



MARINE MAMMAL COMMISSION

26 December 2019

Ms. Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by the Chesapeake Tunnel Joint Venture (CTJV) seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act to take small numbers of marine mammals by harassment. The taking would be incidental to construction activities for the Parallel Thimble Shoal Tunnel Bridge Project in Virginia. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 25 November 2019 notice (83 Fed. Reg. 64847) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

CTJV plans to construct a second tunnel under the Chesapeake Bay during a multi-year project. During this year's activities, operators would install and/or remove up to 870 piles¹ including 12-in timber piles and 36- and 42-in steel pipe piles using a vibratory hammer, impact hammer, and/or down-the-hole (DTH) hammer. CTJV expects activities to take up to 198 days², weather permitting. It would limit pile-driving activities to daylight hours only.

NMFS preliminarily has determined that, at most, the proposed activities could cause Level A and B harassment of small numbers of five marine mammal species. NMFS anticipates that any impact on the affected species and stocks would be negligible. NMFS also does not anticipate any take of marine mammals by death or serious injury and believes that the potential for disturbance will be at the least practicable level because of the proposed mitigation measures. The proposed mitigation, monitoring, and reporting measures include—

¹ The Commission informally noted that the *Federal Register* notice indicated that 888 piles would be installed and/or removed (84 Fed. Reg. 64848), while Table 1 indicated that 878 piles would be installed and/or removed. NMFS clarified that CTJV intends to install and/or remove up to 870 piles.

² The Commission informally noted that the *Federal Register* notice indicated that CTJV would conduct pile installation and removal on up to 188 days of activities (84 Fed. Reg. 64848), while Table 1 yielded 562 days total for pile driving and removal. Given that NMFS indicated that simultaneous pile driving/removal would occur on 180 days, pile driving and/or removal would occur on 382 days—more days than occur within a given year. NMFS clarified that CTJV estimated the number of days of pile driving and/or removal incorrectly and would conduct activities on 198 days based on no more than 18 days of pile driving and/or removal in the months of January through November.

- using a sound attenuation device (i.e., bubble curtain) during impact driving and implementing various measures regarding performance standards;
- ceasing heavy machinery activities if any marine mammal comes within 10 m of the equipment;
- using standard soft-start, delay, and shut-down procedures;
- using two to four qualified land-based protected species observers (PSOs) to monitor the Level A and B harassment zones for 30 minutes before, during, and for 30 minutes after the proposed activities;
- using delay and shut-down procedures, if a species for which authorization has not been granted or if a species for which authorization has been granted but the authorized number of takes already has been met, approaches or is observed within the Level A or B harassment zone;
- reporting injured and dead marine mammals to the Office of Protected Resources and the Greater Atlantic Regional Stranding Coordinator using NMFS's phased approach and suspending activities, if appropriate; and
- submitting a draft and final report.

General comments

Similar to CTJV's previous authorization³, the Commission informally noted a number of issues that were not addressed prior to publication of the *Federal Register* notice (see the Addendum, as well as other portions of this letter). Although the Commission appreciates that NMFS will resolve some of the issues accordingly in the preamble and the final authorization, it notes that to allow full and transparent public review these issues should have been identified and addressed prior to publication of the *Federal Register* notice. Unfortunately, some of the issues remain unresolved and the manner in which NMFS plans to address them is unknown. Thus, the Commission cannot meaningfully comment on these issues, nor can the public because it is unaware of them.

It took NMFS more than three weeks to respond to the Commission's informal comments, which were provided to NMFS the day after the notice published. The Commission understands that NMFS was awaiting responses from CTJV on the majority of the issues, but this effectively truncated the public comment period to one week. 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.

Level A harassment zones

Inputs and extents of Level A harassment zones—In addition to an incorrect number of piles to be driven and/or removed and an incorrect number of pile-driving and -removal days, the Commission informally noted that many of the inputs to estimate Level A harassment zones stipulated by NMFS in Table 7 of the *Federal Register* notice do not comport with the information NMFS provided in Table 1. Specifically, there were errors in the numbers of piles to be driven or installed per day⁴ for

³ See the Commission's [30 May 2018 letter](#).

