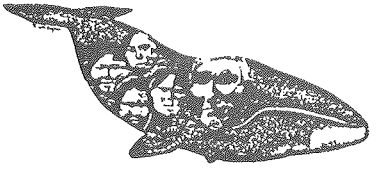

Alaska Eskimo Whaling Commission
P.O. Box 570 • Barrow, Alaska 99723

July 1, 2009

Via Electronic Mail
Michael Payne
Permits, Office of Protected Resources
National Marine Fisheries Service
1315 East-West highway
Silver Spring, MD 20910-3225
PR1.0648-XP00@noaa.gov

Re: Take of Marine Mammals During Open-water Marine Survey Program in the Chukchi Sea, Alaska during 2009-2010. 74 Fed. Reg. 26,217 (June 1, 2009).

Dear Mr. Payne,

Thank you for the opportunity to comment on Shell Offshore Inc. and Shell Gulf of Mexico Inc.'s (hereafter "Shell") application for an Incidental Harassment Authorization ("IHA") to the National Marine Fisheries Service ("NMFS") pursuant to the Marine Mammal Protection Act ("MMPA") for oil and gas related activities in the sensitive Chukchi Sea. *See* 74 Fed. Reg. 26,217 (June 1, 2009). These comments are submitted on behalf of the Alaska Eskimo Whaling Commission ("AEWC"). AEWC represents the eleven bowhead whale subsistence hunting villages of Barrow, Nuiqsut, Kaktovik, Pt. Hope, Wainwright, Kivalina, Wales, Savoonga, Gambell, Little Diomede, and Pt. Lay.

Our communities depend upon the marine mammals at stake in this application and the environment that supports them, which is changing rapidly as a result of climate change. We rely on the migration of bowhead whales and other marine mammals through the Chukchi and Beaufort Seas to feed our people and to preserve our society and culture. The ramifications of improperly managed oil and gas related activities place our continued nutritional and cultural survival at great risk. The AEWC sees the Chukchi Sea as the valuable and unique resource that it is and on behalf of our whaling captains, we are responsible for protecting our Inupiat way of life it supports.

The potential for any take of marine mammals by Shell in the waters that support our communities must be scrutinized with extreme care. In submitting its application, the corporation failed to comply with applicable statutory and regulatory application requirements and has otherwise failed to demonstrate that its activities comport with the requirements for issuing an IHA. For its part, NMFS failed to issue a draft authorization for public review and comment, has accepted many of Shell's assertions that are contrary to both scientific research and agency expe-

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rience, continues to fail to provide for independent verification of offshore operators' compliance with IHA provisions has lost control of the process for conducting statutorily required peer review of operators' monitoring plans, and has otherwise failed to follow the letter of the law. The lack of information about marine mammals in the Chukchi Sea, as demonstrated throughout Shell's application and NMFS's notice, makes it clear that NMFS is not in a position to make the statutory finds required by Congress through the Marine Mammal Protection Act. Moreover, despite this lack of information, NMFS failed to rely on the best available science about marine species in the Chukchi Sea. For these reasons and those discussed below, NMFS's preliminary determinations are arbitrary.

We also have concerns with the timing of IHA applications for work in Arctic waters. As the system currently works, MMPA authorizations terminate in the middle of the open water season. Thus, the full spectrum of activities that may be authorized for any given year are never analyzed together and frankly the quality of the applications and the public process suffer as a result. We ask that: (1) only one authorization be issued per calendar year for work associated with a specific project (*e.g.*, Shell should not be authorized to conduct any work in 2010 associated with Lease Sale 193); (2) NMFS ensure that IHA applications are submitted prior to the April Open Water Meetings so that Native communities will at least receive copies of draft Plans of Cooperation and proposed mitigation measures prior to these meetings so that major flaws and appropriate peer reviewers can be discussed; and (3) NMFS change the expiration date for authorizations so that a single calendar year is authorized rather than activities in the latter part of one calendar year and the early part of the following year.

AEWC also specifically requests that NMFS release its response to comments at the earliest possible time and that NMFS not allow seismic activities to begin until the whaling captains have had a chance to review NMFS's response. We note that in 2008 NMFS did not publish its response to comments on Shell's IHA for seismic operations in the Beaufort Sea until well after the fall subsistence hunt at Cross Island had concluded and seismic operations had already taken place. There can be no excuse for allowing seismic operations to take place directly within one of the most important subsistence hunting areas in the Arctic Ocean prior to NMFS explaining to the local communities and whaling captains why it was issuing an IHA over their well-reasoned objections, which were presented during the public comment period. The fact that NMFS would not release its response to comments until after the activities had taken place casts serious doubt on the validity of NMFS public involvement process and the underlying analysis of impacts to subsistence activities and marine mammals.

