E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RTID 0648-XF108

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Construction of the Alaska Liquefied Natural Gas Project in Prudhoe Bay, Alaska

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

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to 8 Star Alaska, LLC (8 Star Alaska) to incidentally harass marine mammals during construction activities associated with the Alaska Liquefied Natural Gas (Alaska LNG) project in Prudhoe Bay, Alaska.

DATES: This authorization is effective for 1 year from the date of notification by the IHA-holder not to exceed 1 year from the date of issuance (November 11, 2025).

ADDRESSES: Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-oil-and-gas*. In case of problems accessing these documents, please call the contact listed below.

FOR FURTHER INFORMATION CONTACT: Kristy Jacobus, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

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

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the monitoring and reporting of the takings. The definitions of all applicable MMPA statutory terms used above are included in the relevant sections below and can be found in section 3 of the MMPA (16 U.S.C. 1362) and NMFS regulations at 50 CFR 216.103.

Summary of Request

On June 21, 2024, NMFS received a request from Alaska Gasline Development Corporation (AGDC) for an IHA to take marine mammals incidental to construction activities in Prudhoe Bay, Alaska. The application was deemed adequate and complete on February 11, 2025. Following publication of the notice of proposed IHA (90 FR 16600,

April 18, 2025) the applicant informed us that they are requesting issuance of the IHA to 8 Star Alaska, which is jointly owned by AGDC and Glenfarne Alaska LNG, LLC. Therefore, the applicant is hereafter referred to as 8 Star Alaska. 8 Star Alaska's request is for take of six species of marine mammals by Level B harassment and, for a subset of three of these species, Level A harassment. Neither 8 Star Alaska nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued an IHA to AGDC in 2021 for the same activities (86 FR 10658, February 22, 2021). However, no work was conducted under that IHA.

This IHA will authorize incidental take during one year of the larger Alaska LNG project. The larger project involves a pipeline that will span approximately 807 miles (mi) (1,299 kilometers (km)) from a gas treatment facility on Alaska's North Slope (North Slope) to a liquefaction and export facility in southcentral Alaska.

Description of the Specified Activity

8 Star Alaska plans to construct an integrated LNG project with interdependent facilities to liquefy supplies of natural gas from Alaska, in particular from the Point Thomson Unit and Prudhoe Bay Unit production fields on the North Slope. 8 Star Alaska plans to construct an Alaska LNG Gas Treatment Plant (GTP), which they will construct with large, pre-fabricated modules that can only be transported to the North Slope with barges (sealifts).

8 Star Alaska plans to modify the existing West Dock causeway and associated dock heads in Prudhoe Bay, AK to facilitate offloading modular construction components and transporting them to the GTP construction site. Vibratory and impact pile driving associated with the work at West Dock would introduce underwater sound that may result in take by Level A and Level B harassment of marine mammals in Prudhoe Bay, AK. 8

Star Alaska plans to conduct pile driving up to 24 hours per day on approximately 123 days from July through October during the open water (*i.e.*, ice-free) season.

A detailed description of the planned construction project is provided in the **Federal Register** notice for the proposed IHA (90 FR 16600, April 18, 2025). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

Comments and Responses

A notice of NMFS' proposal to issue an IHA to AGDC (now to 8 Star Alaska) was published in the **Federal Register** on April 18, 2025 (90 FR 16600). That notice described, in detail, 8 Star Alaska's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. In that notice, we requested public input on the request for authorization described therein, our analyses, the proposed authorization, and any other aspect of the notice of proposed IHA, and requested that interested persons submit relevant information, suggestions, and comments.

During the 30-day public comment period, NMFS received comments from the Center for Biological Diversity (CBD), the North Slope Borough (NSB), and a member of the public. All relevant, substantive comments, and NMFS' responses, are provided below. The comments and recommendations are available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-oil-and-gas*. Please see the comment submissions for full details regarding the recommendations and supporting rationale.

Comment 1: CBD comments that NMFS cannot issue "renewed" IHAs under the MMPA. They further argue that NMFS cannot issue a series of IHAs without a comprehensive analysis and must analyze and mitigate the total take it is proposing to

authorize across both years. CBD further asserts that the 15-day comment period proposed for renewals is unlawful and places a burden on interested members of the public to review not only the original authorization and supporting documents but also the draft monitoring reports, the renewal request, and the proposed renewal authorization and then to formulate comments, all within 15 calendar days. They state that NMFS should set forth, via proposed regulation or policy document, its rationale for the renewal process and to allow public comment. CBD further states that NMFS should analyze the total take it is proposing to authorize across both years via the incidental take regulation process in section 101(a)(5)(A).

Response: The process of issuing a renewal IHA does not bypass the public notice and comment requirements of the MMPA. The notice of the proposed IHA initiates a 30-day public comment period and expressly notifies the public that under certain, limited conditions an applicant could seek a renewal IHA for an additional year. The notice describes the conditions under which such a renewal request could be considered and expressly seeks public comment in the event such a renewal is sought. Importantly, any such renewals (if issued) would be limited to where the activities are identical or nearly identical to those analyzed in the proposed IHA, monitoring does not indicate impacts that were not previously analyzed and authorized, and the mitigation and monitoring requirements remain the same, all of which allow the public to comment on the appropriateness and effects of a renewal at the same time the public provides comments on the initial IHA.

Importantly, renewal IHAs are evaluated by NMFS on a case-by-case basis and are not an automatic matter of right. Each 1-year IHA, including renewal IHAs, must independently satisfy the negligible impact standard for the authorized taking and include the means of effecting the least practicable adverse impact on the species or stock and its habitat and, where relevant, on the availability of such species or stock for taking for

subsistence uses (*i.e.*, mitigation). Moreover, NMFS is not proposing to issue a "series" of IHAs. For these reasons, a comprehensive analysis of the impacts of potential take across two years is not necessary under the MMPA. Any renewal request would be evaluated under the appropriate statutes (*e.g.*, MMPA, National Environmental Policy Act (NEPA), and Endangered Species Act (ESA)) for compliance with relevant standards. These analyses would consider the environmental baseline at that time, including any impacts of the IHA we have issued.

Should a renewal request be made, additional documentation would be required from 8 Star Alaska that NMFS would make publicly available. NMFS would verify that the activities proposed in the renewal request are identical to those in the initial IHA and that the appropriate analysis and scope and scale of effects had been conducted for the initial IHA. NMFS would also confirm, among other things, that the activities would occur in the same location; involve the same species and stocks; provide for continuation of the same mitigation, monitoring, and reporting requirements; and that no new information has been received that would alter the prior analysis. If new information has been received that would alter the prior analysis, that information would be analyzed in the notice of the proposed renewal IHA. A renewal request would also describe preliminary monitoring data, specifically to verify that effects from the activities do not indicate impacts of a scale or nature not previously analyzed. Any renewal request is subject to an additional 15-day public comment period that provides the public an opportunity to review this information, provide any additional pertinent information and comment on whether the criteria for a renewal have been met. Between the initial 30-day comment period on these same activities and the additional 15 days, the total comment period for a renewal would be 45 days.

In addition to the IHA renewal process being consistent with all requirements under section 101(a)(5)(D), it is also consistent with Congress' intent for issuance of

IHAs to the extent reflected in statements in the legislative history of the MMPA. Through the provision for renewals in the implementing regulations, description of the process and express invitation to comment on specific potential renewals in the Request for Public Comments section of each proposed IHA, the description of the process on NMFS' website, further elaboration on the process through responses to comments such as these, posting of substantive documents on the agency's website, and provision of 30 or 45 days for public review and comment on all proposed initial IHAs and renewals respectively, NMFS has ensured that the public has and would have a full opportunity to meaningfully participate in the agency's decision-making process.

Comment 2: CBD asserts that NMFS incorrectly assumes that requiring aircraft to maintain an elevation of 457 m will fully mitigate take of marine mammals. They assert that when it is not possible to maintain that height due to environmental conditions, those same conditions may not allow for mitigation of harassment due to visibility and safety concerns. CBD therefore asserts that NMFS should consider harassment from aircraft noise.

Response: NMFS assessed the impacts of aircraft and does not expect aircraft noise from this project to result in the take of marine mammals. Born *et al*. (1999) analyzed “escape responses” (*i.e.*, hauled out animals entering the water) from an aircraft and a helicopter flying at an altitude of 150 meters (m) (492 feet [ft]) and determined the probability of seals escaping in relation to distance from aircraft using categorical data analysis and logistic regression analysis. The results of the study indicated that if the aircraft do not approach the seals closer than 500 m (1,640 ft) at that altitude, the risk of flushing the seals into the water can be greatly reduced.

NMFS’ requirement that all aircraft must transit at an altitude of 457 m (1,500 ft) or higher, to the extent practicable, while maintaining Federal Aviation Administration flight rules (*e.g.*, avoidance of cloud ceiling, *etc*.), excluding takeoffs and landing, is

significantly higher than the 150 m aircraft and helicopter altitudes analyzed in Born *et al.* (1999). If flights must occur at altitudes less than 457 m (1,500 ft) due to environmental conditions, aircraft will make course adjustments, as needed, to maintain at least a 457 m (1,500 ft) separation from all observed marine mammals. Helicopters (if used) will not hover or circle above marine mammals.

Further, as stated in the Acoustic Impacts section of the notice of the proposed IHA, there are no known pinniped haulouts near the project location. While an individual animal could haul out under a flight path, given the lack of haulouts in the area and minimal use of aircraft, the likelihood of that occurring at the same time that an aircraft is passing overhead during a period when implementing the required mitigation is not practicable is discountable. NMFS, therefore, disagrees that 8 Star Alaska's use of aircraft is likely to result in harassment.

Comment 3: CBD asserted that NMFS failed to consider additional noise reduction technologies such as bubble curtains, pile caps, dewatered cofferdams, and other physical barrier mitigation techniques. CBD cited NMFS' previous statements regarding use of bubble curtains during vibratory pile driving at the Port of Alaska (89 FR 85686, October 29, 2024) in recommending that bubble curtains should be required for use during vibratory driving associated with this project. They state that, while shallower water might make bubble curtains less effective, they are still a proven mitigation strategy and one that NMFS must use to satisfy the least practicable adverse impact standard. Similarly, NSB also recommends that NMFS require 8 Star Alaska to implement the use of sound attenuation devices when pile driving at West Dock.

Response: NMFS fully considered whether requiring the use of bubble curtains or other sound attenuation methods was appropriate for this IHA, and included additional explanation of these considerations below. Where conditions are conducive to use of sound attenuation devices, it may be appropriate to require that they be used as a

mitigation technique. However, the current conditions in the project area do not lend themselves to the use of bubble curtains for attenuation. The majority of the project area is in water of 3 m (9.8 ft) depth or less. In shallow water, sound source level reductions from the use of bubble curtains are expected to be minimal, based on a wealth of data from similar pile driving in California (Caltrans, 2020), and CBD provides no information to support that the use of bubble curtains in shallow water provides any benefit. The use of bubble curtains can be time consuming and costly, and therefore, because of their minimal effectiveness in shallow water, their use is not practicable and 8 Star Alaska is not required to use them under this IHA. In addition, effective deployment of a bubble curtain system is logistically challenging in shallow water, and there is potential for sea ice, which would make deployment and use of sound attenuation systems even more challenging. Sound attenuation devices have not been used for pile driving in this area during past projects, as a result of these concerns.

NMFS acknowledges describing bubble curtains as effective and important mitigation measures in certain circumstances. However, the statements referenced by CBD were made in regards to construction at the Port of Alaska in Anchorage and in relation to the ESA-listed Cook Inlet beluga whale distinct population segment (DPS). For the Port of Alaska project, bubble curtains during vibratory pile driving were expected to minimize the potential for impacts to ESA-listed Cook Inlet beluga whales transiting through the relatively narrow Knik Arm to critical foraging areas. This same scenario is not present in 8 Star Alaska's project area in Prudhoe Bay, and the current action does not present the same risks to beluga whales as those anticipated for the Port of Alaska project. For example, 8 Star Alaska's project area in Prudhoe Bay does not occur within a narrow strait that animals must travel through in order to reach critical foraging area. Further, outside this context, NMFS does not typically agree that use of a

sound attenuation device is warranted for vibratory pile driving due to the lower potential for more harmful impact from vibratory pile driving.

NMFS notes that in some instances during the project, such as during the gravel pouring at the barge bridge abutments, sheet piles will act as a barrier to noise. NMFS considered this noise isolation in its effects analysis, but did not refer to the sheet piles as a cofferdam or mitigation measure, as they are a planned construction component, rather than an additional mitigation measure.

Pile caps are generally used, regardless of regulatory requirements, to protect piles and equipment during impact pile driving. While NMFS expects that pile caps will likely be used during this project due to their common usage for the aforementioned purposes, we do not typically consider pile caps to be an effective noise mitigation method. They are typically made of wood or plastic and are designed to compress and fracture during use, limiting their consistency with respect to noise mitigation and potentially leading to safety issues if replaced during hammer operations (Caltrans, 2020).

When considering the least practicable adverse impact, NMFS takes into consideration the degree to which the implementation of the measure is expected to reduce impacts and considers the practicability of the measures for applicant implementation. 8 Star Alaska intends to complete as much construction as possible during the ice-free period. Use of additional sound attenuation devices, such as dewatered cofferdams, would likely result in delays and extension of the project, rendering them impracticable.

Comment 4: NSB states that if sound attenuation devices are not used by 8 Star Alaska, NMFS should require a monitoring program that allows for protected species observers (PSOs) to observe most of the Level A and Level B harassment zones during the open water period.

NSB further stated that it is important that industrial activities are mitigated as much as possible to reduce possible impacts to hunters' ability to land whales. NSB asserted if a marine mammal is about to enter or is within the Level A harassment zone, the observer must halt operations to prevent injury and stated that NMFS should require 8 Star Alaska to have a monitoring plan that allows observers to see the entire Level A harassment zone.

Response: NMFS is required to include measures that ensure the least practicable adverse impact. The least practicable adverse impact standard includes a practicability component, and it is not practicable for 8 Star Alaska to observe the entire Level A and Level B harassment zones for all species during all activities, given that the largest Level A harassment zone is 1,190 m (3,904 ft) and the largest Level B harassment zone is 4,642 m (15,230 ft). Monitoring the full zones would require multiple vessels, which is a great expense, potential safety risk to boat crew PSOs, and would result in additional vessel traffic in the project area.

8 Star Alaska will attempt to complete construction during the open-water period and the extended daylight on the North Slope. Consequently, the majority of the work will be completed during daylight hours, which allows for greater opportunities to observe marine mammals. Additionally, as stated in the *Mitigation for Marine Mammals and Their Habitat* section, PSOs will test and use night vision devices (NVDs) and infrared (IR) for nighttime and low visibility monitoring. The IHA also requires 8 Star Alaska to record visibility conditions every 30 minutes throughout construction, which will inform the portion of the estimated Level A and Level B harassment zones PSOs were able to observe.

As stated in the *Ensonified Area* section of this notice, 8 Star Alaska and NMFS modeled the Level A and Level B harassment zones using practical spreading. NMFS expects that the calculated zone sizes are conservative given that the water in the project

area is shallow and sound does not propagate well in shallow water. Further, 8 Star Alaska and NMFS estimated the Level A harassment isopleths using NMFS' optional User Spreadsheet. Because of some of the assumptions included in the methods underlying this tool, NMFS anticipates that the resulting isopleth estimates are typically going to be overestimates. For example, the User Spreadsheet assumes that an animal will stay stationary at a given distance throughout the activity and will receive and accumulate energy from all assumed pile strikes in a 24-hour period, which are unlikely scenarios. Additionally, 8 Star Alaska intends to conduct sound source verification (SSV) to verify sound source levels, propagation, and the Level A and Level B harassment zone sizes. NMFS intends to update the Level A and Level B harassment zone sizes with the verified zone sizes and potentially the associated shutdown zones, as appropriate. It is likely that the SSV will reflect smaller zone sizes, which would therefore be easier for PSOs to observe a larger portion of the zones.

The monitoring required by the final IHA will allow NMFS to have an estimate of the actual number of takes that result from the activities relative to the number authorized. PSO observations in the area visible to them will provide a good sample of the actual takes of marine mammals. Additionally, the IHA also includes a requirement for 8 Star Alaska to deploy three hydrophones during the open-water season, and one during the contingency period (should construction be required during that time) to conduct passive acoustic monitoring (PAM). While these devices will not be monitored in real-time or used for the purposes of implementing mitigation, PAM detections of marine mammals will further inform the actual number of takes that result from the activities relative to the number authorized. Please see the **Monitoring and Reporting** section for additional information.

Comment 5: CBD asserts that NMFS' negligible impact determination for all species relies, in large part, on mitigation measures that rely nearly exclusively on visual

monitoring measures. They assert that NMFS assumes that the use of PSOs as mitigation will be effective and that NMFS fails to acknowledge the difficulty of accurately observing marine mammals from shore.

Response: NMFS disagrees with the comment. NMFS did not rely solely on the mitigation in order to reach its findings under the negligible impact standard. As NMFS stated in the analysis, consideration of the implementation of prescribed mitigation is one factor but is not determinative in any case. In certain circumstances, mitigation is more important in reaching the negligible impact determination, *e.g.*, when mitigation helps to alleviate the likely significance of taking by avoiding or reducing impacts in important areas. Our discussion in the **Negligible Impact Analysis and Determination** section below contains the factors NMFS considered in reaching its negligible impact determinations. Although NMFS' implementing regulations at 50 CFR 216.104(c) state that NMFS may incorporate successful implementation of mitigation measures to arrive at a negligible impact determination, for issuance of an IHA to 8 Star Alaska for pile driving activities in Prudhoe Bay, NMFS did not rely upon an assumption of set level of effectiveness in mitigation to make our negligible impact determinations.