⁴ Table 1 indicated more piles would be installed/removed per day than included in Table 7.

all activities except vibratory driving of 12-in timber piles and impact driving of 36-in piles with a bubble curtain. NMFS also overestimated the propagation loss for DTH drilling of 36- and 42-in piles. Denes et al. (2019) found that propagation loss for DTH drilling at the study site is much less than 15 log R. The average propagation loss for the three piles that were driven without a bubble curtain was 6.63 for root-mean-square sound pressure level (SPL_{rms}) and 8.7 for sound exposure level (SEL). In addition, inputs for vibratory removal of 12-in timber piles and simultaneous DTH drilling and impact installation of 36-in piles with a bubble curtain were not included in Table 7. In response to the Commission's informal comments, NMFS did not adjust the number of piles that could be installed on a given day, citing its assumption that an animal would occur within the Level A harassment zone 50 percent of the time. NMFS indicated that an individual animal would have to remain within the Level A harassment zones when all of the piles are installed throughout the day (84 Fed. Reg. 64863). Since the marine mammals proposed for authorization are highly mobile, it is unlikely that an animal would remain within the Level A harassment zone during the installation of, for example, 10 piles during an 8-hour period (84 Fed. Reg. 64863). Thus, NMFS reduced the number of piles driven per day by approximately 50 percent to estimate more realistic Level A harassment zones.

Although the Commission's informal comment was based on inconsistencies in the operational parameters, it disagrees with NMFS's 50-percent reduction assumption, particularly since the pinnipeds haul out on the portal islands and could occur within the Level A harassment zone throughout the day. But, more importantly, NMFS did not adjust the total number of piles to be driven or removed in a day⁵ based on the information provided in Table 1, which was the basis of the Commission's original comments. Table 1 indicated that (1) 12 or 15 12-in timber piles could be installed per day with an impact hammer, while NMFS assumed only 5 would be installed rather than 6 or 8 based on the 50-percent reduction and (2) 12 36-in piles could be installed/removed per day with a vibratory and impact hammer, while NMFS assumed that 5 and 4 piles would be installed, respectively, rather than 6 based on the 50-percent reduction. NMFS also assumed that five 42-in casings would be removed with a vibratory hammer rather than three as noted in Table 1 and that DTH drilling would occur for two 42-in piles per day—neither of which was reduced by NMFS's arbitrary 50 percent. Furthermore, NMFS still did not include inputs in its revised Table 7 simultaneous DTH drilling and impact installation of 36-in piles with a bubble curtain⁶, even though the Level A harassment zones were provided in NMFS's revised Table 8. The Commission cannot meaningfully comment on the extents of the Level A harassment zones for simultaneous DTH drilling and impact installation of 36-in piles with a bubble curtain. As such, the Commission recommends that NMFS (1) revise the Level A harassment zones based on up to (a) 15 timber piles installed per day with an impact hammer, (b) 12 36-in piles installed per day with both a vibratory and impact hammer, and (c) 3 42-in casings removed with a vibratory hammer per day based on Table 1; (2) provide the relevant inputs for estimating the Level A harassment zones associated with simultaneous DTH drilling and impact installation of 36-in piles with a bubble curtain; and (3) refrain from arbitrarily reducing the number of piles to be installed/removed per day by 50 percent. If NMFS intends to use its arbitrary 50-percent reduction in the number of piles to be installed/removed per day, the Commission recommends that NMFS implement that reduction consistently for all pile sizes, types, and installation/removal methods.

⁵ Before being reduced by an arbitrary 50 percent.

⁶ NMFS has since confirmed that CJTV has changed its plans and will remove the 12-in timber piles by cutting them at the mudline rather than removing them with a vibratory hammer.

Appropriate accumulation time for Level A harassment zones—As the Commission has indicated in previous letters, there are some shortcomings that need to be addressed regarding the method for determining the extent of the Level A harassment zones based on the cumulative SEL (SEL_{cum}) thresholds for the various types of sound sources, including stationary sound sources⁷. For determining the range to the SEL_{cum} thresholds, NMFS uses a baseline accumulation period of 24 hours unless an activity would occur for less time (e.g., 8 hours). In instances when action proponents either are unable or choose not to conduct more sophisticated modeling⁸, the receiver is assumed to be stationary and all of the energy emitted during that period is accumulated for the SEL_{cum} thresholds. For CTJV's activities, that assumption results in the Level A harassment zones for low- and high-frequency cetaceans being greater than the Level B harassment zones during impact pile driving of 36- and 42-in steel piles with and without bubble curtains, during impact installation of 12-in timber piles⁹, and during DTH drilling of 36- and 42-in piles¹⁰ and simultaneous DTH drilling¹¹. Based on the extent of those zones, it is assumed that an animal would experience PTS before responding behaviorally and leaving or avoiding the area. That notion runs counter to the logic that permanent and temporary physiological effects are expected to occur closest to the sound source, with behavioral responses triggered at lower received levels, and thus at farther distances. But, as the Commission has already noted, it also does not believe that NMFS should arbitrarily assume that an animal would remain in the area for, in this case, 50 percent of the piles to be driven.

