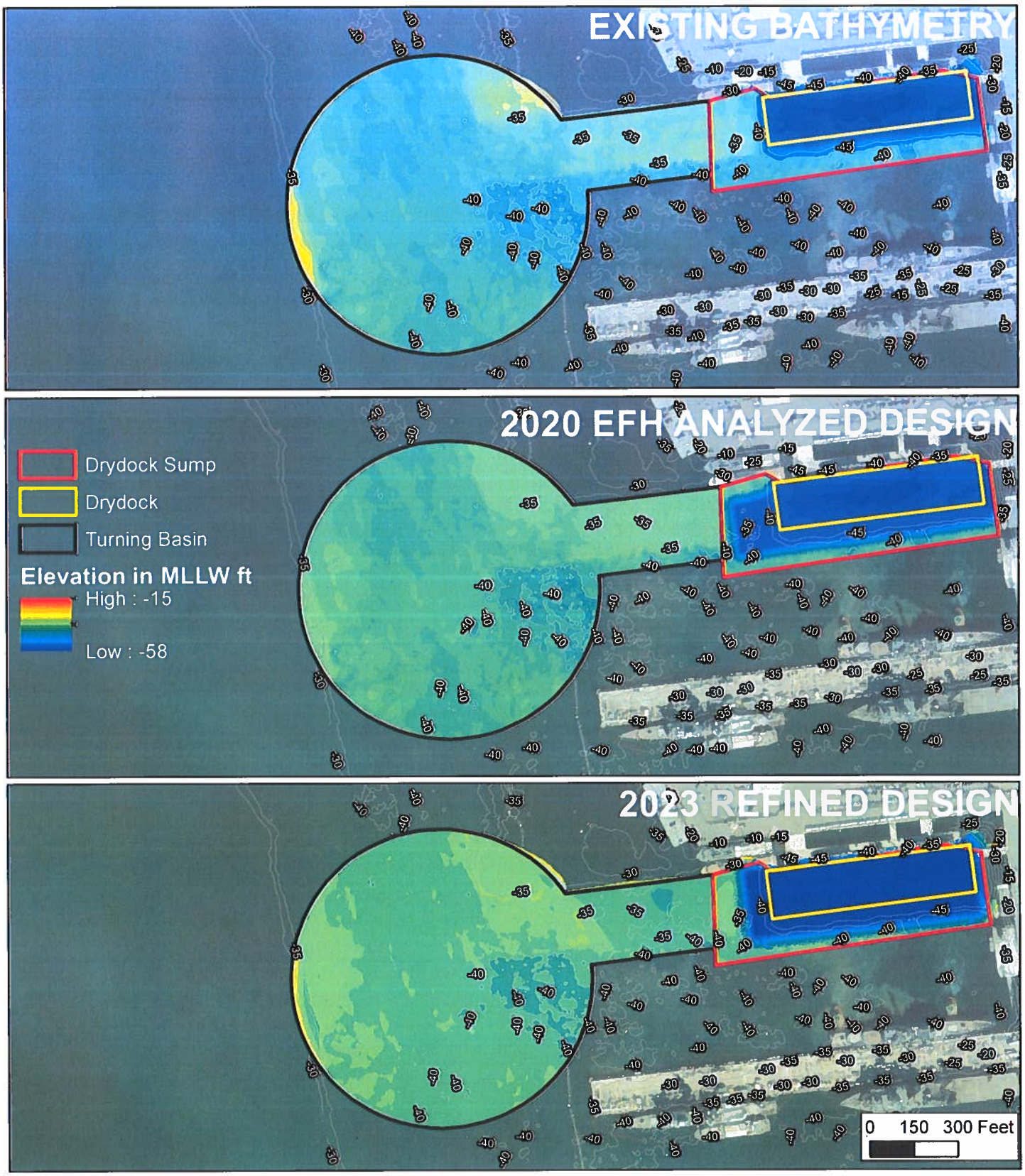
Full calculation of impacts under the analysis methods applied require a quantification of depth changes across the project dredge depths and water shading information (Merkel & Associates 2020a and b). The analysis includes four metrics:

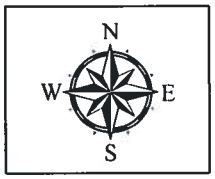
1) Impacts to eelgrass habitat;
2) Depth-based ecological lift/loss;
3) Shading adjusted ecological lift/loss; and,
4) Water column shading loss.

Impacts to Eelgrass – For the NBSD Mole Pier Floating Dry Dock project there is no eelgrass impacted and therefore the first element of the analysis does not apply.