Finally, the AEWC notes its grave disappointment in NMFS' failure, in recent years, to live up to its congressional mandate, set forth in the Marine Mammal Protection Act, to protect arctic marine mammal species and Alaskan Native subsistence uses of those species. The AEWC sincerely hopes that recent changes in the Executive Branch will see NMFS return to its mission and overcome its recent tendencies to bow to pressures from foreign corporations rather than uphold its obligations to American citizens.

I. Applicable Legal Requirements.

A. The Marine Mammal Protection Act

In enacting the MMPA, Congress noted that "marine mammals have proven themselves to be resources of great international significance, esthetic and recreational as well as economic" and "that they should be protected and encouraged to develop . . .." 16 U.S.C. § 1361(6). The MMPA provides a "moratorium on the taking ... of marine mammals," *id.* § 1371(a), and Congressional recognition of the central role of subsistence hunting in specifically exempting the activities of the Inupiat Eskimos from the general prohibitions against take of marine mammals. 16 U.S.C. § 1371(b). Thus, subsistence activities are given priority under the MMPA.

A limited set of statutorily enumerated exceptions to the congressional moratorium on marine mammal taking can be applied for and obtained only if certain statutory and regulatory requirements are met. One such exception is an IHA. Incidental harassment authorizations are only for "a specified activity" in a "specific geographic region" that will take marine mammals incidentally by "harassment of small numbers of marine mammals" when such harassment "will have a negligible impact" on the species or stock. In providing for this exception, Congress again emphasized the priority it gives to the protection of Native Alaskans' subsistence livelihood by prohibiting the Secretary from issuing an IHA for development in Alaska's coastal and federal waters unless the Secretary finds that such activity "will not have an unmitigable adverse impact on the availability" of the species or stock "for subsistence uses." This finding is mandatory; the Secretary has no discretion to avoid or alter the requirement to make the finding; and an IHA may not be issued without it.16 U.S.C. § 1371(a)(5)(D).

Furthermore, an IHA can only be granted if the activity has *no* potential to result in serious injury or mortality. 16 U.S.C. § 1371(a)(5)(D). If such injury or mortality is possible, take can only be authorized pursuant to a Letter of Authorization ("LOA") that complies with 16 U.S.C. § 1371(a)(5)(A) and 50 C.F.R. § 216.105.

In order to obtain an IHA, the applicant must submit an application that comports with applicable regulatory requirements, *see* 50 C.F.R. §§ 216.104, 216.107, and NMFS "shall publish a proposed authorization" for public comment. 16 U.S.C. § 1371(a)(5)(D)(iii). If the activity to be covered by the IHA "may affect the availability of a species or stock for taking for subsistence uses" then NFMS "shall prescribe" "requirements for the independent peer review of proposed monitoring plans or other research proposals." 16 U.S.C. § 1371(a)(5)(D)(ii)-(ii)(II). Under no circumstances can the activity "reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs." 50 C.F.R. § 216.103. In deciding whether to issue an IHA, NMFS "shall evaluate each request to determine, based upon the best available scientific evidence, whether the taking . . . will have a negligible impact on the species or stock and . . . will not have an unmitigable adverse impact on the availability of such species or stock for subsistence use." 50 C.F.R. § 216.104(c).

Additionally, an application for an IHA triggers both consultations under section 7 of the Endangered Species Act ("ESA") regarding the impacts to ESA listed species, 16 U.S.C. § 1536(a)(2), and review of the environmental impacts of activities NMFS may authorize under the

National Environmental Policy Act ("NEPA").

II. NMFS Is Not In A Position To Issue An IHA Until Both The Agency And Shell Comply With All Procedural And Informational Requirements Of The MMPA .

A. Shell's Application Must Be Returned As Incomplete And Inappropriate.

At the outset, we note our disappointment in NMFS for putting out for public comment a woefully incomplete application from Shell for an IHA that fails to provide the mandatory information required by the MMPA and NMFS's implementing regulations. Without the required information, NMFS cannot make the determinations required under the MMPA and the public is foreclosed from exercising its statutory right to comment on Shell's activities and their impacts. *See* 16 U.S.C. § 1371(a)(5)(D)(iii). For this reason, we ask that NMFS return Shell's application as incomplete, *see* 50 C.F.R. § 216.104(b)(3) ("Applications that are determined to be incomplete or in appropriate for the type of taking requested will be returned to the applicant"), or else the agency risks making arbitrary and indefensible determinations under the MMPA.

Indeed, NMFS has previously explained that:

> in order for NMFS to accept an incidental harassment application, such application must be complete, accurate (to the extent possible), and address in some detail the information items requested as part of the application. If an application does not provide documentary evidence sufficient for NMFS to make a preliminary determination that the activity is likely to result in only a small take (by harassment) of marine mammals and have no more than a negligible impact on the species or stocks impacted or their habitat, *NMFS will return the application as incomplete*.