The Commission understands that NMFS has formed an internal committee to address this issue and is consulting with external acousticians and modelers as well. In the absence of relevant recovery time data for marine mammals, the Commission continues to believe that animat modeling, that considers various operational and animal scenarios, should be used to inform the appropriate accumulation time and could be incorporated into NMFS's user spreadsheet that currently estimates the Level A harassment zones. The Commission recommends that NMFS continue to make this issue a *priority* to resolve in the near future and consider incorporating animat modeling into its user spreadsheet.

Bubble curtain efficacy

The Commission has commented numerous times on the assumptions used by NMFS regarding the efficacy of bubble curtains, and advises that [its 2 December 2019 letter](#) be reviewed in conjunction with this letter. NMFS has adopted a standard 7-dB source level reduction when bubble curtains are to be used during impact pile driving. Although variability in attenuation levels can result from differences in device design and site and environmental conditions and from difficulties in properly installing and operating sound attenuation devices, bubble curtains that are placed immediately around the pile do not achieve consistent reductions in sound levels because they cannot attenuate ground-borne sound¹². That is, appreciable attenuation is not observed for the

⁷ However, this also could be an issue for moving sound sources that have short distances between transect lines.

⁸ Sound propagation and animat modeling.

⁹ The Level A and B harassment zones are exactly the same for phocids.

¹⁰ The Level A harassment zones are greater than the Level B harassment zones for phocids as well.

¹¹ Some of these examples were based on revised Level A harassment zones provided by NMFS.

¹² Bubble curtains also attenuate high-frequency rather than low-frequency sound.

sound that resonates through the ground into the far field or for low-frequency sound in general.

In this instance, CTJV contracted JASCO Applied Sciences (JASCO) to conduct *in-situ* measurements of DTH drilling of 42-in piles both with and without a bubble curtain. Although DTH drilling had been characterized by other *in-situ* monitoring projects as non-impulsive, continuous sound, Denes et al. (2019) determined that the sound emitted at CTJV's site was in fact impulsive¹³. This is not too surprising since CTJV was drilling through bedrock. Denes et al. (2019) also found nearly identical mean source levels for two piles that used a bubble curtain and one pile that did not. Although the bubble curtain may have flattened the peak energy of the two piles for which a bubble curtain was used, the overall sound pressure levels for both peak (SPL_{peak}) and SPL_{rms} and the overall sound exposure levels for a single strike (SEL_{s-s}) were comparable and within one standard deviation¹⁴ for the two piles with which the bubble curtain was used and the two piles with which the bubble curtain was not used (Figures 21-23 and Table 4 in Denes et al. 2019). CTJV did not propose to use a bubble curtain when conducting DTH drilling, which is not surprising since it did not provide any substantive sound attenuation. Given that Denes et al. (2019) determined that the sound emitted during DTH drilling was considered impulsive rather than non-impulsive, the Commission questions whether the bubble curtain would provide NMFS's presumed 7-dB reduction in source levels for impact driving, which also emits impulsive sound.

In response to the Commission's recommendation that NMFS refrain from using a source level reduction factor until such time that it consults with various experts regarding the appropriate source level reduction factor to use to minimize far-field effects on marine mammals (see the Commission's [6 November 2019 letter](#)), NMFS indicated that it would evaluate the appropriateness of using an alternative source level reduction factor for sound attenuation device implementation during pile driving for all relevant incidental take authorizations *as more data become available* and contact experts as appropriate (84 Fed. Reg. 64834). NMFS is in possession of the relevant data that refute the appropriateness of the 7-dB source level reduction. However, NMFS again indicated in its response that, at approximately 10 m, Austin et al. (2016) measured reductions in mean source levels for impact pile driving of 10 dB (or higher) when comparing two piles driven using a hydraulic hammer with and without a bubble curtain (84 Fed. Reg. 64834). Highlighting a few references of individual piles that show an appreciable near-field reduction stands in stark contrast to the plethora of data that NMFS has compiled that shows attenuated and unattenuated median source levels measured in the field differ by only 1 to 6 dB at 10 m. Thus, a 7-dB source level reduction factor is unsubstantiated by the data currently available.

