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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RTID 0648-XR035

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Parallel Thimble Shoal Tunnel Project in Virginia Beach, Virginia

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA), as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the Chesapeake Tunnel Joint Venture (CTJV) to incidentally take, by Level A harassment and Level B harassment, five species of marine mammals during the Parallel Thimble Shoal Tunnel Project (PTST) in Virginia Beach, Virginia.

DATES: This Authorization is effective from March 10, 2020 through March 09, 2021.

FOR FURTHER INFORMATION CONTACT: Robert Pauline, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other means of effecting the least practicable [adverse] impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On May 24, 2019, NMFS received a request from the CTJV for an IHA to take marine mammals incidental to pile driving and removal at the Chesapeake Bay Bridge

and Tunnel (CBBT) near Virginia Beach, Virginia. The application was deemed adequate and complete on October 11, 2019. The CTJV's request is for take of small numbers of harbor seal (*Phoca vitulina*), gray seal (*Halichoerus grypus*), bottlenose dolphin (*Tursiops truncatus*), harbor porpoise (*Phocoena phocoena*) and humpback whale (*Megaptera novaeangliae*) by Level A and Level B harassment. Neither the CTJV nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Activity

Overview

The CTJV requested authorization for take of marine mammals incidental to in-water construction activities associated with the PTST project. The project consists of the construction of a two-lane parallel tunnel to the west of the existing Thimble Shoal Tunnel, connecting Portal Island Nos. 1 and 2 of the CBBT facility which extends across the mouth of the Chesapeake Bay near Virginia Beach, Virginia. Upon completion, the new tunnel will carry two lanes of southbound traffic and the existing tunnel will remain in operation and carry two lanes of northbound traffic. The PTST project will address existing constraints to regional mobility based on current traffic volume along the facility. Construction will include the installation and removal of 812 piles over 198 days as shown below in Table 1. Due to minor construction design changes, the **Federal Register** notice announcing the proposed IHA (84 FR 64847; November 25, 2019), had originally estimated that there were would be 878 piles installed and removed over 188 days.

In-water activities associated with the project include impact driving, vibratory driving and drilling with down-the-hole (DTH) hammers. Some piles will be removed via vibratory hammer. Work will occur during standard daylight hours of approximately 8-12 hours per day depending on the season. In-water work will occur every month with the exception of February 2021. In-water construction associated with this IHA will begin in winter of 2020.

The PTST project has been divided into four phases over 5 years. Phase I commenced in June 2017 and consisted of upland pre-tunnel excavation activities, while Phase IV is scheduled to be completed in May of 2022. In-water activities are limited to Phase II and, potentially, Phase IV (if substructure repair work is required at the fishing pier and/or bridge trestles and abutments). Take of marine mammals authorized under this IHA will occur for one year from the date of issuance.

A detailed description of the planned activities is provided in the **Federal Register** notice announcing the proposed IHA (84 FR 64847; November 25, 2019). Since that time the CTJV has made minor revisions to the project's construction schedule. The project is now planned to occur over 11 months with no in-water activity in February 2021. The project schedule contained in the proposed IHA was to occur over 10 months with no in-water work during September and October of 2020. The in-water activities described in the proposed IHA **Federal Register** notice generally remain the same. Any changes from the proposed IHA **Federal Register** notice are identified in this notice. Therefore, a detailed description is not provided here. Please refer to the proposed IHA **Federal Register** notice for a detailed description of the activity.

Table 1—Pile Driving Activities Associated With the PTST Project

Pile Location	Pile Function	Pile Type	Installation/Removal Method	Bubble Curtain (Yes/No)	Number of Piles Below MHW	Number of Days per Activity (Total)	Number of Days per Activity (per Hammer Type) Full Production	Anticipated Installation Date
Portal Island No. 1	Mooring dolphins	12-inch Timber piles	Vibratory (Install)	No	120	18	18 Days (7 Piles/Day)	1 May 2020 through 20 June 2020
			Impact (if needed)	No			14 Days (9 Piles/Day)	
Portal Island No. 1	Temporary Dock	42-inch Diameter Steel Pipe Casing*	DTH (install)	No	58	20	20 Days (3 Piles/day)	7 Feb 2019 through 7 June 2020
			Vibratory (removal)	No			10 Days (6 Piles/day)	
		36-inch Diameter Steel Pipe Pile	Impact	Yes		20	20 Days (3 Piles/day)	
Portal Island No. 1	Omega Trestle	36-inch Diameter Steel Pipe Piles	DTH (Install)	No	18	9	9 Days (2 Piles/Day)	7 Feb 2020 through 28 April 2020
			Impact	Yes			6 Days (3 Piles/Day)	
Portal Island No. 1	Berm Support of Excavation Wall - West Side	36-inch Diameter Steel Interlocked Pipe Piles	DTH (install)	No	133	27	27 Days (5 Piles/Day	7 Feb 2020 through 1 June 2020
			Impact	Yes			13 Days (10 Piles/Day)	
Portal Island No. 1	Berm Support of Excavation Wall - East	36-inch Diameter Steel Interlocked	DTH (Install)	No	121	25	25 Days (5 Piles/Day)	7 Feb 2020 through 1 September 2020
			Impact	Yes			12 Days (10 Piles/Day)	

	Side	Pipe Piles						
Portal Island No. 1	Mooring Piles and Templates	36-inch Diameter Steel Pipe Piles	Vibratory (Install & Removal)	No	12	3	3 Days (5 Piles/Day)	7 Feb 2020 through 31 October 2020
Portal Island No. 2	Mooring Dolphins	12-inch Timber Piles	Vibratory (Install)	No	60	9	9 Days (7 Piles/Day)	20 June 2020 through 1 August 2020
			Impact (if needed)	No			7 Days (9 Piles/Day)	
Portal Island No. 2	Omega Trestle	36-inch Diameter Steel Pipe Piles	DTH (Install)	No	28	14	14 Days (2 Piles/Day)	1 June 2020 through 30 September 2020
			Impact	Yes			12 Days (3Piles/Day)	
Portal Island No. 2	Berm Support of Excavation Wall - West Side	36-inch Diameter Steel Interlocked Pipe Piles	DTH (Install)	No	124	25	25 Days (5 Piles/Day)	1 July 2020 through 6Feb 2021
			Impact	Yes			13 Days (10 Piles/Day)	
Portal Island No. 2	Berm Support of Excavation Wall - East Side	36-inch Diameter Steel Interlocked Pipe Piles	DTH (Install)	No	122	25	25 Days (5 Piles/Day)	10 September 2020 through 6 Feb 2021
			Impact	Yes			13 Days (10 Piles/Day)	
Portal Island No. 2	Mooring Piles and Templates	36-inch Diameter Steel Pipe Piles	Vibratory (Install & Removal)	No	16	3	3 Days (6 Piles/Day)	1 March 2020 through 31 October 2020
Total					**812 Piles**	**198 Days**		

Mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Mitigation** and **Monitoring and Reporting** sections).