60 Fed. Reg. 28,379, 28,381 (May 31, 1995) (emphasis added). The following is a list of information that is missing from Shell's application:

- A POC or "information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses," 50 C.F.R. § 216.104(a)(12);
- A scheduled meeting "with the affected subsistence communities to discuss proposed activities and to resolve potential conflicts," 50 C.F.R. § 216.104(a)(12)(ii);
- A "description of what measures the applicant has taken and/or will take to ensure that proposed activities will not interfere with subsistence whaling or sealing," 50 C.F.R. § 216.104(a)(12)(iii);
- Information on how it will "learn[] of" research opportunities or how it will "encourage[e]" or "coordinat[e]" any research related activities, 50 C.F.R. § 216.104(a)(14);
- A description of the "specified activities," 16 U.S.C. § 1371(a)(5)(D)(i);
- A description of the "specified geographic region," 16 U.S.C. § 1371(a)(5)(D)(i);
- A description of the "age, sex, and reproductive condition" of the marine mammals that will be impacted. 50 C.F.R. § 216.104(a)(6).

Additionally, and as is also discussed below, *see infra* at 8, Shell failed to submit an appropriate application since its activities clearly will result in Level A harassment as well as potential serious injury to marine mammals. Thus, for this reason as well, Shell's application must be returned.

Shell's failure to comply with applicable statutory and regulatory requirements are reason enough to deny its application since this information is necessary for NFMS to be able to draft the authorization and for the public to be able to provide comments on it – neither of which has happened here. *See* 61 Fed. Reg. 15,884, 15,885 (April 10, 1996) ("in order for NMFS to determine that there will not be an unmitigable adverse impact on the availability of marine mammals for taking for subsistence purposes, the information items specified in § 216.104(a)(11) (previously § 228.4(a)(11)) will still need to be provided.").

B. The IHA Cannot Be Approved Until NFMS Provides The Public An Opportunity To Comment On The Draft Authorization.

The plain language of both the MMPA and NMFS's implementing regulations require that NMFS provide the opportunity for public comment on the "proposed incidental harassment *authorization*," 50 C.F.R. § 216.104(b)(1)(i) (emphasis added); 16 U.S.C. § 1371(a)(5)(D)(iii), and not just on the application itself as NMFS has done here. The authorization itself must prescribe certain requirements such as "permissible methods for taking by harassment," "means of effecting the least practicable impact on such species," measures to "ensure no unmitigable adverse impact on the availability of the species or stock for taking for subsistence use," requirements pertaining to "monitoring and reporting" and for "independent peer review" of such monitoring and reporting if the taking may affect subsistence use. 16 U.S.C. § 1371(a)(50(D)(ii). Indeed, NMFS's regulations further provide that "[a]ny preliminary finding of 'negligible impact' and 'no unmitigable adverse impact' shall be proposed for public comment along with [] the proposed incidental harassment authorization . . .." 50 C.F.R. § 216.104(c).

Without a complete draft authorization and accompanying findings, AEWC cannot provide meaningful comments on Shell's proposed activities, ways to mitigate the impacts of those activities on marine mammals, and measures that are necessary to protect subsistence uses and sensitive resources. For example, AEWC cannot ensure that the authorization will comport with the requirements of the applicable CAA. Until NFMS can comply with the MMPA and its own regulations, it cannot issue an IHA to Shell.

III. Shell's Application Is Not Ripe for Approval Until The Following Substantive Requirements Are Met.

A. Conflict Avoidance Agreements Are Essential To Protecting Subsistence Users.

By regulation, Shell must include with its application a plan of cooperation ("POC") that ensures potential conflicts with subsistence uses are resolved/ mitigated prior to the issuance of an IHA. It's AEWC's view that signing and following the CAA meets the POC requirement as it pertains to bowhead whales.

Since 1986, the Open Water Season Conflict Avoidance Agreement ("CAA") has served as the required plan of cooperation for arctic offshore operators. In fact, the CAA was in use prior to NMFS' issuance of its regulations and the POC requirement was included in the regulatory language to point operators to the CAA. The Agreement sets forth mitigation measures agreed between operators and hunters, based on local knowledge of marine mammal behavior, scientific research on marine mammal reactions to industrial operations, and past experience of hunters and operators in the design and implementation of effective mitigation measures. Further, it provides for a schedule of meetings in preparation for each upcoming season, as well as post-season review meetings to evaluate the effectiveness of mitigation measures employed during a given season.

In addition to the above, an operator's adherence to the terms of the CAA enables the Secretary to make the "no unmitigable adverse impact" finding required by Congress in the MMPA. NMFS is well-advised to heed the long-standing practice of relying on the CAA to enable the Secretary to make the required finding, as the agency has no other basis upon which to determine whether a specified set of mitigation measures will enable hunters to retain access to migrating marine mammals without increasing the risks associated with an already high-risk practice. A copy of the 2009 CAA is attached to these comments.[1]

B. The Adverse Impacts To Subsistence Use From Shell's Proposed Operations Must Be Mitigated.

The MMPA requires that any incidental take authorized will not have "an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses" by Alaska Natives. 16 U.S.C. § 1371(a)(5)(D)(i)(II). For the reasons discussed herein such a conclusion cannot be adequately supported.