Depth-based ecological lift/loss – To complete analysis of changes in functional lift/loss associated with the refined project the proposed dredge design was acquired from James Georgo, NAVFAC MIDLANT on May 4, 2023. The delivered data set also included the September 2022 condition survey providing current bathymetry for change analyses. The design contours received were used to develop a design bathymetric surface from which the exiting bathymetry was subtracted. This resulted in an identification of net changes in the site elevation that are expected as a result of the proposed dredging. Figure 2 displays the existing bathymetry along with the project implementation bathymetry under both the 2020 original EFH analysis (Merkel & Associates 2020a and b) and the dredging contemplated under the current refined project design. By subtracting the existing bathymetry from the 2020 design and that of the refined 2023 design it is possible to see the proposed distribution and depths of dredging contemplated for the previously analyzed design, and that of the 2023 refined design (Figure 3). The subtraction of the elevation delta plots for the 2020 design from that of the 2023 design results in a plot of the net difference between the previously analyzed design conditions and that of the refined design (Figure 3).

To complete depth based functional lift/loss analysis it is necessary to determine the change in elevation distribution between the pre-dredge (September 2022 condition survey) and the 2023 project design surface (Table 2). Using the quantified area at each 1-foot depth step, and a depth relative ecological lift value (Merkel & Associates 2020a), the area adjusted ecological lift is calculated for both the pre-dredge and post-dredge conditions. The existing condition ecological value is then subtracted from the proposed ecological value for each elevation step to determine the ecological lift and loss associated with the changes in elevation. These interval values are then summed to determine an overall ecological lift/loss based on changing elevations (Table 2). The ecological loss equivalency was then calculated based on value relative to soft bottom habitat at an elevation of -51 feet MLLW (Merkel & Associates 2020a, Marine Taxonomic Services 2020).