Comments and Responses

A notice of NMFS' proposal to issue an IHA to the CTJV was published in the Federal Register on November 25, 2019 (84 FR 64847). That notice described, in detail, the CTJV's planned activity, the marine mammal species that may be affected by the activity, the anticipated effects on marine mammals and their habitat, proposed amount and manner of take, and proposed mitigation, monitoring and reporting measures. During the 30-day public comment period NMFS received a comment letter from the Marine Mammal Commission (Commission). The Commission's recommendations and our responses are provided here, and the comments have been posted online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

Comment 1: The Commission recommends that NMFS refrain from publishing for public comment proposed incidental harassment authorizations which contain errors and inconsistencies in the basic underlying information and instead return such applications to action proponents as incomplete.

Response: NMFS thanks the Commission for its recommendation. NMFS reviews the notices thoroughly prior to publication and, despite certain errors noted by the Commission, publishes (in this case and others) proposals that are based on the best scientific evidence available and that are sufficient to facilitate public comment on our proposed actions under the MMPA.

Comment 2: The Commission recommended that NMFS resolve differences between Table 1 and Table 7 in the proposed IHA concerning the number of piles driven per day

Response: The CTJV revised the project schedule and has arrived at 812 total piles driven and removed over 198 days of driving operations as shown in Table 1 in this notice.

Comment 3: The Commission recommended that NMFS refrain from reducing the number of piles to be installed/removed per day by 50 percent in order to calculate take by Level A harassment. If NMFS intends to use a 50-percent reduction in the number of piles to be installed/removed per day, the Commission recommended that NMFS implement that reduction consistently for all pile sizes, types, and installation/removal methods.

Response: For purposes of estimated take by Level A harassment, NMFS assumed that the number of piles installed on a given day was 50 percent of the total planned number. Since the marine mammals proposed for authorization are highly mobile, it is unlikely that an animal would remain within an established Level A harassment zone during the installation/removal of multiple piles throughout a given day. To provide a more realistic estimate of take by Level A harassment, NMFS assumed that an animal would occur within the injury zone for 50 percent of the driving time, which equates to 50 percent of the piles planned for installation/removal. NMFS acknowledges the necessity of implementing this reduction across all pile sizes, types, and installation/removal methods and has done so as shown in Table 5.

Comment 4: In the absence of relevant recovery time data for marine mammals, the Commission recommended that animat modeling be used to inform the appropriate accumulation time to determine injury isopleths and estimate takes by Level A harassment. The Commission also recommended that NMFS continue to make this issue a priority to resolve in the near future and consider incorporating animat modeling into its user spreadsheet.

Response: NMFS appreciates the Commission's interest in this issue, and considers the issue a priority.

Comment 5: The Commission recommends that NMFS consult with acousticians regarding the appropriate source level reduction factor to use to minimize near-field (<100 m) and far-field (>100 m) effects on marine mammals or use the data NMFS has compiled regarding source level reductions at 10 m for near-field effects and assume no source level reduction for far-field effects for all relevant incidental take authorizations.

Response: NMFS disagrees with the Commission regarding this issue, and does not adopt the recommendation. The Commission has raised this concern before and NMFS refers readers to our full response, which may be found in a previous notice of issuance of an IHA (84 FR64833, November 25, 2019).

Comment 6: The Commission recommended that NMFS use the untruncated seasonal densities for bottlenose dolphins from Engelhaupt *et al*. (2016), consistent with the previous authorization and the July 2019 monitoring data, to estimate the numbers of Level B harassment takes.

Response: NMFS has accepted the Commission's recommendation and will use untruncated data from Engelhaupt *et al*. (2016) to estimate take of bottlenose dolphins as shown in Table 9 of this notice of issuance.

Comment 7: The Commission reiterates programmatic recommendations regarding NMFS' potential use of the renewal mechanism for one-year IHAs.

Response: NMFS disagrees with the Commission's recommendations, as stated in our previous comment responses relating to other actions, which we incorporate here by reference (*e.g.*, 84 FR 52464; October 2, 2019).

Changes from the Proposed IHA to the Final IHA

Stock abundance updates to Table 2 (Marine Mammal Species Likely To Occur Near the Project Area) were made in this notice for North Atlantic right whale, fin whale, the coastal southern migratory stock of bottlenose dolphin, harbor porpoise, and humpback whale based on the 2019 draft Stock Assessment Report published on November 27, 2019 (84 FR 65353).

NMFS indicated in the **Federal Register** notice that the IHA would cover in-water activities beginning in the fall 2019. However, activities will not begin until the authorization is issued in winter 2019. NMFS also indicated in the proposed IHA **Federal Register** notice that up to 888 piles would be driven and/or removed. The CTJV has since clarified that 812 piles will be driven and/or removed over 198 days during the effective period of the issued IHA. The construction schedule has been revised and now includes in-water activity over 11 months, with none in February, instead of 10 months of activity, with none in September or October as indicated in the proposed IHA **Federal Register** notice. Additionally, there will be no vibratory removal of 12-in timber piles as

described in the proposed IHA. Temporary 12-in timber piles will either be cut off at the mudline or undergo vibratory removal as part of future work for which a separate IHA may be requested. While vibratory installation of timber piles will occur, there are no references to vibratory removal of 12-in timber piles in this **Federal Register** notice of issuance.

NMFS indicated in the proposed **Federal Register** notice that the source level for impact driving of 12-in piles originated from the Ballena project described in Caltrans (2015). However, that referenced source level came from only a single pile. The correct source levels according to Caltrans (2015) are 180 dB re 1 μPa peak, 170 dB re 1 μPa rms, and 160 dB re 1 μPa2-sec at 10 m. NMFS has included the updated information in Table 4 and Table 5 of this notice and updated the Level A and B harassment zones and numbers of takes accordingly. NMFS incorrectly specified in Table 9 of the proposed IHA **Federal Register** notice the Level B harassment zone for impact installation of 36-in piles as 1,555 m rather than 1,585 m and for vibratory installation/removal of 12-in timber piles as 1,354 m rather than 1,359 m. NMFS has made the appropriate corrections to Table 7 of this notice and revised numbers of takes accordingly.

NMFS has included in the issued IHA a requirement that at least two protected species observers (PSOs) will be required to monitor before, during, and after the proposed pile-driving and -removal activities.

NMFS has included language requiring extrapolation of the numbers of Level A harassment takes in the issued IHA as well Level B harassment takes based on the extents of the zones that could be monitored. Finally, take numbers for all authorized species

have been revised and are described in the **Estimated Take** section and listed in Table 10.

Description of Marine Mammals in the Area of Specified Activities

Table 2 lists all species with expected potential for occurrence near the project area and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2019). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's 2018 United States Atlantic and Gulf of Mexico Marine Mammal Stock Assessments (Hayes *et al.* 2019) and draft 2019 United States Atlantic and Gulf of Mexico Marine Mammal Stock Assessments published in the Federal Register on November 27, 2019 (84 FR 65353). All

values presented in Table 2 are the most recent available at the time of publication and are available in the 2018 SAR and draft 2019 SAR.