In the Proposed Mitigation section of the notice of the proposed IHA (90 FR 16600, April 18, 2025), NMFS states that placement of PSOs on elevated structures on West Dock will allow PSOs to observe phocids within the Level A and Level B harassment zones, to an estimated distance of 500 m. NMFS states that due to the large Level A and Level B harassment zones, PSOs will not be able to effectively observe the entire zones during all activities for all species. While NMFS does not assume total effectiveness of monitoring, NMFS expects the mitigation based upon visual observations will be effective in minimizing impact to marine mammals, and NMFS has appropriately determined that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Comment 6: NSB recommended that NMFS require 8 Star Alaska to consult with NMFS, the Borough, and the Alaska Eskimo Whaling Commission (AEWC) to ensure that there are enough acoustic monitoring devices deployed and placed in the most appropriate locations and distances from West Dock. In a related comment, CBD asserts that PSOs will not be available at all times to monitor all activities, and that even if observers were available, they cannot observe the entirety of zones. CBD asserts that by not requiring real-time PAM, NMFS fails to ensure the least practicable impact to marine mammals affected by this project.

Response: NMFS and 8 Star Alaska have had extensive discussions about potential mitigation for marine mammals, including measures recommended by the Peer Review Panel (PRP) and by commenters. 8 Star Alaska has consulted further with NSB and AEWC and intends to continue to do so, as stated in the Plan of Cooperation (POC). 8 Star Alaska will deploy three hydrophones in its PAM setup during the open-water season. If work is required during the ice-covered contingency period, 8 Star Alaska will deploy one hydrophone during that construction. Additional hydrophones during the contingency period are not warranted, as we do not expect cetaceans to be present in the area during this time (Quakenbush *et al.,* 2018, Citta *et al.,* 2016) and while ringed seals likely will be present, few, if any, spotted or bearded seals are likely to be present during that time (Bengston *et al.,* 2005; Lowry *et al.,* 1998; Simpkins *et al*., 2003). NMFS does not expect the use of PAM to conduct real-time mitigation to be notably more effective in minimizing impacts than the included requirements due to the limited expected marine mammal vocalizations expected during the project period. Moreover, the significant additional cost and effort associated with real-time PAM implementation are impracticable. Therefore, in consideration of these limitations, further described in the *Monitoring Plan Peer Review* section of the proposed IHA (90 FR 16600, April 18,

2025) and in this notice, NMFS did not require 8 Star Alaska to use PAM to conduct real-time mitigation.

NMFS expects PSOs will be able to effectively monitor shutdown zones and implement shutdown procedures as appropriate, minimizing instances of auditory injury and reducing the duration and/or intensity of Level B harassment events. It is unclear what CBD is referring to when they state that PSOs will not be available at all times, as at least two PSOs will be present during all pile driving and removal activities. PSOs will begin monitoring 3 days prior to the onset of pile driving and removal activities and continue through 3 days after completion of the pile driving and removal activities. PSOs will monitor 24 hours per day, even during periods when construction is not occurring.

After evaluating all of the applicable information, NMFS has concluded that the required mitigation measures will effect the least practicable adverse impact on the affected marine mammal species and stocks and their habitats.

Comment 7: CBD asserted that NMFS failed to consider the use of drones, in addition to PSOs, to detect the presence of marine mammals.

Response: NMFS agrees that drones can be an effective tool for monitoring marine mammals during certain projects. NMFS believes that visual monitoring and the related protocols NMFS has prescribed are, however, an appropriate part of the suite of mitigation measures here that satisfy the MMPA's least practicable adverse impact standard. The use of drones would not substantially increase the effectiveness of the mitigation measures or effect the least practicable adverse impact determination. The use of drones is also not practicable for 8 Star Alaska to implement due to operational constraints including line-of-sight limits for operating drones, battery range/duration, the need for Federal Aviation Administration licensed and trained staff, and the distance limitations of some drones would render them unusable for observing for long periods.

Thus visual monitoring and related protocols satisfy the MMPA's least practicable adverse impact standard.

Comment 8: CBD recommends that NMFS should assume that each acoustic detection during pile driving or removal represents a take by Level B harassment. This recommendation is based on the PRP's recommendation that, using real-time PAM, each acoustic detection that occurs during pile driving or removal should be considered a take by Level B harassment.

Response: NMFS disagrees with the recommendation that NMFS should assume that each acoustic detection during pile driving or removal should be considered a take by Level B harassment. The PRP recommended that 8 Star Alaska use real-time PAM to estimate takes by Level B harassment only in the far field, assuming that each acoustic detection that occurs during pile driving or removal represents a Level B harassment take. However, as described in the *Monitoring Plan Peer Review* section of the proposed IHA (90 FR 16600, April 18, 2025) and in this notice, NMFS does not agree with these recommendations and is not requiring 8 Star Alaska to use real-time PAM. Furthermore, 8 Star Alaska does not intend to set the hydrophones up as a localization array, and therefore, the data will not be appropriate for reporting specific locations of marine mammal detections.

An animal's occurrence within the estimated Level B harassment zone does not necessarily mean that it was actually taken by Level B harassment, absent data regarding received noise levels and behavioral response of the animal. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "Level B harassment" as any act of pursuit, torment, or annoyance, which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding,

feeding, or sheltering. As such, assuming that each acoustic detection is a take by Level B harassment would not be appropriate, as Level B harassment may not have occurred.

Comment 9: CBD asserts that NMFS' "take estimates from modeling likely underestimate or incorrectly estimate take and therefore the negligible impact analysis is flawed." They state that NMFS based estimates on assumption of uniform densities within the project area even though NMFS acknowledges that uniform density through the Level A and Level B harassment zones is not likely appropriate for this project.

Response: NMFS disagrees with the commenter's assertion that "take estimates from modeling likely underestimate or incorrectly estimate take and therefore the negligible impact analysis is flawed." As described in the response to comment 4, the Level A and Level B harassment zones are likely overestimates given modeling assumptions. In addition, as described in the *Marine Mammal Occurrence* section, the cetacean densities are likely overestimates given the offshore location of the surveys relied upon. Therefore, if anything, the marine mammal take numbers are likely overestimates.

NMFS acknowledges that given varying habitat attributes throughout the zones such as distance from the shore and water depth, marine mammals likely do not occur in a uniform density within the harassment zones. NMFS used an average density over the project area, using the best available data, to calculate estimated take numbers. These densities are described further in the *Marine Mammal Occurrence* section of the notice of proposed IHA and this final IHA. NMFS is not aware of, nor has the commenter provided, more spatially explicit density estimates that would allow for a more refined take estimate.

Comment 10: CBD states that NMFS' requirement for 8 Star Alaska to initiate pile driving prior to March 1 during the contingency period to discourage ringed seals

from establishing birthing lairs near pile driving should not be considered to mitigate harassment, but instead should be considered as additional take.

Response: Winter and spring construction activities could result in the disruption of a ringed seal's behavioral patterns (*i.e.*, if a seal would have otherwise built a lair in the project area, it could be displaced). However, a seal which is taken by Level B harassment by behavioral disturbance (causing it to build its lair in a different location) would still be counted as one take by Level B harassment, though it is important to consider how the impacts of different types of take may impact an individual.

Tagging data suggest that ringed seals utilize multiple lairs and Kelly *et al*. (1986) determined that, on average, one seal used 2.85 lairs, although the authors suggested that this is likely an underestimate. Density estimates for the number of ringed seal ice structures have been calculated (Frost and Burns 1989; Kelly *et al*. 1986; Williams *et al*. 2002), and the average density of ice structures from these reports is 1.58/km^2. As such, it is unreasonable to expect that more than a few takes from the displacement of seal lair construction, an above water behavior, would occur. These few specific potential takes are adequately addressed by the take estimate and authorization and their impacts have been appropriately considered in the analysis. There are many other available locations for the seals to construct their lairs away from the project area, so potentially preventing a few individual seals from constructing lairs in the project area is not expected to negatively affect pupping success. NMFS also notes that construction is only expected to occur during this contingency period if 8 Star Alaska is unable to complete construction during the open-water season, and NMFS expects that if 8 Star Alaska works during the contingency period, it would be because of construction delays (and therefore, days on which they did not work) during their planned open water work season.

Comment 11: A member of the public asserts that cumulative impacts are being ignored. The commenter states that NEPA requires Federal agencies to account for

cumulative impacts and that NMFS must conduct a full cumulative impacts analysis. The commenter points to plans for expanded oil and gas development, deep sea and seabed mining, Arctic shipping corridors, and new military infrastructure in the Arctic.

Response: NMFS participated as a cooperating agency on the Federal Energy Regulatory Commission's (FERC) 2020 Alaska LNG Project Final Environmental Impact Statement (FEIS), which was finalized on March 6, 2020, and is available at *https://www.ferc.gov/industries-data/natural-gas/environment/final-environmental-impact-statement-feis*. The FEIS concluded that cumulative impacts would be unlikely or minor. NMFS independently reviewed and evaluated the 2020 Alaska LNG Project FEIS and determined that it was adequate and sufficient to meet our responsibilities under NEPA for the issuance of the 2020 Prudhoe Bay IHA (86 FR 10658, February 22, 2021). NMFS therefore adopted the 2020 Alaska LNG Project FEIS on February 16, 2021. Regarding new information, NMFS prepared a supplemental information report (SIR) which documents NMFS' reevaluation and analysis of whether supplementation is needed for the Alaska LNG Project FEIS pursuant to NEPA. The SIR considered new information since the publication of the 2020 Alaska LNG Project FEIS as well as minor changes to the project and analyses. As described in the SIR, these do not amount to a substantial change relevant to environmental concerns, and the new information does not alter the significance of adverse effects that bear on the analysis in the 2020 Alaska LNG FEIS. Therefore, supplementation of the 2020 Alaska LNG FEIS is not needed, and the 2020 Alaska LNG FEIS remains valid. Additionally, NMFS issued a Biological Opinion under section 7 of the ESA that independently considered the reasonably foreseeable cumulative effects of activities on ESA-listed species and determined that 8 Star Alaska's proposed action is not likely to jeopardize the continued existence of ESA-listed species in the action area.

Comment 12: CBD asserts that NMFS' take estimate has not accounted for the cumulative stresses on the species from climate change, and that NMFS must account for how the impacts from climate change will make ice seals more vulnerable to impacts from other stressors, including pile driving from this project.

Response: NMFS' take estimates appropriately consider the take anticipated to occur from 8 Star Alaska's activities in Prudhoe Bay, Alaska. Both the statute and the agency's implementing regulations call for analysis of the effects of the applicant's activities on the affected species and stocks, not analysis of other unrelated activities and their impacts on the species and stocks. That does not mean, however, that effects on the species and stocks caused by other activities are ignored. The preamble for NMFS' implementing regulations under section 101(a)(5) (54 FR 40338; September 29, 1989) explains in response to comments that the impacts from other past and ongoing anthropogenic activities are to be incorporated into the negligible impact analysis via their impacts on the environmental baseline. Consistent with that direction, NMFS has factored into its negligible impact analyses the impacts of other past and ongoing anthropogenic activities via their impacts on the baseline (*e.g.*, as reflected in the density/distribution and status of the species, population size and growth rate, and other relevant stressors). See the **Negligible Impact Analysis and Determination** section of this notice.

NMFS' 1989 final rule for the MMPA implementing regulations also addressed public comments regarding cumulative effects from future, unrelated activities. There we stated that such effects are not considered in making findings under section 101(a)(5) concerning negligible impact. We indicated that NMFS would consider cumulative effects that are reasonably foreseeable when preparing a NEPA analysis and also that reasonably foreseeable cumulative effects would be considered under section 7 of the ESA for ESA-listed species.

In this case, we have found that the total marine mammal take from the planned activity will have a negligible impact on all affected marine mammal species or stocks, small numbers of marine mammals will be taken relative to the population size of the affected species or stocks, and that there will not be an unmitigable adverse impact on subsistence uses from 8 Star Alaska's planned activities. Further, the cumulative effects to listed species of the specified activity in combination with other activities are analyzed in the ESA biological opinion, and the cumulative impacts to the human environment are considered in the Alaska LNG Project Final FEIS, both of which consider changing environmental conditions.

Comment 13: NSB states that noise likely to be produced by the project has the potential to propagate as far as the migratory path of bowheads and possibly deflect whales to the north away from the typical migratory path. NSB comments that due to the possible consequences to subsistence communities, it is important that industrial activities are mitigated as much as possible to reduce possible impacts to hunters' ability to land whales, and that it is incumbent on NMFS to ensure that 8 Star Alaska's proposed activity will not have an unmitigable adverse impact on the availability of bowhead whales for subsistence uses.

Response: In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives.

The communities of Nuiqsut, Utqiaġvik and Kaktovik engage in subsistence harvests off the North Slope of Alaska. Noise from 8 Star Alaska's activities is not expected to affect the subsistence activities of users from Utqiaġvik and Kaktovik due to their distance from 8 Star Alaska's activities, Kaktovik's very limited use of waters offshore of Prudhoe Bay, and considering that the planned activities would occur in an already developed area. Utqiaġvik is approximately 320 km (200 mi) from West Dock,

and farther north, and disruption of bowhead whale behavioral patterns as a result of 8 Star Alaska's pile driving is not expected to impact individuals in the vicinity of Utqiaġvik's whale harvesting area. As described in the **Estimated Take of Marine Mammals** section, only a small number of takes of bowhead whales (a maximum of 110 takes, less than 1 percent of the stock abundance) are expected to be disturbed by the construction activities, and even if some subset of these individuals deflected farther offshore near the project site, it is reasonable to predict that most individuals would likely resume a more typical migration path by the time they reach the Utqiaġvik hunting area and, therefore, significant impacts to the Utqiaġvik hunt would not be expected. However, 8 Star Alaska is required to continue coordinating with subsistence groups, including the Whaling Captains Associations (Utqiaġvik, Nuiqsut, and Kaktovik), as described in the POC. This additional coordination may result in additional mitigation measures, if agreed upon by the communities and 8 Star Alaska. 8 Star Alaska will also conduct SSV to determine sound source levels and propagation for the construction noise, which will further inform and refine our understanding of the distance to which the construction noise is expected to propagate and the likely impact on marine mammals (including bowhead whales). As described in the notice of the proposed IHA (90 FR 16600; April 18, 2025), even if a small subset of taken bowhead whales were to deflect further offshore, NMFS expects that individuals would resume a more typical migration pathway by the time they reached Utqiaġvik and Kaktovik.

As noted in NSB's letter, NMFS is requiring a number of measures to mitigate effects to subsistence hunting as discussed in the *Mitigation for Subsistence Uses of Marine Mammals or Plan of Cooperation* section. This includes robust communication with subsistence users as described in the POC, including AEWC and Whaling Captain Associations, as recommended by the commenter and discussed further in response to Comment 15. 8 Star Alaska must cease pile driving and limit barges to waters landward

of Cross Island during the Nuiqsut whaling season (typically August 25th to September 15th). Further, the mitigation for marine mammals is expected to reduce the frequency and severity of takes of marine mammals.

8 Star Alaska is required by FERC to enter a Conflict Avoidance Agreement (CAA) for the construction season. NMFS supports and encourages participation of applicants in the CAA process, though it does not require applicants to sign the CAA.

Based on the description of 8 Star Alaska's activities, the mitigation measures for subsistence and marine mammals, and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from 8 Star Alaska's activities. Please see the **Unmitigable Adverse Impact Analysis and Determination** section of this notice for further discussion.

Comment 14: NSB comments that 8 Star Alaska anticipated three Level A harassment takes of bowhead whales, but NMFS is not authorizing any Level A harassment takes for bowhead whales. They state that it is unclear how NMFS reached that conclusion. NSB further expresses concern that Level A harassment can result in injury or mortality.

Response: NMFS disagrees that it was unclear how we reached the determination that Level A harassment of bowhead whales is not expected to occur.

As described in the **Estimated Take of Marine Mammals** section of the proposed IHA (90 FR 16600, April 18, 2025) and this notice, NMFS does not expect bowhead whales to occur within the Level A harassment zones due to the shallow waters (approximately 19 ft [5.8] in depth at the isopleth), lack of historic sightings, and required mitigation. Waters less than 15 ft [4.6 m] deep are considered too shallow to support these whales, and in three decades of aerial surveys by the Bureau of Ocean Energy Management (BOEM) (Aerial Surveys of Arctic Marine Mammals [ASAMM]), no bowhead whale has been recorded in waters less than 16.4 ft (5 m) deep (Clarke and

Ferguson 2010). Further, no bowhead whales have been observed during ASAMM surveys in Block 1a (which encompasses the Level A harassment zone) (Clarke *et al*., 2017b, 2018, 2019, 2020). Shutdown requirements within designated shutdown zones for low-frequency (LF) cetaceans (which includes bowhead whales) are expected to prevent take by Level A harassment given the large size and visibility of bowhead whales. Additionally, Level A harassment zones are calculated with an associated duration component based on the amount of pile driving expected to occur within one day. Therefore, a marine mammal is not taken by Level A harassment instantaneously when it enters the Level A harassment zone, and given the shallow depths, even if a bowhead did enter the Level A harassment zone, we would not expect it to remain within the zone for a long enough period to incur auditory injury. Therefore, as described in the **Estimated Take of Marine Mammals** section of the notice of the proposed IHA and this final IHA, we do not expect Level A harassment of bowhead whales to occur, and no such take is authorized.

NMFS further notes, as described in the notice of the proposed IHA (90 FR 16600, April 18, 2025), that Level A harassment includes any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild. For this IHA, NMFS authorized Level A harassment of bearded seal, ringed seal, and spotted seal as individuals of these stocks are likely to incur auditory injury. Level A harassment does not include serious injury or mortality, and, as described in the proposed IHA (90 FR 16600, April 18, 2025), no serious injury or mortality is anticipated or authorized.

Comment 15: NSB requests that 8 Star Alaska be directed to meet and consult with the AEWC, respective Whaling Captains Associations, and the Ice Seal Committee prior to any project-related activities to ensure that the most appropriate and applicable

measures are in place to avoid impacting the availability of bowhead whales and ice seals, respectively, for subsistence uses.