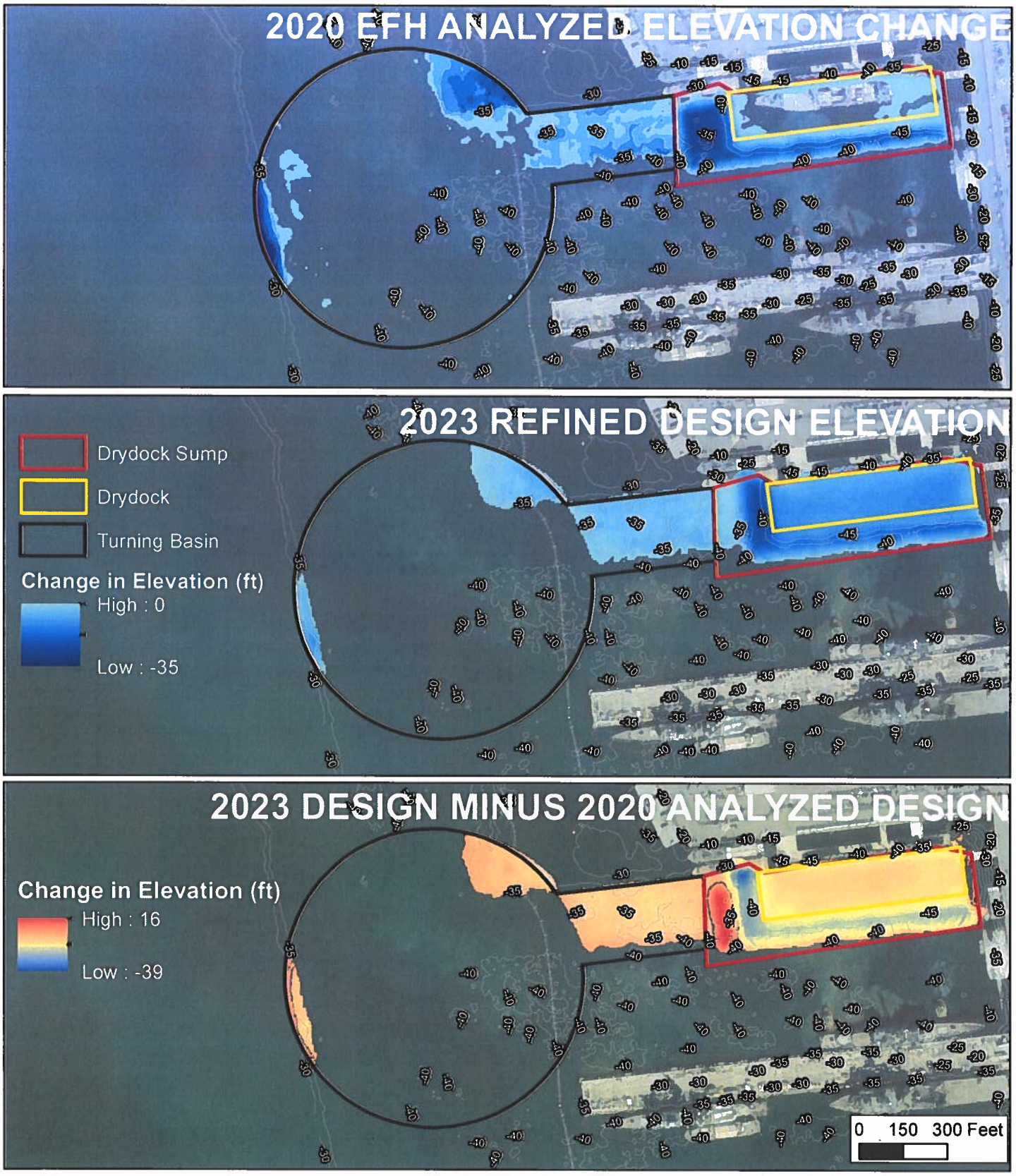




Mole Pier Drydock Bathymetric Surface Models

Naval Base San Diego, San Diego Bay

Figure 2



Mole Pier Drydock Habitat Change Analysis

Naval Base San Diego, San Diego Bay

Figure 3

Table 2. Quantitative Analysis of Benthic Ecological Lift/Loss for 2023 Refined FDD Design

Project Depth / Area Change				Depth Based Ecological Lift/Loss				Shading Adjusted Ecological Lift/Loss			
Elevation (Ft MLLW)	Area Proposed (sf)	Area Existing (sf)	Area Change (sf)	Depth Relative Lift	Area Adjusted Lift (proposed)	Area Adjusted Lift (existing)	Area Adjusted Lift Change	Area Shaded (sf)	Shading Depth Correction (ft)	Area Adjusted Shading Lost Lift	Depth & Area Lift Change
-58	158301	0	158301	0.821	30.08%	0.00%	30.08%		0	0.00%	30.08%
-57	8611	0	8611	0.846	1.69%	0.00%	1.69%		0	0.00%	1.69%
-56	4930	0	4930	0.872	1.00%	0.00%	1.00%	1232	0	0.00%	1.00%
-55	4714	28212	-23497	0.898	0.98%	5.86%	-4.88%	19485	0	0.00%	-4.88%
-54	5167	48662	-43496	0.923	1.10%	10.40%	-9.30%	56565	0	0.00%	-9.30%
-53	5371	34110	-28739	0.949	1.18%	7.49%	-6.31%	37647	0	0.00%	-6.31%
-52	5436	16727	-11291	0.974	1.23%	3.77%	-2.55%	5877	0	0.00%	-2.55%
-51	5737	10527	-4790	1.000	1.33%	2.44%	-1.11%	5295	0	0.00%	-1.11%
-50	5909	7373	-1464	1.026	1.40%	1.75%	-0.35%	2323	0	0.00%	-0.35%
-49	5167	6071	-904	1.051	1.26%	1.48%	-0.22%	72	0	0.00%	-0.22%
-48	4671	4639	32	1.077	1.16%	1.16%	0.01%	40	0	0.00%	0.01%
-47	4499	3789	710	1.102	1.15%	0.97%	0.18%	454	0	0.00%	0.18%
-46	3993	3251	743	1.128	1.04%	0.85%	0.19%	34	0	0.00%	0.19%
-45	3983	3261	721	1.154	1.06%	0.87%	0.19%		0	0.00%	0.19%
-44	3961	6932	-2971	1.179	1.08%	1.89%	-0.81%		0	0.00%	-0.81%
-43	3843	3886	-43	1.205	1.07%	1.08%	-0.01%		0	0.00%	-0.01%
-42	3713	4295	-581	1.230	1.06%	1.22%	-0.17%		0	0.00%	-0.17%
-41	8654	8299	355	1.256	2.52%	2.41%	0.10%		0	0.00%	0.10%
-40	43098	16221	26877	1.282	12.79%	4.81%	7.97%		0	0.00%	7.97%
-39	52936	31193	21743	1.307	16.02%	9.44%	6.58%		0	0.00%	6.58%
-38	49610	19062	30547	1.333	15.31%	5.88%	9.43%		0	0.00%	9.43%
-37	22098	55917	-33819	1.358	6.95%	17.59%	-10.64%		0	0.00%	-10.64%
-36	6006	68715	-62709	1.384	1.92%	22.02%	-20.09%		0	0.00%	-20.09%
-35	3358	22701	-19342	1.410	1.10%	7.41%	-6.31%		0	0.00%	-6.31%
-34	2217	11905	-9687	1.435	0.74%	3.96%	-3.22%		0	0.00%	-3.22%
-33	1636	7599	-5963	1.461	0.55%	2.57%	-2.02%		0	0.00%	-2.02%
-32	1216	1937	-721	1.486	0.42%	0.67%	-0.25%		0	0.00%	-0.25%
-31	936	2024	-1087	1.512	0.33%	0.71%	-0.38%		0	0.00%	-0.38%
-30	947	1948	-1001	1.538	0.34%	0.69%	-0.36%		0	0.00%	-0.36%
-29	753	1421	-667	1.563	0.27%	0.51%	-0.24%		0	0.00%	-0.24%
-28	355	1206	-850	1.589	0.13%	0.44%	-0.31%		-1	0.00%	-0.31%
-27	118	65	54	1.614	0.04%	0.02%	0.02%		-2	0.00%	0.02%
-26				1.640	0.00%	0.00%	0.00%		-3	0.00%	0.00%
-25				1.666	0.00%	0.00%	0.00%		-4	0.00%	0.00%
-24				1.691	0.00%	0.00%	0.00%		-5	0.00%	0.00%
-23				1.717	0.00%	0.00%	0.00%		-6	0.00%	0.00%
-22				1.742	0.00%	0.00%	0.00%		-7	0.00%	0.00%
-21				1.768	0.00%	0.00%	0.00%		-8	0.00%	0.00%
-20				1.794	0.00%	0.00%	0.00%		-9	0.00%	0.00%
-19				1.819	0.00%	0.00%	0.00%		-10	0.00%	0.00%
-18				1.845	0.00%	0.00%	0.00%		-11	0.00%	0.00%
-17				1.870	0.00%	0.00%	0.00%		-12	0.00%	0.00%
-16				1.896	0.00%	0.00%	0.00%		-13	0.00%	0.00%
-15				1.922	0.00%	0.00%	0.00%		-14	0.00%	0.00%
-14				1.947	0.00%	0.00%	0.00%		-15	0.00%	0.00%
-13				1.973	0.00%	0.00%	0.00%		-16	0.00%	0.00%
-12				1.998	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-11				2.024	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-10				2.050	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-9				2.075	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-8				2.101	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-7				2.126	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-6				2.152	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-5				2.178	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-4				2.203	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-3				2.229	0.00%	0.00%	0.00%		-17	0.00%	0.00%
-2				2.254	0.00%	0.00%	0.00%		-17	0.00%	0.00%
Totals	**431945.2**	**431945**	**0**		**108.29%**	**120.37%**	**-12.08%**	**129024**	**NA**	**0.00%**	**-12.08%**

