21 May 2018

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 San Francisco Bay Area Water Emergency Transportation Authority (SF WETA) seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act (the MMPA) to take small numbers of marine mammals by harassment. The taking would be incidental to ferry terminal expansion and renovations in San Francisco, California. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 27 April 2018 notice (83 Fed. Reg. 18507) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

SF WETA plans to expand and renovate the ferry terminal in San Francisco. Operators would install up to 81 24- to 36-in steel piles using a vibratory and impact hammer. They also would remove up to six 36-in steel piles using a vibratory hammer. SF WETA expects activities to take 41 days, weather permitting. It would limit pile-driving and -removal activities to daylight hours from 1 June to 30 November 2018.

NMFS preliminarily has determined that, at most, the proposed activities temporarily would modify the behavior of small numbers of seven 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—

- conducting in-situ sound source measurements during 10 percent of impact pile-driving activities[1] and adjusting the Level A and B harassment zones, if necessary;
- using a sound attenuation device (e.g., bubble curtain and pile cushion) during impact driving and implementing performance standards measures for the bubble curtain;
- ceasing pile-driving and -removal activities if any marine mammal comes within 10 m of the equipment;

[1] NMFS clarified measurements would be taken during impact driving of 10 percent of each pile size and will specify this requirement in the final authorization.

- using a qualified land-based protected species observer to monitor the Level A and B harassment zones for 30 minutes before, during, and for 30 minutes after the proposed activities;
- using standard soft-start, delay, and shut-down procedures;
- using delay and shut-down procedures, if a species for which authorization has not been granted (including but not limited to humpback whales or Guadalupe fur seals) or if a species for which authorization has been granted but the authorized takes are met, approaches or is observed within the Level B harassment zone;
- conducting marine mammal baseline observations on two separate days within one week of initiation of activities;
- reporting injured and dead marine mammals to the Office of Protected Resources and the West Coast Regional Stranding Coordinator using NMFS's phased approach and suspending activities, if appropriate; and
- submitting a final report.

General comments and concerns

In addition to minor errors and missing information in the preamble to and the proposed authorization, the Commission informally noted some further concerns. Those included (1) using in-situ source level data for vibratory pile driving that were unnecessarily high[2] rather than median values[3], (2) using outdated density data for harbor seals and California sea lions[4], and (3) not increasing the number of proposed Level B harassment takes for gray whales to average group size (from two to four, respectively). Although NMFS plans to include all related revisions in the final authorization, the Commission notes that these types of issues have been ongoing in NMFS's proposed incidental harassment authorizations. In this instance, many of the issues[5] should have been addressed when the original application was reviewed internally by NMFS[6]. Therefore, the Commission recommends that NMFS review more thoroughly both the applications prior to deeming them complete and its notices prior to submitting them for publication in the *Federal Register*.

In addition, the Commission informally noted that the Level A harassment zones for phocids were quite large for impact pile driving (i.e., 141 and 270 m). Even though SF WETA plans to shut down its activities if a harbor seal is observed within that zone[7], an animal could pop up in the zone prior to being detected. Thus, the Commission informally suggested that SF WETA request up to five Level A harassment takes of harbor seals. SF WETA agreed with that suggestion.

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[2] SF WETA proposed to use the maximum root-mean-square sound pressure levels for vibratory pile driving as measured during last year's activities—those values were 6 to 16 dB higher than the median source levels. The Commission notes that the median and mean source levels for vibratory pile driving generally are less than reported elsewhere because the substrate at the project site is comprised primarily of mud, which also should be specified in the final authorization.

[3] Those corrections resulted in reductions to the proposed Level A and B harassment zones.

[4] Densities were increased from 0.83 to 3.957 harbor seals/km^2 and from 0.090 to 0.161 California sea lions/km^2.

[5] Other issues should have been discovered during review of the draft *Federal Register* notice.

[6] During NMFS's early review team (ERT) meetings.

[7] Impact pile driving was not needed during the previous year's activities but was included in the proposed authorization as a contingency, if necessary.

The Commission has pointed out similar concerns for other recent proposed authorizations[8]. Although NMFS agreed to include Level A harassment takes, these issues should have been identified and addressed prior to publication of the proposed authorization in the *Federal Register*, specifically when the original application was reviewed internally by NMFS[9]. Therefore, the Commission recommends that NMFS better evaluate the proposed Level A harassment zones that are to be implemented and the associated numbers of Level A harassment takes requested for each proposed incidental take authorization prior to publication in the *Federal Register*.