Response: The IHA includes a requirement that 8 Star Alaska must conduct coordination with subsistence communities as described in the POC. This includes coordination with AEWC, Whaling Captains Associations (Utqiaġvik, Nuiqsut, and Kaktovik), and the Ice Seal Committee, as recommended by the commenter. 8 Star Alaska will continue to work with NMFS, AEWC, and the Whaling Captains Associations from Utqiaġvik, Nuiqsut, and Kaktovik, to develop and agree to a Communications Plan. The goals along with the timeline, tools, and process for developing a robust Communications Plan are provided in Appendix C of the revised POC, available at *https://www.fisheries.noaa.gov/action/incidental-take-authorization-alaska-gasline-development-corporation-liquefied-natural-gas-0.* The Communications Plan will be implemented before initiating construction operations to minimize the risk of interfering with subsistence hunting activities. 8 Star Alaska will continue to work closely with subsistence hunters from North Slope communities, including the Ice Seal Committee, to minimize disturbance of subsistence hunting. If additional measures are agreed upon, they will be added to the POC, which 8 Star Alaska is required by the IHA to follow.

Comment 16: NSB expresses concern about takes by Level A harassment of ringed, spotted, and bearded seals given their importance for subsistence and that they are difficult to monitor. NSB expresses further concern about pile driving during the ice covered season, as seals continue to use the area for feeding and pupping. They assert that monitoring seals under ice, especially to prevent Level A harassment takes and avoid serious injury or mortality, is difficult. They comment that if 8 Star Alaska is going to conduct pile driving during the ice-covered period, adequate monitoring must be required by NMFS, including acoustic monitoring.

Response: 8 Star Alaska has considered the potential to conduct pile driving during its winter/spring contingency period. However, 8 Star Alaska intends to complete construction during the open-water season when the additional ice-related concerns raised by NSB are not a concern, and seals are not building or using lairs. If 8 Star Alaska does conduct construction during the ice-covered season, it will implement mitigation and monitoring measures for seals that are expected to avoid injury of seals, and minimize potential disturbance of seals, as described in the **Mitigation** section of this notice and in the *Monitoring Plan Peer Review* section of this notice.

8 Star Alaska has informed NMFS that it is highly motivated to complete work during the open-water season, as work during the ice-covered winter/spring contingency period would require additional equipment and include other constraints.

Regarding monitoring, if construction during the contingency period is required, 8 Star Alaska will deploy one hydrophone for PAM of marine mammals. Additional hydrophones during the contingency period are not warranted, as we do not expect cetaceans to be present in the area during this time (Quakenbush *et al.,* 2018, Citta *et al.,* 2016) and while ringed seals likely will be present, few, if any, spotted or bearded seals are likely to be present during that time (Bengston *et al.,* 2005; Lowry *et al.,* 1998; Simpkins *et al*., 2003). NMFS is not including specific location requirements for 8 Star Alaska's hydrophone placement, as the location will depend on conditions in the construction year. A location for the contingency period hydrophone would be selected closer to construction and must be reviewed by NMFS, the NSB, and the AEWC, and approved by NMFS prior to deployment. While the device will not be monitored in real-time or used for the purposes of implementing mitigation, PAM detections of marine mammals will further inform the actual number of takes that result from the activities relative to the number authorized.

PSOs will be present for all pile driving during the contingency period, and a subsistence advisor would be present during this period to survey areas within a buffer zone of Dock Head 4 (DH4) where water depth is greater than 10 ft (3m) to identify potential ringed seal structures before activity begins.

Comment 17: A member of the public commented that the 2020 Alaska LNG Biological Opinion is not sufficient to analyze effects to species listed under the ESA, and that a new ESA consultation is necessary.

Response: As stated in the proposed IHA (90 FR 16600, April 18, 2025), section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the promulgation of regulations, NMFS consults internally whenever we propose to authorize take for endangered or threatened species, in this case with the Alaska Regional Office (AKRO).

NMFS issued a Biological Opinion on June 3, 2020, concluding that the issuance of an IHA for the same project activities in Prudhoe Bay was not likely to jeopardize the continued existence of the threatened and endangered species under NMFS' jurisdiction. On July 14, 2025, NMFS OPR reinitiated consultation with NMFS AKRO pursuant to Section 7 of the ESA on the issuance of an IHA to 8 Star Alaska. As described in this final IHA, AKRO issued a Biological Opinion which found that the Alaska LNG project is not likely to jeopardize the continued existence of the bowhead whale, bearded seal (Beringia DPS), and ringed seal (Arctic subspecies).

Comment 18: A member of the public states that NMFS must demonstrate that it has fully considered how disruptions to marine mammal behavior and abundance will

affect subsistence practices under the MMPA and Executive Order (EO) 13175 (Consultation and Coordination with Indian Tribal Governments).

Response: In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

Given the nature of the activity, and the required mitigation measures, serious injury and mortality of marine mammals is not expected to occur. Impacts to marine mammals would mostly include limited, temporary behavioral disturbances of seals, however, some slight auditory injury in seals within the lower frequencies associated with pile driving is possible. Additionally, a small number of takes of bowhead whales, by Level B harassment only, are predicted to occur in the vicinity of 8 Star Alaska's activity. As described above, the required mitigation measures, such as implementation of shutdown zones, are expected to reduce the frequency and severity of takes of marine mammals. The low frequency and severity of harassment effects is not expected to result in impacts on the reproduction or survival of any individuals, let alone have impacts on annual rates of recruitment or survival of this stock, and therefore, impacts to stock abundance are not anticipated.

Project activities could deter target species from Prudhoe Bay and the area ensonified above the relevant harassment thresholds. However, as described in the

Effects of Specified Activities on Subsistence Uses of Marine Mammals section of this notice, subsistence use of seals and beluga whales is extremely limited in this area, as it is not within the preferred and frequented hunting areas. Bowhead whales typically remain outside of the area between the barrier islands and Prudhoe Bay, minimizing the likelihood of impacts from 8 Star Alaska's project. The proposed takes are not expected to affect the fitness of any bowhead whales, or cause significant deflection outside of the typical migratory path in areas where subsistence hunts occur, and the activities are not otherwise expected to interfere with the hunt. Additionally, during the Nuiqsut whaling season, NMFS requires 8 Star Alaska to cease pile driving and that project vessels must transit landward of Cross Island, therefore minimizing the potential impact to the Nuiqsut hunt. 8 Star Alaska will continue to coordinate with local communities and subsistence groups to minimize impacts of the project, as described in the POC.

Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and other proposed mitigation and monitoring measures, NMFS has determined that 8 Star Alaska's proposed activities will not have an unmitigable adverse impact on subsistence uses of marine mammals.

NMFS is fully aware of and sensitive to its Federal trust responsibilities to all Indian Tribes, including those required by EO 13175. However, in this case, there is no consultation requirement triggered under EO 13175, as this action does not constitute a regulation that has tribal implications or that imposes direct compliance costs on tribal governments. Further, as described in the 2020 Alaska LNG Project FEIS, FERC engaged in government-to-government consultation with the Alaska Native Tribes, including related to potential subsistence impacts. Please see section 4.13.2 (Alaska Native Tribal Consultations) of the 2020 Alaska LNG Project FEIS for additional information on these consultations.

Comment 19: A member of the public recommended that NMFS deny the proposed IHA or, at minimum, significantly expand its environmental analysis before issuing an IHA.

Response: As described in this notice, NMFS has made the necessary findings, as required by section 101(a)(5)(D) of the MMPA and NMFS' implementing regulations, and therefore, denying the proposed IHA was not warranted. NMFS has conducted the appropriate analyses (*e.g.*, as required by the MMPA, NEPA, and ESA) and has responded to the commenter's specific recommendations in response to Comments 11 and 17.

Changes from the Proposed IHA to Final IHA

The final IHA includes updated sound source levels for the impact installation of 48-inch (122 centimeter [cm]) steel pipe piles (see **Estimated Take of Marine Mammals** section). These source level changes result in new Level A and Level B harassment isopleths and shutdown zones for impact installation of 48-inch (122 cm) steel pipe piles and increased take estimates for bowhead whale, beluga whale, ringed seal, spotted seal, and bearded seal (see **Estimated Take of Marine Mammals** and **Mitigation** sections of this notice).

The source level changes are a result of comments received from the Marine Mammal Commission (the Commission) on source levels for impact installation of 48-inch (122 cm) steel pipe piles in the proposed rule for Taking Marine Mammals Incidental to Alaska LNG Project in Cook Inlet (90 FR 35762, July 29, 2025). The Commission reviewed the datasets that NMFS used to determine its proposed levels of 213 decibel (dB) peak sound pressure level (SPLpeak), 192 dB root-mean-square sound pressure level (SPLrms), and 179 dB single strike sound exposure level (SELs-s) in the proposed rule (the same of which were used in the notice of proposed IHA (90 FR 16600, April 18, 2025)) for impact installation of 48-inch (122 cm) steel pipe piles and

recommended instead that NMFS use the median source levels of 209 dB SPLpeak, 195 dB SPLrms, and 181 dB SELs-s from Caltrans (2020; Alameda, Vallejo, and Kitsap) and Austin *et al*. (2016), while omitting certain datasets that the Commission stated are inappropriate for use in informing appropriate proxy source levels.

NMFS agrees with the Commission that data from Antioch, Avon Wharf, and Navy Kitsap (Caltrans, 2020) should be excluded from consideration and that data from Austin *et al*. (2016) should be included. NMFS also agrees that certain incorrect source levels from Illingworth and Rodkin (2017) should not be used. However, NMFS disagrees that the source levels from Illingworth and Rodkin (2017) should be entirely disregarded. Therefore, for this final IHA, NMFS has determined it appropriate to use median values of 208 dB SPLpeak, 195 dB SPLrms, and 180 dB SELs-s (Caltrans, 2020; Illingworth and Rodkin, 2017; Austin *et al.* 2016) as source levels for impact installation of 48-inch (122 cm) steel pipe piles. This change is consistent with NMFS' partial concurrence with the Commission's recommendation related to the aforementioned Cook Inlet rule related to the Alaska LNG project (90 FR 35762, July 29, 2025).

This authorization is effective from 1 year from the date of notification by the IHA-holder, not to exceed 1 year from the date of issuance (November 11, 2025). It will become effective upon written notification from the applicant to NMFS, but not beginning later than 1 year from the date of issuance or extending beyond 2 years from the date of issuance. This is a change from the proposed IHA, in which NMFS proposed that the IHA would be effective for 1 year from June 1, 2027 or June 1, 2028. There is no change in NMFS' analysis based on this change, which provides additional flexibility to 8 Star Alaska, given current uncertainty regarding the project start date.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the

potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species)*. Additional information may be found in the Aerial Survey of Arctic Marine Mammals (ASAMM) reports, which are available online at *https://www.fisheries.noaa.gov/alaska/marine-mammal-protection/aerial-surveys-arctic-marine-mammals*, with the exception of the 2020 and 2021 reports, which are available in the NMFS repository (*https://repository.library.noaa.gov/*).

Table 1 lists all species or stocks for which take is expected and authorized for this activity and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no serious injury or mortality is anticipated or authorized here, PBR and annual serious injury and mortality (M/SI) from anthropogenic sources are included here as gross indicators of the status of the species or stocks and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Pacific and Alaska

SARs. All values presented in table 1 are the most recent available at the time of publication (including from the draft 2024 SARs) and are available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

Table 1 -- Marine Mammal Species[1] With Estimated Take from the Specified Activities

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[2]	Stock abundance (CV, Nmin, most recent abundance survey)[3]	PBR	Annual M/SI[4]
Order Artiodactyla – Cetacea – Mysticeti (baleen whales)						
Family Eschrichtiidae						
Gray Whale	*Eschrichtius robustus*	Eastern N Pacific	-, -, N	26,960 (0.05, 25,849, 2016)	801	131
Family Balaenidae						
Bowhead whale	*Balaena mysticetus*	Western Arctic	E, D, Y	15,227 (0.165, 13,263, 2019)	133	57
Odontoceti (toothed whales, dolphins, and porpoises)						
Family Monodontidae (white whales)						
Beluga Whale	*Delphinapterus leucas*	Beaufort Sea	-, -, N	39,258 (0.229, N/A, 1992)	UND	104
Beluga Whale	*Delphinapterus leucas*	Eastern Chukchi	-, -, N	13,305 (0.51, 8,875, 2017)	178	56
Order Carnivora – Pinnipedia						
Family Phocidae (earless seals)						
Bearded Seal	*Erignathus barbatus*	Beringia	T, D, Y	UND (UND, UND, 2013)[5]	UND	6,709
Ringed Seal	*Pusa hispida*	Arctic	T, D, Y	UND (UND, UND, 2013)[6]	UND	6,459

Spotted Seal	*Phoca largha*	Bering	-, -, N	461,625 (N/A, 423,237, 2013)	25,394	5,254

[1]Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (*https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/*).
[2]ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.
[3]NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance.
[4]These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.*, commercial fisheries, vessel strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.
[5]Reliable population estimate for the entire stock not available. PBR is based upon the negatively biased Nmin for bearded seals in the U.S. portion of the stock.
[6] A reliable population estimate for the entire stock is not available. Using a sub-sample of data collected from the U.S portion of the Bering Sea, an abundance estimate of 171,418 ringed seals has been calculated, but this estimate does not account for availability bias due to seals in the water or in the shorefast ice zone at the time of the survey. The actual number of ringed seals in the U.S. portion of the Bering Sea is likely much higher. Using the Nmin based upon this negatively biased population estimate, the PBR is calculated to be 4,755 seals, although this is also a negatively biased estimate.

A detailed description of the species likely to be affected by the Alaska LNG project in Prudhoe Bay, AK, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (90 FR 16600, April 18, 2025). Since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (*https://www.fisheries.noaa.gov/find-species*) for generalized species accounts.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have

equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc*.). Generalized hearing ranges were chosen based on the ~65 decibel (dB) threshold from composite audiograms, previous analyses in NMFS (2018), and/or data from Southall *et al*. (2007) and Southall *et al.* (2019). We note that the names of two hearing groups and the generalized hearing ranges of all marine mammal hearing groups have been recently updated (NMFS 2024) as reflected below in table 2.

Table 2 -- Marine Mammal Hearing Groups (NMFS, 2024)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 36 kHz
High-frequency (HF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
Very High-frequency (VHF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	200 Hz to 165 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	40 Hz to 90 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 68 kHz
* Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges may not be as broad. Generalized hearing range chosen based on ~65 dB threshold from composite audiogram, previous analysis in NMFS 2018, and/or data from Southall et al. 2007; Southall et al. 2019. Additionally, animals are able to detect very loud sounds above and below that "generalized" hearing range.	

For more detail concerning these groups and associated frequency ranges, please see NMFS (2024) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from 8 Star Alaska's construction of the Alaska LNG facilities in Prudhoe Bay, AK have the potential to result in harassment of marine

mammals in the vicinity of the project area. The notice of proposed IHA (90 FR 16600, April 18, 2025) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from 8 Star Alaska's construction activity on marine mammals and their habitat. That information and analysis is referenced in this notice and is not repeated here; please refer to the notice of proposed IHA (90 FR 16600, April 18, 2025).

Estimated Take of Marine Mammals

This section provides an estimate of the number of incidental takes authorized through the IHA, which will inform NMFS' consideration of "small numbers," the negligible impact determinations, and impacts on subsistence uses.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes will primarily be by Level B harassment, as vibratory and impact pile driving have the potential to result in disruption of behavioral patterns for individual marine mammals. There is some potential for auditory injury (Level A harassment) to result from impact pile driving, primarily for phocids, due to the size of the Level A harassment zones and the difficulty in being detected by observers. Auditory injury is unlikely to occur to cetaceans. The mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

As described previously, no serious injury or mortality is anticipated or authorized for this activity. Below we describe how the take numbers are estimated.

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

Acoustic Criteria

NMFS recommends the use of acoustic criteria that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur auditory injury of some degree (equated to Level A harassment).

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.*, Southall *et al.,* 2007, 2021, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are

likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.*, vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by temporary threshold shift (TTS) as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

8 Star Alaska's construction activity includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 μPa are applicable.

Level A harassment – NMFS' Updated Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) (Updated Technical Guidance, 2024) identifies dual criteria to assess auditory injury (Level A harassment) to five different underwater marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). 8 Star Alaska's construction activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving) sources.

The 2024 Updated Technical Guidance criteria include both updated thresholds and updated weighting functions for each hearing group. The thresholds are provided in the table below. The references, analysis, and methodology used in the development of the criteria are described in NMFS' 2024 Updated Technical Guidance, which may be

accessed at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance-other-acoustic-tools*.

Table 3 -- Thresholds Identifying the Onset of Auditory Injury

	Auditory Injury Onset Acoustic Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 222 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 197 dB
High-Frequency (HF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,HF,24h}$: 193 dB	*Cell 4* $L_{E,HF,24h}$: 201 dB
Very High-Frequency (VHF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,VHF,24h}$: 159 dB	*Cell 6* $L_{E,VHF,24h}$: 181 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 223 dB $L_{E,PW,24h}$: 183 dB	*Cell 8* $L_{E,PW,24h}$: 195 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 230 dB $L_{E,OW,24h}$: 185 dB	*Cell 10* $L_{E,OW,24h}$: 199 dB

*Dual metric criteria for impulsive sounds: Use whichever criteria results in the larger isopleth for calculating auditory injury onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level criteria associated with impulsive sounds, the PK SPL criteria are recommended for consideration for non-impulsive sources.

Note: Peak sound pressure level ($L_{p,0\text{-}pk}$) has a reference value of 1 µPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 µPa^{2}s. In this table, criteria are abbreviated to be more reflective of International Organization for Standardization standards (ISO 2017). The subscript "flat" is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals underwater (*i.e.*, 7 Hz to 165 kHz). The subscript associated with cumulative sound exposure level criteria indicates the designated marine mammal auditory weighting function (LF, HF, and VHF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level criteria could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these criteria will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the project. Marine mammals are expected to be

affected via sound generated by the primary components of the project (*i.e.*, pile driving and removal). The maximum (underwater) area ensonified above the thresholds for behavioral harassment referenced above is 67.7 km^2 (26.1 mi^2), and the calculated distance to the farthest behavioral isopleth is approximately 4.6 km (2.9 mi).