Dredging Area	**9.92 acres**	**Net Dry Dock Area and Structure Shading**	**2.96**	**acres**	**Total Loss Equivalency**
Change in Function	**-12.08%**	**Shading Based Change in function**	**0.00%**		**-1.20 acres**
Loss Equivalency	**-1.20 acres**	**Loss Equivalency**	**0.00**	**acres**	**of -51 ft soft bottom**

Loss of function associated with harbor deepening to accommodate the FDD project would result in an equivalent loss of 1.20 acre of soft bottom habitat at -51 feet MLLW (Table 3).

Table 3. Quantification of Eelgrass Mitigation Required to Offset Mole Pier FDD Impacts

Quantified Functional Loss Component	*EFHA Analyzed*		*Current Design*	
	Soft bottom Equivalency (ac)	*Eelgrass Equivalency (ac)*	*Soft bottom Equivalency (ac)*	*Eelgrass Equivalency (ac)*
Impacts to eelgrass habitat		0.000		0.000
Depth-based ecological lift/loss	0.70	0.068	1.20	0.118
Shading adjusted ecological lift/loss	0.00	0.000	0.00	0.000
Water column shading loss		0.016		0.019
TOTAL		**0.084**		**0.137**

Shading adjusted ecological lift/loss – This analysis considers shading of the benthic habitat associated with over-water structures. Shading impacts diminish with depth based on light extinction such that below 29 feet MLLW, shading no longer results in functional loss at the bottom because light no longer contributes to benthic productivity. For the present project no shading adjusted ecological loss was determined to occur within the EFHA because the shading of the drydock and associated structures occurred over waters deeper than 29 feet. Though the current design contemplates increased coverage by 0.5% to 0.9% from that analyzed in the EFHA these changes would be in waters deeper than 29 feet and thus no additional functional loss is anticipated, and the loss would remain at 0.00 acre equivalency.

Water column shading loss – The water column shading loss considers loss of plankton productivity beneath shading structures. Differing from depth-based ecological lift/loss and shading adjusted ecological lift/loss that are calculated as equivalent loss area of unvegetated bottom at -51 ft MLLW that are then converted to eelgrass bed area equivalents, this metric is quantified directly in units of eelgrass (*Z. marina*) equivalency. The calculation process has been described previously (Merkel & Associates 2020b). For the water column productivity analysis, productivity diminishes with water depth from the surface down to a depth of -29 feet. Below this depth, light is unable to support photosynthesis within the bay and thus shading is not a factor. The volume of water is reduced by bathymetry that extends into the shaded area at elevations greater than -29 feet. Since the proposed FDD is to be developed within an areas that previously supported a dry dock and the original sump remains, none of the shaded areas occur in waters shallower than -29 feet. As a result, changes in water column productivity impacts between the analyzed project within the 2020 EFHA and the 2023 refined project can be addressed by simple scaling of coverage levels.