Table 2—Marine Mammal Species Likely To Occur Near the Project Area

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, N_{min}, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Balaenidae						
North Atlantic right whale[5]	*Eubalaena glacialis*	Western North Atlantic (WNA)	E, D; Y	428 (0, 418; See SAR)	0.8	5.55
Family Balaenopteridae (rorquals)						
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine	-,-; N	1,380 (0; 1,380, see SAR)	22	12.15
Fin whale[5]	*Balaenoptera physalus*	WNA	E,D; Y	7,418 (0.25; 6,029; See SAR)	12	2.35
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Bottlenose dolphin	*Tursiops truncatus*	WNA Coastal, Northern Migratory	-,-; Y	6,639 (0.41; 4,759; 2011)	48	6.1-13.2
		WNA Coastal, Southern Migratory	-,-; Y	3,751 (0.06; 2,353; 2011)	23	0-14.3
		Northern North Carolina Estuarine System	-,-; Y	823 (0.06; 782; See SAR)	7.8	0.8-18.2
Family Phocoenidae (porpoises)						
Harbor porpoise	*Phocoena phocoena*	Gulf of Maine/Bay of Fundy	-, -; N	95,543 (0.31; 74,034; See SAR)	851	217
Order Carnivora – Superfamily Pinnipedia						
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina*	WNA	-; N	75,834 (0.1; 66,884, 2012)	2,006	350
Gray seal[4]	*Halichoerus grypus*	WNA	-; N	27,131 (0.19, 23,158, See SAR)	1,359	5,410

1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2- NMFS marine mammal stock assessment reports online at*: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable
3 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.*, commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.
4 - The NMFS stock abundance estimate applies to U.S. population only, however the actual stock abundance is approximately 505,000.
5 - Species are not expected to be taken or authorized for take.

A detailed description of the of the species likely to be affected by the planned project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (84 FR 64847; November 25, 2019) for additional information. Since that time the draft 2019 United States Atlantic and Gulf of Mexico Marine Mammal Stock Assessments has been released (84 FR 65353; November 27, 2019). Updates from the draft SAR have been incorporated for the North Atlantic right whale, fin whale, the coastal southern migratory stock of bottlenose dolphin, harbor porpoise, and humpback whale. We are not aware of any additional changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (https://www.fisheries.noaa.gov/find-species) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

Underwater noise from impact pile driving, vibratory pile driving, vibratory pile removal, and drilling with a DTH hammer associated with the PTST project have the potential to result in harassment of marine mammals in the vicinity of the action area. The **Federal Register** notice for the proposed IHA (84 FR 64847; November 25, 2019) included a discussion of the potential effects of such disturbances on marine mammals

and their habitat, therefore that information is not repeated in detail here; please refer to the **Federal Register** notice (84 FR 64847; November 25, 2019) for that information.

Estimated Take

This section provides an estimate of the number of incidental takes authorized through this IHA, which informs both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) 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 (Level B harassment).

Authorized takes will primarily be by Level B harassment, as use of the acoustic sources (*i.e.*, pile driving, DTH drilling) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, for phocids (harbor seals, gray seals) mid-frequency species (bottlenose dolphins) and high-frequency species (harbor porpoises) due to the size of the predicted auditory injury zones. The planned mitigation and monitoring measures (see **Mitigation** and **Monitoring and Reporting** sections below) are expected to minimize the severity of such taking to the extent practicable. As described previously, no mortality is anticipated or authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the take estimate.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007; Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic

threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μPa (rms) for continuous (*e.g.,* vibratory pile-driving) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources. The CTJV's planned activity includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving, DTH drilling) sources, and therefore the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment for non-explosive sources—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The CTJV's planned activity includes the use includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving, DTH drilling) sources.

These thresholds are provided in Table 3 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.

Table 3—Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Acoustic Thresholds* (Received Level)	
Hearing Group	**Impulsive**	**Non-impulsive**
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 199 dB

Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 4* $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 6* $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 8* $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 10* $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of 1µPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the planned project. Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. The maximum (underwater) area ensonified is determined by the topography of the Bay including shorelines to the west south and north as well as by hard structures such as portal islands.

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$TL = B * Log_{10} (R_1/R_2)$, where

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

R_1= the distance of the modeled SPL from the driven pile, and

R_2= the distance from the driven pile of the initial measurement

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source (20*log[range]). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10*log[range]). A practical spreading value of 15 is often used under conditions, such as the PTST project site where water generally increases with depth as the receiver moves away from pile driving locations, resulting in an expected

propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss is assumed here.

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. In order to calculate distances to the Level A harassment and Level B harassment thresholds for the 36-inch steel piles planned in this project, the CTJV used acoustic monitoring data from other locations as described in Caltrans 2015 for impact and vibratory driving. The CTJV also conducted their own sound source verification testing on 42-inch steel casings as described below to determine source levels associated with DTH drilling. NMFS used vibratory driving of 36-in steel pile source levels for vibratory driving of 42-inch casings source levels. The CTJV plans to employ bubble curtains during impact driving of 36-inch steel piles and, therefore, reduced the source level by 7 dB (a conservative estimate based on several studies including Austin *et al.* 2016).

Source levels for drilling with a DTH hammer were field verified at the PTST project site by JASCO Applied Sciences in July 2019 (Denes, 2019). Underwater sound levels were measured during drilling with a DTH hammer at five pile locations – three without bubble curtain attenuation and two with bubble curtain attenuation. The average SPL value at 10 m for the DTH location without a bubble curtain was 180 dB re 1µPa, while the average SEL and PK levels were 164 dB re 1µPa2·s and 190 dB re 1µPa, respectively. These values were greater than DTH testing done at a location in Alaska (Denes *et al.* 2016). The dominant signal characteristic was also found to be impulsive rather than continuous. Southall *et al.* (2007) suggested that impulsive sounds can be distinguished from non-impulsive sounds by comparing the SPL of a 0.035 s window that

includes the pulse and with a 1 s window that may include multiple pulses. If the SPL of the 0.035 s window is 3 dB greater than the 1 s window, then the signal should be considered impulsive. Denes (2019) observed that at the PTST site, the SPL of the 0.035 s pulse is 5 dB higher than the SPL of the 1 s sample, so the DTH source is classified here as impulsive. Source levels associated with DTH drilling of 42-inch steel casings were assumed to be the same as recorded for installation of 36-in steel pipe by DTH.

The CTJV utilized in-water measurements generated by the Greenbusch Group (2018) from the WSDOT Seattle Pier 62 project (83 FR 39709) to establish proxy sound source levels for vibratory installation of 12-inch timber piles. NMFS reviewed the report by the Greenbusch Group (2018) and determined that the findings were derived by pooling together all steel pile and timber pile at various distance measurements data together. The data was not normalized to the standard 10 m distance. NMFS analyzed source measurements at different distances for all 63 individual timber piles that were removed and normalized the values to 10 m. The results showed that the median is 152 dB SPLrms. This value was used as the source level for vibratory installation of 12-inch timber piles. Source levels for impact driving of 12-in timber piles were from the Ballena Bay Marina project in Alameda, CA as described in Caltrans 2015 but have been revised in this document. The lower values contained in the proposed IHA notice were from a single pile at the Ballena Bay Marina and did not reflect the measurements from all of the piles that were tested. Sound source levels used to calculate take are shown in Table 4.

