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FROM: 2023 NMFS Arctic Peer Review Panel

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SUBJECT: 2023 Peer Review Report of Port of Nome Marine Mammal Monitoring and Mitigation Plan

DATE: April 5, 2023

1 Project Specific Monitoring Recommendations

1.1 NMFS Guidance

- Include a succinct, but explicit, numbered list of the monitoring measures that the Panel is recommending be modified, added, or deleted for each of the applicants' monitoring plans. For each recommendation:
- Provide concise recommendations that include enough detail to understand what is being recommended (i.e., include methodologies where necessary).
- Include a detailed rationale that describes why the additional or modified measures are considered necessary or an improvement over the original proposal and considers any points or potential barriers raised in the discussion.

1.2 Arctic Peer Review Panel (Panel) Recommendations

We reviewed the Monitoring Plan for the first year of Phase 1 of the Port of Nome Modification Project, which is planned for the 2024 open water season. Phase 1 is expected to occur over a total of four open water seasons.

The applicant did not include objectives in the Monitoring Plan. However, the applicant's presentation to the Panel identified several monitoring objectives. We recommend that the Monitoring Plan include the applicant's objectives for monitoring, as identified in the presentation to the Panel.

To evaluate what activities will occur concurrently in year 1, we recommend that the applicant include in its application and Monitoring Plan a chronogram showing the estimated periods for all activities that would require monitoring, including dredging, armor stone installation, pile driving of each category (temporary, anchor, sheet, fender, pile removal, filling, and compacting cells), and construction-related vessel transits. This allows identification of what periods will incur concurrent noise production and from which sources. The applicant should also describe

whether concurrent activities are expected to affect the estimated sizes of, and monitoring requirements for, the mitigation zones.

1.2.1 Number, Experience, and Location of Protected Species Observers (PSOs)

We recommend a minimum of two (2) PSOs on duty per PSO location at all times, with a sufficient number of PSOs to allow for rotation of PSOs every 4 hours. The Panel does not believe it would be feasible for one PSO to be able to monitor the shutdown zone while also monitoring for the presence and behavior of marine mammals in the Level B harassment zone and communicating with the construction site leads. Therefore, we also recommend that PSOs be deployed on each side of the construction zone to monitor the Level B harassment zone, as indicated in the Monitoring Plan. Deployment of PSOs away from the construction zone also minimizes safety concerns for the PSOs.

We recommend the lead PSO have at least one year of prior PSO experience, preferably on projects located within Alaska. The lead PSO would be stationed directly at the construction site and would be responsible for monitoring the Level A shutdown zone and for communications with the construction site manager when mitigation measures are necessary. The lead PSO would also oversee and coordinate the other PSOs. The Monitoring Plan should state that PSOs will be rotated in 4-hour shifts and individual PSOs will not work more than 12 hours per day.

1.2.2 Observation of Level B Zones >2 km

We agree, in general, that PSOs can visually detect marine mammals at a distance of about 2 km, depending on weather conditions. However, marine mammals that enter the Level B harassment zones beyond the 2 km visual range of PSOs are not likely to be detected. Therefore, the number and location of the PSOs, as proposed, is not expected to provide adequate monitoring of the Level B harassment zones for two specific activities: 1) vibratory pile driving of ~1600 20” sheet piles, which is expected to occur over 57 days, and which has a modeled distance to the Level B zone of 5.17 km and 2) vibratory pile driving of ~21 36” fender piles, which, if this activity occurs in year one, is expected to occur over ~ 2 days (not necessarily consecutive), and which has a modeled distance to the Level B zone of 21.54 km. Inadequate monitoring of the Level B harassment zone for these two pile driving activities would not allow for an accurate estimation of total takes due to these activities, nor would it increase our understanding of the effects of these activities on marine mammals.