The 2020 EFHA productivity calculations analyzed a water coverage totaling 2.619 acres and determined the productivity loss from phytoplankton would be 0.016 acre of eelgrass equivalence (Merkel & Associates 2020b). The present refinement of the project increases the coverage including all structures and the dry dock to a total area of 2.962 acres. This brings the shade loss equivalency to 0.019 acre of eelgrass equivalence loss.

The proposed refinements of the Mole Pier FDD project result in minor overall increases in impact and mitigation requirements (Table 3). For Depth-based ecological lift/loss, as well as shading adjusted benthic ecological lift/loss, the quantified effects are based on an unvegeted soft-bottom equivalent area of habitat at -51 feet MLLW. These losses are converted to an equivalency of eelgrass habitat to -51 foot deep unvegetated soft bottom habitat. For the analysis it was determined that 1 acre of eelgrass was equivalent to 10.2 acres of unvegetated soft bottom habitat at -51 feet, as was applied in the prior analyses. For water column shading the calculated equivalency is presented as acres of eelgrass without further translation.

The analysis suggests the expanded dredging and bay coverage associated with the revised project design would add 0.053 acres (214 m^2) of mitigation need to the project to be derived from established eelgrass. This would bring the project mitigation needs up to 0.137 acre (554 m^2) of eelgrass. If this mitigation is derived from the Navy's San Diego Bay Eelgrass Mitigation Bank, then the area calculated would be required to be debited from the bank in association with the project construction. Should the mitigation be derived though new eelgrass restoration, then delays associated with the establishment time frame, derived through CEMP mitigation ratios would apply.

If you have any questions, please contact me.

Sincerely,

Keith W. Merkel
Principal Ecologist

References

Marine Taxonomic Services Ltd. 2020. Bay Habitat Mitigation Planning for Commercial Out Lease of a Floating Dry Dock at the MGBW Maintenance Piers in San Diego Bay, California. Prepared for Mission Environmental, LLC. February 2020.

Merkel & Associates 2020a. NBSD Mole Pier Floating Dry Dock Ecological Functional Loss Analysis and Potential for Offsetting Mitigation Employing the NEMS Bank, or New Eelgrass Restoration. February 8, 2020.

Merkel & Associates 2020b. Supplemental Analysis for Ecological Functional Loss Associated with Water Column Shading by the NBSD Mole Pier and MGBW Floating Dry Docks. April 3, 2020.

From:	Eric Chavez - NOAA Federal
To:	Suk, S H (Sean) CIV USN NAVFAC SW SAN CA (USA)
Cc:	Dan Lawson - NOAA Federal; Seneca, Lisa A CIV USN NAVFAC SW SAN CA (USA); Basinet, Richard J CIV USN NAVFAC SW SAN CA (USA)
Subject:	Re: [Non-DoD Source] Re: EFHA for NBSD Floating Drydock Project
Date:	Tuesday, April 14, 2020 04:03:57 PM
Attachments:	~WRD000.jpg

Sean,

NOAA's National Marine Fisheries Service (NMFS) has reviewed the U.S. Department of the Navy (Navy) Essential Fish Habitat (EFH) Assessment for the Floating Dry Dock Project at Naval Base San Diego (NBSD), located in south-central San Diego Bay, California (proposed project). NMFS has also reviewed other relevant information, including the "*Bay Habitat Mitigation Planning for Commercial Out Lease of a Floating Dry Dock at the MGBW Maintenance Piers in San Diego Bay, California*" prepared by Marine Taxonomic Services, Ltd., the "*NBSD Mole Pier Floating Dry Dock Ecological Functional Loss Analysis and Potential for Offsetting Mitigation Employing the NEMS Bank or New Eelgrass Restoration*," and the "*Supplemental Analysis for Ecological Functional Loss Associated with Water Column Shading by the NBSD Mole Pier and MGBW Floating Dry Docks*," both prepared by Merkel & Associates, Inc. (Mitigation Plans).