Table 4—The Sound Source Levels (dB Peak, dB RMS, and dB sSEL) by Hammer Type

Type of Pile	Hammer Type	Estimated Peak Noise Level (dB Peak)	Estimated Pressure Level (dB RMS)	Estimated Single Strike Sound Exposure Level (dB sSEL)	Relevant Piles at the PTST Project	Pile Function

Table 4—The Sound Source Levels (dB Peak, dB RMS, and dB sSEL) by Hammer Type

Type of Pile	Hammer Type	Estimated Peak Noise Level (dB Peak)	Estimated Pressure Level (dB RMS)	Estimated Single Strike Sound Exposure Level (dB sSEL)	Relevant Piles at the PTST Project	Pile Function
36-inch Steel Pipe	Impact[a]	210	193	183	Plumb	Omega Trestle, Temporary Dock, Berm Wall West, and Berm Wall East
	Impact with Bubble Curtain[b]	203	186	176	Plumb	Berm Wall West, Berm Wall East, and Temporary Dock
	DTH – Impulsive[d]	190	180	164	Plumb	Omega Trestle, Berm Wall West, and Berm Wall East
	Vibratory[a]	NA	170	170	Pipe Piles	Mooring Piles and Templates
12-inch Timber Pile	Vibratory[c]	NA	152	152	Plumb	Mooring Dolphins
	Impact[a]	180	170	160	Plumb	Mooring Dolphins
42-inch Steel Casing	DTH – Impulsive[d]	190	180	164	Steel Casing	Temporary Dock
	Vibratory[a]	NA	170	170	Pipe Piles	Temporary Dock

Note: sSEL = Single Strike Exposure Level; dB = decibel; N/A = not applicable
[a] Caltrans 2015.
[b] 7 dB reduction was assumed for use an encased bubble curtain (Austin *et al.* 2016).
[c] Greenbusch Group 2018.
[d] Denes *et al.* 2019.

The CTJV used NMFS' Optional User Spreadsheet, available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*, to input project-specific parameters and calculate the isopleths for the Level A harassment zones for impact and vibratory pile driving. When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that

includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary source pile driving, the NMFS User Spreadsheet predicts the distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would incur PTS.

Table 5 provides the sound source values and input employed in the User Spreadsheet to calculate harassment isopleths for each source type while Table 6 shows distances to Level A harassment isopleths. Note that the isopleths calculated using the planned number of piles driven per day is conservative. PTS is based on accumulated exposure over time. Therefore, an individual animal would have to be within the calculated PTS zones when all of the piles of a single type and driving method are being actively installed throughout an entire day. The marine mammals authorized for take are highly mobile. It is unlikely that an animal would remain within the PTS zone during the installation of, for example, 10 piles over an 8-hour period. NMFS opted to reduce the number of piles driven per day by 50 percent in order to derive more realistic PTS isopleths. In cases where the number of planned piles per day was an odd number, NMFS used the next largest whole number that was greater than 50 percent. These are

shown in Table 5 in the row with the heading *Number of piles/day*. Table 6 contains calculated distances to PTS isopleths and Table 7 depicts distances to Level B harassment isopleths.

Table 5—User Spreadsheet Input Parameters Used for Calculating Harassment Isopleths

Model Parameter	12-in timber		36-in and 42-in steel				
	Vibratory	Impact	Vibratory	Impact	Impact - with bubble	DTH	DTH - Simultaneous
Spreadsheet Tab	A.1	E.1	A.1	E.1	E.1	E.1	E.1
Weighting Factor (kHz)	2.5	2	2.5	2.0	2.0	2.0	2.0
RMS (dB)	152	170	170	193	186	180	180
Peak/SEL (dB)	na	180/160	na	210/183	203/176	190/164	190/164
Number of piles/day*	4	5	3	5	5	3	3
Duration to drive a pile (minutes)	30	na	12.0	na	na	na	na
Propagation	15	15	15	15	15	15	15
Distance from source (meters)	10	10	10	10	10	10	10
Strikes per pile	na	1000	na	1,000	1000	25,200	50,400

*Represents 50% of piles planned per day

Table 6-Radial Distance to PTS Isopleths (meters)

Hammer Type		Low-Frequency Cetaceans		Mid-Frequency Cetaceans		High-Frequency Cetaceans		Phocid Pinnipeds		Pile Location in the PTST Project
--	Pile Type	Island 1	Island 2	Island 1	Island 2	Island 1	Island 2	Island 1	Island 2	
Impact	12-in. Timber	86	86	3	3	102	102	46	46	Mooring Dolphins
	36-in. Steel	2,920	2,920	104	104	3,478	3,478	1,563	1,563	Omega Trestle, Temporary Dock, Berm Wall West, and Berm Wall East
Impact with Bubble Curtain	36-in. Steel	997	997	36	36	1,188	1,188	534	534	Berm Wall West, Berm Wall East, and Temporary Dock
DTH – Impulsive	36 and 42-in. Steel	966	966	34	34	1,151	1,151	517	517	Casing for Temporary Dock
DTH Simultaneous		1,534	1,534	55	55	1,827	1,827	821	821	Omega Trestle, Temporary Dock, Berm Wall West, and Berm Wall East
DTH & Impact Hammer (Bubble Curtain) Simultaneous	36-and 42-in. Steel	1,963	1,963	70	70	2,399	2,399	1,051	1,051	Omega Trestle, Temporary Dock, Berm Wall West, and Berm Wall East

Continuous (Vibratory)	12-in. Timber	3	3	0.2	0.2	4	4	2	2	Mooring Dolphins
	36-in. Steel	19	19	2	2	29	29	12	12	Mooring Piles and Templates
	42-in. Steel	19	--	2	--	29	--	12	--	Casing for Temporary Dock

Table 7—Radial Distance (meters) to Level B Harassment Monitoring Isopleths

Driving Method	Pile Type	Distance from Island 1 & 2	Pile Location
Impact	12-in. Timber	22	Mooring Dolphins
	36-in. Steel	1,585	Omega Trestle, Temporary Dock, Berm Wall West, and Berm Wall East
Impact with Bubble Curtain	36-in. Steel	541	Berm Wall West, Berm Wall East, and Temporary Dock
DTH - Impulsive	42-in. Steel	215*	Casing for Temporary Dock
	36-in. Steel	215	Omega Trestle, Temporary Dock, Berm Wall West, and Berm Wall East
Continuous (Vibratory)	12-in. mooring	1,359	Mooring Dolphins
	36-in. Steel	21,544	Mooring Piles and Templates
	42-in. Steel	21,544*	Casing for Temporary Dock

*Activity will not occur on Portal Island 2

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals and describe how it is brought together with the information above to produce a quantitative take estimate. When available, peer-reviewed scientific publications were used to estimate marine mammal abundance in the project area. In some cases population estimates, densities, and other quantitative information are lacking. Local observational data and estimated group size were utilized where applicable.