To estimate Level B takes of marine mammals beyond the visual range of PSOs (i.e., the far-field, generally beyond 2 km), the applicant has proposed to extrapolate takes based on marine mammals detected within the 2 km zone. However, extrapolating takes to the far-field based on observed takes may not be accurate if the species and densities of marine mammals within the observed zone are different than the species and densities of marine mammals beyond the observed zone. This is particularly problematic in the unobserved portion of the Level B harassment zone that is further from shore (i.e., deeper waters), which may represent a different marine mammal habitat. Additionally, because density data for most of the marine mammals species expected to occur in the project area are either outdated or come from other

regions, observations of the entire extent of the Level B harassment zone are necessary to more accurately estimate total Level B takes.

We therefore recommend that the applicant implement additional monitoring measures to assist in the detection of marine mammals in the far-field, i.e., at Level B harassment zone distances that are greater than 2 km for an amount of time that will allow for scientifically defensible method of extrapolation. We acknowledge these additional monitoring measures may represent an added expense and that there are safety and logistical concerns. However, because this is expected to be a multi-year project of national importance that will increase input of sound in the water during construction and as the port becomes operational, the additional monitoring measures will increase our understanding of the occurrence of marine mammals in the far-field of the disturbed area in the region, in general, and also add to our understanding of the effects of pile driving on marine mammals in the region.

- For observations during sheet pile installation, we recommend deploying a PSO on an offshore static platform (e.g., an anchored barge or a vessel) at a distance of ~3 km from the source each day of pile driving.
- For observations during fender pile installation, we recommend an aerial overflight with a plane sufficient for visual marine mammal monitoring be flown prior to the start of pile driving activities each day (estimated 2 days total in year one) to determine species present in the area for that day. An alternative option would be equipping the offshore static platform with a series of remote live cameras located at a distance of ~5 km to detect marine mammals that may occur in the far field by a PSO operator on land. The Panel recognizes that fender piles will be driven for a total of 2 days over the entire season one, however, due to the dimensions of the level B zone requiring aerial observations, this activity should be concentrated in as few days as possible throughout the season to minimize the temporal footprint of this acoustic disturbance and to reduce the cost of the aerial support. Also, please see point 1.2.9 *Seasonal Restriction for Fender Pile.*

1.2.3 Passive Acoustic Monitoring (PAM)

Assuming the applicant will expand visual observations based on the previous recommendation, PAM is not recommended. However, if the applicant will **not** be expanding visual observations, we strongly recommend the use of archival PAM to remedy the ineffective monitoring in the far-field and to evaluate whether the level of acoustic detections in the far-field of the disturbance area is equivalent to the level of visual detections in the near-field. One PAM station at ~3 km would be needed for the pile sheet installation, and at least 3 PAM stations would be needed for the fender pile installation, at distances of ~5 km, ~10 km, and ~15 km from the source. This would increase our understanding of effects of pile driving on marine mammals in the far field. It would also provide data for subsequent IHA applications, for example by providing better data upon which to extrapolate takes to the far-field.

Recognizing a potential negative bias due to false absence when animals are not vocally active, as well as the detection range dependent on the sensitivity of the equipment, it is important to

highlight here that when considering PAM efforts, high quality instrumentation should be selected to maximize detection range and deployment duration.

1.2.4 Pre- and Post-Construction Monitoring

We recommend the collection of marine mammal data in the construction area, including the far-field (out to at least 5 km), prior to and after pile driving activities. These data should be collected by PSOs with experience identifying marine mammals, preferably from Nome or elsewhere in the Bering Sea region. Data could be collected by sub-sampling throughout the day, in smaller blocks of time (such as 2 hours every day at the same location). We recommend the applicant consider developing a marine mammal and environmental reporting app or other reporting method by community members. Having a user-friendly app would make reporting of sightings easier, faster, and more reliable, and would further our knowledge of the effects of construction-related disturbance (by comparison of pre, during, and after construction periods), and marine mammal occurrence in this region during all seasons.

We note that the presentation given at the meeting included a pre-construction monitoring period of approximately one week, but this was not included in the Monitoring Plan. We encourage pre-construction monitoring of at least one week (or more if possible) and recommend that be included in the Monitoring Plan.