The proposed project includes the installation and operation of two steel floating dry dock facilities on NBSD, including all required dredging and sediment disposal, as well as all required demolition and construction activities. One dry dock will be located at the south berth of the Mole Pier, while the second would be installed at a commercial outlease location near the Marine Group Boat Works, LLC (MGBW) maintenance piers. Dredging activities would include the removal of approximately 86,121 cubic yards (cy) of sediment at the Mole Pier and 165,000 cy of sediment at the MGBW maintenance piers using a barge-mounted clamshell dredge. Options for dredge disposal include beneficial reuse, ocean disposal, or upland disposal; with beneficial reuse being the current preferred option pending the results of future sediment testing. Prior to dry dock installation, existing wharf decking and mooring dolphins at the Mole Pier site will be partially demolished using a hydraulic cutter or pile clipper to cut piles at the mudline and remove them via crane. Construction of the floating dry docks includes installation of new mooring dolphins and fendering upgrades to existing wharf structures, and installation of access structures at the MGBW site. Pile installation, which will involve a combination of impact and vibratory hammer, will include 32 (24-inch) octagonal concrete piles, 2 (24-inch) steel round pipe piles, and 2 (16-inch) steel round pipe piles at the Mole Pier site, while the MGBW site will require 32 (24-inch) octagonal concrete piles, 8 (24-inch) steel piles, 2 (24-inch) steel piles, and 24 (24-inch) octagonal concrete piles. Overall, the proposed project at the two locations would result in dredging of approximately 251,121 cy over a 10.34 acre footprint (4.79 acres and 5.55 acres at Mole Pier and MGBW, respectively), 5.1 acres of shading (3 acres and 2.1 acres at Mole Pier and MGBW, respectively), and 0.83 acre of eelgrass impacts at MGBW. Project activities associated with the MGBW dry dock are currently scheduled to begin as early as the fall (September) of 2020, whereas project activities associated with the NBSD Mole Pier dry dock are currently projected to occur some time after the spring of 2024

The proposed project occurs in EFH for various federally managed fish species within the Pacific Coast Groundfish and Coastal Pelagic Species Fishery Management Plans (FMPs). In addition, the project occurs within an estuary and eelgrass habitat, which have been designated as habitat areas of particular concern (HAPCs) for various federally managed fish species within the Pacific Coast Groundfish FMP. Designated HAPC are not afforded any additional regulatory protection under the Magnuson-Stevens Fishery Conservation and Management Act; however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process.

Project related activities that may adversely affect EFH include dredging, disposal of dredge material, increased coverage from overwater structures, and pile installation and removal. Adverse effects to EFH from dredging include direct removal and/or burial of organisms and habitats, turbidity, and/or siltation, contaminant release and uptake, release of oxygen consuming substances, entrainment, noise disturbance, and alteration to hydrodynamic regimes and physical habitat.

Increased shading from the addition of large overwater structures would decrease productivity and have adverse impacts to the physical and biological elements of EFH. Of primary concern to NMFS are the loss of eelgrass habitat, conversion of intertidal and shallow subtidal habitat to moderately deep and deep subtidal habitat (as characterized in the San Diego Bay Integrated Natural Resource Management Plan) to allow the installation and operation of the dry docks, and an increase in shading of bay waters from new overwater structures. However, the proposed project includes conservation measures to avoid, minimize, or offset those impacts. Specifically, the aforementioned Mitigation Plans propose to use .084 acre (Mole Pier) and 1.084 acre (MGBW) of credits from the Navy's San Diego Bay Eelgrass Mitigation Bank to offset the impacts associated with the direct loss of eelgrass habitat, conversion of shallow water habitat to deeper water, and shading impacts from the two new dry dock structures. NMFS has reviewed the Mitigation Plans and does not object to the proposed compensatory mitigation. Therefore, as long as the proposed conservation measures are implemented, including the compensatory mitigation, we have no additional EFH Conservation Recommendations to provide at this time. Thank you for consulting with NMFS.

Regards,

Eric

On Sat, Apr 4, 2020 at 3:05 PM Suk, S H (Sean) CIV USN NAVFAC SW SAN CA (USA) <seung.suk@navy.mil> wrote:

> Hello Eric,
>
> Hope you and your family are doing well and staying safe during these challenging times.
>
> Per my message earlier this week, here is our response to address the issues brought up during our joint webinar on 4 March 2020 for this project.
>
> The attached document is the supplement to our previous consultation material supporting this project.
>
> v/r,
>
> sean
>
> **From:** Eric Chavez - NOAA Federal <eric.chavez@noaa.gov>
> **Sent:** Thursday, February 27, 2020 4:47 PM
> **To:** Suk, S H (Sean) CIV USN COMNAVREG SW SAN CA (USA) <seung.suk@navy.mil>
> **Cc:** Dan Lawson - NOAA Federal <dan.lawson@noaa.gov>; Seneca, Lisa A CIV USN NAVFAC SW SAN CA (USA) <lisa.seneca@navy.mil>; Basinet, Richard J CIV USN NAVFAC SW SAN CA (USA) <richard.basinet@navy.mil>
> **Subject:** Re: [Non-DoD Source] Re: EFHA for NBSD Floating Drydock Project