Humpback Whale

Humpback whales are relatively rare in the Chesapeake Bay and density data for this species within the project vicinity were not available nor able to be calculated. Populations in the mid-Atlantic have been estimated for humpback whales off the coast of New Jersey with a density of 0.000130 per square kilometer (Whitt *et al.* 2015). Habitat-based density models produced by the Duke University Marine Geospatial Ecology Laboratory (Roberts *et al.* 2016) represent the best available information regarding marine mammal densities offshore near the mouth of the Chesapeake Bay. At the closest point to the PTST project area, humpback densities ranged from a high of 0.107/100 km^2 in March to 0.00010/100 km^2 in August. Furthermore, the CTJV conducted marine mammal monitoring during SSV testing for 5 days in July 2019. During that time there were no sightings or takes of humpback whales.

Because humpback whale occurrence is low as demonstrated above, the CTJV and NMFS estimated that there will be a single humpback sighting every two months for the duration of in-water pile driving activities. Only 10 months of in-water construction were anticipated when the proposed IHA was published, resulting in the proposed take of 10 animals. A revised construction schedule has been developed by the CTJV and includes 11 months of planned in-water pile driving activity. Using an average group size of two animals, pile driving activities over an 11-month period would result in 12 takes (rounding up) of humpback whale by Level B harassment. No takes by Level A harassment are expected or authorized.

Bottlenose Dolphin

Expected bottlenose dolphin take was estimated using a 2016 report on the occurrence, distribution, and density of marine mammals near Naval Station Norfolk and Virginia Beach, Virginia (Engelhaupt *et al.* 2016). Three years of dolphin survey data were collected from either in-shore or open ocean transects. In the proposed IHA, a subset of survey data from Engelhaupt

et al. (2016) was used to determine seasonal dolphin densities in the Bay near the project area. A spatially refined approach was employed by plotting dolphin sightings within 12 km of the project location and then determining densities following methodology outlined in Engelhaupt *et al.* (2016) and Miller *et al.* (2019) using the package DISTANCE in R statistical software. The Commission believes that use of this truncated data was inappropriate since Engelhaupt *et al.* (2016) did not survey all of the area near the project site, but only surveyed within approximately 4 km of the coast. The Commission determined that this approach was flawed as it was not based on distance sampling methods and did not assume equal survey effort within the harassment zones, since the majority of the identified harassment zones had no survey effort. In response, NMFS indicated that it would use Engelhaupt *et al.* (2016) data to expand the truncated area using from 12 km to 19 km. The Commission felt that this was also inappropriate as monitoring data from the CTJV's site indicated that the densities provided by Engelhaupt *et al.* (2016) were closer to what was actually observed at the project area compared to the truncated Engelhaupt *et al.* (2016) data. The CTJV's sightings data from July 2019 recorded an average density of animals sighted of 4.37 dolphins/km^2. That density is actually greater than the original, untruncated Engelhaupt *et al.* (2016) density of 3.88 dolphins/km^2 for summer. The observed 4.37 dolphins/km^2 is much greater than the truncated estimate of 0.62 dolphins/km^2 utilized in the notice of proposed IHA which was initially used to estimate take numbers. Given this information, it is likely that the number of takes estimated in the proposed IHA is far less than what is expected to be observed. Therefore, NMFS opted to use the original seasonal density values documented by Engelhaupt *et al.* (2016). These values were broken out by month as shown Table 9. The Level B harassment area for each pile and driving type as shown in Table 8 was multiplied by the appropriate seasonal density and the anticipated number of days of a

specific activity per month number to derive a total number of takes for each construction project component as shown in Table 9 (*i.e*. mooring cluster, temporary dock, omega trestle/ west O-pile walls/mooring piles & templates, and omega trestle/east O-pile walls).

Table 8—In-Water Area (km^2) Used for Calculating Dolphin Takes per Construction Components per Hammer Type

Construction Component	Pile Type	Impact Hammer	Vibratory Hammer	Impact + DTH Hammers	DTH + DTH Hammers
Mooring Cluster	12-in Timber	0.003	4.16	NA	NA
Temporary Dock	36-in and 42-in Steel	0.63*	830	1.72	0.25
Omega Trestle and West O-pile wall	36-in and 42-in Steel		830	1.72	0.49
East O-pile Wall	36-in and 42-in Steel		NA	1.43	0.31

*Impact Hammer with Bubble Curtain

Table 9—Estimated Takes of Bottlenose Dolphin by Level B Harassment by Month and Driving Activity

Month	March	April	May	June	July	August	September	October	November	December	January	February	
Dolphin Density (n/km^2)	1	1	1	3.55	3.55	3.55	3.88	3.88	3.88	0.63	0.63	0.63	
Days/Month based on Pile Driving Activity	**Mooring Cluster**												
Vibratory - Timber Piles	0	0	1	1	0	0	0	0	0	0	0	0	
Impact - Timber Piles	0	0	2	7	6	5	5	0	0	0	0	0	
Dolphin Takes	0.0	0.0	4.2	14.8	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	19
	Temporary Dock												
DTH+ Impact - Steel Pile	4	11	11	4	0	0	0	0	0	0	0	0	
Vibratory - Steel Pile	2	3	3	2	0	0	0	0	0	0	0	0	
Two DTH - Steel Pile	0	0	0	0	0	0	0	0	0	0	0	0	
Dolphin Takes	1667	2509	2509	5917	0	0	0	0	0	0	0	0	12,602
	Omega Trestle/ West O-pile Walls/ Mooring Piles & Templates												
Vibratory - Steel Pile	0	0	0	1	1	0	2	1	0	0	0	0	
Two DTH - Steel Pile	1	2	2	2	2	2	2	5	0	0	0	0	
DTH+ Impact - Steel Pile	4	2	5	5	5	8	5	5	5	5	2	0	
Dolphin Takes	7	4	10	2981	2981	52.4	6478.0	3263.3	33.4	5.4	2.2	0.0	15,817

	Omega Trestle / East O-Pile Walls												
DTH+ Impact - Steel Pile	0	2	2	7	8	8	8	5	5	5	2	0	
Two DTH - Steel Pile	0	0	0	0	2	0	1	1	1	0	0	0	
Dolphin Takes	0	3	3	36	43	41	46	29	29	5	2	0	235
Total No. of Pile Driving Days per Month	11	20	26	29	24	23	23	17	11	10	4	0	
Total Takes													**28,674**

The number of calculated takes for each of the four project components identified in Table 9 resulted in a total of 28,674 authorized takes. The authorized takes were split out among the three dolphin stocks as shown in Table 10. There is insufficient information to apportion the takes precisely to the three stocks present in the area. Given that most of the NNCES stock are found in the Pamlico Sound estuarine system, NMFS will assume that no more than 200 of the authorized takes will be from this stock. Since members of the northern migratory coastal and southern migratory coastal stocks are thought to occur in or near the Bay in greater numbers, we will conservatively assume that no more than half of the remaining animals will accrue to either of these stocks. Additionally, a subset of these takes would likely be comprised of Chesapeake Bay resident dolphins, although size of that population is unknown.

Since the largest Level A harassment isopleth is 104 m and there is a shutdown zone of 100 m, NMFS will assume that 1 percent of each designated stock will occur between 100 and 104 meters or will appear in the PTS zone without first being observed by PSOs resulting in the number of dolphin takes by Level A harassment shown in Table 10. NMFS had not proposed take by Level A harassment in the notice of proposed IHA. However, the Level A harassment isopleth for impact driving of 36-in steel piles exceeds the 100-m shutdown zone and the number of authorized takes has increased.