The project includes vibratory pile installation and removal and impact pile installation. Source levels for these activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for each pile size and activity are presented in table 4. Source levels for vibratory installation and removal of piles of the same diameter are assumed to be the same.

Table 4 -- Sound Source Levels for Pile Driving

Pile Size and Type	Hammer Type	Source Level (at 10 m)			Literature Source
		Peak (dB re 1 µPa)	RMS (dB re 1 µPa)	SEL (dB re 1 μPa^2 sec)	
11.5-inch (29.2 cm) H-Pile	Impact	200	183	170	Caltrans (2015) (12-inch (30 cm) H-Pile)
14-inch (36 cm) H-Pile	Impact	200	183	170	Caltrans (2015) (12-inch (30 cm) H-Pile)
	Vibratory	165	150	150	Caltrans (2015) (12- to 16-inch (30 to 40 cm) H-Pile)
48-Inch (122 cm) Pipe Pile*	Impact	208	195	180	Caltrans (2020); Austin, *et al.* (2016); Illingworth & Rodkin (2017); (48-inch (122 cm) Steel Pipe Pile)
Sheet Piles (19.69 and 25-inch (50 and 64 cm)	Vibratory	175	160	160	Caltrans (2015) (AZ Steel Sheet)

*Source levels for impact installation of 48-inch (122 cm) steel pipe piles have changed since publication of the proposed IHA due to comments received from the Commission on the proposed rule for Taking of Marine Mammals Incidental to Alaska LNG Project in Cook Inlet (90 FR 35762, July 29, 2025) (see **Changes from Proposed IHA to Final IHA** section of this notice).

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water

chemistry, and bottom composition topography. The general formula for underwater TL is:

$TL = B * Log10 (R_1 /R_2)$,

where

TL = transmission loss in dB;

B = transmission loss coefficient;

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

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

Absent site-specific acoustical monitoring with differing measured transmission loss, a practical spreading value of 15 is used as the transmission loss coefficient in the above formula. Project and site-specific transmission loss data for the Prudhoe Bay portion of 8 Star Alaska's Alaska LNG project are not available; therefore, the default coefficient of 15 is used to determine the distances to the Level A and Level B harassment thresholds. However, as discussed in the **Monitoring and Reporting** section, 8 Star Alaska will conduct SSV for pile driving. Following the analysis of SSV results, 8 Star Alaska may propose adjusted shutdown zones and revised Level A and Level B harassment zones (for the purpose of monitoring and reporting) for NMFS review and approval. All Level B harassment isopleths are reported in table 6. The maximum (underwater) area ensonified above the thresholds for behavioral harassment is 67.7 km^2 (42 mi^2).

The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the 2024 Updated Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods

underlying this optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources, such as pile driving, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur auditory injury. Inputs used in the optional User Spreadsheet tool are provided in table 5, and the resulting estimated isopleths are reported in table 6.

Table 5 -- User Spreadsheet Input Parameters Used for Calculating Level A Harassment Isopleths (Source Levels Provided in table 4)

Pile Size	Piles Per Day[a]	Strikes Per Pile	Duration to Drive Pile (min)	Weighting Factor Adjustment
Impact				
11.5-inch (29.2 cm) H-Pile	26.09[b]	1,000	N/A	2
14-inch (36 cm) H-Pile	4	1,000	N/A	2
48-inch (122 cm) Pipe Pile	1.25	1,000	N/A	2
Vibratory				
14-inch (36 cm) H-Pile	8	N/A	15	2.5
19.69-inch (50 cm) Sheet Pile	15.24[b]	N/A	18.9	2.5
25-inch (64 cm) Sheet Pile	12	N/A	24	2.5

[a] These estimates include contingencies for weather, equipment, workflow, and other factors that affect the number of piles per day and are assumed to be a maximum anticipated per day. Given that 8 Star Alaska plans to pile drive up to 24 hours per day, it is appropriate to assume that the number of piles installed within the 24-hour period may not be a whole number.
[b] These averages assume that 8 Star Alaska will drive 11.5-inch (29.2-cm) H-piles and sheet piles at a rate of 25 ft (7.6 m) per day.

Table 6 -- Calculated Distances to Level A and Level B Harassment Isopleths

Pile Type	Hammer Type	Level A Harassment Zone (m)			Level B Harassment Zone (m)
		LF Cetaceans	HF Cetaceans	Phocids	
11.5-inch (29.2 cm) H-Pile	Impact	1,190	152	1,057	342
14-inch (36 cm) H-Pile	Impact	341	44	303	341
	Vibratory	3	1	4	1,000
48-inch (122 cm) Pipe Pile*	Impact	729	93	647	2,154
19.69-inch (50.01 cm) Sheet Pile	Vibratory	23	9	29	4,642
25-inch (64 cm) Sheet Pile	Vibratory	23	9	29	4,642

*The Level A and Level B harassment isopleths for impact installation of 48-inch steel pipe piles have changed since the publication of the proposed IHA due to changes in source levels (see **Changes from Proposed IHA to Final IHA** section of this notice and table 4).

Level A harassment zones are typically smaller than Level B harassment zones. However, in rare cases such as the impact pile driving of the 11.5-inch (29.2 cm) H-piles by 8 Star Alaska, the calculated Level A harassment isopleth is greater than the calculated Level B harassment isopleth for LF cetaceans and phocids. Calculation of Level A harassment isopleths include a duration component, which in the case of impact pile driving, is estimated through the total number of daily strikes and the associated pulse duration. For a stationary sound source such as impact pile driving, we assume here that an animal is exposed to all of the strikes expected within a 24-hour period. Calculation of a Level B harassment zone does not include a duration component. Depending on the duration included in the calculation, the calculated Level A harassment isopleths can be larger than the calculated Level B harassment isopleth for the same activity.

Marine Mammal Occurrence

In this section we provide information about the occurrence of marine mammals, including density or other relevant information which will inform the take calculations.

From 2011-2019, each fall and summer, NMFS and BOEM conducted aerial surveys in the Arctic, the ASAMM surveys (Clarke *et al*., 2012, 2013, 2014, 2015a, 2017a, 2017b, 2018, 2019, and 2020). The goal of these surveys was to document the distribution and relative abundance of bowhead, gray, right, fin, and beluga whales and other marine mammals in the area of potential oil and natural gas exploration, development, and production activities in the Alaskan Beaufort and northeastern Chukchi Seas. In 2020 and 2021, NMFS conducted aerial surveys during the fall in the western Beaufort Sea focusing on Point Barrow to Prudhoe Bay (Brower *et al*., 2022a, 2022b). These surveys were conducted within blocks that overlay the Beaufort and Chukchi Seas oil and gas lease sale areas offshore of Alaska (figure 16 in 8 Star Alaska's application), and provide sighting data for bowhead, gray, and beluga whales. NMFS used data from these surveys from 2011-2021 to estimate seasonal densities of cetaceans in the project area. During the summer, NMFS observed for marine mammals on effort for 15,127 km from 2011-2019 and 15,968 km during the fall from 2011 to 2021. We note that the Prudhoe Bay portion of the Alaska LNG project is in ASAMM survey block 1; the inshore boundary of this block terminates at the McClure Island group. It was not until 2016 that on-effort surveys began inside the McClure Island group (including Prudhoe Bay) since bowhead whales, the focus of the surveys, are not likely to enter this area, given its shallow depth. However, no bowheads and only one beluga whale have been observed in block 1a (including Prudhoe Bay). Therefore, the density estimates provided here are likely an overestimate because they rely on offshore surveys where marine mammals are more likely to be present.

Cetaceans

8 Star Alaska calculated summer and fall density estimates for bowhead whale, gray whale, and beluga whale by dividing the average number of whales observed per km of transect effort in ASAMM Block 1 by two times the effective strip width (ESW) to

encompass both sides of the transect line (whales per km/(2xESW) (table 7 and table 8). The ESW for bowhead whale, gray whale, and beluga whale from the Aero Commander aircraft are 1.15 km (0.71 mi), 1.2 km (0.75 mi), and 0.613 km (0.38 mi), respectively (Ferguson and Clarke, 2013). Fall sighting data is available from 2011-2021. Surveys were not conducted in the summer of 2020 and 2021, and therefore sighting data for the summer is only available from 2011-2019. Additionally, although beluga whale sighting data was available from 2011-2013, it was only summarized by depth zone, rather than by survey block. Therefore, and given that more recent data is available, data from 2011-2013 was excluded for beluga whales.

Table 7 and table 8, below, include calculated summer and fall densities for each species. All resulting densities are expected to be overestimates for the Alaska LNG analysis because the data are based on sighting effort outside of the barrier islands and these species rarely occur within the barrier islands. To estimate take of each cetacean species, 8 Star Alaska used the higher density in an effort to avoid underestimating take. Therefore, NMFS estimated take of gray whale and beluga whale using the summer densities, 0.00003 and 0.009 whales/km^2 respectively, and estimated take using the fall density of 0.017 whales/km^2 for bowhead whale.

As noted in the **Federal Register** notice for the proposed IHA (90 FR 16600, April 18, 2025), we do not expect cetaceans to be present during 8 Star Alaska's winter/spring contingency pile driving period.

Table 7 -- Summer Sighting and Density Data

Year	Transect (km)	# sightings		
		Bowhead Whale	Gray Whale	Beluga Whale
2011	346	1	0	N/A [a]
2012	1493	5	0	N/A [a]
2013	1582	21	0	N/A [a]
2014	1393	17	0	13
2015	1262	15	0	37
2016	1914	97	1	0
2017	3003	8	0	4
2018	2491	2	0	6

2019	1643	6	0	63
Total	15127	172	1	123
Encounter Rate (whales/km)		0.01137	0.00007	0.01051 [b]
Density (whales/km^2) [c]		0.0049	0.00003	0.009

[a] Beluga sighting data from 2011 to 2013 was only summarized by depth zone, rather than by survey block. Therefore, data from 2011-2013 was excluded for beluga whales.

[b] Encounter rate for beluga whales was calculated using total transect from 2014-2019, which was 11,706 km

[c] Density was calculated with the formula of Encounter rate/(2xESW). ESW for each species are as follows: Bowhead whale: 1.15, Gray whale: 1.201, Beluga whale: 0.614 (Ferguson and Clarke, 2013)

Table 8 -- Fall Sighting and Density Data

Year	Transect (km)	# sightings		
		Bowhead Whale	Gray Whale	Beluga Whale
2011	1130	24	0	N/A [a]
2012	1696	17	0	N/A [a]
2013	1121	21	0	N/A [a]
2014	1538	79	1	9
2015	1663	17	0	3
2016	2360	23	0	1
2017	1803	255	0	0
2018	1535	69	0	0
2019	2055	45	0	1
2020	379	54	0	0
2021	668	15	0	3
Total	15968	619	1	17
Encounter Rate (whales/km)		0.03877	0.00006	0.00141[b]
Density (whales/km^2) [c]		0.017	0.00002	0.00115

[a] Beluga sighting data from 2011 to 2013 was only summarized by depth zone, rather than by survey block. Therefore, data from 2011-2013 was excluded for beluga whales.

[b] Encounter rate for beluga whales was calculated using total transect from 2014-2021, which was 12,021 km.

[c] Density was calculated with the formula of Encounter rate/(2xESW). ESW for each species are as follows: Bowhead whale-1.15, Gray whale-1.201, Beluga whale-0.614 (Ferguson and Clarke, 2013)

Ringed Seal

Ringed seals are the most abundant species in the project area. They haul out on the ice to molt between late May and early June, and spring aerial surveys provide the most comprehensive density estimates available. Spring surveys are expected to provide the best ringed seal density information, as the greatest percentage of seals have abandoned their lairs and are hauled out on the ice (Kelly *et al*., 2010). Spring aerial surveys conducted in the central Beaufort Sea from 1996-1999 (Frost *et al*., 2004) and

around the West Dock area as part of industry monitoring programs for the construction of the Northstar production facility from 1997-2002 (Richardson and Williams, 2003, Richardson and Williams, 2002) were considered the best data available to determine spring density in the area of the project. The yearly densities from these spring aerial surveys were averaged to determine spring ringed seal density. The average observed spring ringed seal density from this monitoring effort was 0.634 seals/km^2 (table 9). While more recent ASAMM surveys have been conducted in the project area, these surveys did not identify observed pinnipeds to species, and therefore these data are not included.

Table 9 -- Ringed Seal Densities Estimated Using Spring Aerial Surveys Conducted from 1996 to 2002

Survey Year	Density (seals/km^2)	Reference
1996	0.81	Frost *et al*. (2004)
1997	0.73	Frost *et al*. (2004)
1997	0.43	Richardson and Williams (2002)
1998	0.64	Frost *et al*. (2004)
1998	0.39	Richardson and Williams (2002)
1999	0.87	Frost *et al*. (2004)
1999	0.63	Richardson and Williams (2002)
2000	0.47	Richardson and Williams (2002)
2001	0.54	Richardson and Williams (2002)
2002	0.83	Richardson and Williams (2003)
Average	0.634	

In order to generate a summer density, as 8 Star Alaska expects that the majority of their work will occur during the summer, we first begin with the spring density. Summer densities of ringed seals in the project area are expected to significantly decrease as ringed seals range considerable distances during the open water season. Summer density was estimated to be 50 percent of the spring density (0.634 seals/km^2), resulting in a summer density of 0.317 seals/km^2. Given that 8 Star Alaska will only pile drive during the winter if they are unable to complete the work during the summer and fall

open water season, NMFS estimated ringed seal takes using the summer density of 0.317 seals/km^2 rather than winter.

Spotted Seal

The spotted seal occurs in the Beaufort Sea in small numbers during the summer open water period. At the onset of freeze-up in the fall, spotted seals return to the Chukchi Sea and then Bering Sea to spend the winter and spring. As such, 8 Star Alaska does not expect spotted seals to occur in the project area during 8 Star Alaska's winter/spring contingency period, and NMFS concurs.

Only a few of the studies referenced in calculating the ringed seal densities also include data for spotted seals. Given the limited spotted seal data, NMFS expects that relying on this data may result in an underestimate, and that it is more appropriate to calculate the spotted seal density as a percentage of ringed seal density. Therefore, summer spotted seal density was estimated as a percentage of ringed seal sightings observed during monitoring during seismic exploration in this area from 2006-2008 (Funk *et al*., 2010). Spotted seals comprised 34.8 percent of ringed seal sightings during these monitoring efforts. Therefore, summer spotted seal density was calculated as 34.8 percent of the ringed seal density of 0.317 seals/km^2, which results in an estimated spotted seal summer density of 0.11 seals/km^2. This density will be used to estimate take of spotted seal.

Bearded Seal

The majority of bearded seals spend the winter and spring in the Chukchi and Bering Seas; however, some remain in the Beaufort Sea year-round. A reliable population estimate for the bearded seal stock is not available, and occurrence in the Beaufort Sea is less known than in the Bering Sea. Spring aerial surveys conducted as part of industry monitoring for the Northstar production facility provide limited sighting numbers from 1999-2002 (Richardson and Williams, 2002, 2003).

Bearded seals occur in the Beaufort Sea more frequently during the open water season, rather than other parts of the year. They prefer water farther offshore. Only a few of the studies referenced in calculating the ringed seal densities also include data for bearded seals. Given the limited bearded seal data, NMFS expects that relying on this data may result in an underestimate, and that it is more appropriate to calculate the bearded seal density as a proportion of the ringed seal density. Therefore, summer bearded seal density was estimated as a percentage of ringed seal sightings observed during seismic exploration in this area from 2006-2008 (Funk *et al*., 2010). Bearded seals comprised 21.3 percent of ringed seal sightings during these monitoring efforts. Therefore, summer bearded seal density was calculated as 21.3 percent of the summer ringed seal density of 0.317 seals/km^2, which results in an estimated bearded seal density of 0.068 seals/km^2. NMFS used this density to estimate take of bearded seal.

As noted in the **Federal Register** notice for the proposed IHA (90 FR 16600, April 18, 2025), bearded seals could potentially occur in the project area during 8 Star Alaska's winter/spring contingency period. However, we would expect very few, if any bearded seals to be present during this time. In consideration of this species presence information and 8 Star Alaska's plan to conduct most construction during the open-water season, NMFS estimated take of bearded seal using the summer density.

Take Estimation

Here we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and that has been authorized.

To estimate take by Level A and Level B harassment, 8 Star Alaska multiplied the area (km^2) estimated to be ensonified above the Level A or Level B harassment thresholds (table 10 and table 11) for each species, respectively, for pile driving (and removal) of each pile size and hammer type by the duration (days) of that activity in that

season by the seasonal density for each species (number of animals/km^2). NMFS generally concurs with, and has adopted this method, with the exception of the estimated duration of the activity (described below). NMFS also used updated densities as described in the *Marine Mammal Occurrence* section.

Table 10 -- Level B Harassment Zones

Pile Type	Area (km^2)
Impact	
11.5-inch (29.2 cm) H-Pile	0.37
14-inch (36 cm) H-Pile	0.37
48-inch (122 cm) Pipe Pile*	14.58
Vibratory	
14-inch (36 cm) H-Pile	3.14
Sheet Piles (19.69- and 25-Inch (50.01 and 64 cm))	67.7

*The Level B harassment zones for impact installation of 48-inch (122 cm) steel pipe piles have changed since the publication of the proposed IHA due to changes in source levels (see **Changes from Proposed IHA to Final IHA** section of this notice and table 6).