Hi Sean,

I have reviewed the updated information related to EFH, with a particular focus on the mitigation plans. As is to be expected with a relatively complex, multi-step analysis like the one contained and applied within the two mitigation plans, I have a number of questions. I believe the most efficient way of addressing them is through a conference call, ideally involving the relevant consultants. Since it contains a more detailed account of the analysis performed, my recommendation would be for us to go through the mitigation plan prepared by Marine Taxonomic Services, Ltd. in a more or less sequential order (though I also have a few questions re: the plan prepared by Merkel & Associates, Inc.). Please note I'm not asking for a detailed presentation of the entire process as I've read the plan and understand the gist of it. Rather, I'd plan to move through the document together trying to fill in gaps and pose questions as we progress through the steps of the analysis. The only additional information I think would be helpful, preferably in advance, would be sample calculations. These would be helpful at each step, but especially in relation to Section 5 (Mitigation Ledger).

Given the amount of ground to cover, I'd recommend a 2-hour slot to try to cover everything at once. Would you let me know if you'd be open to that? If so, could you identify some potential dates and times when folks on your end would be available? I could reserve a conference line if needed. Since the Navy is not able to use "doodle poll," to get the ball rolling regarding potential dates/times that could work, I'm including my current availability over the next few weeks below.

Mon (3/2): 9am - 11am

Tues (3/3): 8am - 12pm

Wed (3/4): 8am - 11:30 am

Thur (3/5): anytime

Wed (3/11): anytime

Thur (3/12): anytime

Fri (3/13): 2pm - 4pm

Mon (3/16): anytime

Tues (3/17): anytime

Wed (3/18): 3pm-5pm

Thur (3/19): anytime

Finally, the Navy has proposed two potential mitigation options for offsetting impacts: 1) use of credits from the Navy's Eelgrass Mitigation Bank, or 2) creation of a new eelgrass mitigation site. We've previously expressed our general support for the use of mitigation bank credits as an appropriate offsetting measure. Regarding the second option, important information as to how it would be implemented appears to be lacking. For instance, we're not clear where it would be located, existing site characteristics, pre- and post-mitigation depths and the material required to make those modifications, etc. Absent that type of information typically included in a mitigation plan, it is difficult to provide any meaningful input on that option. More importantly, when conducting the EFH consultation, it will be difficult to conclude that impacts will be adequately offset without those contents of a mitigation plan.

Thanks in advance and please feel free to give me a call if you'd like to chat.

Eric

On Tue, Feb 25, 2020 at 4:08 PM Suk, S H (Sean) CIV USN COMNAVREG SW SAN CA (USA) <seung.suk@navy.mil> wrote:

> Hello Dan,
>
> Per our phone conversation today, here are the responses to your questions:
>
> - Can you confirm the pile-driving condition: "If a turtle is seen within the 185 meter zone after pile driving has commenced, the Navy may continue driving that pile to completion, as long as that turtle is not within 25 meters of the project work area. **The Navy may not initiate the driving of another pile until at least 15 minutes has passed since the last sighting**" applies to 15 minutes of the last sighting of a turtle within 185 meters? Yes, this is correct. No new pile driving will occur until the turtle is confirmed outside of this monitoring distance or 15 minutes have passed since the last sighting.

- The proposed action includes several options for the disposal of dredge material, including nearshore sites within San Diego Bay, outside the Bay, and offshore. Will there be any monitoring/avoidance measures to prevent any harmful interactions between disposal and green sea turtles? Common practices include monitoring ~100 meters for protected species and delaying disposal until observed animals have left or not been sighted in 15 minutes consistent with other monitoring during dredging and other activities. Yes, we will implement the standard monitoring BMPs from the SD Bay Programmatic for dredge disposal including the 100 m monitoring 15 minutes prior to.

- I note that the Green Sea Turtle Assessment makes reference to being "consistent with and to avoid confusion for the marine species monitors, we will be implementing the same 25 m shutdown zone for both green turtles and marine mammals" surrounding pile driving activities. However, the measures to avoid harassment of marine mammals and achieve compliance with the MMPA were not specified in the Green Sea Turtle Assessment. Based on the anticipated sound levels described in the assessment (194 dB re 1 μPa), a 25 meter shutdown zone will not be sufficient to avoid harassment of marine mammals under the MMPA (avoiding exposure of 160+ dB re 1 μPa). While the monitoring/shutdown zones for sea turtles proposed for this project may be sufficient for sea turtles, a 185 meter monitoring/shutdown zone at all times during pile driving would not appear to be sufficient to meet MMPA guidelines for marine mammals. In the interest of avoiding confusion, I would consider first designing marine mammal monitoring/shutdown zones that will comply with MMPA harassment guidelines, and then adopt those as being conservative for sea turtles, to avoid confusion for monitors. We are applying for MMPA Level B Takes through an IHA. The 25 m shutdown zone is specifically to prevent a Level A Take under MMPA and for being consistent for both marine mammals and Sea Turtles to avoid confusion for the monitors.