Appropriateness of the Level A harassment zones

As the Commission has indicated in previous letters, it supports NMFS's use of the updated permanent threshold shift (PTS) thresholds and associated weighting functions that are used to estimate the Level A harassment zones. However, there are some shortcomings that need to be addressed regarding the methodology for determining the extent of the Level A harassment zones based on the associated PTS cumulative sound exposure level (SEL_{cum}) thresholds for the various types of sound sources, including stationary sound sources. 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). The Commission supports that approach *if* an action proponent is able to conduct more sophisticated sound propagation and animat modeling. However, that approach is less than ideal for action proponents that either are unable, or choose not, to conduct more sophisticated modeling.

As an example, the Level A harassment zone for high-frequency cetaceans was estimated to be much greater than the Level B harassment zone (602 vs. 341 m, respectively) for impact driving of 36-in piles[10]. Based on the extent of those zones, it is assumed that an animal would experience PTS before behaviorally responding and 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. Numerous Navy environmental impact statements[11], as well as a National Research Council (NRC) report (Figure 4-1; NRC 2005), support this logic.

The Commission does not question the Level A harassment thresholds themselves, but rather the manner in which the SEL_{cum} thresholds are currently implemented. The Level A and B harassment zones do not make sense biologically or acoustically due to NMFS's unrealistic assumption that the animals remain stationary throughout the entire day of the activity.[12] This is particularly problematic when action proponents, including the Navy, are using a simple area x

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[8] For example, see the Commission's 8 May 2018, 2 April 2018, and another 2 April 2018 letters
[9] Also during the ERT meetings.
[10] A similar trend was observed for high-frequency cetaceans for impact driving of 24- and 30-in piles and for low-frequency cetaceans for impact driving of 24-, 30-, and 36-in piles as well (see Tables 5 and 7 in the *Federal Register* notice). These trends would have been even more pronounced had NMFS not assumed a 10-dB source level reduction based on bubble curtain implementation.
[11] With which NMFS has been a cooperating agency.
[12] Which generally has been more of an issue for stationary sound sources. However, this also could be an issue for moving sound sources that have short distances between transect lines, in which the user spreadsheet may not be appropriate for use unless the source level could be adjusted accordingly.

density method for take estimation. By assuming a stationary receiver, all of the energy emitted during a 24-hour period is accumulated for the SEL_{cum} thresholds.

The Commission continues to believe that it would be prudent for NMFS to consult with scientists and acousticians to determine the appropriate accumulation time that action proponents should use to determine the extent of the Level A harassment zones based on the associated SEL_{cum} thresholds in such situations. Those zones should incorporate more than a few hammer strikes (or acoustic pulses) but less than an entire workday's worth of strikes (or pulses). This recommendation is the same as those made in the Commission's 11 July 2017 letter on NMFS's final Technical Guidance and multiple previous letters[13]. Other federal partners, including the Navy, have made similar recommendations. Since the Commission and other federal partners determined that this issue needs resolution, the Commission recommends that NMFS make this issue a *priority* to resolve in the near future. The Commission further recommends that NMFS consult with both internal[14] and external scientists and acousticians to determine the appropriate accumulation time that action proponents should use to determine the extent of the Level A harassment zones based on the associated SEL_{cum} thresholds for the various types of sound sources, including stationary sound sources, when simple area x density methods are employed. Estimated swimming speeds of various species and behavior patterns (including residency patterns)[15] should be considered. Evaluating various scenarios using animat modeling should help address this issue as well.

Bubble curtain efficacy

The Commission had previously commented on the assumptions NMFS has used regarding efficacy of bubble curtains[16]. NMFS has been inconsistently applying presumed source level reductions when bubble curtains are used during impact pile driving. In some instances, source level reductions are assumed to be 10 dB (for the proposed authorization) when bubble curtains are to be employed, while 0 dB (83 Fed. Reg. 22640, 81 Fed. Reg. 15082), 6 dB (81 Fed. Reg. 26647), and 8 dB (81 Fed. Reg. 19342) have been used in other instances. Some of the variability in attenuation levels is based on differences in device design, site and environmental conditions, and difficulties in properly installing and operating sound attenuation devices—the latter which could be alleviated with NMFS's proposed requirement for SF WETA to implement various bubble curtain performance standards[17]. However, the main reason why bubble curtains do not achieve consistently reduced sound levels is because sound resonates through the ground into the far field.

MacGillivray et al. (2007) measured attenuated and unattenuated impact pile driving of 36-in steel piles in Washington. The bubble curtain provided an approximate 21-dB reduction in peak sound pressure levels (SPL_{peak}) and an approximate 26-dB reduction in root-mean-square sound pressure levels at a distance of 10 m (SPL_{rms}; Table 2 in MacGillivray et al. 2007). At a distance of

[13] Including its 11 May 2017, 11 April 2017, and 31 August 2015 letters.
[14] Including staff in the Marine Mammal and Sea Turtle Conservation Division of the Office of Protected Resources and staff in the Office of Science and Technology.
[15] Results from monitoring reports, including animal responses, submitted in support of incidental harassment authorizations issued by NMFS also may inform this matter.
[16] See its 3 January 2017 letter.
[17] NMFS is not including these requirements consistently for all incidental take authorizations that include bubble curtains.