Table 11 -- Level A Harassment Zones

Pile Type	Area (km^2)		
	LF Cetacean	HF Cetacean	Phocids
Impact			
11.5-inch (29.2 cm) H-Pile	4.45	0.073	3.51
14-inch (36 cm) H-Pile	0.37	0.006	0.29
48-inch (122 cm) Pipe Pile*	1.67	0.025	1.32
Vibratory			
14-inch (36 cm) H-Pile	0.00	0.00	0.00
19.69-inch (50.01 cm) Sheet Pile	0.00	0.00	0.00
25-inch (64 cm) Sheet Pile	0.00	0.00	0.00

*The Level A harassment zones for impact installation of 48-inch (122 cm) steel pipe piles have changed since the publication of the proposed IHA due to changes in source levels (see **Changes from Proposed IHA to Final IHA** section of this notice and table 6).

NMFS calculated take using summer densities for all species except for bowhead whale (table 12). For bowhead whales, NMFS conservatively calculated take using the fall density.

Table 12 -- Marine Mammal Densities Used to Estimate Take

Species	Density (animals/km^2)	Season
Bowhead whale	0.017	Fall (September-October)
Gray whale	0.00003	Summer (July-August)
Beluga whale	0.009	Summer (July-August)

Ringed seal	0.317	Summer (July-August)
Spotted seal	0.11	Summer (July-August)
Bearded seal	0.068	Summer (July-August)

Table 13 -- Estimated Take by Level B Harassment by Species, Pile Size and Type, and Installation/Removal Method

Activity	Estimated duration (days)	Bowhead whale	Gray whale	Beluga whale	Ringed seal	Spotted seal	Bearded seal
DH4							
Anchor Pile (11.5-inch (29.2 cm) H-Pile) (impact)	9	0.06	0.00	0.03	1.04	0.36	0.22
25-inch (64 cm) Sheet Pile (Vibratory)	36	41.43	0.07	21.93	772.54	268.07	165.72
Mooring Dolphins (48-inch (122 cm) Pipe Pile) (Impact)	10	2.48	0.00	1.31	46.21	16.03	9.91
Spud Piles (14-inch (36 cm) H-Pile) (vibratory)	12	0.64	0.00	0.34	11.95	4.15	2.56
South Bridge Abutment							
Dock Face (19.69-inch (50 cm) Sheet Pile) (Vibratory)	23	26.47	0.05	14.01	493.57	171.27	105.88
Tailwall (19.69-inch (50 cm) Sheet Pile) (Vibratory)	23	26.47	0.05	14.01	493.57	171.27	105.88
Anchor Pile (14-inch (36 cm) H-Pile) (Impact)	1	0.01	0.00	0.00	0.12	0.04	0.02
North Bridge Abutment							
Dock Face (19.69-inch (50 cm)	24	27.62	0.05	14.62	515.03	178.72	110.48

Sheet Pile) (Vibratory)							
Tailwall (19.69-inch (50 cm) Sheet Pile) (Vibratory)	17	19.56	0.03	10.36	364.81	126.59	78.26
Anchor Pile (14-inch (36 cm) H-Pile (Impact)	1	0.01	0.00	0.00	0.12	0.04	0.02
Barge Bridge							
Mooring Dolphins (48-inch (122 cm) Pipe Pile) (Impact)	4	0.99	0.00	0.52	18.48	6.41	3.96
Spud Pile (14-inch (36 cm) H-Pile) (vibratory)	4	0.21	0.00	0.11	3.98	1.38	0.85
Total	164	145.94	0.25	77.26	2,721.41	944.34	583.77
75 percent of Total	123	109.46	0.19	57.95	2,041.06	708.25	437.83
Authorized take by Level B Harassment		110[a]	2[b]	58[a]	2,041[a]	708[a]	438[a]

[a] Level B harassment takes have increased for bowhead whale, beluga whale, ringed seal, spotted seal, and bearded seal since the publication of the proposed IHA due to changes in source levels and Level B harassment zones for impact installation of 48-inch (122 cm) steel pipe piles (see **Changes from Proposed IHA to Final IHA** section of this notice and table 10).

[b] Although 75 percent of the calculated total is 0.2, in order to account for group size (Clarke *et al*., 2017b), NMFS is authorizing two takes by Level B harassment of gray whale.

8 Star Alaska expects that construction will likely be completed during the open-water construction season. 8 Star Alaska calculated that the construction would require approximately 164 days of in-water work; however, this estimate does not take into account that different pile types would be installed on the same day, therefore reducing the total number of pile driving days. Therefore, NMFS expects that the take calculation using the method described above overestimates take. Taking into consideration the number of calendar days, construction occurring 6 days per week, and no work occurring on days during the whaling season, there are 123 days in the months of July through October on which the work is expected to occur (75 percent of the 164 days estimated by

8 Star Alaska). As such, for each species, NMFS is authorizing 75 percent of the take estimate calculated using the estimated 164 work days (except for Level A harassment take of bowhead whales and beluga whales, and Level B harassment of gray whales as noted below).

NMFS recognizes that 8 Star Alaska may work outside of this period in their February to April contingency period; however, we expect that if 8 Star Alaska works during the contingency period, it would be because of construction delays (and therefore, days on which they did not work) during their planned open water work season. Additionally, we recognize that ringed seals may be present in ice lairs during the contingency period. However, 8 Star Alaska must initiate pile driving prior to March 1, as described in the **Mitigation** section. Initiating pile driving before March 1 is expected to discourage seals from establishing birthing lairs near pile driving. As such, we expect that this measure will eliminate the potential for physical injury to ringed seals during this period. Therefore, NMFS expects that the take estimates described herein are reasonable even if 8 Star Alaska must pile drive during their contingency period.

Table 14 -- Estimated Take by Level A Harassment by Species, Pile Size and Type, and Installation/Removal Method

Activity	Estimated duration (days)	Bowhead whale	Gray whale	Beluga whale	Ringed seal	Spotted seal	Bearded seal
DH4							
Anchor Pile (11.5-inch (29.2 cm) H-Pile) (impact)	9	0.68	0.00	0.01	10.01	3.47	2.15
25-inch (64 cm) Sheet Pile (Vibratory)	36	0.00	0.00	0.00	0.03	0.01	0.01
Mooring Dolphins (48-inch (122 cm) Pipe Pile) (Impact)	10	0.28	0.00	0.00	4.17	1.45	0.89
Spud Piles (14-inch (36 cm)	12	0.00	0.00	0.00	0.00	0.00	0.00

H-Pile) (vibratory)							
South Bridge Abutment							
Dock Face (19.69-inch (50 cm) Sheet Pile) (Vibratory)	23	0.00	0.00	0.00	0.02	0.01	0.00
Tailwall (19.69-inch (50 cm) Sheet Pile) (Vibratory)	23	0.00	0.00	0.00	0.02	0.01	0.00
Anchor Pile (14-inch (36 cm) H-Pile) (Impact)	1	0.01	0.00	0.00	0.09	0.03	0.02
North Bridge Abutment							
Dock Face (19.69-inch (50 cm) Sheet Pile) (Vibratory)	24	0.00	0.00	0.00	0.02	0.01	0.00
Tailwall (19.69-inch (50 cm) Sheet Pile) (Vibratory)	17	0.00	0.00	0.00	0.01	0.00	0.00
Anchor Pile (14-inch (36 cm) H-Pile (Impact)	1	0.01	0.00	0.00	0.09	0.03	0.02
Barge Bridge							
Mooring Dolphins (48-inch (122 cm) Pipe Pile) (Impact)	4	0.11	0.00	0.00	1.67	0.58	0.36
Spud Pile (14-inch (36 cm) H-Pile) (vibratory)	4	0.00	0.00	0.00	0.00	0.00	0.00
Total	164	1.09	0.00	0.01	16.14	5.6	3.46
75 percent of Total	123	0.82	0.00	0.01	12.1	4.2	2.6
Authorized Take by Level A Harassment		0[a]	0	0	12[b]	4	3[b]

[a] NMFS does not expect bowhead whales to occur within the Level A harassment zone, and therefore NMFS did not authorize take by Level A harassment of bowhead whales.

[b] Level A harassment takes have increased for ringed seals and bearded seals since the publication of the proposed IHA due to changes in source levels and Level A harassment zones for impact installation of 48-inch (122 cm) steel pipe piles (see **Changes from Proposed IHA to Final IHA** section of this notice and table 11).

NMFS does not expect bowhead whales to occur within the Level A harassment zones due to the shallow waters (approximately 19 ft [5.8 m] in depth at the isopleth), lack of historic sightings, and required mitigation. Waters less than 15 ft [4.6 m] deep are considered too shallow to support these whales, and in three decades of aerial surveys by BOEM (ASAMM), no bowhead whale has been recorded in waters less than 16.4 ft (5 m) deep (Clarke and Ferguson 2010). Further, no bowhead whales have been observed during ASAMM surveys in Block 1a (which encompasses the Level A harassment zone) when surveys were conducted in Block 1a (Clarke *et al*., 2017b, 2018, 2019, 2020). Shutdown requirements within designated shutdown zones for LF cetaceans (which includes bowhead whales) are expected to prevent take by Level A harassment given the large size and visibility of bowhead whales. Additionally, Level A harassment zones are calculated with an associated duration component based on the amount of pile driving expected to occur within 1 day. Therefore, a marine mammal is not taken by Level A harassment instantaneously when it enters the Level A harassment zone, and given the shallow depths, even if a bowhead did enter the Level A harassment zone, we would not expect it to remain within the zone for a long enough period to incur auditory injury. Therefore, we do not expect Level A harassment of bowhead whales to occur, and are not authorizing Level A harassment take of bowheads.

The likelihood of gray whales occurring in the Level A harassment zone is extremely low, as evidenced by the very low densities included in the *Marine Mammal Occurrence* section and the lack of modeled takes in table 14. Further, shutdown requirements within designated shutdown zones for LF cetaceans (which include gray whales) are expected to prevent take by Level A harassment given the large size and visibility of gray whales, and the duration component associated with the Level A harassment zones. Even if a gray whale did enter the Level A harassment zone, NMFS would not expect it to remain within the zone for a long enough period to incur auditory

injury, given the mitigation and visibility. Therefore, NMFS does not expect Level A harassment of gray whales to occur and is not authorizing Level A harassment take of gray whale.

The largest Level A harassment isopleth for high-frequency cetaceans (including the beluga whale) extends 152 m from the source during impact driving of the 11.5-inch (29.2 cm) H pile (table 6). Considering the small size of the Level A harassment zones, and the low likelihood that a beluga whale will occur in this area, as evidenced by the estimated values in table 14, Level A harassment is unlikely to occur. Additionally, 8 Star Alaska is planning to implement a 150 m shutdown zone during this activity. NMFS expects shutdown zones (table 16) will eliminate the potential for Level A harassment take of the beluga whale. Therefore, NMFS has not authorized takes of beluga whale by Level A harassment.

Table 15 -- Authorized Take by Level A and Level B Harassment, By Species and Stock

Species	Stock	Level A Harassment	Level B Harassment	Total Instances of Take	Stock Abundance	Percent of Stock
Bowhead Whale	Western Arctic	0	110	110	15,227	0.7
Gray Whale	Eastern North Pacific	0	2	2	26,960	0.01
Beluga Whale*	Beaufort Sea	0	58	58	39,258	0.15
	Eastern Chukchi	0	58	58	13,305	0.44
Ringed Seal	Arctic	12	2,041	2,053	UND	N/A
Spotted Seal	Bering	4	708	712	461,625	0.15
Bearded Seal	Beringia	3	438	441	UND	N/A

*Beluga whales in the project area are likely to be from the Beaufort Sea stock. However, NMFS has conservatively attributed all takes to each stock for their analysis.

Effects of Specified Activities on Subsistence Uses of Marine Mammals

The availability of the affected marine mammal stocks or species for subsistence uses may be impacted by this activity. The subsistence uses that may be affected and the potential impacts of the activity on those uses are described below. Measures included in this IHA to reduce the impacts of the activity on subsistence uses are described in the **Mitigation** section. Last, the information from this section and the **Mitigation** section is analyzed to determine whether the necessary findings may be made in the **Unmitigable Adverse Impact Analysis and Determination** section.

The communities of Nuiqsut, Utqiaġvik and Kaktovik engage in subsistence harvests off the North Slope of Alaska. Alaska Native communities have harvested bowhead whales for subsistence and cultural purposes with oversight and quotas regulated by the International Whaling Commission (IWC). The NSB Department of Wildlife Management has been conducting bowhead whale subsistence harvest research since the early 1980's to collect the data needed by the IWC to set harvest quotas. Bowhead whale harvest (percent of total marine mammal harvest), harvest weight, and percent of households using bowhead whale are presented in table 25 of 8 Star Alaska's application.

Due to ongoing oil and gas activities in the North Slope, the Department of the Interior funded a subsistence mapping study conducted in 2004 (Stephen R. Braund & Associates, 2010) and the Alaska LNG Project funded a study, conducted by the Alaska Department of Fish & Game in 2014 (Brown *et al.*, 2016), to characterize and describe the harvests and uses of wild foods by subsistence communities on the North Slope. These are the most recent and applicable studies that NMFS is aware of and are used to describe the harvests of Utqiaġvik, Kaktovik, and Nuiqsut below.

Most of the Beaufort Sea population of beluga whales migrate from the Bering Sea into the Beaufort Sea in April or May. The spring migration routes through ice leads

are similar to those of the bowhead whale. Fall migration through the western Beaufort Sea occurs in September or October. Surveys of the fall distribution strongly indicate that most belugas migrate offshore along the pack ice front beyond the reach of subsistence harvesters. Beluga whales are harvested opportunistically during the bowhead harvest and throughout ice-free months. No beluga whale harvests were reported in 2006 survey interviews conducted by Stephen R. Braund & Associates in any community (Stephen R. Braund & Associates, 2010). Beluga harvests were also not reported in Nuiqsut and Kaktovik, although households did report using beluga whale, likely through sharing from other communities (Brown *et al*., 2016). We do not expect the planned activities at the Alaska LNG project site to affect beluga whale subsistence harvests, as none are expected.

Gray whale harvests were not reported by any of the communities surveyed by Stephen R. Braund & Associates (2010) or Brown *et al.* (2016) in any of the survey years, and therefore are not included as an important subsistence species and are not further discussed.

Utqiaġvik

Utqiaġvik (formerly known as Barrow) is the northernmost community on the North Slope and the United States and is approximately 320 km (200 mi) northwest of Prudhoe Bay. According to Brown *et al*. (2016), 71 percent of households reported using marine mammals as a resource. Of the marine mammals harvested, bowhead whale made up the largest composition of marine mammals harvested at 54 percent by weight, while bearded seals represented 30 percent, ringed seals 2 percent, and beluga whale 2 percent of total marine mammal weight harvested (Brown *et al*., 2016). Bowhead whale was reported as a resource used in 70 percent of households, bearded seal in 44 percent of households, ringed seal in 19 percent of households, beluga whale in 15 percent of households, and spotted seals in 5 percent.

The spring hunt of bowhead whales occurs while bowheads are making their migration east toward the eastern Beaufort Sea. Crews begin to camp on the ice in mid- to late-April and stay out on the edge of the ice for about 2-6 weeks, depending on the condition of the ice (Brown *et al*., 2016). During the fall bowhead migration west, crews travel on open boat, making day trips from the community. During the summer months of July and August, bearded seals and ringed seals are targeted offshore near ice floes (Brown *et al*., 2016).

The community of Utqiaġvik's subsistence activities occur outside of the area impacted by activities considered in this authorization. We do not expect impacts to Utqiaġvik's subsistence activities, and they are not discussed further beyond the explanation provided here. Impacts to marine mammals from the planned construction will mostly include limited, temporary behavioral disturbances of seals, however, some slight auditory injury within the lower frequencies associated with pile driving is possible. Additionally a small number of takes of bowhead whales, by Level B harassment only, are predicted to occur in the vicinity of 8 Star Alaska's activity. Even if some subset of taken individuals deflected farther offshore near the project site, it is reasonable to predict that most individuals would likely resume a more typical migration path by the time they reach the Utqiaġvik hunting area, and therefore, significant impacts to the Utqiaġvik hunt would be unlikely.

The planned activities and associated harassment of marine mammals are not expected to impact marine mammals in numbers or locations sufficient to render them unavailable for Utqiaġvik subsistence harvest given the short-term, temporary, and localized nature of construction activities, and the planned mitigation measures. Additionally, no serious injury or mortality of marine mammals is expected or authorized, and the activities are not expected to have any impacts on reproductive or survival rates of any marine mammal species.

Kaktovik

Kaktovik is the easternmost village in the NSB. Kaktovik is located on the north shore of Barter Island, situated between the Okpilak and Jago rivers on the Beaufort Sea coast. Kaktovik's subsistence-harvest areas are to the east of the project area and target marine mammal species migrating eastward during spring and summer occur seaward of the project area and westward in the fall.

Bowhead whale hunters report traveling between Camden Bay to the west and Nuvagapak Lagoon to the east. This range does not include the project area impacted by the activities analyzed for this IHA. The small number of takes of bowhead whales, by Level B harassment only, predicted to occur in the vicinity of 8 Star Alaska's activity are not expected to have any impacts on the fitness of any bowhead whales. Further, we do not expect construction activities to deflect the bowhead whale migration offshore in the Kaktovik hunting area, given the distance from the western extent of the hunting area (Camden Bay) to the predicted Level B harassment isopleths. Even if some subset of taken individuals deflected farther offshore near the project site, it is reasonable to predict that most individuals will likely resume a more typical migration path by the time they reach the Kaktovik hunting area during the eastbound migration, and during the westbound migration, a bowhead exposed to construction noise would have already passed the hunting area prior to exposure. Significant impacts to the Kaktovik hunt would be unlikely, and Kaktovik bowhead whale hunting is not discussed further. Please refer to 8 Star Alaska's application for additional information.