We were encouraged to note that the applicant has collected marine mammals sightings data in this area in recent years. The applicant noted they would attempt to utilize this data for the current project for the purpose of establishing a baseline understanding of marine mammal occurrence in the area under pre-construction conditions (undisturbed) and, for the longer term, whether spatial displacement of marine mammals has occurred as a result of the project-related activities.

1.2.5 Monitoring for Estimation of Take

To estimate actual takes within the observed portion of the Level B harassment zone, we suggest that the applicant develop a method for estimating animals they may have been missed by PSOs using correction factors to account for species-specific detection probabilities (f(0) and g(0)), where possible).

1.2.6 Improve Accuracy of Mitigation Monitoring Zones

The size of the Level A and B monitoring zones are based on NMFS's multi-species pile driving calculator and are based on similar size and type piles from other pile driving projects. However, to ensure that modeled distances are applicable to this project, we suggest that the applicant either 1) obtain already-collected data for empirical propagation loss analysis obtained in other studies in this same region either confirm or replace the practical spreading loss (15 logR) by a more precise empirical-based propagation loss in the calculation of the isopleth distances, or 2) conduct sound field verification (SFV) measurements to determine the project-specific propagation loss for a representative number of piles (particularly sheet piles as these would be the bulk of the pile driving activity).

1.2.7 Reduction of Sound Source with Bubble Curtain

Since the Level B harassments zone association with the installation of sheet and fender piles are so large, we suggest that the applicant consider the use of sound attenuation devices by which to decrease the effective size of the zones. Examples of sound attenuation devices to consider include single or double bubble curtains, noise mitigation screens, and hydro sound dampers (nets with air-filled or foam-filled elastic balloons) (Bellman 2014; Elmer and Savery 2014). These sound attenuation devices, when properly applied, have been successful at substantially reducing the required monitoring distances.

1.2.8 Vessel Speed Reduction in the Susitna Delta Exclusion Zone, Cook Inlet

When operating within the Susitna Delta Exclusion Zone in Cook Inlet, the Monitoring Plan states vessels will travel less than 4 knots for proper monitoring. This is unrealistic since tidal currents in this area of Cook Inlet can exceed 11 knots. Therefore, a through-water speed limit of 4 knots could mean the vessel is actually moving over ground in a range of -7 to +15 knots. The Panel recommends the alternative approach of timing the Port of Alaska departures or recalls aligned with the tide periods to avoid navigating at through-water speeds exceeding 4 knots.

1.2.9 Seasonal Restriction for Fender Piles

Because fender pile installation would result in a Level B harassment zone that exceeds the visual capabilities of the PSOs, we recommend this activity take place during the time of year that has the lowest density of marine mammals, which likely is mid-summer.

1.2.10 Reporting

Because this is planned as a multi-year project, we recommend that the applicant include a section in the final report with recommendations for future year monitoring improvements based on lessons learned during the first year of construction activities.

If PAM is used in this first year, the details of the acoustic monitoring should also be included in the 90-day report.

The Panel requests that we receive a copy of the 90-day report when submitted by the applicant for an initial review and for use in subsequent Monitoring Plan reviews.

2 Broad Future Recommendations

2.1 NMFS Guidance

- Monitoring recommendations - Panelists may include broader recommendations that could apply to multiple applicants and could be added to the document.
- Process Recommendations/Reflections: As we work to modify the overall structure of the peer review Panel, please include any reflections on the changes that we have made that would inform future improvements (ex: ease of implementation of new Panel instructions, etc.)

2.2 Panel Recommendations

2.2.1 Test Use of Web Camera to Augment Visual Observations

It may be instructive to look at the use of remote cameras either currently installed at the Port of Nome and/or installed at other project-specific locations to evaluate their effectiveness at detection of marine mammals. This could be accomplished by comparing detections reported from the analysis of web cameras' footage with detections from visual PSOs for the same field of view. Artificial Intelligence (AI) methods already exist for this type of image processing (e.g., Araujo et al. 2022) and the Panel recommends exploring this approach to enable semi-automatic analysis of video.