100–1,100 meters, the bubble curtain provided a reduction of 6 to 7 dB for both SPL_{peak} and SPL_{rms}. MacGillivray et al. (2007) indicated that the effectiveness of the mitigation method[18] was range-dependent and sound attenuation diminished with range from the pile.

The California Department of Transportation (Caltrans) also conducted performance testing of bubble curtains. Effectiveness of the bubble curtain varied with direction and distance from the pile and under different tidal conditions (Caltrans 2005). In general, the bubble curtain provided the greatest reduction in SPLs in the near field[19]. At distances of 400–500 m, SPLs were reduced by only 1 to 2 dB. Although a flood tide may have had some effect on the performance of the bubble curtain, the SPL reductions were still 5 to 10 dB at distances of 45–120 m. This finding confirms that, at greater distances, more of the sound emitted during impact pile driving resonates from the ground than through the water column[20]. Bubble curtains are not designed to, nor can they, attenuate ground-borne sound. Furthermore, Caltrans (2015) stated that, because of the uncertainties associated with the degree of attenuation that would be provided by a bubble curtain, an assumed source level reduction should be limited to 5 dB. The Commission contends that even a 5-dB reduction could lead to an underestimation of impacts.

Given that Level A harassment is primarily based on thresholds[21] associated with SEL_{cum}, it is the far-field sound that matters—particularly when the estimated ranges to Level A harassment are on the order of 500[22] to 1,000s[23] of meters. Level B harassment also would be estimated to occur at comparable or greater far-field distances. At those distances, reductions in sound levels have not been shown to consistently produce reductions of 5 dB let alone 10 dB[24]. The Commission further notes that bubble curtains may provide effective mitigation as compared to SPL_{peak} thresholds for fish in the near field[25], but they have no proven efficacy for substantially reducing sound levels in the far field for marine mammals. Therefore, the Commission recommends that NMFS refrain from using a source level reduction factor for sound attenuation device implementation during impact pile driving for all relevant incidental take authorizations.

If and when NMFS determines the appropriate accumulation time associated with its SEL_{cum} thresholds, it could consider using a source level reduction to estimate the ranges to Level A harassment, which would likely be much less than 10 dB. NMFS should then review the related literature on bubble curtain efficacy in concert with estimated ranges to the SEL_{cum} thresholds based on the revised accumulation time to determine what, if any, source level reduction would be appropriate. Source levels should not be reduced when determining the range to Level B harassment.

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[18] A similar trend was observed for foam temporary noise attenuation piles.
[19] In general, the majority of the sound level measurements have been collected in the near field (well within 100 m) for studies involving unattenuated and attenuated pile driving using a bubble curtain.
[20] This phenomenon also was noted in Caltrans (2015). If sound was primarily being emitted through the water column, comparable reductions (or greater reductions with increasing water depths) should be produced with increasing distance from the source, not lesser reductions.
[21] NMFS uses dual metrics for determining the range to Level A harassment, SPL_{peak} and SEL_{cum}. However, the ranges to SPL_{peak} are always less than the ranges to SEL_{cum} for impact pile-driving activities.
[22] As referenced in the proposed authorization.
[23] As referenced in 83 Fed. Reg. 18791 and other similar notices.
[24] Which would apply to Level B harassment as well.
[25] Bubble curtains originally were used to minimize both lethal and sub-lethal effects on fish.

Rounding of take estimates

The method used to estimate the numbers of takes during the proposed activities, which summed fractions of takes for each species across project days, does not account for and negates the intent of NMFS's 24-hour reset policy. As the Commission has indicated in previous letters regarding this matter[26], the issue at hand involves policy rather than mathematical accuracy. The Commission understands that NMFS has nearly completed revising its draft criteria and plans to share them with the Commission in the near term. The Commission recommends that NMFS provide those criteria in a timely manner.