Ringed, spotted, and bearded seals are harvested by the community of Kaktovik. Residents hunt seals in rivers during ice-free months, primarily July-August. Ringed seals are an important subsistence resource for Native Alaskans living in communities along the Beaufort Sea coast. Kaktovik hunters travel by boat to look for ringed seals on floating ice (often while also hunting for bearded seal) or sometimes along the ice edge

by snow machine before break-up, during the spring (Stephen R. Braund & Associates 2010). In 2006, 7 people (18 percent of survey respondents) indicated that they had recently hunted for ringed seals in Kaktovik (Stephen R. Braund & Associates, 2010). Residents reported looking for ringed seal, usually while also searching for bearded seal, offshore between Prudhoe Bay to the west and Demarcation Bay to the east (Stephen R. Braund & Associates, 2010). Ringed seal hunting typically peaks between March and August but continues into September, as well (Stephen R. Braund & Associates. 2010). Although residents reported hunting ringed seals up to approximately 30 mi (48 km) from shore, the highest numbers of overlapping use areas generally occur within a few miles from shore (Stephen R. Braund & Associates, 2010). The total use area for ringed seal from 1995-2006 encompassed approximately 2,139 mi^2 (5540 km^2). Harvest of ringed seals by Kaktovik hunters does not typically occur to the west of Camden Bay. Additionally, impacts to ringed seals are expected to include temporary behavioral disturbances and some slight auditory injury within the lower frequencies associated with pile driving. Serious injury or mortality of ringed seals is not anticipated from the planned activities, and the activities are not expected to have any impacts on ringed seal reproductive or survival rates, or to impact availability of ringed seals. Therefore, Alaska LNG project activities are not expected to impact Kaktovik ringed seal harvests.

Kaktovik hunters harvested 126 pounds of spotted seals in 1992 (ADF&G Community Subsistence Information System (CSIS); retrieved and analyzed August 15, 2018). Spotted seals were not reported harvested in 2006 survey interviews conducted in Nuiqsut (Stephen R. Braund & Associates, 2010).

Hunting of bearded seals is more common than that of ringed seals by Kaktovik residents, with 68 percent of respondents reporting the hunting of bearded seals over the previous 10 years (Stephen R. Braund & Associates, 2010). Kaktovik bearded seal hunting occurs along the coast as far west as Prudhoe Bay and as far east as the United

States/Canada border (Stephen R. Braund & Associates, 2010). Residents reported looking for bearded seal as far as approximately 30 mi (48 km) from shore, but generally hunt them closer to shore, up to 5 mi (8 km; Stephen R. Braund & Associates 2010). Between 1994 -2003, 29 bearded seals were taken in Kaktovik. Bearded seal hunting activities, like ringed seal, begin in March, peaking in July and August, and then conclude in September (Stephen R. Braund & Associate, 2010).

The community of Kaktovik is approximately 100 (direct) mi (161 km) from the planned project at Prudhoe Bay; subsistence activities for these communities primarily occur outside of the project construction area and the associated Level A and Level B harassment zones. The planned construction and use of improvements to West Dock will occur in Prudhoe Bay, adjacent to existing oil and gas infrastructures, and in an area that is not typically used for subsistence other than extremely limited bearded seal hunting by residents of Kaktovik.

Because of the distance from Kaktovik, and Kaktovik's very limited use of waters offshore of Prudhoe Bay, and because the planned activities will occur in an already-developed area, it is unlikely that the planned activities will have any effects on the use of marine mammals for subsistence by residents of Kaktovik. Further, the planned activities are not expected to impact marine mammals in numbers or locations sufficient to render them unavailable for subsistence harvest given the short-term, temporary, and localized nature of construction activities, and the planned mitigation measures. Impacts to marine mammals will mostly include limited, temporary behavioral disturbances of seals, with limited auditory injury associated with pile driving. Serious injury or mortality of marine mammals is not anticipated from the planned activities, and the activities are not expected to have any impacts on reproductive or survival rates of any marine mammal species. Therefore, we do not discuss Kaktovik's subsistence activities further.

Nuiqsut

The construction activities will occur closest to the marine subsistence use area used by the Native Village of Nuiqsut. Nuiqsut is located on the west bank of the Nechelik Channel on the lower Colville River, about 25 mi (40 km) from the Arctic Ocean and approximately 150 mi (242 km) southeast of Utqiaġvik. Nuiqsut subsistence hunters utilize an extensive search area, spanning 16,322 mi^2 (42,274 km^2) across the central Arctic Slope (see figure 19 of 8 Star Alaska's application, Brown *et al.,* 2016). Marine mammal hunting is primarily concentrated in two areas: (1) Harrison Bay, between Atigaru Point and Oliktok Point, including a northward extent of approximately 50 mi (80 km) beyond the Colville River Delta (Brown *et al.,* 2016); and (2) east of the Colville River Delta between Prudhoe and Foggy Island bays, which includes an area of approximately 100 mi^2 (259 km^2) surrounding the Midway Islands, McClure Island and Cross Island (Brown *et al.,* 2016). The community of Nuiqsut uses subsistence-harvest areas adjacent to the construction area; however, West Dock is not a common hunting area, nor is it visited regularly by Nuiqsut subsistence hunters primarily because of its industrial history.

The most important seal hunting area for Nuiqsut hunters is off the Colville Delta, an area extending as far west as Fish Creek and as far east as Pingok Island. Seal hunting search areas by Nuiqsut hunters also included Harrison Bay, and a 30-mi (48-km) stretch northeast of Nuiqsut between the Colville and Kuparuk rivers, near Simpson Lagoon and Jones Islands (Brown *et al.,* 2016). Cross Island is a productive area for seals, but is too far from Nuiqsut to be used on a regular basis. Seal subsistence use areas of Nuiqsut from 1995 through 2006 are depicted in figure 21 of 8 Star Alaska's application.

Ringed seals are an important subsistence resource for Native Alaskans living in communities along the Beaufort Sea coast. Nuiqsut residents commonly harvest ringed seal in the Beaufort Sea during the summer months (Stephen R. Braund & Associates, 2010). There are a higher number of use areas extending east and west of the Colville

River delta. Residents reported traveling as far as Cape Halkett to the west and Camden Bay to the east in search of ringed seal. Survey respondents reported traveling offshore up to 30 mi (48 km; Stephen R. Braund & Associates, 2010). Residents reported hunting ringed seals throughout the late spring, summer, and early fall with a higher number of use areas reported in June, July, and August (Stephen R. Braund & Associates, 2010). In 2006, 12 people (36 percent of survey respondents) indicated that they had recently hunted for ringed seals in Nuiqsut (Stephen R. Braund & Associates, 2010).

Nuiqsut bearded seal use areas extend as far west as Cape Halkett, as far east as Camden Bay, and offshore up to 40 mi (64 km). In 2006, 12 people (69 percent of survey respondents) indicated that they had recently hunted for bearded seals in Nuiqsut (Stephen R. Braund & Associates, 2010). Nuiqsut hunters reported hunting bearded seal during the summer season in open water as the seals are following the ice pack. Residents reported hunting bearded seal between June and September, although a small number of use areas were reportedly used in May and October (Stephen R. Braund & Associates, 2010). The number of reported bearded seal use areas peak in July and August, when the majority of seals are available along the ice pack (Stephen R. Braund & Associates, 2010).

Nuiqsut's bowhead whale hunt occurs in the fall at Cross Island, a barrier island located approximately 12 mi (19 km) northwest of West Dock. Nuiqsut whalers base their activities from Cross Island (Galginaitis 2014), and the whaling search and the harvest areas typically are concentrated north of the island. Hunting activities between 1997 and 2006 occurred almost as far west as Thetis Island, as far east as Barter Island (Kaktovik), and up to approximately 50 mi (80 km) offshore (Stephen R Braund & Associates, 2010). Harvest locations in 1973-2011 and GPS tracks of 2001-2011 whaling efforts are shown in figure 19 of 8 Star Alaska's application.

Bowhead whales are harvested by Nuiqsut whalers during the fall whaling season. Nuiqsut residents typically hunt bowhead whales in September, although a small number of use areas were reported in August and extending into October (Stephen R. Braund & Associates, 2010). Pile driving will not occur during Nuiqsut whaling.

Nuiqsut subsistence hunting crews operating from Cross Island have harvested three to four bowhead whales per year (Bacon *et al.,* 2009; Galginaitis 2014). In 2014, the AEWC allocated Nuiqsut a quota of four bowhead whales each year; however, through transfers of quota from other communities, in 2015 Nuiqsut was able to harvest five whales (Brown *et al.,* 2016). In 2006, 10 people (30 percent of survey respondents) in Nuiqsut indicated that they had recently hunted for bowhead whales (Stephen R. Braund & Associates, 2010). In 2016, Nuiqsut whaling crews harvested four bowhead whales (Suydam *et al.,* 2017).

Nuiqsut is 70 mi (112 km) away from the project and is likely to be the community that has the greatest potential to experience any impacts to subsistence practices. The primary potential for Alaska LNG project impacts to Nuiqsut's subsistence use of marine mammals is associated with barge activity, which could interfere with summer seal and fall bowhead whale hunting (Alaska LNG 2016). Barge activity is beyond the scope of this IHA, but noise associated with barging could deflect bowhead whales as they migrate through Nuiqsut's fall whaling grounds or cause temporary disturbances of seals, making successful harvests more difficult. Barge traffic will occur from July through September. Although barging activities will not cease during Nuiqsut's fall bowhead whale hunting activities, 8 Star Alaska plans to keep vessels landward of Cross Island during the August 25-September 15 period, avoiding the high use areas offshore of the island during the entire whaling season in most years and greatly reducing the impact to the whale hunt (Alaska LNG 2016, 2017).

Pile driving associated with construction at West Dock could also affect subsistence hunting of bowhead whales, as the Level B harassment zones extend up to 4.6 km from the pile driving site for some pile and hammer type combinations. As such, 8 Star Alaska will not pile drive during the Nuiqsut whaling season (see **Mitigation**). 8 Star Alaska has consulted with AEWC and NSB on mitigation measures to limit impacts (Alaska LNG 2016) and has continued to provide formal and informal project updates to these groups, as recently as July 2023.

The activities are not expected to impact marine mammals in numbers or locations sufficient to render them unavailable for subsistence harvest given the short-term, temporary, and localized nature of construction activities, and the mitigation measures. Impacts to marine mammals will mostly include limited, temporary behavioral disturbances of seals, however, some auditory injury is possible. Serious injury or mortality of marine mammals is not anticipated from the activities, and the activities are not expected to have any impacts on reproductive or survival rates of any marine mammal species.

In summary, impacts to subsistence hunting are not expected due to the distance between West Dock construction and primary seal hunting areas, and mitigation during the Nuiqsut bowhead whale hunt.

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses. NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment,

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

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

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

(2) The practicability of the measures for applicant implementation, which may consider such things as cost and impact on operations.

The mitigation requirements described in the following section were proposed by 8 Star Alaska in its adequate and complete application or are the result of subsequent coordination between NMFS and 8 Star Alaska. 8 Star Alaska has agreed that all of the mitigation measures are practicable. NMFS has fully reviewed the specified activities and the mitigation measures to determine if the mitigation measures will result in the least practicable adverse impact on marine mammals and their habitat, as required by the MMPA, and has determined the measures are appropriate. NMFS describes these below as mitigation requirements, and has included them in the IHA.

Mitigation for Marine Mammals and their Habitat

In addition to the measures described later in this section, 8 Star Alaska will employ the following mitigation measures:

- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For in-water construction, heavy machinery activities other than pile driving, if a marine mammal comes within 10 m (33 ft), operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions;
- For those marine mammals for which take by Level B harassment has not been requested, in-water pile installation/removal will shut down immediately when it is safe to do so if such species are observed within or entering the Level B harassment zones; and
- If take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take.

Aircraft

Aircraft will transit at an altitude of 457 m (1,500 ft) or higher, to the extent practicable, while maintaining Federal Aviation Administration flight rules (*e.g.*, avoidance of cloud ceiling, *etc*.), excluding takeoffs and landing. If flights must occur at altitudes less than 457 m (1,500 ft) due to environmental conditions, aircraft must make course adjustments, as needed, to maintain at least a 457 m (1,500 ft) separation from all observed marine mammals. Helicopters (if used) must not hover or circle above marine mammals. A minimum transit altitude is expected to reduce the potential for disturbance to marine mammals from transiting aircraft.

The following mitigation measures will apply to 8 Star Alaska's in-water construction activities. In addition, 8 Star Alaska will be required to implement all mitigation measures described in the reinitiated biological opinion.

Establishment of Shutdown Zones

8 Star Alaska will establish shutdown zones for all pile driving and removal activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will vary based on the activity type and marine mammal hearing group (see table 16). A minimum shutdown zone of 10 m will be required for all in-water construction activities to avoid physical interaction with marine mammals. The largest shutdown zones are generally for low frequency cetaceans as shown in table 16. In this instance, the largest shutdown zone for low frequency cetaceans is 1,200 m. 8 Star Alaska expects that they will be able to effectively observe phocids at distance up to 500 m, large cetaceans at 2-4 km, and belugas at 2-3 km.

Table 16 -- Shutdown Zones During Pile Installation and Removal (m)

Pile Size	Hammer Type	LF Cetaceans	HF Cetaceans	Phocids
11.5-inch (29.2 cm) H-Pile	Impact	1,200	150	500
14-inch (36 cm) H-Pile	Impact	350	50	300
	Vibratory	10	10	10
48-inch (122 cm) Pipe Pile	Impact	750*	100	500
Sheet Piles	Vibratory	20	10	30
Screeding		215		

* This shutdown zone has changed from the proposed IHA due to a change to the Level A harassment isopleth (see table 6).

The placement of PSOs during all pile driving and removal activities (described in detail in the **Monitoring and Reporting** section) will ensure that the entire shutdown zone is visible during pile installation. If visibility degrades to where the PSO determines that they cannot effectively monitor the entire shutdown zone during pile driving, the

applicant may continue to drive the pile section that was being driven to its target depth when visibility degraded to unobservable conditions, but will not drive additional sections of pile until conditions improve. Pile driving may continue during low light conditions to allow for the evaluation of night vision devices (NVDs) and infrared (IR) sensing devices, as described in the **Monitoring and Reporting** section, below.

If marine mammals are observed within the shutdown zone, pile driving will be delayed until the animal has moved out of the shutdown zone, either verified by an observer or after 15 minutes (small cetaceans and pinnipeds) or 30 minutes (large cetaceans) has elapsed without redetection of the animal. If a marine mammal approaches or enters the shutdown zone during pile driving, the activity will be halted. If a species for which authorization has not been granted, or a species which has been granted but the authorized takes are met, is observed approaching or within the Level B harassment zone during pile driving or tension anchoring, the activity will be halted. Pile driving may resume after the animal has moved out of and is moving away from the shutdown zone or after at least 15 or 30 minutes (described above) has passed since the last observation of the animal.

Pre- and Post- activity Monitoring

Monitoring must take place from 30 minutes prior to initiation of pile driving activities (*i.e.*, pre-clearance monitoring) through 30 minutes post-completion of pile driving. Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs must observe the shutdown and monitoring zones for a period of 30 minutes. If a marine mammal is observed within the shutdown zone, a soft-start (described below) cannot proceed until the animal has left the zone or has not been observed for 15 minutes (pinnipeds) or 30 minutes (cetaceans). When a marine mammal for which Level B harassment take is authorized is present in the Level B harassment zone, activities may begin and Level B harassment take will be

recorded. Pile driving or removal activities can begin if the entire Level B harassment zone is not visible at the start of construction, as long as the shutdown zone may be effectively monitored, as described above.

Monitoring for Level A and Level B Harassment

8 Star Alaska will monitor for marine mammals in the Level B harassment zones and Level A harassment zones, to the extent practicable, and throughout the area as far as visual monitoring can occur. Monitoring enables observers to be aware of, and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential shutdown of activity should the animal enter the shutdown zone. Placement of PSOs on elevated structures on West Dock will allow PSOs to observe phocids within the Level A and Level B harassment zones, to an estimated distance of 500 m. Due to the large Level A and Level B harassment zones (table 6), PSOs will not be able to effectively observe the entire zones during all activities for all species. All marine mammals observed within the visible portion of the harassment zones will be recorded. 8 Star Alaska will also conduct acoustic monitoring as described in the **Monitoring and Reporting** section, below.

Nighttime Monitoring

PSOs will use NVDs and IR for nighttime and low visibility monitoring. 8 Star Alaska will select devices for monitoring, and will test the devices to determine the efficacy of the monitoring equipment and technique. For a detailed explanation of 8 Star Alaska's plan to test the NVDs and IR equipment, please see 8 Star Alaska's Marine Mammal Monitoring and Mitigation Plan, available online at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.* (Please note that 8 Star Alaska will not assess object detection at distance intervals using buoys as stated in the Marine Mammal

Monitoring and Mitigation Plan. Rather, they will test object detection on land using existing landmarks at known distances from PSOs, such as road signs.)

Soft Start

Soft-start procedures provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors will be required to provide an initial set of three strikes from the hammer at reduced energy, followed by a 30-second waiting period, then two subsequent three-strike sets before initiating continuous driving. Soft start will be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer.

Pile Driving During Contingency Period

In the event that 8 Star Alaska must continue pile driving or removal during their contingency period (February- April), 8 Star Alaska must begin pile driving before March 1, the approximate onset of ice seal lairing season. Initiating pile driving before March 1 is expected to discourage seals from establishing birthing lairs near pile driving. Discouraging seals from establishing birthing lairs near pile driving will likely reduce potential instances of take by Level B harassment by reducing the likelihood of an individual seal occurring within the Level B harassment zone on multiple occasions, which would be far more likely if seals established lairs within the zone. Additionally, a subsistence advisor will survey areas within a buffer zone of DH4 where water depth is greater than 10 ft (3 m) to identify potential ringed seal structures before activity begins. Construction crews must avoid identified ice seal structures by a minimum of 500 ft (150 m). NMFS expects these measures to prevent physical interaction between seals and construction equipment.