Under the MMPA, in order for impacts to be mitigated the measures must be "*successfully* implemented." *See* 16 U.S.C. § 1371(a)(5)(D)(ii)(I). Thus, Shell cannot on the one hand rely on mitigation to claim its activities will not adversely impact subsistence use, but on the other hand fail to commit to mitigating the impacts of its action or ensuring the public has the opportunity to comment on the mitigation measures.

For example, Shell acknowledges there "could be an adverse impact on the Inupiat bowhead subsistence hunt" but claims the impact "is mitigated" despite the fact the mitigation measures upon which Shell relies have yet to even be established, since at this time, Shell has not yet signed the 2009 CAA. Moreover, Shell states only that "[a]daptive mitigation measures may be employed during times of active scouting and whaling," Shell Application at 43 (emphasis added), but provides no description of what such measures entail or evidence of their effectiveness, and further makes no definitive commitment to such measures. It should be noted that "adaptive management" was the technique used in the early years of arctic offshore operations and the development of the CAA. The "feedback loop" used in this process is evident in the CAA today with the requirement for a post-season review meeting. Any effort by Shell or others to return to

[1] Shell had not signed the 2009 Open Water CAA at the time it submitted its application to NMFS, but has done so now.

an "adaptive management" practice would represent a step backward of more than two decades in process of developing effective mitigation measures and a reliable management regime for arctic offshore development in the context of local subsistence uses.

Moreover, without the concrete mitigation provisions set forth in the CAA, Shell's application is far too amorphous for NMFS or anyone else to determine what the impact to subsistence uses will be, let alone whether any adverse impacts can or cannot be mitigated. Shell only provides ranges of dates in months and estimates the number of days its activities might last. *See, e.g.*, 74 Fed. Reg. at 26,219 (the "activity is proposed to occur during August-October 2009" and "will last a maximum of 50 days"). For the strudel scour survey, no information is provided on the geographic region that will be impacted beyond the surveys occurring in the Chukchi and near the shore. *See, e.g.* 74 Fed. Reg. at 26219 (noting that helicopter overflights will take place and that "[a]reas that have strudel scour identified during the aerial survey will be verified and surveyed with a marine vessel"). Stating the dates and durations of activities in such uncertain terms makes it impossible for NMFS to assess whether Shell's activities will interfere with subsistence hunting, migration, or feeding or marine mammals. Without this detailed information, NMFS is making arbitrary determinations about the actual impacts of Shell's activities on subsistence uses in the Chukchi Sea.

Likewise, Shell makes no effort to quantify the take by "age, sex, and reproductive condition" of the marine mammals or "the number of times such takings by each type of taking are likely to occur." 50 C.F.R. § 216.104(a)(6). Scientific studies indicate that for baleen whales cow-calf pairs should be used as the "defining limit." (McCauley 2000) (Attachment 1) ("Cow/calf pairs are in the author's experience more likely to exhibit an avoidance response to man-made sounds they are unaccustomed to. Thus any management issues relating to seismic surveys should consider the cow/calf responses as the defining limits."). The reason is that "[t]he potential continual dislocation of these animals in a confined area would interrupt [the cow-calf] resting and feeding stage, with potentially more serious consequences than any localised avoidance response to an operating seismic vessel as seen during their migratory swimming behaviour." *Id.* Thus, more specific information is needed on the marine mammals that will be affected by Shell's operations for NMFS to reach the required conclusions.

The analysis that is provided regarding bowhead whales also assumes, without supporting evidence, their migrations through the Chukchi follow a narrow path. As discussed later in these comments, insufficient data exist about bowhead whale and other species' use of the Chukchi and Shell should not be authorized to operate in this sensitive area until further information has been collected. For this same reason, we also ask NMFS to cap the seismic and related activities that it authorizes each year in the Arctic to ensure that we are not damaging sensitive marine resources that are relied on for subsistence in ways that we are unaware of.

1. The specified activities and geographic region analysis are not sufficient to support the issuance of an IHA.

The Marine Mammal Protection Act allows take authorization only for "specified activities" within a "specified geographic region." 16 U.S.C. § 1371(a)(5)(D)(i). As an initial matter, Shell has failed to provide sufficient information on either of these requirements. With regard to

its "activities" Shell's application contains numerous statements indicating the corporation's uncertainty about its activities a few short months from now. *See, e.g.,* Shell Application at 3, 4 (uncertain which vessel will be used for the work and dispersing and collecting underwater hydrophones).