Harbor Porpoise

Given that harbor porpoises are uncommon in the project area, this exposure analysis assumes that there is a porpoise sighting once during every two months of operations which would equate to six sightings (rounding up) over 11 months. Assuming an average group size of two (Hansen *et al*. 2018; Elliser *et al*. 2018) over 11 months of

in-water work results in a total of 12 estimated takes of porpoises. (In the proposed IHA, NMFS had assumed 10 months of driving resulting in 10 total takes.) Harbor porpoises are members of the high-frequency hearing group which have Level A harassment isopleths as large as 3,478 m during impact installation of 10 36-in steel piles per day. Given the relatively large Level A harassment zones during impact driving, NMFS assumed in the previous IHA (83 FR 36522; July 30, 2018) that 40 percent of estimated porpoises takes would be by Level A harassment. NMFS assumed the same ratio for the issued IHA resulting in five authorized takes of porpoises by Level A harassment and seven takes by Level B harassment. When the CTJV conducted marine mammal monitoring during SSV testing at the project location for 5 days in July 2019, there were no sightings of porpoises.

Harbor Seal

The number of harbor seals expected to be present in the PTST project area was estimated using survey data for in-water and hauled out seals collected by the United States Navy at the portal islands from November 2014 through April 2018 (Rees *et al.*, 2016; Jones *et al.* 2018). The survey data revealed a daily maximum of 45 animals during this period which occurred in January, 2018. The maximum number of animals observed per day (45) was multiplied by the total number of planned driving days between November and May (72) since seals are not present in the area from June through October. In the proposed IHA, NMFS had assumed 173 days of driving during this same period. Based on this revised calculation NMFS has authorized 3,240 incidental takes of harbor seal for this IHA. Note that the CTJV monitoring report did not record

any seal observations over 5 days of SSV testing, but this would be expected as seals are not present during July.

The largest Level A harassment isopleth for phocid species is approximately 1,563 meters which would occur during impact driving of 36-inch steel piles. The smallest Level A harassment isopleths are 2 m and would occur during impact and vibratory driving of 12-inch timber piles. NMFS has prescribed a shutdown zone for harbor seals of 15 meters as a mitigation measure since seals are common in the project area and are known to approach the shoreline. A larger shutdown zone would likely result in multiple shutdowns and impede the project schedule. From the previously issued IHA, NMFS assumed that 40 percent of the exposed seals will occur within the Level A harassment zone specified for a given scenario and the remaining affected seals would result in Level B harassment takes. Therefore, NMFS has authorized 1,296 takes by Level A harassment and 2,124 takes by Level B harassment.

Gray Seal

The number of gray seals expected to be present at the PTST project area was estimated using survey data collected by the U.S. Navy at the portal islands from 2014 through 2018 (Rees *et al.* 2016; Jones *et al*. 2018). One seal was observed in February of 2015 and one seal was recorded in February of 2016 while no seals were observed at any time during 2017 or 2018. As part of the proposed IHA, NMFS anticipated gray seals would occur only during the 21 planned work days for February at a rate of one animal per day. Due to revisions to the construction schedule, no in-water pile driving is scheduled to occur in February under the effective period for this IHA. However, there could be delays to the construction schedule resulting in the need for in-water work in

February 2021. To reduce the possibility that non-authorized take of gray seal could result in work stoppage, NMFS has conservatively authorized take of four gray seals, one by Level A harassment and three by Level B harassment.

Table 10 shows authorized take numbers for Level A and Level B harassment.

Table 10—Authorized Take by Level A and Level B Harassment

Species	Stock	Level A Takes	Level B Takes	Percentage of Stock
Humpback whale	Gulf of Maine	--	12	0.8
Harbor porpoise	Gulf of Maine/Bay of Fundy	5	7	<0.01
Bottlenose dolphin	WNA Coastal, Northern Migratory	142	14,095	<33*
	WNA Coastal, Southern Migratory	142	14,095	<33*
	NNCES	2	198	24
Harbor seal	Western North Atlantic	1,296	2,124	4.5
Gray seal	Western North Atlantic	1	3	<0.01

*Assumes multiple repeated takes of same individuals from small portion of each stock as well as repeated takes of Chesapeake Bay resident population (size unknown).

Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other

means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

In addition to the measures described later in this section, the CTJV will employ the following standard mitigation measures:

- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity, and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;

- For in-water heavy machinery work other than pile driving (*e.g.*, standard barges, etc.), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) movement of the barge to the pile location; or (2) positioning of the pile on the substrate via a crane (*i.e.*, stabbing the pile);
- Work may only occur during daylight hours, when visual monitoring of marine mammals can be conducted;
- For those marine mammals for which Level B harassment take has not been requested, in-water pile driving will shut down immediately if such species are observed within or entering the monitoring zone (*i.e.*, Level B harassment zone); and
- If take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take.

The following measures will apply to the CTJV's mitigation requirements:

Establishment of Shutdown Zone—For all pile driving and drilling activities, the CTJV will establish a shutdown zone. The purpose of a shutdown zone is generally to define an area within which shutdown of activity will occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). These shutdown zones will be used to reduce incidental Level A harassment from impact pile driving for bottlenose dolphins and harbor porpoises. Shutdown zones for species authorized for take are as follows:

- 100 meters for harbor porpoise and bottlenose dolphin.

- 15 meters for harbor seal and gray seal.
- For humpback whale, shutdown distances are shown in Table 14 under low-frequency cetaceans and are dependent on activity type.

Establishment of Monitoring Zones for Level A and Level B Harassment—The CTJV will establish monitoring zones based on calculated Level A harassment isopleths associated with specific pile driving activities and scenarios. These are areas beyond the established shutdown zone in which animals could be exposed to sound levels that could result in Level A harassment in the form of PTS. The CTJV will also establish and monitor Level B harassment zones which are areas where SPLs are equal to or exceed the 160 dB rms threshold for impact driving and DTH drilling and 120 dB rms threshold during vibratory driving. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. The monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential cease of activity should the animal enter the shutdown zone. The Level A and Level B harassment monitoring zones are described in Table 11. Since some of the Level A and Level B harassment monitoring zones cannot be effectively observed in their entirety, exposures will be recorded and extrapolated based upon the number of observed take and the percentage of the Level A and Level B harassment zone that was not visible.

Table 11—Level A and Level B Harassment Monitoring Zones During Project Activities (meters)

Scenario		Level A Harassment Zones				Level B Monitoring Zones
		Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	
Driving Type	**Pile Type**	**Island 1 & 2**	**Island 1 & 2**	**Island 1 & 2**	**Island 1 & 2**	**Island 1 & 2**
Impact	12-in. Timber	90	--	105	--	25
	36-in. Steel	2,920	105	3,480	1,565	1,585
Impact with Bubble Curtain	36-in. Steel	1,000	--	1,190	535	545
DTH – Impulsive	42-in. Steel	970	--	1,155	520	215
DTH Simultaneous at same island	42-in. Steel	1,535	--	1,830	825	215
DTH & Impact Hammer with bubble curtain: Simultaneous at the same island	36-and 42-in. Steel	1,970	--	2,400	1,055	545
DTH at PI 1. And Impact with Bubble Curtain Hammer at PI 2	36-and 42-in. Steel	970	--	1,155	520	215 from PI 1 545 from PI 2

Continuous (Vibratory)	12-in. Timber	--	--	--	--	1,360
	36-in. Steel	20	--	--	--	21,545
	42-in.** Steel	20	--	--	--	21,545

-- indicates that shutdown zone is larger than calculated harassment zone.
**Activity only planned at Portal Island 1 as part of project pile driving plan.