8 Star Alaska does not plan to use a bubble curtain or other sound attenuation devices, and NMFS concurs that sound attenuation devices are not appropriate for this project. Conditions in the project area mean that the common practice of using bubble curtains for attenuation is not appropriate, as the water is shallow and therefore sound source level reductions are likely to be minimal (Caltrans, 2020), effective deployment of a bubble curtain system is logistically challenging in shallow water, and there is potential for sea ice, which would make deployment and use of sound attenuation systems even more challenging. Sound attenuation devices have not been used for pile driving in this area during past projects.

Mitigation for Subsistence Uses of Marine Mammals or Plan of Cooperation

Regulations at 50 CFR 216.104(a)(12) further require IHA applicants conducting activities in or near a traditional Arctic subsistence hunting area and/or that may affect the availability of a species or stock of marine mammals for Arctic subsistence uses to provide a Plan of Cooperation or information that identifies what measures have been taken and/or will be taken to minimize adverse effects on the availability of marine mammals for subsistence purposes. A plan must include the following:

- A statement that the applicant has notified and provided the affected subsistence community with a draft plan of cooperation;
- A schedule for meeting with the affected subsistence communities to discuss activities and to resolve potential conflicts regarding any aspects of either the operation or the plan of cooperation;
- A description of what measures the applicant has taken and/or will take to ensure that activities will not interfere with subsistence whaling or sealing; and
- What plans the applicant has to continue to meet with the affected communities, both prior to and while conducting the activity, to resolve conflicts and to notify the communities of any changes in the operation.

8 Star Alaska provided a draft POC to NMFS on March 27, 2019 and submitted revised versions on February 7, 2020, November 16, 2020, December 21, 2020, January 4, 2021, and, most recently, June 20, 2024. The POC outlines 8 Star Alaska's extensive coordination with subsistence communities that may be affected by the Alaska LNG project. It includes a brief description of the project, community outreach that has already been conducted, as well as the concerns raised in those discussions and how they were addressed, and project mitigation measures. 8 Star Alaska will continue coordination with subsistence communities throughout the project duration, and will develop a Communications Plan in coordination with subsistence groups, as described below and in the POC. The POC is a living document and has been updated throughout the project review and permitting process. 8 Star Alaska will continue to coordinate with subsistence communities as additional project information, such as the expected construction period, becomes available and will provide NMFS with an updated POC when additional coordination occurs. The IHA includes a requirement stating that 8 Star Alaska must conduct the communication and coordination as described in the POC, which is available on our website at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.*

8 Star Alaska continues to document its communications with the North Slope subsistence communities, as well as the substance of its communications with subsistence stakeholder groups, and has developed mitigation measures that include measures suggested by community members as well as industry standard measures. 8 Star Alaska will continue to routinely engage with local communities and subsistence groups. Multiple user groups are often consulted simultaneously as part of larger coalition meetings such as the Arctic Safety Waterways Committee meetings. Local communities and subsistence groups identified by 8 Star Alaska are listed in the POC. 8 Star Alaska will develop a Communication Plan and will implement this plan before initiating

construction operations to coordinate activities with local subsistence users, as well as Village Whaling Captains' Associations, to minimize the risk of interfering with subsistence hunting activities, and keep current as to the timing and status of the bowhead whale hunt and other subsistence hunts. A project informational mailer with a request for community feedback (traditional mail, email, phone) will be sent to community members prior to construction. Following the construction season, 8 Star Alaska intends to have a post-season co-management meeting with the commissioners and committee heads to discuss results of mitigation measures and outcomes of the preceding season. The goal of the post-season meeting is to build upon the knowledge base, discuss successful or unsuccessful outcomes of mitigation measures, and possibly refine plans or mitigation measures if necessary.

The AEWC works annually with industry partners to develop a CAA. This agreement implements mitigation measures that allow industry to conduct their work in or transiting the vicinity of active subsistence hunters, in areas where subsistence hunters anticipate hunting, or in areas that are in sufficient proximity to areas expected to be used for subsistence hunting where the planned activities could potentially adversely affect the subsistence bowhead whale hunt through effects on bowhead whales, while maintaining the availability of bowheads for subsistence hunters. 8 Star Alaska is required to enter the CAA for the construction year by an order from the FERC.

8 Star Alaska will not conduct pile driving during the Nuiqsut whaling season in an effort to eliminate effects on the availability of bowhead whales for subsistence hunting that could occur as a result of project noise. Nuiqsut whaling is approximately August 25-September 15, though the exact dates may change.

Barging activities could potentially impact Nuiqsut’s fall bowhead whale hunt and possibly other marine mammal harvest activities in the Beaufort Sea. As mentioned previously, barging activities are beyond the scope of this IHA, and no take is expected to

occur as a result of barging activities. However, NMFS will require 8 Star Alaska to limit barges to waters landward of Cross Island during the Nuiqsut whaling season (approximately August 25-September 15, though the exact dates may change) in an effort to avoid any potential impacts on subsistence uses. 8 Star Alaska has consulted with AEWC and NSB on mitigation measures to limit impacts and has continued to provide formal and informal project updates to these groups.

As described above in the **Effects of Specified Activities on Subsistence Uses of Marine Mammals** section, 8 Star Alaska's construction activities at West Dock do not overlap with the areas where subsistence hunters typically harvest ice seals, and given the extent of impacts to seals described in that section, these activities are not expected to impact subsistence hunts of ice seals. Therefore, NMFS has not included mitigation measures for subsistence harvest of ice seals; however, 8 Star Alaska will continue to meet with subsistence groups, including the Ice Seal Committee, as described in the POC.

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

Monitoring and Reporting

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

compliance as well as ensuring that the most value is obtained from the required monitoring.

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

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the activity; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and,
- Mitigation and monitoring effectiveness.

The monitoring and reporting requirements described in the following were proposed by 8 Star Alaska in its adequate and complete application and/or are the result of subsequent coordination between NMFS and 8 Star Alaska. 8 Star Alaska has agreed to the requirements. NMFS describes these below as requirements and has included them in the IHA.

Visual Monitoring

Marine mammal monitoring must be conducted in accordance with the Marine Mammal Monitoring Plan, available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable*. Marine mammal monitoring during pile driving and removal must be conducted by NMFS-approved PSOs in a manner consistent with the following:

- PSOs must be independent of the activity contractor (for example, employed by a subcontractor) and have no other assigned tasks during monitoring periods.
- At least one PSO must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute other relevant experience, education (degree in biological science or related field), or training for prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization. PSOs may also substitute Alaska native traditional knowledge for experience (NMFS recognizes that PSOs with traditional knowledge may also have prior experience, and therefore be eligible to serve as the lead PSO).
- Where a team of three or more PSOs is required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization; and
- PSOs must be approved by NMFS prior to beginning any activity subject to this IHA.

PSOs must have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;

- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammal observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

At least two PSOs will be present during all pile driving/removal activities. PSOs will have an unobstructed view of all water within the shutdown zones. PSOs will observe as much of the Level A and Level B harassment zone as possible. PSO locations are as follows:

- Dock Head 4 – During impact pile driving at DH4, two PSOs must be stationed to view toward the east, north, and west of the sweater treatment plan. During vibratory pile driving at DH4, two PSOs must monitor from each PSO location (four PSOs); and
- Barge Bridge – During work at the barge bridge, two PSOs must be stationed at the north end of the bridge.

PSOs will be stationed on elevated platforms at DH4, and on the elevated bridge during work at the barge bridge. They will possess the equipment described in the Marine Mammal Monitoring and Mitigation Plan, including NVDs during nighttime monitoring. However, during the primary construction season, nighttime on the North Slope will be

brief. Given the elevated PSO sites and equipment, 8 Star Alaska expects that they will be able to effectively observe phocids at distances up to 500 m, large cetaceans at 2-4 km, and belugas at 2-3 km, however, PSOs will not be able to effectively observe the entire area of the Level A harassment (seals only) or Level B harassment zones during all pile driving activities.

PSOs will begin monitoring 3 days prior to the onset of pile driving and removal activities and continue through three days after completion of the pile driving and removal activities. PSOs will monitor 24 hours per day, even during periods when construction is not occurring. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the elapsed between uses of the pile driving equipment is no more than 30 minutes.

Acoustic Monitoring

Acoustic monitoring, to be conducted for purposes of measuring sound source levels and sound propagation, must be conducted in accordance with accepted methodology as described in an Acoustic Monitoring Plan, which 8 Star Alaska must develop after its contractor is selected. The plan must be reviewed by NMFS, the NSB, and the AEWC, and approved by NMFS. 8 Star Alaska must conduct acoustic monitoring for the number of each pile type and size indicated in the approved plan. 8 Star Alaska may request that NMFS adjust the shutdown zones and revise the Level A and Level B harassment zones, as appropriate, pending NMFS' review and approval of the results of acoustic monitoring.

8 Star Alaska will also conduct PAM for marine mammals. 8 Star Alaska will deploy three hydrophones during the open-water season to monitor for marine mammals,

in accordance with a Marine Mammal Monitoring and Mitigation Plan and Acoustic Monitoring Plan. This PAM is intended to inform the estimate of marine mammals in the Level B harassment zone, given that PSOs are not able to observe the entire zone for all species and activities.

8 Star Alaska will deploy the hydrophones as recommended by the PRP, located between the 1,400 m and 4,700 m zones (noting that the 1,400 m zone was updated since the PRP report to reflect an updated acoustic analysis (formerly 2,200 m)), as described below, and will adjust the locations as appropriate if the Level B harassment zones are adjusted following SSV results. 8 Star Alaska will deploy the PAM recorders 3 days prior to the start of pile driving and will retrieve them three days after completion of pile driving during the open-water season.

Should construction be required during the contingency period when there will be ice-cover, 8 Star Alaska will deploy one hydrophone at the end of the open-water season located in between the 1,400 m and 4,700 m zones, perpendicular to the pile driving site. The location must be reviewed by NMFS, the NSB, and the AEWC, and approved by NMFS prior to deployment. Additional hydrophones during the contingency period are not warranted, as we do not expect cetaceans to be present in the area during this time (Citta *et al*., 2017, Quakenbush *et al*., 2018), and while ringed seals likely will be present, few, if any, spotted or bearded seals are likely to be present during that time (Bengtson *et al*., 2005, Lowry *et al*., 1998, Simpkins *et al*., 2003).

Reporting

A draft marine mammal monitoring report will be submitted to NMFS within 90 days after the completion of marine mammal and acoustic monitoring or 60 days prior to the issuance of any subsequent IHA for this project, whichever comes first. The report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including precise start and stop time of each type of construction operation mode, how many and what types of piles were driven or removed and by what method (*i.e.*, impact or vibratory);
- Total number of hours during which each construction activity type occurred;
- Total number of hours that PSOs were on duty during each construction activity, and total number of hours that PSOs were on duty during periods of no construction activity;
- Weather parameters and water conditions during each monitoring period (*e.g.*, wind speed, percent cover, visibility, sea state), and number of hours of observation that occurred during various visibility and sea state conditions;
- The number of marine mammals observed, by species and operation mode, relative to the pile location, and if pile driving or removal was occurring at time of sighting;
- The number of marine mammals observed (including periods with no construction);
- Age and sex class, if possible, of all marine mammals observed;
- PSO locations during marine mammal monitoring, including elevation above sea level;
- 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);
- 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;

- Number of individuals of each species (differentiated by month as appropriate) detected within the Level A and Level B harassment zones;
- Histograms of perpendicular distances to PSO sightings, by species (or species group if sample sizes are small);
- Sighting rates summarized into daily or weekly periods for the before, during, and after construction periods;
- Maps showing visual detections by species and construction activity type.
- 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;
- 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 of individuals;
- An estimation of potential takes, by species, by Level A and Level B harassment based on the number of observed exposures within the Level A and Level B harassment zones and the percentages of the Level A and Level B harassment zones that were not visible;
- Submit all PSO datasheets and/or raw sighting data (in a separate file from the Final Report referenced immediately above).

If no comments are received from NMFS within 30 days, the draft report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

For the SSV, 8 Star Alaska's acoustic monitoring report must, at minimum, include the following:

- Hydrophone equipment and methods: Recording device, sampling rate, distance (m) from the pile where recordings were made, depth of recording device(s);

- Type and size of pile being driven, substrate type, method of driving during recordings;
- For impact pile driving: Pulse duration and mean, median, and maximum sound levels (dB re: 1µPa): Cumulative sound exposure level (SELcum), peak sound pressure level (SPLpeak), root-mean-square sound pressure level (SPLrms), and single-strike sound exposure level (SELs-s).
- For vibratory driving/removal: Mean, median, and maximum sound levels (dB re: 1µPa): SPL_{rms}, SELcum, and timeframe over which the sound is averaged.
- Number of strikes (impact) or duration (vibratory) per pile measured, one-third octave band spectrum, power spectral density plot;
- Estimated source levels referenced to 10 m, transmission loss coefficients, and estimated Level A and Level B harassment zones.

For the PAM for marine mammals, 8 Star Alaska's acoustic monitoring report must, at minimum, include the following:

- Number of marine mammal detections (including species, date and time of detections, and type of pile driving underway during each detection, if applicable);
- Detection rates summarized into daily or weekly periods for the before, during, and after construction periods;
- Received sound levels from pile driving activity;
- The following hydrophone equipment and method information: Recording devices, sampling rate, sensitivity of the PAM equipment, locations of the hydrophones, duty cycle, distance (m) from the pile where recordings were made, depth of recording devices, and depth of water in area of recording devices.

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the Holder must report the incident to the Office of

Protected Resources (OPR), NMFS (*PR.ITP.MonitoringReports@noaa.gov* and *itp.jacobus@noaa.gov*) and to the Alaska regional stranding network (877-925-7773) as soon as feasible. If the death or injury was clearly caused by the specified activity, the Holder must immediately cease the activities until NMFS OPR 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 this IHA. The Holder must not resume their activities until notified by NMFS.

The report must include the following information:

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

Monitoring Plan Peer Review

The MMPA requires that monitoring plans be independently peer reviewed where the proposed activity may affect the availability of a species or stock for taking for subsistence uses (16 U.S.C. 1371(a)(5)(D)(ii)(III)). Regarding this requirement, NMFS' implementing regulations state that upon receipt of a complete monitoring plan, and at its discretion, NMFS will either submit the plan to members of a peer review panel for review or within 60 days of receipt of the proposed monitoring plan, schedule a workshop to review the plan (50 CFR 216.108(d)).

NMFS has established an independent peer review panel to review 8 Star Alaska's Monitoring Plan for 8 Star Alaska's planned project in Prudhoe Bay. NMFS

provided 8 Star Alaska's monitoring plan to the PRP and asked them to answer the following questions:

1. Will the applicant's stated objectives effectively further the understanding of the impacts of their activities on marine mammals and otherwise accomplish the goals stated below? If not, how should the objectives be modified to better accomplish the goals below?

2. Can the applicant achieve the stated objectives based on the methods described in the plan?

3. Are there technical modifications to the proposed monitoring techniques and methodologies proposed by the applicant that should be considered to better accomplish the objectives?

4. Are there techniques not proposed by the applicant (*i.e.*, additional monitoring techniques or methodologies) that should be considered for inclusion in the applicant's monitoring program to better accomplish the objectives?

5. What is the best way for an applicant to present their data and results (formatting, metrics, graphics, *etc*.) in the required reports that are to be submitted to NMFS (*i.e.*, 90-day report)?

The PRP met in March 2020 and subsequently provided a final report to NMFS containing recommendations that the panel members felt were applicable to 8 Star Alaska's monitoring plan. The panel concluded that the objectives are appropriate; however, they provided some recommendations to improve 8 Star Alaska's ability to achieve their stated objectives. The PRP's primary recommendations and comments are summarized and addressed below. The PRP's full report is available on our website at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.* Given that 8 Star Alaska's activities have not changed since the PRP reviewed the Monitoring Plan, an additional peer review

was not necessary. However, where changes in best available science since the peer review (such as the publication of NMFS 2024) affect aspects of the monitoring plan and NMFS' analysis herein, we have noted those changes, and modified the monitoring requirements that resulted from PRP recommendations, as appropriate, and as described below.

The PRP recommended that 8 Star Alaska station PSOs on elevated platforms to increase sighting distance. NMFS agrees and is requiring 8 Star Alaska to provide elevated monitoring locations for PSOs. The structures will vary depending on the construction location.

The PRP recommended that PSOs focus on scanning the shoreline and water, alternately with visual scans and using binoculars, to detect as many animals as possible rather than following individual animals for any length of time to collect detailed behavioral information. NMFS requires PSOs to document and report the behavior of marine mammals observed within the Level A and Level B harassment zones. While NMFS agrees that PSOs should not document behavior at the expense of detecting other marine mammals, particularly within the shutdown zone, we are asking PSOs to record an estimate of the amount of time that an animal spends in the harassment zone, which is important to help understand the likelihood of incurring auditory injury (given the duration component of the thresholds) and the severity of behavioral disturbance.

The PRP recommended that the PSOs record visibility conditions at regular intervals (*e.g.*, every 5 minutes) and as conditions change throughout the day. The panel recommended using either laser range finders or a series of "landmarks" at varying distances from each observer. The PRP notes that if 8 Star Alaska uses landmarks, 8 Star Alaska could measure the distance to the landmarks on the ground before pile driving or removal begins, and reference these landmarks throughout the season to record visibility. The landmarks could be buildings, signs, or other stationary objects on land that are

located at increasing distances from each observation platform. PSOs should record visibility according to the farthest landmark the laser range finder can detect or that the PSO can clearly see. NMFS is requiring 8 Star Alaska to record visibility conditions throughout construction; however, NMFS is requiring PSOs to record visibility every 30 minutes, rather than every 5 minutes, in an effort to minimize distraction from observing marine mammals. PSOs will be equipped with range finders, and will establish reference landmarks on land.

The PRP recommended that 8 Star Alaska have a designated person on site keeping an activity log that includes the precise start and stop dates and times of each type of construction operation mode. 8 Star Alaska's field lead PSO will record this information during construction.