Nor does Shell disclose the full spectrum of activities in which it will engage. For example, Shell mentions support vessels and other equipment in its application but such machinery is not disclosed among Shell's activities. Indeed, Shell even changed the air gun array it planned to use after submitting its application, *see* 74 Fed. Reg. at 26,218, but did not conduct any new analysis of the impacts from this change thus negating its analysis of the impacts from the original air gun array. NMFS relied on surveys conducted in 2008 by Shell to calculate the area of "water exposed to received levels at or above 160 dB." 74 Fed. Reg. at 26,225. The 2008 surveys, however, were based on signals from "four 10 in^3 airguns," *id.*, and not the 40 in^3 airguns that Shell now intends to use. 74 Fed. Reg. at 26,218. Thus, for this reason as well, Shell's application must be returned. Shell needs to adequately specify the activities and impacts of all the actions that will be undertaken in the Chukchi.

Similarly, where Shell will be conducting this work is equally amorphous. *See, e.g.*, Shell Application at 3, 4 ("Actual locations of site clearance and shallow hazards surveys have not been definitively set"). Simply stating that activities will occur within the Chukchi does not properly define a "specified geographic region" for activities as required by the MMPA. 16 U.S.C. § 1371(a)(5)(D)(i). The Chukchi Sea spans an area of 595,000 km^2 and encompasses a diversity of habitats that support many species of marine mammals in varying densities.

Likewise, the assertion that the activities will take place "on leases that were acquired in Outer Continental Shelf (OCS) Lease Sale 193" but that "[a]ctual locations of site clearance and shallow hazards surveys have not been set" but "will occur within . . . [the] lease blocks shown in Figure 1 of Shell's application," 74 Fed. Reg. at 26,219, also fails to provide the public with sufficient information about the activities that may be authorized. The "Figure 1" referenced in this statement simply shows a multitude of Shell OCS lease blocks in the Chukchi Sea; it certainly does not document any "specific sites" (much less dates and duration) where Shell's activities will occur. Moreover, the strudel scour surveys will not take place in the lease sale areas, but in unspecified locations between the lease sale blocks and the coast. *See* 74 Fed. Reg. at 26,219 ("Areas that have strudel scour identified during the aerial survey will be verified and surveyed with a marine vessel after the breakup of nearshore ice" likely sometime "in July through mid-August 2010."). Until Shell can disclose specifically where nearshore marine strudel scour surveys will be conducted, how vast the areas that will be surveyed, and the acreage that will be subjected to "multi-beam bathymetric sonar," "side-scan sonar," and "single beam bathymetric sonar," 74 Fed. Reg. at 26,219, Shell should not be authorized to conduct these activities.

Additionally, NMFS's regulations explicitly require an IHA applicant to provide the "date(s) and duration" of the activity. Shell also fails to meet this requirement. Instead, Shell states that its activities are "proposed to occur during August-October 2009," "during mid-May/early June 2010," and "July through mid-August 2010" and "will last a maximum of 50 days," "no more than four days," or are "not anticipated to take more than 10 days." 74 Fed.

Reg. at 26,219.

If Shell wishes to carry out in federal waters activities that harass marine mammals, it must comply with the take authorization provisions of the MMPA and specify the dates and locations of its actions. Without this information, NMFS cannot make the required findings that must accompany an IHA.

C. The Likely Take Of Marine Mammals Due To Shell's Operations Exceeds The Limits Set By Congress In Allowing The Incidental Take Exception To the United States' Moratorium On All But Subsistence Takes Of Marine Mammals.

With respect to the "take" of marine mammals, NMFS may only issue an IHA if the activity will result in only incidental take by "harassment of small numbers of marine mammals," 16 U.S.C. § 1371(a)(5)(D), and that "based on the best scientific evidence available, that the total taking by the specified activity during the specified time period will have a negligible impact on the species or stock . . .." 50 C.F.R. § 216.102(a).

Harassment is defined under the MMPA 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; 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." 16 U.S.C. § 1362(18)(A).

1. Shell's Proposed Activities Will Cause Level A Take And Serious Injury.

Take as the result of airgun use and other seismic operations are the focal point for both NMFS and Shell. In terms of assessing the impacts of air gun use on marine mammals, there are two basic reactions that must be addressed: threshold shifts from exposure to sound and deflection of marine mammals from the ensonified area.

With respect to sound exposure, NMFS has previously explained in enacting the Arctic specific MMPA regulations that:

> if an application indicates that an acoustic source at its maximum output level has the potential to cause a temporary threshold shift in a marine mammal's hearing ability, that taking would constitute a 'harassment' take, since the animal's hearing ability would recover and the section 101(a)(5)(D) application would be appropriate. However, if the acoustic source at its maximum level had the potential to cause a permanent threshold shift in a marine mammal's hearing ability, that activity would be considered to be capable of causing serious injury to a marine mammal and would therefore not be appropriate for an incidental harassment authorization.

60 Fed. Reg at 28,381 (May 31, 1995). Since Shell's operations at their maximum level have the

"*potential to cause permanent threshold shift*" if marine mammals did not leave the ensonified area, an LOA and not an IHA is required here.