Proposed one-year authorization renewals

NMFS has indicated that it may issue a second one-year[27] incidental harassment authorization renewal for this and other future authorizations. NMFS would issue a renewal on a case-by-case basis without additional public notice or comment opportunity when (1) another year of identical, or nearly identical activities, as described in the 'Specified Activities' section of the *Federal Register* notice is planned or (2) the originally planned activities would not be completed by the time the incidental harassment authorization expires and a renewal would allow for completion of the authorized activities beyond the timeframe described in the 'Dates and Duration' section of the notice. NMFS would consider issuing a renewal only if—

- the request for renewal is received no later than 60 days prior to the expiration of the current authorization;
- the activities to be conducted either are identical to the previously analyzed and authorized activities or include changes so minor (e.g., reduction in pile size) that they do not affect the previous analyses, take estimates, or mitigation and monitoring requirements;
- a preliminary monitoring report provides the results of the required monitoring to date and those results do not indicate impacts of a scale or nature not previously analyzed or authorized;
- the status of the affected species or stocks and any other pertinent information, including the mitigation and monitoring requirements, remain the same and appropriate; and
- the original determinations under the MMPA remain valid.

The Commission agrees that NMFS should take appropriate steps to streamline the authorization process under section 101(a)(5)(D) of the MMPA to the extent possible. However, the Commission is concerned that the renewal process proposed in the *Federal Register* notice is inconsistent with the statutory requirements. Section 101(a)(5)(D) clearly states that proposed authorizations are subject to publication in the *Federal Register* and elsewhere and that there be a presumably concurrent opportunity for public review and comment. NMFS's proposed renewal process would bypass the public notice and comment requirements when it is considering the renewal.

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[26] See the Commission's 29 November 2016 letter detailing this issue.

[27] NMFS informed the Commission that the renewal would be issued as a one-time opportunity, after which time a new authorization application would be required. NMFS has yet to specify this in any *Federal Register* notice detailing the new proposed renewal process but should do so.

The Commission further notes that NMFS recently implemented an abbreviated authorization process by publishing the required information[28] via an abbreviated *Federal Register* notice and by referencing the relevant documents. The abbreviated process preserves the full opportunity for public review and comment, does not appear to be unduly burdensome on either the applicant or NMFS, and is much preferred over NMFS's proposed renewal process[29]. Thus, the Commission recommends that NMFS refrain from implementing its proposed renewal process and instead use abbreviated *Federal Register* notices and reference existing documents to streamline the incidental harassment authorization process.

If NMFS believes that its proposed renewal process is consistent with the applicable statutory requirements and intends that process to be generally applicable to all incidental harassment authorizations that meet the specified criteria, it should not seek to adopt such a process through a brief notice at the end of a specific proposed authorization. That process should be adopted through more general procedures, preferably a rulemaking, that provides NMFS's rationale and analysis regarding why it believes the proposed renewal process is consistent with the requirements of section 101(a)(5)(D) of the MMPA and adequate public notice and opportunity for comment. If NMFS adopts the proposed renewal process notwithstanding the Commission's recommendation, the Commission further recommends that NMFS provide the Commission and the public with a legal analysis supporting its conclusion that the process is consistent with the requirements under section 101(a)(5)(D) of the MMPA. Furthermore, if NMFS decides to bypass the notice and comment process in advance of issuing a renewal, it should nevertheless publish notice in the *Federal Register* whenever such a renewal has been issued.

Adequate opportunity to consider public comments

The Commission has repeatedly expressed concern over NMFS's failure to provide an adequate opportunity for public comment. The opportunity for public comment provided under section 101(a)(5)(D)(iii) of the MMPA should be a meaningful one that allows NMFS sufficient time to not only solicit public comments, but also to analyze, assess, and respond to those comments and revise, as appropriate, its proposed authorization and rationale in light of those comments. Thus, submittal of the necessary documentation by applicants and processing of applications by NMFS must be timelier, thus avoiding abbreviated timeframes in which NMFS is able to consider the comments received.

In this instance, the public comment period closes on 29 May 2018, three days before SF WETA's activities are scheduled to begin. SF WETA did not submit its application until 22 January 2018, which reduced the time NMFS had available to review and comment on it, draft the proposed authorization, and ultimately consider public comments before issuing the final authorization. NMFS guidance states that applicants must submit their applications 6 to 9 months in advance of the intended project start date and that some incidental harassment authorizations may take longer to process[30]. Since SF WETA's activities are scheduled to begin only a few days after the comment period closes, the Commission is not convinced that NMFS has sufficient time to review the Commission's or the public's comments or to revise the proposed authorization accordingly.

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[28] Including any changes to the proposed activities or assumptions made and results from the draft monitoring report.
[29] See the Commission's 30 April 2018 letter detailing this matter.
[30] https://www.fisheries.noaa.gov/node/23111

Therefore, the Commission recommends that, in the future, NMFS take all steps necessary to ensure that it publishes and finalizes proposed incidental harassment authorizations far enough in advance of the planned start date of the proposed activities to ensure full consideration is given to any and all comments received.

The Commission hopes you find its letter useful. Please contact me if you have questions regarding the Commission's recommendations.

Sincerely,

Peter O. Thomas, Ph.D.,
Executive Director

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