



## INCIDENTAL HARASSMENT AUTHORIZATION

The Hampton Roads Connector Partners (HRCP) is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1371(a)(5)(D)) to harass marine mammals incidental to the Hampton Roads Bridge-Tunnel (HRBT) Expansion Project, Hampton-Norfolk, Virginia, when adhering to the following terms and conditions.

1. This Incidental Harassment Authorization (IHA) is valid for a period of one year from the date of issuance.
2. This IHA is valid only for construction activities associated with the HRBT Expansion Project, Hampton-Norfolk, Virginia.
3. General Conditions
  - (a) A copy of this IHA must be in the possession of HRCP, its designees, work crew personnel, and Protected Species Observers (PSOs) operating under the authority of this IHA.
  - (b) The species authorized for taking are harbor seal (*Phoca vitulina*), gray seal (*Halichoerus grypus*), bottlenose dolphin (*Tursiops truncatus*), harbor porpoise (*Phocoena phocoena*) and humpback whale (*Megaptera novaeangliae*).
  - (c) The taking, by Level A harassment and Level B harassment, is limited to the species listed in condition 3(b). Table 1 (attached) provides the authorized number of takes per species and stock.
  - (d) HRCP must conduct briefings for construction supervisors and crews, the monitoring team, and HRCP staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.
  - (e) The taking by serious injury or death of any of the species listed in condition 3(b) or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA. Any taking exceeding



the authorized amounts listed in Table 1 is prohibited and may result in the modification, suspension, or revocation of this IHA.

#### 4. Mitigation Measures

The holder of this IHA is required to implement the following mitigation measures:

- (a) For in-water construction, heavy machinery activities other than pile driving, if a marine mammal comes within 10 meters (m), HRCP must cease operations and reduce vessel speed to the minimum level required to maintain steerage and safe working conditions.
- (b) HRCP must implement shutdown zones and monitoring zones as described in Tables 2 and 3, respectively (attached).
- (c) Marine mammal monitoring must take place from 30 minutes prior to initiation of pile driving activity through 30 minutes post-completion of pile driving activity. Pre-activity monitoring must be conducted for 30 minutes to ensure that the shutdown zone is clear of marine mammals, and pile driving may commence when observers have declared the shutdown zone clear of marine mammals. In the event of a delay or shutdown of activity resulting from marine mammals in the shutdown zone (Table 2), their behavior must be monitored and documented until they leave of their own volition or a minimum period of 15 minutes with no further observation of the animal has elapsed, at which point the activity may begin.
- (d) If a marine mammal is entering or is observed within an established shutdown zone (Table 2), pile driving must be halted or delayed. Pile driving may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone, or 15 minutes have passed without subsequent detections of marine mammals.
- (e) If a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the Level B harassment zone (monitoring zone) (Table 3), pile driving installation activities must shut down immediately using delay and shut-down procedures. Activities must not resume until the animal has been confirmed to have left the area or the 15-minute observation time period has elapsed.
- (f) During pile driving events involving concurrent use of multiple vibratory hammers at three project construction sites (North Trestle, North Shore, South Island), HRCP must monitor a Core Monitoring Area. The Core Monitoring Area must encompass the area between the two bridge/tunnels, with PSOs positioned at key areas to monitor the geographic area between the bridges. The PSOs must be able

to view west/southwest towards Batten Bay and the mouth of the Nansemond River.

- (g) HRCP would conduct work during daylight hours, and if poor environmental conditions restrict full visibility of the shutdown zone, pile installation must be delayed. However, work may extend into the night as necessary under conditions where there is full visibility of the shutdown zone or where stopping ongoing work would otherwise create an unsafe work condition.
- (h) HRCP must use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets. A soft start must 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 thirty minutes or longer.
- (i) HRCP must use an air bubble curtain system during impact pile driving of 36-in steel pipe piles in water depths greater than 6 m for the Jet Grouting Trestle. Bubble curtains must meet the following requirements:
  - i. The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.
  - ii. The lowest bubble ring must 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.
  - iii. The bubble curtain must be operated such that there is proper (equal) balancing of air flow to all bubblers.

## 5. Monitoring Measures

The holder of this IHA is required to abide by the following marine mammal monitoring measures:

Marine mammal monitoring must be conducted as described below.