Additionally, research is increasingly showing that marine mammals may remain within dangerous distances of seismic operations rather than leaving a valued resource such as a feeding ground. *See* (Richardson, 2004) (Attachment 2) ("For Bowhead whales, a recent LGL Ltd. study of migrating animals showed that deflection began at lower received levels than had been previously documented, with most individuals remaining >20 km from the airguns." And more recent data showed that "bowheads are more tolerant of airgun pulses when feeding in summer than when migrating in autumn."). The International Whaling Commission ("IWC") scientific committee has indicated that the lack of deflection by feeding whales in Camden Bay (during Shell seismic activities) likely shows that whales will tolerate and expose themselves to potentially harmful levels of sound when needing to perform a biologically vital activity, such as feeding (mating, giving birth, etc.).

Thus, the noise from Shell's proposed operations could injure marine mammals if they are close enough to the source. Shell intends to employ marine mammal observers ("MMO") and safety radii of "190 and 180 dB (rms)" for pinnipeds and cetaceans to mitigate these effects. *See* Shell MP at 3. However, the safety radii proposed by Shell do not negate these impacts. The safety radii only function as well as the observers on the vessels can see and report marine mammals within the radii or the general vicinity of the vessel. MMOs are human and suffer from human flaws. Not only does Shell admit that observes are bad at judging distances in the water – i.e., whether a marine mammal is within the radii are, *see* Shell MP at 8 (discussing use of lasers for "visually estimating distances to objects in the water"), but that at night and during storms MMO are particularly ineffective. *See* Shell MP at 9 (night vision devices "are not nearly as effective as visual observation during daylight hours"). Thus, Shell's proposed MMO program is not sufficient mitigation to prevent Shell from engaging in Level A harassment.

a. Shell's proposed activities create the potential for injury due to deflection.

NMFS does little to assess whether Level A harassment is occurring as a result of the deflection of marine mammals as a result of Shell's proposed operations. Deflected marine mammals may suffer impacts due to masking of natural sounds including calling to others of their species, physiological damage from stress and other non-auditory effects, harm from pollution of their environment, tolerance, and hearing impacts. *See* (Nieukrik, 2004) (Attachment 3) ("Airgun activity . . . effect on the baleen whales studied here is unknown; possible effects include masking of conspecific sounds, increased stress levels, changing vocalizations, and ear damage (Richardson et al., 1995)."). Thus, movement of marine mammals away from noise in the marine environment is common, and constitutes take because it "disturb[s]" marine mammals "by causing disruption of behavioral pattern[s]" such as feeding and migrating. *See* 16 U.S.C. § 1362(18) (defining "harassment"). Not only do these operations disrupt the animals' behavioral patterns, but they also create the potential for injury by causing marine mammals to miss feeding opportunities, expend more energy, and stray from migratory routes when they are deflected.

Moreover, these impacts cannot be assessed in the isolation of one proposed project but

must be placed in the larger context of what these animals are experiencing throughout their *ranges in Arctic waters*. *See* Angliss, R. P., and B. M. Allen. BOWHEAD WHALE (Balaena mysticetus): Western Arctic Stock Assessment (4/1/2008) NOAA-TM-AFSC-193. (last visited June 29: http://www.nmfs. noaa.gov/pr/pdfs/sars/ak2008whbh-arw.pdf) ("since 2006 there has been elevated interest in exploiting petroleum reserves in the seas around Alaska, including most areas where bowheads feed and migrate. The accumulation of impacts from vessels, seismic exploration, and drilling are of concern across the North Slope of Alaska.").

For example, Shell's proposal is only one of numerous oil industry activities recently occurring, planned, or ongoing in the U.S. portions of the Chukchi and Beaufort seas. NMFS's website reveals the following additional MMPA authorizations that were applied for in the range of the species at issue here all within 2008-2010: 2008 CGG Veritas On-Ice Seismic In Beaufort Sea, AK; 2008 Shell Seismic- Alaskan Arctic; 2008 PGS Seismic Survey in the Beaufort Sea, AK; 2008 ConocoPhillips Alaska Inc. Shallow Hazard and Site Clearance Surveys in Chukchi Sea, AK; 2008 BP Seismic Survey in the Liberty Prospect, Beaufort Sea, AK; 2008 ASRC Open Water Seismic Survey in Chukchi Sea, AK. *See* NMFS, Incidental Take Authorizations (last visited June 26, 2009: HYPERLINK "http://www.nmfs.noaa.gov/pr/permits%20/incidental.htm" http://www.nmfs.noaa.gov/pr/permits /incidental.htm). Furthermore, Shell is also planning on conducting exploratory drilling in both the Chukchi and the Beaufort in 2010. NMFS must determine whether level A take is likely to result from multiple harassing events within the same year or season, which could result in whales being deflected at multiple points throughout their migration routes.