If the currently available data show that a 7-dB reduction is unsubstantiated at 10 m, that reduction would never persist in the far field at distances of 100 m or more. NMFS did acknowledge that at distances farther away from a pile (e.g., 1 km), a variety of factors can influence the measured sound level (including transmission loss, benthic type, pile location, etc.; 84 Fed. Reg. 64834). However, it did not include frequency or ground-borne refraction in the list of factors that influence far-field sound levels.

Although it is unclear why NMFS is not consulting with the relevant experts, including acousticians at the University of Washington-Applied Physics Laboratory (UW-APL), to resolve this

¹³ With a mean pulse duration of 20 msec.

¹⁴ For both source levels and sound levels in the far field, up to 70 m from the pile.

issue, it is clear that NMFS is not basing its use of the 7-dB source level reduction factor on best available science, particularly since it has the necessary data to address this issue. As such, the Commission recommends that NMFS (1) consult with acousticians, including those at UW-API, regarding the appropriate source level reduction factor to use to minimize near-field (<100 m) and far-field (>100 m) effects on marine mammals¹⁵ or (2) 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.

Bottlenose dolphin takes

The Commission informally noted that it was unclear why CTJV truncated the seasonal bottlenose dolphin density data¹⁶ from Engelhaupt et al. (2016) data¹⁷ to 12 km, effectively reducing the densities in some cases by a factor of 6¹⁸. CTJV and thus NMFS used the untruncated seasonal densities from Engelhaupt et al. (2016) in the previous incidental harassment authorization and those should have been used again. CTJV indicated that a subset of survey data from Engelhaupt et al. (2016) was used to determine seasonal dolphin densities in the bay near the project area. CTJV used a spatially-refined approach of plotting dolphin sightings within 12 km of the project location and then determined densities following the methodology outlined in Engelhaupt et al. (2016) and using distance sampling software. That method makes no logical sense as Engelhaupt et al. (2016) did not survey all of the area near the project site, but rather they surveyed within approximately 4 km of the coast (see Figure 1). It is unclear whether CTJV drew a box 12 km around the project site and encompassed some of the sightings data. If so, that approach is fundamentally flawed as it is not based on distance sampling methods and does not assume equal survey effort within that box, since the majority of the box had no survey effort. Thus, lack of survey effort does not equate to lack of dolphins. If CTJV just truncated Engelhaupt's data at 12 km, that too is not appropriate. Furthermore, the Commission informally noted that based on CTJV's sightings data from July 2019, the average density of animals sighted was 4.37 dolphins/km² (based on the average of 23.2 dolphins observed per day within 1.3 km, which equated to an area of 5.31 km²). That density is actually greater than the original, untruncated Engelhaupt et al. (2016) density of 3.88 dolphins/km² for summer. The observed 4.37 dolphins/km² is much greater than the truncated estimate of 0.62 dolphins/km² noted in Table 10 of the *Federal Register* notice and used to estimate the numbers of takes.

In response to the Commission's informal comments, CTJV indicated that it would revise the seasonal bottlenose dolphin densities by truncating the data at 19 km¹⁹ rather than 12 km. CTJV noted that the 19-km dolphin density estimates are likely the best fitting data as those data are very close to the Level B harassment zone of 21 km for vibratory pile driving and removal. CTJV further considered it likely that, as the revised dolphin density estimates are extended beyond the actual

¹⁵ Which also includes Level A harassment in some instances.

¹⁶ Inshore data.

¹⁷ Densities of 0.63 dolphins/km² for winter, 1.0 dolphins/km² for spring, 3.55 dolphins/km² for summer, and 3.88 dolphins/km² for fall.

¹⁸ Densities of 0.26 dolphins/km² for winter, 0.6 dolphins/km² for spring, 0.62 dolphins/km² for summer, and 1.17 dolphins/km² for fall.