Soft Start - The use of soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors will be required to provide an initial set of strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure will be conducted a total of three times before impact pile driving begins. Soft start will be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer. Soft start is not required during vibratory or DTH pile driving activities.

Use of Bubble Curtains - Use of air bubble curtain system will be implemented by the CTJV during impact driving of 36-in steel piles except in water less than 10 ft in depth. The use of this sound attenuation device will reduce SPLs and the size of the zones of influence for Level A harassment and Level B harassment. Bubble curtains will meet the following requirements:

- The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.
- The lowest bubble ring shall be in contact with the mudline and/or rock bottom for the full circumference of the ring, and the weights attached to the bottom ring shall ensure 100 percent mudline and/or rock bottom contact. No parts of the ring or other objects shall prevent full mudline and/or rock bottom contact.
- The bubble curtain shall be operated such that there is proper (equal) balancing of air flow to all bubblers.

- The applicant shall require that construction contractors train personnel in the proper balancing of air flow to the bubblers and corrections to the attenuation device to meet the performance standards. This shall occur prior to the initiation of pile driving activities.

Pre-Activity Monitoring - Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. If the Level B harassment zone has been observed for 30 minutes and non-permitted species are not present within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the Level B harassment monitoring zone. When a marine mammal permitted for take by Level B harassment is present in the Level B harassment zone, activities may begin and Level B harassment take will be recorded. If work ceases for more than 30 minutes, the pre-activity monitoring of both the Level B harassment and shutdown zone will commence again. Additionally, in-water construction activity must be delayed or cease, if poor environmental conditions restrict full visibility of the shut-down zone(s) until the entire shut-down zone(s) is visible.

Based on our evaluation of the applicant's planned measures, NMFS has determined that the required mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the planned action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density).

- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.

- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

Marine Mammal Visual Monitoring

Monitoring shall be conducted by NMFS-approved observers. Trained observers shall be placed from the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator. Observer training must be provided prior to project start, and shall include instruction on species identification (sufficient to distinguish the species in the project area), description and categorization of observed behaviors and interpretation of behaviors that may be construed as being reactions to the specified activity, proper completion of data forms, and other basic components of biological monitoring, including tracking of observed animals or groups of animals such that repeat sound exposures may be attributed to individuals (to the extent possible).

Monitoring will be conducted 30 minutes before, during, and 30 minutes after pile driving activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven. Pile driving activities include the time to install a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes. The CTJV will be required to station between two and four PSOs at locations offering the best available views of the

monitoring zones. At least two PSOs will be required to monitor before, during, and after the pile-driving and -removal activities. At least one PSO must be located in close proximity to each pile driving rig during active operation of single or multiple, concurrent driving devices. At least one additional PSO is required at each active driving rig or other location providing best possible view if the Level B harassment zone and shutdown zones cannot reasonably be observed by one PSO.

PSOs will scan the waters using binoculars, and/or spotting scopes, and will use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs will be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. The CTJV will adhere to the following PSO qualifications:

(i) Independent observers (*i.e.*, not construction personnel) are required.

(ii) At least one observer must have prior experience working as an observer.

(iii) Other observers may substitute education (degree in biological science or related field) or training for experience.

(iv) Where a team of three or more observers are required, one observer shall be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer.

(v) The CTJV shall submit observer CVs for approval by NMFS.

Additional standard observer qualifications include:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Observers will be required to use approved data forms. Among other pieces of information, The CTJV will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, the CTJV will attempt to distinguish between the number of individual animals taken and the number of incidences of take. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;

- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity, and if possible, the correlation to SPLs;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Description of implementation of mitigation measures *(e.g.*, shutdown or delay);
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

A draft report will be submitted to NMFS within 90 days of the completion of marine mammal monitoring, or 60 days prior to the requested date of issuance of any future IHA for projects at the same location, whichever comes first. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days (and associated PSO data sheets), and will also provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and an extrapolated total take estimate based on the number of marine mammals observed during the course of construction. A final report must be submitted within 30 days following resolution of comments on the draft report.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the CTJV shall report the incident to the Office of Protected Resources (OPR), NMFS and to the Greater Atlantic Region New England/Mid-Atlantic Regional Stranding Coordinator as soon as feasible. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses

(*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Pile driving activities associated with the planned PTST project, as outlined previously, have the potential to disturb or displace marine mammals. The specified activities may result in take, in the form of Level B harassment (behavioral disturbance) or Level A harassment (auditory injury), incidental to underwater sounds generated from pile driving. Potential takes could occur if individuals are present in the ensonified zone when pile driving occurs. Level A harassment is anticipated for bottlenose dolphins, harbor porpoises, harbor seals, and gray seals.

No serious injury or mortality is anticipated given the nature of the activities and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the construction method and the implementation of the planned mitigation measures. Specifically, vibratory driving, impact driving, and drilling with DTH hammers will be the primary methods of installation and pile removal will occur with a vibratory hammer. Impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks. When impact pile driving is used, implementation of bubble curtains, soft

start and shutdown zones significantly reduces any possibility of injury. Given sufficient notice through use of soft starts (for impact driving), marine mammals are expected to move away from a sound source that is annoying prior to it becoming potentially injurious.

The CTJV will use qualified PSOs stationed strategically to increase detectability of marine mammals, enabling a high rate of success in implementation of shutdowns to avoid injury for most species. PSOs will be stationed on a specific Portal Island whenever pile driving operations are underway at that location. Additional PSOs will be stationed at the same Portal Island and in other locations in order to provide a relatively clear views of the shutdown zone and monitoring zones. These factors will limit exposure of animals to noise levels that could result in injury.

The CTJV's planned pile driving activities are highly localized. Only a relatively small portion of the Chesapeake Bay may be affected. Localized noise exposures produced by project activities may cause short-term behavioral modifications in affected cetaceans and pinnipeds Moreover, the required mitigation and monitoring measures are expected to further reduce the likelihood of injury as well as reduce behavioral disturbances.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006). Individual animals, even if taken multiple times, will most likely move away from the sound source and be temporarily displaced from the areas of pile driving, although even

this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted along both Atlantic and Pacific coasts, which have taken place with no known long-term adverse consequences from behavioral harassment. Furthermore, many projects similar to this one are also believed to result in multiple takes of individual animals without any documented long-term adverse effects. Level B harassment will be minimized through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring.