- The Port of Nome has a live camera: https://www.nomealaska.org/port-nome/page/noaa-weather-camera.
- The FAA has live cameras: https://weathercams.faa.gov/map/-175.99104,59.88008,-133.80354,68.47345/airport/OME/details/camera/10310/full

The applicant may also consider tethered balloons as a test for deployment of higher elevation - long-range remote cameras (for initial Arctic examples, see Bouffaut et al. 2022 and Landrø et al. 2022).

2.2.2 Timing of Peer Review

We acknowledge NMFS has very little control over when an applicant submits the application, but the peer review should incorporate more time to review the Monitoring Plan, particularly when looking to incorporate feedback from Alaska Native Co-Management Organizations such as the Alaska Eskimo Whaling Commission.

2.2.3 Rulemaking vs Annual IHAs

Projects that are going to take multiple years should pursue an Incidental Take Regulation (ITR) instead of IHA.

2.2.4 Peer Review Panel of 90-day Report

The Panel recommends the submitted 90-day report is provided to this Panel for review. This will allow for continued improvements to monitoring plans, particularly for these multi-year projects. In addition, the Panel would like to receive NMFS' comments on the Panel's recommendation at the 90-day report schedule, as was provided on 3/3/2023 by the email entitled "2020 PRP Monitoring Recommendation Report out." This will allow the Panel to better understand NMFS' perspective and create transparency.

3 Other Recommendations

3.1 NMFS Guidance

- In the past, Panelists have opted to make recommendations related strictly to mitigation or otherwise outside of the scope of the Peer Review. We welcome all input from the Panel; however, we also recommend that Panel members submit any input that is not

directly related to the planned monitoring (e.g., input related to mitigation, take estimates, etc.) as a public comment during the public comment period on the proposed IHA (noting this may occur before or after the peer review meeting).

3.2 Panel Recommendations

The Peer Review Panel has provided recommendations for NMFS consideration in past years that are not included as part of this report, but may be applicable, such as the *Incidental Harassment Authorization Applications for the US Arctic: General Report and Recommendations (May 4, 2017)*.

A currently omitted effect by the disturbance generated by the construction activities is spatial displacement. This effect has been well documented in many other construction projects, including pile driving operations (e.g., Weilgart 2007, Anderwald et al. 2013). In order to increase our understanding of impacts and to use the best available science, marine mammal presence needs to be monitored before, during, and after the disturbance period (Green 1979). The data collected during the three periods is then compared to identify a potential reduction in presence during the disturbance period. A statistical power analysis is required to determine the efficiency of the pre- and post-monitoring duration. Power can be calculated and reported to comment on the confidence one might have in the conclusions drawn from the results of a study. In this case, a statistical power analysis will be useful to estimate the minimum number of sightings or sample size required for the pre- and post-monitoring periods in order to detect an effect in marine mammal presence due to the construction disturbance.

Should this analysis suggest that the pre/post periods of observations are too long to be incorporated into the scheduling of the construction season, then an alternative approach should be considered. We suggest the alternative of conducting monitoring at a control site concurrently with the monitoring at the construction area, i.e., a similar coastal location in the region but outside the zone of disturbance by the activities. The comparison of the observations between control and disturbed sites will determine whether the disturbance is impacting the presence and marine mammal diversity. In addition to the comparison among periods, an important consideration is any ongoing disturbance in the area independently of the construction. For example, in the case of the Port of Nome, shipping in and out of the port might potentially displace marine mammals away. Therefore, the study design should consider the collection of vessel traffic information as an additional variable to the analysis, to control for confounding effects.

Plenty of literature on disturbance effects studies exist for marine mammals and other taxa where the pre/post and control sampling methods are tested and described. The Panel recommends that future applicants review this literature to implement a solid sampling scheme to allow evaluating any spatial displacement effects in addition to level B takes.

4 References

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