¹⁹ Densities of 0.25 dolphins/km² for winter, 0.96 dolphins/km² for spring, 2.05 dolphins/km² for summer, and 1.19 dolphins/km² for fall.

survey area, using the entire dataset for density estimates would likely overestimate dolphin takes unnecessarily. The Commission disagrees.

First, it appears that CTJV may not understand how the original densities were calculated and what is and is not appropriate for reapportioning them²⁰. Second, if a 19-km box was drawn around the site, lack of survey effort does not equate to lack of bottlenose dolphins, particularly when the water depths at the project site are comparable to where Engelhaupt et al. (2016) conducted their surveys, in approximately 10 m of water. Third, if CTJV truncated the data at 19 km, that also is not appropriate. Engelhaupt et al. (2016) noted that inshore density estimates in Chesapeake Bay and off Cape Henry²¹, which are both within the Level B harassment zones, were greater than the entire inshore dataset for the warm season²². Thus, the densities are greater in the project area than along the Outer Coast—data that CTJV is attempting to remove from its density calculation. Fourth, monitoring data from CTJV's site indicate that the densities provided by Engelhaupt et al. (2016) are in fact appropriate. Fourth, the revised dolphin density estimates were not extended well beyond the survey area, as the habitat and water depths of the inshore surveys by Engelhaupt et al. (2016) and the areas around CTJV's project site are very similar. Thus, it follows that the densities would be similar, which is evident from the 2019 monitoring data.

In addition, the Commission informally noted that once the number of observed takes is extrapolated to the extents of the Level B harassment zones that are unobserved²³, CTJV very likely will exceed the authorized numbers of takes. This is problematic for resident species such as bottlenose dolphins that may occur in the project area throughout the day but for which individuals generally are not tracked by PSOs. Thus, the same animals could be taken throughout the day but would be enumerated as separate takes. To ensure that the number of bottlenose dolphin takes is sufficient and to minimize any unnecessary delays in conducting the proposed activities, the Commission recommends that NMFS use the untruncated seasonal densities for bottlenose dolphins from Engelhaupt et al. (2016)¹⁷, consistent with the previous authorization and the July 2019 monitoring data, to estimate the numbers of Level B harassment takes. Given that the same individuals could be taken on multiple days²⁴, NMFS could authorize the *maximum number of individuals* taken on a given day and the *number of days* that the activities would occur rather than the total number of Level B harassment takes, similar to its recent authorization for the City of Astoria's construction activities (84 Fed. Reg. 68130).

²⁰ CTJV appears to imply that, because Engelhaupt et al. (2016) truncated the data at ~325 m based on the best fit for $f(0)$, data beyond that distance were not reliable or therefore not included in the density estimates. CTJV indicated it was unclear how the density estimates would be affected with the extrapolation to 12 or 19 km. The reason the data were truncated at 325 m was due to the reduced platform elevation (4 m above the water) and the lack of big-eye binocular use, as used on large vessel surveys. The quality of the data are not questionable, neither are the assumptions underlying density estimation. Densities are applicable beyond the truncation distance and beyond only those transects specifically surveyed.

²¹ Engelhaupt et al. (2016) further delineated the densities based on sightings data in Chesapeake Bay, off Cape Henry, and along the Outer Coast.

²² The average density for the entire inshore dataset in summer/fall was 3.72 dolphins/km² compared to 3.82 for just Chesapeake Bay and Cape Henry (Table 5 in Engelhaupt et al. 2016).

²³ More than 10 and 21 km for DTH drilling and vibratory pile driving, respectively.

²⁴ Based on the available photo-identification data, Engelhaupt et al. (2016) indicated that individuals were often observed in close proximity to their original sighting locations and were observed multiple times in the same season or same year, but rarely between years.

Proposed one-year authorization renewals

NMFS has indicated that it may issue a one-year incidental harassment authorization renewal for this and other future authorizations if various criteria are met and after an expedited public comment period of 15 days. The Commission and various other entities (e.g., 84 Fed. Reg. 31035 and 52466) have asserted and continue to affirm that the renewal process is inconsistent with the statutory requirements under section 101(a)(5)(D) of the MMPA. As such, the Commission recommends that NMFS refrain from issuing renewals for any authorization and instead use its abbreviated *Federal Register* notice process. That process is similarly expeditious and fulfills NMFS's intent to maximize efficiencies.