Each of these operations may deflect marine mammals altering their behavior and setting them off migratory courses or feeding grounds on numerous occasions. Each such deflection can cause the animals to expend additional energy, miss feeding opportunities, or stray from its intended course and when this occurs repeatedly, it certainly has the potential to injure marine mammals. Without an analysis of the effects of all of the planned operations on marine mammals, it is impossible to assess the level of take of these animals that is on-going. It is for this reason that we advocate NMFS implement a cap on the overall seismic related activities that can occur in Arctic waters each year.

b. Increases in carcasses/stranding also indicate the potential for injury.

Stranded marine mammals or their carcasses are also a sign of injury. NMFS states in its notice that it "does not expect any marine mammals will . . . strand as a result of the proposed survey." 74 Fed. Reg. at 26,222. In reaching this conclusion, NMFS claims that strandings have not been recorded for the Beaufort and Chukchi Seas. Had NMFS consulted with native groups it would have learned this is in fact false. The Department of Wildlife Management of the North Slope Borough has completed a study documenting twenty-five years worth of stranding data and showing that five dead whales were reported in 2008 alone in comparison with the five dead whales that were reported in the same area over the course of twenty-five years. (Rosa, 2009) (Attachment 4). Indeed, the study points to "[a]nthropogenic activities such as oil and gas development, commercial fishing, and shipping" which "create disturbance, noise, and chemical pollution, all of which have been shown to have detrimental effects on wildlife, including

whales" as a potential cause for the recent increase in stranded whales documented by the Borough. *Id.*

In light of the increase in seismic operations in the Arctic since 2006, the Borough's study raises serious concerns about the impacts of these operations and their "potential to injure a marine mammal." *See* 16 U.S.C. § 1362(18)(A)(i). While we think this study taken together with the June, 2008 standing of "melon headed whales off Madagascar that appears to be associated with seismic surveys," 74 Fed. Reg. at 26,222, demonstrate that seismic operations have the potential to injure marine mammals beyond beaked whales, certainly the Borough's study shows that direct injury of whales is on-going. These direct impacts must be analyzed and explanations sought out before additional activities with the potential to injure marine mammals are authorized.

Thus, NMFS must explain how, in light of this new information, Shell's application does not have the potential to injure marine mammals. The agency must also require Shell to report the numbers and species of dead animals it encounters and require necropsies to be performed on dead marine mammals found during Shell's operations.

2. NMFS Failed To Use The Best Scientific Evidence Available In Assessing The Level Of Take From Shell's Operations.

In assessing "the total taking by the specified activity" and whether it will have a negligible impact, NMFS must use the "best scientific evidence available." *See* 50 C.F.R. § 216.102(a). It has not done so here.

a. NMFS did not use the best scientific evidence in setting the sound levels against which take was assessed.

NMFS uses exposure to sound levels ≥160 dB re 1 μPa (rms) as the measure in assessing the impacts from Shell's proposal. 74 Fed. Reg. at 26,225; Shell Application at 25. We disagree that 160 dB remains an appropriate measure for take of marine mammals for several reasons.

First, in conducting scoping on its national acoustic guidelines for marine mammals, NFMS noted that the existing system for determining take – *i.e.*, the 160 dB mark – "considers only the sound pressure level of an exposure but not its other attributes, such as duration, frequency, or repetition rate, all of which are critical for assessing impacts on marine mammals" and "also assumes a consistent relationship between rms (root-mean-square) and peak pressure values for impulse sounds, which is known to be inaccurate under certain (many) conditions." 70 Fed. Reg. 1871, 1873 (Jan. 11, 2005). Thus, NMFS itself has recognized that 160 dB (rms) is not an adequate measure.

Second, current scientific research establishes that 120 dB (rms) is a more appropriate measure for impacts to marine mammals. Using baleen whales as an example, studies suggest that seismic frequencies may be more damaging than originally anticipated. For example, a literature review of baleen whale sound sensitivity determined that bowhead whale vocalizations

ranged from 129 to 189 dB, *see* Erbe (Attachment 5). This study concluded that

> Inferring from their vocalizations, bowheads should be most sensitive to frequencies between 20 Hz-5 kHz, with maximum sensitivity between 100-500 Hz. The lowest reported 3rd octave band level causing a behavioral response was **84dB, followed by 87, 90 and 94 dB**.

(Erbe 2002) (Attachment 5) (emphasis added). Moreover, "Richardson et al. (1999) reported that sighting rates of bowhead whales during aerial surveys in the Beaufort Sea were lower when the whales were exposed to seismic survey sounds of 120–130 dB re 1 μPa (rms), indicating a movement response at sound levels lower than had previously been reported for bowhead whales (Richardson et al. 1986; Richardson and Würsig 1997)." (Gailey 2007) (Attachment 6). Thus, if the ensonified zone around seismic operations is dropped down to 120 dB for purposes of impacts analysis, it is likely that many more bowheads will be harassed by Shell's proposed activities.

These studies and others like them are significant because research on anthropogenic sound is also showing that such noises "mask sounds associated with foraging" and "can decrease an animal's ability to find and capture food" and make communication sounds which "can decrease the ability of individuals to establish or maintain contact with group members or potential mates." (ICES 2005) (Attachment 7).