- (a) Marine mammal monitoring during pile driving must be conducted by NMFS-approved PSOs in a manner consistent with the following:

- i. HRCP will station between one and four PSOs at locations offering the best available views of the Level A and Level B monitoring zones during in-water pile driving at the North Trestle, North Island, South Trestle, and South Island. When and where able, as determined by the PSO or Lead PSO when multiple observers are required, Level A and Level B harassment zones may be monitored for multiple pile driving locations by the same individual PSO. HRCP must station between one and two PSOs at locations offering the best available views of the Level A and Level B monitoring zones during in-water pile driving at Willoughby Bay.
- (b) PSO requirements during monitoring.
- i. Independent PSOs (*i.e.*, not construction personnel) who have no other assigned tasks during monitoring periods must be used.
  - ii. Other PSOs may substitute education (degree in biological science or related field) or training for experience.
  - iii. Where a team of three or more PSOs are required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience working as a marine mammal observer during construction.
  - iv. HRCP must submit PSO CVs for approval by NMFS prior to the beginning of pile driving and drilling.

## 6. Reporting

The holder of this IHA is required to:

- (a) Submit a draft report on all monitoring conducted under the IHA within ninety calendar days of the completion of marine mammal monitoring or sixty days prior to the issuance of any subsequent IHA for this project, whichever comes first. A final report must be prepared and submitted within thirty days following resolution of comments on the draft report from NMFS. This report must contain the following:
  - i. Dates and times (begin and end) of all marine mammal monitoring.
  - ii. Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (*i.e.*, impact or vibratory).
  - iii. Weather parameters and water conditions during each monitoring period (*e.g.*, wind speed, percent cover, visibility, sea state).

- iv. The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at time of sighting.
- v. Age and sex class, if possible, of all marine mammals observed.
- vi. PSO locations during marine mammal monitoring.
- vii. Distances and bearings of each marine mammal observed to the pile being driven or removed for each sighting (if pile driving or removal was occurring at time of sighting).
- viii. Description of any marine mammal behavior patterns during observation, including direction of travel and estimated time spent within the Level A and Level B harassment zones while the source was active.
- ix. Number of individuals of each species (differentiated by month as appropriate) detected within the monitoring zone, and estimates of number of marine mammals taken, by species (a correction factor may be applied to total take numbers, as appropriate).
- x. Detailed information about any implementation of any mitigation triggered (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting behavior of the animal, if any.
- xi. Description of attempts to distinguish between the number of individual animals taken and the number of incidences of take, such as ability to track groups or individuals.
- xii. Level B harassment exposures recorded by PSOs must be extrapolated. An extrapolation of the estimated takes by Level B harassment must be based on the number of observed exposures within the Level B harassment zone and the percentages of the Level B harassment zone that was not visible.
- xiii. Marine mammal PSO observational datasheets or raw data.
- xiv. Description of other human activity in the area.

(b) Reporting injured or dead marine mammals:

- i. In the event that personnel involved in the construction activities discover an injured or dead marine mammal, HRCP shall report the incident to the Office of Protected Resources (OPR) (301-427-8401), NMFS and to the Greater Atlantic Region New England/Mid-Atlantic Regional Stranding Coordinator (978-282-8478 or 978-281-9291) as soon as feasible. If the death or injury was clearly caused by the specified activity, the IHA-holder must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional

measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS.

The report must include the following information:

1. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
  2. Species identification (if known) or description of the animal(s) involved;
  3. Condition of the animal(s) (including carcass condition if the animal is dead);
  4. Observed behaviors of the animal(s), if alive;
  5. If available, photographs or video footage of the animal(s); and
  6. General circumstances under which the animal was discovered.
7. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

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Donna S. Wieting,  
Director, Office of Protected Resources  
National Marine Fisheries Service

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Date

## Appendices

**Table 1—Species authorized for take**

<b>Species</b>	<b>Stock</b>	<b>Authorized Level A Takes</b>	<b>Authorized Level B Takes</b>
Humpback whale	Gulf of Maine	0	12
Harbor porpoise	Gulf of Maine/Bay of Fundy	2	4
Bottlenose dolphin	WNA Coastal, Northern Migratory <sup>a</sup>	0	29,320
	WNA Coastal, Southern Migratory <sup>a</sup>	0	29,320
	NNCES <sup>a</sup>	0	216
Harbor seal	Western North Atlantic	459	1,725
Gray seal	Western North Atlantic	0	9