Over the past few years, NMFS informed the Commission that a renewal would be issued as a one-time opportunity, after which time a new authorization application would be required. NMFS also has included such verbiage in its response to comments regarding renewals. Specifically, NMFS indicated that it had modified the language for future proposed incidental harassment authorizations to clarify that all authorizations, including renewal authorizations, are valid for no more than one year and that the agency will consider *only one renewal* for a project at this time (e.g., 84 Fed. Reg. 36892 from 30 July 2019). However, NMFS has yet to stipulate that the agency will consider *only one renewal* or that a renewal is a *one-time opportunity* in any *Federal Register* notice requesting comments on the possibility of a renewal, on its webpage detailing the renewal process²⁵, or in any draft or final authorization that includes a term and condition for a renewal (including section 8 of CTJV's draft authorization).

In response to the Commission's 29 November 2019 letter recommending that NMFS stipulate those specifics in the relevant documents and on its webpage, NMFS indicated that, in the 'summary' portion of its notices, it requests comments on a possible *one-year renewal* that could be issued under certain circumstances and if all requirements are met (84 Fed. Reg. 68131). However, neither the notices, nor the webpage or final authorizations state that *one-year renewals* are *one-time opportunities*. NMFS also indicated that, for notices involving proposed renewals, it has not included an option of an additional renewal (84 Fed. Reg. 68131). Absent specifics regarding one-year renewals being a one-time opportunity in the *Federal Register* notices, on NMFS's webpage, and more importantly as a term and condition in its draft and final authorizations, NMFS appears to knowingly allow that door to remain open. If NMFS chooses to continue proposing to issue renewals, the Commission recommends that it (1) stipulate that a renewal is a *one-time opportunity* (a) in all *Federal Register* notices requesting comments on the possibility of a renewal, (b) on its webpage detailing the renewal process, and (c) in all draft and final authorizations that include a term and condition for a renewal and, (2) if NMFS refuses to stipulate a renewal being a one-time opportunity, justify why it will include such a stipulation in its *Federal Register* notices, on its webpage, and in all draft and final authorizations.

In addition, the Commission commented in its [22 November 2019 letter](#) that NMFS was not ensuring that the renewal requirements had been met prior to proposing to issue a renewal or

²⁵ <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-harassment-authorization-renewals>

following its renewal process²⁶. Although NMFS indicated in response that it carefully considers whether applicants meet the criteria for a renewal upon request (84 Fed. Reg. 68131), it also has chosen to process proposed renewals for action proponents that have not met those criteria (i.e., Point Blue Conservation Science). The Commission recommends that NMFS refrain from proposing to issue a renewal in the *Federal Register* if action proponents have not met *all* renewal requirements.

Please contact me if you have questions regarding the Commission's recommendations.

Sincerely,



Peter O. Thomas, Ph.D.
Executive Director

References

- Denes, S., J. Vallarta, and D. Zeddies 2019. Sound source characterization of down-the-hole hammering: Thimble Shoal, Virginia. Version 1.0. JASCO Applied Sciences (USA) Inc., Silver Spring, Maryland. 80 pages.
- Engelhaupt, A., J. Aschettino, T.A. Jefferson, D. Engelhaupt, and M. Richlen. 2016. Occurrence, distribution, and density of marine mammals near Naval Station Norfolk and Virginia Beach. HDR Inc., Virginia Beach, Virginia. 156 pages.

²⁶ As part of that process, NMFS indicated it would contact directly all commenters on the original authorization to inform them of the opportunity to submit any additional comments on the proposed renewal authorization. The Commission has yet to be contacted for any renewal. It is unclear whether other commenters have been contacted.

Addendum

The Commission informally identified the following issues in the preamble to and draft authorization. NMFS indicated that these issues would be resolved in the CTJV's marine mammal monitoring plan, the final authorization, and the *Federal Register* notice for the authorization issuance.