In addition to the expected effects resulting from authorized Level B harassment, we anticipate that small numbers of dolphins, harbor porpoises, harbor seals and gray seals may sustain some limited Level A harassment in the form of auditory injury. However, animals that experience PTS would likely only receive slight PTS, *i.e.* minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by pile driving (*i.e.*, the low-frequency region below 2 kHz), not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal's threshold would increase by a few dBs, which is not likely to meaningfully affect its ability to forage and communicate with conspecifics. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start.

The project is not expected to have significant adverse effects on marine mammal habitat. No important feeding and/or reproductive areas for marine mammals are known to be near the project area. Project activities would not permanently modify existing marine mammal habitat. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammal foraging opportunities in a limited portion of the foraging range. However, because of the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality is anticipated or authorized;
- Limited Level A harassment exposures (dolphins, harbor porpoises, harbor seals, and gray seals) are anticipated to result only in slight PTS, within the lower frequencies associated with pile driving;
- The anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior that would not result in fitness impacts to individuals;
- The specified activity and associated ensonifed areas are very small relative to the overall habitat ranges of all species and does not include habitat areas of special significance (BIAs or ESA-designated critical habitat); and

- The presumed efficacy of the required mitigation measures in reducing the effects of the specified activity.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from the planned activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Authorized take of marine mammal stocks comprises less than 5 percent of the Western North Atlantic harbor seal stock abundance, and less than one percent of all other authorized stocks, with the exception of bottlenose dolphins. There are three bottlenose dolphin stocks that could occur in the project area. Therefore, the estimated 28,674 dolphin takes by Level A and Level B harassment would likely be split among the western North Atlantic northern migratory coastal stock, western North Atlantic southern migratory coastal stock, and NNCES stock. Based on the stocks' respective occurrence in

the area, NMFS estimated that there would be no more than 200 takes from the NNCES stock, representing 24 percent of that population, with the remaining takes split evenly between the northern and southern migratory coastal stocks. Based on consideration of various factors described below, we have determined the numbers of individuals taken would comprise less than one-third of the best available population abundance estimate of either coastal migratory stock. Detailed descriptions of the stocks' ranges have been provided in **Description of Marine Mammals in the Area of Specified Activities**.

Both the northern migratory coastal and southern migratory coastal stocks have expansive ranges and they are the only dolphin stocks thought to make broad-scale, seasonal migrations in coastal waters of the western North Atlantic. Given the large ranges associated with these two stocks it is unlikely that large segments of either stock would approach the project area and enter into the Bay. The majority of both stocks are likely to be found widely dispersed across their respective habitat ranges and unlikely to be concentrated in or near the Chesapeake Bay.

Furthermore, the Chesapeake Bay and nearby offshore waters represent the boundaries of the ranges of each of the two coastal stocks during migration. The northern migratory coastal stock is found during warm water months from coastal Virginia, including the Chesapeake Bay and Long Island, New York. The stock migrates south in late summer and fall. During cold water months dolphins may be found in coastal waters from Cape Lookout, North Carolina, to the North Carolina/Virginia. During January–March, the southern migratory coastal stock appears to move as far south as northern Florida. From April to June, the stock moves back north to North Carolina. During the warm water months of July–August, the stock is presumed to occupy coastal waters north

of Cape Lookout, North Carolina, to Assateague, Virginia, including the Chesapeake Bay. There is likely some overlap between the northern and southern migratory stocks during spring and fall migrations, but the extent of overlap is unknown.

The Bay and waters offshore of the mouth are located on the periphery of the migratory ranges of both coastal stocks (although during different seasons). Additionally, each of the migratory coastal stocks are likely to be located in the vicinity of the Bay for relatively short timeframes. Given the limited number of animals from each migratory coastal stock likely to be found at the seasonal migratory boundaries of their respective ranges, in combination with the short time periods (~two months) animals might remain at these boundaries, it is reasonable to assume that takes are likely to occur only within some small portion of either of the migratory coastal stocks.

Both migratory coastal stocks likely overlap with the NNCES stock at various times during their seasonal migrations. The NNCES stock is defined as animals that primarily occupy waters of the Pamlico Sound estuarine system (which also includes Core, Roanoke, and Albemarle sounds, and the Neuse River) during warm water months (July–August). Members of this stock also use coastal waters (≤1 km from shore) of North Carolina from Beaufort north to Virginia Beach, Virginia, including the lower Chesapeake Bay. Comparison of dolphin photo-identification data confirmed that limited numbers of individual dolphins observed in Roanoke Sound have also been sighted in the Chesapeake Bay (Young 2018). Like the migratory coastal dolphin stocks, the NNCES stock covers a large range. The spatial extent of most small and resident bottlenose dolphin populations is on the order of 500 km^2, while the NNCES stock occupies over 8,000 km^2 (LeBrecque *et al*. 2015). Given this large range, it is again unlikely that a

preponderance of animals from the NNCES stock would depart the North Carolina estuarine system and travel to the northern extent of the stock's range and enter into the Bay. However, recent evidence suggests that there is likely a small resident community of NNCES dolphins of indeterminate size that inhabits the Chesapeake Bay year-round (Patterson, Pers. Comm*).*

Many of the dolphin observations in the Bay are likely repeated sightings of the same individuals. The Potomac-Chesapeake Dolphin Project has observed over 1,200 unique animals since observations began in 2015. Re-sightings of the same individual can be highly variable. Some dolphins are observed once per year, while others are highly regular with greater than 10 sightings per year (Mann, *pers. comm.*). Similarly, using available photo-identification data, Engelhaupt *et al*. (2016) determined that specific individuals were often observed in close proximity to their original sighting locations and were observed multiple times in the same season or same year. Ninety-one percent of re-sighted individuals (100 of 110) in the study area were recorded less than 30 km from the initial sighting location. Multiple sightings of the same individual would considerably reduce the number of individual animals that are taken by harassment. Furthermore, the existence of a resident dolphin population in the Bay would increase the percentage of dolphin takes that are actually re-sightings of the same individuals.

In summary and as described above, the following factors primarily support our preliminary determination regarding the incidental take of small numbers of a species or stock:

- The take of marine mammal stocks authorized for take comprises less than 5 percent of any stock abundance (with the exception of bottlenose dolphin stocks);

- Potential bottlenose dolphin takes in the project area are likely to be allocated among three distinct stocks;
- Bottlenose dolphin stocks in the project area have extensive ranges and it would be unlikely to find a high percentage of any one stock concentrated in a relatively small area such as the project area or the Bay;
- The Bay represents the migratory boundary for each of the specified dolphin stocks and it would be unlikely to find a high percentage of any stock concentrated at such boundaries; and
- Many of the takes would be repeats of the same animal and it is likely that a number of individual animals could be taken 10 or more times.

Based on the analysis contained herein of the planned activity (including the required mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our action (*i.e*., the issuance of incidental harassment authorizations) with respect

to potential impacts on the human environment. This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the issuance of this IHA to the CTJV qualifies to be categorically excluded from further NEPA review.

Endangered Species Act (ESA)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

No incidental take of ESA-listed species is authorized or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Authorization

NMFS has issued an IHA to the CTJV for the incidental take of marine mammal due to pile driving activities as part of the PTST project for a period of one year from the date of issuance, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: March 10, 2020.

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Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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