**Table 2—Shutdown Zones**

Pile Type/Activity	Sound Source Level at 10 m	Level A harassment Shutdown Zone (m)			
		Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid
<b>Vibratory Pile Driving</b>					
24-in steel pile installation (All Locations)	161 dB SPL	15	10	21	10
36-in steel pile installation (All Locations)	167 dB SPL	32	10	47	20
36-in steel pile installation (TMB Platform)	167 dB SPL	28	10	41	17
42-in steel pile installation (All Locations)	168 dB SPL	42	10	62	26
<b>Impact Pile for the Jet Grouting Trestle</b>					
36-in steel pile installation	183 dB SEL/193 SPL	243	10	290	130
36-in steel pile installation (attenuated)	176 dB SEL/186 SPL	83	10	99	45
<b>Impact Pile Driving North Trestle</b>					
36-in steel pile installation (North Shore Work Trestle)	183 dB SEL/193 SPL	243	10	290	130
<b>Impact Pile Driving for North Trestle, Willoughby Bay, and South Trestle Test Pile Program</b>					
24-in concrete square pile installation/removal	166 dB SEL/190 SPL	121	10	144	65
30-in concrete square pile installation/removal	177 dB SEL/187 SPL	652	24	777	349
54-in concrete square pile installation/removal	177 dB SEL/187 SPL	652	24	777	349
<b>Impact Pile Driving for South Island</b>					
36-in steel pile installation (TBM Platform)	183 dB SEL/193 SPL	243	10	290	130
36-in steel pile installation (Conveyor Trestle)	183 dB SEL/193 SPL	243	10	290	130
<b>DTH Drilling</b>					
36-in steel pile installation (TBM Platform)	164SEL/180 dB SPL	1,171	42	1,395	100
36-in steel pile installation (North Shore Work Trestle)	164 SEL/180 dB SPL	1,534	55	1,827	100
36-in steel pile installation (Jet Grouting Trestle)	164 SEL/180 dB SPL	1,534	55	1,827	100

36-in steel pile installation (Conveyor Trestle)	164 SEL/180 dB SPL	1,534	55	1,827	100
<b>Multiple Hammers - Vibratory Pile Driving (if occurs)*</b>					
42-in steel pile installation (assumes 3 piles installed simultaneously, 6 piling events * 30 minutes each event in a 24-hr period)	173 dB SPL	100	100	100	100
42-in steel pile installation (assumes 2 piles installed simultaneously, 9 piling events * 30 minutes each event in a 24-hr period)	171 dB SPL	100	100	100	100

\*These zones are applicable for any multiple hammer events of any pile size where sound fields overlap.

**Table 3—Level B Harassment monitoring zones**

<b>Location and Component</b>	<b>Method and Pile Type</b>	<b>Distance to Level B Harassment Zone (m)</b>
<b>Vibratory Hammer (Level B Isopleth = 120 dB)</b>		
<b>North Trestle</b>		
<b>Moorings</b>	42-in steel piles	15,849
<b>North Shore Work Trestle</b>	36-in steel piles	13,594
<b>Moorings</b>	24-in steel piles	5,412
<b>North Island</b>		
<b>Moorings</b>	42-in steel piles	15,849
<b>South Island</b>		
<b>TBM Platform</b>	36-in steel piles	13,594
<b>Conveyor Trestle</b>	36-in steel piles	13,594
<b>Jet Grouting Trestle</b>	36-in steel piles	13,594
<b>South Trestle</b>		
<b>Moorings</b>	42-in steel piles	15,849
<b>Moorings</b>	24-in steel piles	5,412
<b>Willoughby Bay</b>		
<b>Moorings</b>	42-in steel piles	15,849
<b>Moorings</b>	24-in steel piles	5,412
<b>Down-the-Hole Hammer (Level B Isopleth = 120 dB)</b>		

<b>Location and Component</b>	<b>Method and Pile Type</b>	<b>Distance to Level B Harassment Zone (m)</b>
<b>North Shore Work Trestle</b>	36-in steel piles	11,659
<b>TBM Platform</b>	36-in steel piles	11,659
<b>Jet Grouting Trestle</b>	36-in steel piles	11,659
<b>Conveyor Trestle</b>	36-in steel piles	11,659
<b>Impact Hammer (Level B Isopleth = 160 dB)</b>		
<b>North Trestle</b>		
<b>North Shore Work Trestle</b>	36-in steel piles	1,585
<b>South Island</b>		
<b>TBM Platform</b>	36-in steel piles	1,585
<b>Conveyor Trestle</b>	36-in steel piles	1,585
<b>Jet Grouting Trestle with Bubble Curtain</b>	36-in steel piles	541*
<b>North Trestle, South Trestle, Willoughby Bay</b>		
<b>Test Pile Program</b>	54-in concrete cylinder piles	631
<b>Test Pile Program</b>	30-in concrete square piles	631
<b>Test Pile Program</b>	24-in concrete square piles	117

*dB = decibels; km<sup>2</sup> = square kilometers; TBM = Tunnel Boring Machine.*

\*Values smaller than other 36-in steel piles due to usage of a bubble curtain, resulting in a 7 dB reduction in dB rms, dB peak, and dB SEL.