Let me know if you have any other questions. Thank you for your quick review.

v/r,

sean

From: Dan Lawson - NOAA Federal <dan.lawson@noaa.gov>
Sent: Monday, February 24, 2020 2:58 PM
To: Suk, S H (Sean) CIV USN COMNAVREG SW SAN CA (USA) <seung.suk@navy.mil>
Cc: Eric Chavez - NOAA Federal <eric.chavez@noaa.gov>; Seneca, Lisa A CIV USN NAVFAC SW SAN CA (USA) <lisa.seneca@navy.mil>; Basinet, Richard J CIV USN NAVFAC SW SAN CA (USA) <richard.basinet@navy.mil>
Subject: [Non-DoD Source] Re: EFHA for NBSD Floating Drydock Project

Hi Sean

I have reviewed the ESA consultation request and supporting information for construction of a floating dry dock facility at Naval Base San Diego, received in our office on February 20, 2020. I note there are some places where the descriptions of proposed minimization and avoidance measures in the Green Sea Turtle Assessment don't match up in full with the descriptions of Best Management Practices in the EFH Assessment - where there is any apparent discrepancy, we rely upon what is provided in the Green Sea Turtle and ESA consultation request. Generally speaking, the proposed measures that are described in the ESA Green Sea Turtle Assessment are looking good with regard to minimizing potential impacts to green sea turtles. But there are a few things I need to highlight and/or request clarification of in order to continue and complete informal ESA consultation.

- Can you confirm the pile-driving condition: "If a turtle is seen within the 185 meter zone after pile driving has commenced, the Navy may continue driving that pile to completion, as long as that turtle is not within 25 meters of the project work area. **The Navy may not initiate the driving of another pile until at least 15 minutes has passed since the last sighting**" applies to 15 minutes of the last sighting of a turtle within 185 meters?

- The proposed action includes several options for the disposal of dredge material, including nearshore sites within San Diego Bay, outside the Bay, and offshore. Will there be any monitoring/avoidance measures to prevent any harmful interactions between disposal and green sea turtles? Common practices include monitoring ~100 meters for protected species and delaying disposal until observed animals have left or not been sighted in 15 minutes consistent with other monitoring during dredging and other activities.

- I note that the Green Sea Turtle Assessment makes reference to being "consistent with and to avoid confusion for the marine species monitors, we will be implementing the same 25 m shutdown zone for both green turtles and marine mammals" surrounding pile driving activities. However, the measures to avoid harassment of marine mammals and achieve compliance with the MMPA were not specified in the Green Sea Turtle Assessment. Based on the anticipated sound levels described in the assessment (194 dB re 1 μPa), a 25 meter shutdown zone will not be sufficient to avoid harassment of marine mammals under the MMPA (avoiding exposure of 160+ dB re 1 μPa). While the monitoring/shutdown zones for sea turtles proposed for this project may be sufficient for sea turtles, a 185 meter monitoring/shutdown zone at all times during pile driving would not appear to be sufficient to meet MMPA guidelines for marine mammals. In the interest of avoiding confusion, I would consider first designing marine mammal monitoring/shutdown zones that will comply with MMPA harassment guidelines, and then adopt those as being

conservative for sea turtles, to avoid confusion for monitors.

I'm happy to discuss any of these items at your convenience. Please note that if we do not receive a response from you within 30 days, we will consider this consultation request withdrawn, and will notify you that we are closing out the consultation due to inactivity. After that, a new consultation request must be submitted to initiate consultation on this proposed action.

Dan

On Tue, Feb 11, 2020 at 8:49 PM Suk, S H (Sean) CIV USN COMNAVREG SW SAN CA (USA) <seung.suk@navy.mil> wrote:

> Hello Eric,
>
> Please see the attached EFHA for the NBSD Floating Drydock Project. There are also two supporting attachments for the habitat mitigation.
>
> The ESA informal consultation request letter and the green sea turtle assessment are also attached for reference.
>
> A hard copy of the signed ESA informal consultation request letter and all attachments have been sent via FEDEX.
>
> v/r,
>
> Sean Suk
>
> NAVFAC SW
>
> Environmental

(619) 532-4149

DSN 312-522-4149

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Dan Lawson
NMFS Protected Resources Division
West Coast Region

7600 Sand Point Way NE, Bldg 1

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Eric Chavez
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