The PRP commended 8 Star Alaska 's proposed use and experimentation with NVD and IR technology. The panel noted that there are many devices with a broad range of capabilities that should be thoroughly understood before the experiment is conducted. As described in the *Mitigation for Marine Mammals and their Habitat*, 8 Star Alaska plans to use and test NVD and IR technology, and 8 Star Alaska will select the most effective devices based on surveys of experienced PSOs and literature provided by the panel.

The PRP expressed concern about the limited effective visual detection range of the PSOs in comparison with the estimated size of the Level A and Level B harassment zones, including 8 Star Alaska 's ability to shut down at the proposed distances, and 8 Star Alaska 's ability to estimate actual Level A and Level B harassment takes. The panel noted that effective sighting distances are likely 200 m for seals, and 1 km for mysticetes, based on ship-based PSO observations in the Chukchi Sea (LGL *et al*., 2011). They noted that the effective sighting distance for beluga whales may be greater than 200 m, although visibility would likely decrease in windy conditions with white caps (DeMaster

et al., 2001). The panel recommended that 8 Star Alaska implement real-time PAM to verify the harassment zone sizes, and to improve detection of marine mammals at distances where visual detection probability is limited or not possible. The panel recommended that 8 Star Alaska begin PAM 2-3 weeks prior to the start of construction and continue through 2-3 weeks after construction activities conclude for the season. They recommended archival bottom mounted recorders as an alternative to real-time PAM, but noted that these setups are not as easy to relocate and that data can only be accessed after recovery.

In a related comment, the panel recommended that 8 Star Alaska report total estimated Level A and Level B harassment takes using two methods. First, the panel recommended that 8 Star Alaska assume that animal density is uniform throughout the Level B harassment zone and use distance sampling methods, such as Burt *et al*. (2014), based only on the shore-based PSO observations to estimate actual takes by Level B harassment. Second, the PRP recommended that 8 Star Alaska also use real-time PAM to estimate takes by Level B harassment only in the far field, assuming that each acoustic detection that occurs during pile driving or removal is a Level B harassment take.

In consideration of the effective sighting distances included in the PRP report, and estimated effective sighting distances from the applicant, NMFS has acknowledged the shorter likely sighting distances (via the potential takes by Level A harassment considered in the analysis) and has included a shutdown zone for phocids of 500 m during impact pile driving of 11.5-in (29.2 cm) H-Piles and 48-inch (122 cm) pile piles and of 300 m for impact pile driving of 14-inch (36 cm) H-piles, both of which are expected to be visible to PSOs. While this distance is greater than the 200 m estimated by the PRP, shore-based PSOs typically have greater visibility. Additionally, 8 Star Alaska 's PSOs will observe from elevated locations.

NMFS is not requiring 8 Star Alaska to report Level A and Level B harassment takes using distance sampling methods, as NMFS does not believe that it is appropriate to apply precise distance sampling methods intended for systematic surveys to estimating take numbers in this situation. As noted by the panel, the assumption of uniform density throughout the Level A and Level B harassment zones is not likely appropriate for this project, given varying habitat attributes throughout the zones such as distance from the shore and water depth. The pile driving and removal activities are likely to further affect the distribution within the zones. However, as a simpler alternative to help understand the potential exposures within the unseen area, NMFS is requiring 8 Star Alaska to include an estimation of potential takes by Level A and Level B harassment based on the number of observed exposures within the Level A or Level B harassment zone and the percentage of the Level A or Level B harassment zone that was not visible in their final report.

NMFS is not requiring 8 Star Alaska to implement real-time PAM (as described below). However, NMFS is requiring 8 Star Alaska to conduct SSV at the start of construction, and as appropriate, NMFS may update the Level A and Level B harassment zones and shutdown zones based on the SSV results. Additionally, NMFS is requiring 8 Star Alaska to deploy three archival PAM receivers during the open water season to collect data that indicates the presence of marine mammals. As stated previously, the PRP recommended archival bottom mounted recorders as an alternative to real-time PAM, although NMFS is requiring 8 Star Alaska to deploy these in stationary locations, rather than relocating the receivers for various construction activities as recommended by the PRP. If NMFS updates the Level B harassment zones following review of the SSV results, the hydrophones may be relocated, as described in 8 Star Alaska's monitoring plan. 8 Star Alaska will implement the majority, if not all, of the pile driving and removal during the open water season. Since 8 Star Alaska would need to deploy the PAM system after ice melt, deploying it 2-3 weeks before and after the construction period would

narrow 8 Star Alaska's open water work window by at least 1 month. Additionally, while 8 Star Alaska 's construction is occurring within a limited timeframe, other companies have operations in the area also, which may interfere with the ability to gather baseline data regarding marine mammal presence without interference from other industrial activities. Marine mammals in the project area are migratory, so presence within the work area would change throughout the suggested monitoring period, even if 8 Star Alaska was not conducting the activity. As such, NMFS is requiring 8 Star Alaska to deploy the three archival PAM receivers for 3 days prior to the start of construction, through construction, and for 3 days after completion of construction activities. 8 Star Alaska will deploy the hydrophones in the general locations suggested by the PRP (noting that some zones have been updated since the PRP report) and as described in the *Acoustic Monitoring* section above. If the Level A and Level B harassment zones are updated based on SSV results, the hydrophones may be relocated, as appropriate.

If construction during the contingency period is necessary, 8 Star Alaska will deploy one overwintering hydrophone at the end of the open-water season for monitoring during the contingency period. Additional hydrophones during the contingency period are not warranted, as we do not expect cetaceans to be present in the area during this time (Quakenbush *et al*., 2018, Citta *et al*., 2017) and while ringed seals likely will be present, few, if any, spotted or bearded seals are likely to be present during that time (Bengtson *et al*., 2005, Lowry *et al*., 1998, Simpkins *et al*., 2003). A location for the contingency period hydrophone will be selected closer to construction, and must be reviewed by NMFS, the NSB, and the AEWC, and approved by NMFS prior to deployment.

Real-time PAM might be helpful if there were a limited ability to detect animals using other methods as required to support the implementation of mitigation action, such as shutting down operations at the time that a detection occurs. However, in this instance, visual monitoring by PSOs can adequately detect marine mammals and minimize take by

Level A harassment, and the authorization includes take by Level A harassment of ice seals. Further, the operation of real-time PAM is significantly more costly than collecting PAM data for later analyses, as someone would need to monitor the data in real-time, and the PAM buoys would need to be relocated for changes in Level A and Level B harassment zone sizes between various pile sizes and installation or removal methods. Given the limitations described above, and the limited additional detection value added by the addition of real-time PAM in these circumstances, implementation of real-time PAM is not warranted in light of the associated cost and effort.

The PRP also recommended that PSO observations begin 2-3 weeks prior to construction, continue through the construction season, and continue for 2-3 weeks after the construction season ends. Given that ice conditions in the weeks leading up to the construction period will differ from that during construction (as will ice seal presence), NMFS is requiring PSOs to observe from shore during the 3 days before construction begins, and for 3 additional days after the construction season ends, rather than 2-3 weeks. During the construction season, NMFS is requiring PSOs to monitor 24 hours per day, even during periods without construction.

The PRP also made recommendations regarding how 8 Star Alaska should present their monitoring data and results. Please refer to part V of the report for those suggestions. 8 Star Alaska will implement the reporting recommendations that do not require PAM as stated in the recommendations. NMFS is requiring 8 Star Alaska to conduct the reporting in recommendations i and j (report received sound levels, propagation loss, isopleth distances and sound source levels, as well as sighting and acoustic detection rates summarized into daily or weekly periods for the before, during, and after construction periods). However, NMFS is not requiring 8 Star Alaska to include maps showing acoustic detections by species and construction activity type (part of recommendation h), as 8 Star Alaska does not intend to set the hydrophones up as a

localization array, and therefore, the data would not be appropriate for reporting specific locations of marine mammal detections.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the majority of our analysis applies to all the species listed in table 15, given that many of the anticipated effects of this project on different marine mammal stocks are expected to be relatively similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to

differences in population status, or impacts on habitat, they are described independently in the analysis below.

Pile driving and removal activities associated with the project, as outlined previously, have the potential to disturb or temporarily displace marine mammals or, in limited cases, cause auditory injury. Specifically, the specified activities may result in take, in the form of Level A and Level B harassment, from underwater sounds generated from pile driving and removal. Potential takes could occur if individuals of these species are present in zones ensonified above the thresholds for Level A or Level B harassment, identified above, when these activities are underway. While 8 Star Alaska may pile drive at any time of day (24 hours per day), we do not expect noise-producing pile driving will actually occur at all times during a 24-hour period, given the general construction process, including time for setting up piles for installation.

The takes by Level A and Level B harassment will be due to potential behavioral disturbance, TTS, and auditory injury. No mortality or serious injury is anticipated given the nature of the activity. Level A harassment is only anticipated for ringed seal, spotted seal, and bearded seal. The potential for Level A harassment is minimized through the construction method and the implementation of the required mitigation (see **Mitigation**).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.,* Thorson and Reyff, 2006, HDR Inc., 2012, Lerma, 2014, ABR, 2016). Most likely for pile driving, individuals will move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving, which is just a portion of 8 Star Alaska 's construction. Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation

measures described herein. If sound produced by project activities is sufficiently disturbing, animals are likely to avoid the area while the activity is occurring. While vibratory pile driving associated with the project may produce sound at distances of many km from the project site, the project site itself is located in an active industrial area, as previously described. Therefore, we expect that animals disturbed by project sound will avoid the area and use more-preferred habitats.

In addition to the expected effects resulting from Level B harassment, we anticipate that ringed seals, spotted seals, and bearded seals may sustain limited Level A harassment in the form of auditory injury. However, animals that experience auditory injury will likely only receive minor degradation of hearing capabilities within regions of hearing that align most completely with the frequency range of the energy produced by pile driving, *i.e.* the low-frequency region below 2 kHz, not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal will lose no more than a few dB in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics.

Habitat disturbance and alteration resulting from project activities could have a few highly localized, short-term effects for a few marine mammals; however, the area of affected habitat will be small compared to that available to marine mammal species. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range. We do not expect pile driving activities to have significant, long-term consequences to marine invertebrate populations. Given the relatively short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat, including fish and invertebrates, are not expected to cause

significant or long-term negative consequences to marine mammals or to populations of fish or invertebrate species.

A small portion of the project area overlaps with habitat that was previously designated as ringed seal critical habitat, but subsequently vacated by the U.S. District Court for the District of Alaska. Although this portion of habitat located within the project area contains features necessary for ringed seal formation and maintenance of subnivean birth lairs, basking and molting, and foraging, these features also exist outside of the project area and should be available to ringed seals. 8 Star Alaska's February to April pile driving contingency period overlaps with the period when ringed seals are constructing subnivean lairs, giving birth, and nursing pups. As discussed in the **Mitigation** section, in the unlikely event that they need to work during the contingency period, 8 Star Alaska will be required to begin construction prior to March 1 when ringed seals are known to begin constructing lairs. As such, we expect that ringed seals will construct their lairs away from the pile driving operations, therefore minimizing disturbance and avoiding any potential for physical injury to seals in lairs. We expect that 8 Star Alaska will complete the majority, if not all of the pile driving during the open water season, so any pile driving that did remain could likely be completed in the earlier portion of the contingency period, further reducing the potential for impacts to ringed seals while lairing or pupping.

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

- No serious injury or mortality is anticipated or authorized;

- The relatively small number of takes by Level A harassment, for seals only, are anticipated to result only in slight auditory injury within the lower frequencies associated with pile driving;
- The intensity of anticipated takes by Level B harassment will be minimized through implementation of the mitigation measures described above. While some instances of TTS could occur, the majority of Level B harassment takes will likely be in the form of avoidance of the project area, temporary cessation of foraging and vocalizing, or changes in dive behavior;
- The area impacted by the specified activity is very small relative to the overall habitat ranges of all species;
- The project area has minimal overlap with ringed seal critical habitat;
- Impacts to critical behaviors such as lairing and pupping by ringed seals will be avoided and minimized through implementation of mitigation measures described above;
- 8 Star Alaska will cease pile driving during the Nuiqsut whaling season, therefore minimizing the amount or severity of take of bowhead whale during a time when animals are expected to migrate by in relatively higher density.

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

Small Numbers

As noted previously, only take of small numbers of marine mammals may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and

so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers (see 86 FR 5322, January 19, 2021). Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The number of authorized instances of take for each species or stock is included in table 15. Our analysis shows that less than one-third of the best available population abundance estimate of each stock could be taken by harassment (in fact, take of individuals is no more than 0.7 percent of the abundance for all affected stocks). The number of animals authorized to be taken for each stock is considered small relative to the relevant stock's abundances.

For beluga whale, the percentages in table 15 assume that all takes of beluga whale will accrue to each stock; however, we expect that most, if not all, beluga whales taken by this project will be from the Beaufort Sea stock.

For the Beringia stock of bearded seals, a complete stock abundance value is not available. An abundance estimate is currently only available for the portion of bearded seals in the Bering Sea (Muto *et al.,* 2021). This abundance estimate for the Bering Sea is 301,836 bearded seals (Conn *et al*., 2014). Given the 438 takes by Level B harassment and 3 takes by Level A harassment for the stock, comparison to the Bering Sea estimate, which is only a portion of the Beringia stock (which also includes animals in the Chukchi and Beaufort Seas), shows that, at most, less than one percent of the stock is expected to be impacted.

A complete stock abundance value is also not available for the Arctic stock of ringed seals. The abundance estimate available, 171,418 animals, is only a partial

estimate of the Bering Sea portion of the population (Conn *et al*., 2014). As noted in the SAR, this estimate does not include animals in the shore fast ice zone, and the authors did not account for availability bias. Muto *et al*. 2021 expect that the Bering Sea portion of the population is actually much higher. Given the 2,041 takes by Level B harassment and 12 takes by Level A harassment takes for the stock, comparison to the Bering Sea partial estimate, which is only a portion of the Arctic stock (which also includes animals in the Chukchi and Beaufort Seas) represents only 1.2 percent of the stock.

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

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

Given the nature of the activity, and the required mitigation measures, serious injury and mortality of marine mammals is not expected to occur. Impacts to marine mammals will mostly include limited, temporary behavioral disturbances of seals, however, some slight auditory injury in seals within the lower frequencies associated

with pile driving is possible. Additionally, a small number of takes of bowhead whales, by Level B harassment only, are predicted to occur in the vicinity of 8 Star Alaska's activity. As described above, the required mitigation measures, such as implementation of shutdown zones, are expected to reduce the frequency and severity of takes of marine mammals.

Project activities could deter target species from Prudhoe Bay and the area ensonified above the relevant harassment thresholds. However, as described in the **Effects of Specified Activities on Subsistence Uses of Marine Mammals** section, subsistence use of seals and beluga whales is extremely limited in this area, as it is not within the preferred and frequented hunting areas. Bowhead whales typically remain outside of the area between the barrier islands and Prudhoe Bay, minimizing the likelihood of impacts from 8 Star Alaska's project. The takes are not expected to affect the fitness of any bowhead whales, or cause significant deflection outside of the typical migratory path in areas where subsistence hunts occur, and nor are the activities otherwise expected to interfere with the hunt. Additionally, during the Nuiqsut whaling season, 8 Star Alaska must cease pile driving, and project vessels must transit landward of Cross Island, therefore minimizing the potential impact to the Nuiqsut hunt. 8 Star Alaska will continue to coordinate with local communities and subsistence groups to minimize impacts of the project, as described in the POC.

Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the mitigation and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from 8 Star Alaska's activities.

Endangered Species Act

Section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 *et seq*.) requires that each Federal agency ensures that any action it authorizes, funds, or carries out is not likely to

jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS OPR consults internally whenever we propose to authorize take for endangered or threatened species, in this case with the Alaska Regional Office.

Three marine mammal species, bowhead whale, bearded seal (Beringia distinct population segment), and ringed seal (Arctic subspecies), occur in the project area and are listed under the ESA. The NMFS Alaska Regional Office issued a Biological Opinion on October 31, 2025 under section 7 of the ESA, on the issuance of an IHA to 8 Star Alaska under section 101(a)(5)(D) of the MMPA by NMFS OPR. The Biological Opinion concluded that the action is not likely to jeopardize the continued existence of bowhead whales, bearded seal (Beringia distinct population segment), and ringed seal (Arctic subspecies).

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment. NMFS participated as a cooperating agency on the 2020 Alaska LNG Project FEIS, which was finalized on March 6, 2020, and is available at *https://www.ferc.gov/industries-data/natural-gas/environment/final-environmental-impact-statement-feis*.

When acting as a cooperating agency, as is the case with this project, NMFS may satisfy its independent NEPA obligations by either preparing a separate NEPA analysis for its issuance of an incidental take authorization or, if appropriate, by adopting the NEPA analysis prepared by the lead agency. NMFS independently reviewed and evaluated the 2020 Alaska LNG Project FEIS and determined that was adequate and

sufficient to meet our responsibilities under NEPA for the issuance of the 2020 Prudhoe Bay IHA (86 FR 10658, February 22, 2021). NMFS therefore adopted the 2020 Alaska LNG Project FEIS on February 16, 2021.

In accordance with the information and analysis contained in this notice of final IHA, NMFS has determined that the final IHA will not result in impacts that were not fully considered in the 2020 Alaska LNG FEIS. 8 Star Alaska has made no substantial changes to the activities that are relevant to environmental concerns nor are there substantial new circumstances or information about the significance of adverse effects that bear on the analysis. Therefore, NMFS has determined that the 2020 Alaska LNG FEIS remains valid, and there is no need to supplement the document for issuance of this IHA. NMFS' Record of Decision for the Alaska LNG Project FEIS in relation to Issuance of an IHA to 8 Star Alaska can be found at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-oil-and-gas*.

Authorization

NMFS has issued an IHA to 8 Star Alaska for the potential harassment of small numbers of six marine mammal species incidental to the Alaska LNG project in Prudhoe Bay, AK, that includes the previously explained mitigation, monitoring, and reporting requirements.

Dated: November 13, 2025.

Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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