- NMFS indicated in the *Federal Register* notice that the incidental harassment authorization would cover in-water activities that would begin in fall 2019. Activities would not begin until the authorization is issued in winter 2019.
- NMFS indicated in the *Federal Register* notice that 888 and 878 piles would be driven and/or removed. CTJV clarified that 870 piles would be driven and/or removed during the authorization.
- NMFS indicated in the *Federal Register* notice that pile driving and removal would occur on up to 188 days in one portion of the notice; while information in other portions of the notice indicated that pile driving and removal would occur on up to 382 days. CTJV clarified that pile driving and removal would occur on up to 198 days, 18 days per month from January through November. NMFS indicated that the numbers of takes of seals would (1) increase from 3,114 to 3,564 Level A harassment takes and from 4,671 to 5,346 Level B harassment takes of harbor seals based on the increase in the total number of days of activities and (2) decrease from 8 to 7 Level A harassment takes and from 13 to 11 Level B harassment takes of gray seals based on the decrease in days of activities in February from 21 to 18. This issue also would affect the estimation of Level B harassment takes of bottlenose dolphins, which was discussed previously.
- NMFS indicated in the *Federal Register* notice that the source level for impact driving of 12-in piles originated from the Ballena project described in Caltrans (2015). The Commission could not locate in Caltrans (2015) the source level data referenced in Table 6 of the notice²⁷, but noted that Table I.2-3 in Caltrans (2015) provided source levels of 180 dB re 1 $\mu\text{Pa}_{\text{peak}}$, 170 dB re 1 $\mu\text{Pa}_{\text{rms}}$, and 160 dB re 1 $\mu\text{Pa}^2\text{-sec}$ at 10 m. NMFS indicated that the Ballena source level data originated from Figure I.7-2 in Caltrans (2015) but that the source levels were from only one pile. NMFS indicated the source levels would be updated to reflect the data in Table I.2-3 in Caltrans (2015) and the Level A and B harassment zones²⁸ and numbers of takes²⁹ would be re-estimated accordingly.
- NMFS incorrectly specified in Table 9 of the *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 indicated that the Level B harassment zones and numbers of takes²⁹ would be re-estimated accordingly.
- Based on Denes et al. (2019), NMFS incorrectly specified propagation loss for DTH drilling for estimating the extents of the Level A and B harassment zones. For Level B harassment, propagation loss should have been 6.63 rather than 15 log R. NMFS indicated that the Level B harassment zone would increase from 251 m to 10.4 km and the numbers of takes²⁹ would be re-estimated accordingly.

²⁷ 177 dB re 1 $\mu\text{Pa}_{\text{peak}}$, 165 dB re 1 $\mu\text{Pa}_{\text{rms}}$, and 157 dB re 1 $\mu\text{Pa}^2\text{-sec}$ at 10 m.

²⁸ The Level B harassment zone would increase from 22 to 46 m.

²⁹ The bottlenose dolphin was the only species for which takes were calculated using the ensonified area x density x number of days of activities.

- NMFS did not include the percentage of each stock that would be taken in Table 13 of the *Federal Register* notice but indicated the percentages would be included in the notice for authorization issuance.
- NMFS omitted various information in Table 14 of the *Federal Register* notice and Table 2 of the draft authorization regarding both Level A and B harassment zones. Based on those omissions and the various revisions to those zones noted herein, NMFS indicated that the tables in the notice for authorization issuance and in Table 2 of the final authorization would be revised accordingly.
- NMFS did not specify in section 5 of the draft authorization that at least two, and up to four, PSOs would be required to monitor before, during, and after the proposed pile-driving and -removal activities. NMFS indicated it would move the PSO monitoring requirements from section 4 to section 5 of the final authorization and would include the numbers of PSOs that would be required to monitor for marine mammals in section 5 as well.
- NMFS specified in the *Federal Register* notice and draft authorization that CTJV would be required to extrapolate the numbers of Level B harassment takes based on the extents of the zones that could be monitored. However, NMFS did not include the same requirement for Level A harassment takes but plans to do so in the notice for authorization issuance and in section 5(a)(xii) of the final authorization.
- NMFS did not specify in the draft authorization the requirements that (1) pile-driving and -removal activities occur during daylight hours only and (2) pile driving and removal 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 visible³⁰. NMFS indicated that both requirements would be included in the final authorization.

References

- Caltrans. 2015. Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. State of California Department of Transportation, Sacramento, California. 532 pages.
- Denes, S., J. Vallarta, and D. Zeddies 2019. Sound source characterization of down-the-hole hammering: Thimble Shoal, Virginia. Version 1.0. JASCO Applied Sciences (USA) Inc., Silver Spring, Maryland. 80 pages.

³⁰ These requirements were specified in the *Federal Register* notice.