Moreover, the Erbe study also concluded that "[i]t is generally agreed that any sound at some level can cause physiological damage to the ear and other organs and tissues." (Erbe 2002) (Attachment 5). Placed in the context of an unknown baseline of sound levels in the Chukchi, it is critically important that NMFS take a precautionary approach to permitting additional noise sources in this poorly studied and understood habitat. *See* Shell MP at 11 ("One goal of this acoustic program is to understand the soundscape of the Chukchi Sea . . . [including] the collection of data on vessel traffic within the system."). Thus, the best available science dictates that NMFS use a more cautious approach in addressing impacts to marine mammals from seismic operations.

b. NMFS did not use the best scientific evidence in assessing the impacts of Shell's operations.

In assessing the level of take and whether it is negligible, NMFS relied on flawed density estimates that call all of NMFS's preliminary conclusions into question. Density data are lacking or outdated for almost all of the marine mammals that may be affected by Shell's operations in the Chukchi Sea especially for the fall. Thus, NMFS admits that the numbers of marine mammals that might be affected are based on "estimates . . . from data collected in regions, habitats, or seasons that differ from those in the proposed survey area" and that "there is some uncertainty related to the use of regional population densities for applications that are local in focus." 74 Fed. Reg. at 26,223 ("there is some uncertainty about the representativeness of the data and assumptions used in the calculations"). Indeed, NMFS even relies upon data from the Beaufort Sea to calculate densities for marine mammals in the Chukchi. *See* 74 Fed. Reg. at 26,223. A few species specific examples are provided that illustrate NMFS's failure to utilize the best

available scientific studies in assessing Shell's application.

Beluga Whales: NMFS's guess at the number of beluga whales in the Chukchi in the summer relies on a study from Moore *et al.* that was published in 2000 based upon information from "industry vessels." 74 Fed. Reg. at 26,223. The estimate is contrary to the best available scientific information on beluga whale presence in the Chukchi in the stock assessment for the species from 2005. *See* Angliss, R. P., and B. M. Allen. 2008. BELUGA WHALE (Delphinapterus leucas): Eastern Chukchi Sea Stock Assessment. (4/2/2008) NOAA-TM-AFSC-193. (last visited June 29: http://www.nmfs. noaa.gov/pr/pdfs/sars/ak2008whbg-che.pdf). While more updated information is necessary on beluga presence in the Chukchi during the summer, even the stock assessment for this species demonstrates the arbitrary nature of NMFS's density calculations and the information upon which these calculations rely.

Bowhead Whales: Again, NMFS's guess at the number of bowhead whales in the Chukchi in the summer relies on a study from Moore *et al.* that was published in 2000. Yet, even the Stock Assessment for bowhead whales cites to a 2003 study that documented bowheads "in the Chukchi and Bering Seas in the summers" that are "thought to be a part of the expanding Western Arctic stock." Angliss, R. P., and B. M. Allen. BOWHEAD WHALE (Balaena mysticetus): Western Arctic Stock Assessment (4/1/2008) NOAA-TM-AFSC-193. (last visited June 29: http://www.nmfs. noaa.gov/pr/pdfs/sars/ak2008whbh-arw.pdf). While a study published in 2003 still is not a sufficient basis for a 2009 density analysis, this study does show that additional information is available that indicates that number of bowhead whales in the Chukchi may be higher than estimated by NMFS.

Harbor Porpoise: NMFS's sole basis for the density of harbor porpoises in the Chukchi Sea is observations from observers "on industry vessels in 2006." 74 Fed. Reg. at 26,224. Again, we disagree that such data is sufficient to serve as a basis for a density estimate. This is compounded by NMFS's decision not to rely on data from "early autumn months" in calculating the "fall period" density of porpoises and to use "minimal values" instead, which is equally arbitrary. *Id.* Moreover, NMFS's last stock assessment for the Bering Sea Stock of harbor porpoise indicated that there are probably several stocks in Alaska but that "no data are available" to verify as much. Angliss, R. P., and B. M. Allen. 2008. HARBOR PORPOISE (Phocoena phocoena): Bering Sea Stock Assessment. (3/31/2008) (last visited June 29: http://www.nmfs. noaa.gov/pr/pdfs/ sars/ak2008poha-be.pdf). Without knowing whether a specific stock of harbor porpoise exists in the area that will be impacted by Shell's operations and the population numbers and health of that stock, NMFS cannot determine the level of take and whether such take will be negligible to the stock. Thus, operations in the Chukchi should not proceed until additional studies have been conducted.

Ringed Seals: Ringed seals provide another prime example of NMFS's reliance on industry operations for information on the species. *See* 74 Fed. Reg. at 26,224. Again, the industry operations obtained far lower numbers than the scientific studies of ringed seals. *Id.; see also* Angliss, R. P., and R. B. Outlaw. 2006. RINGED SEAL (Phoca hispida): Alaska Stock Assessment. (5/15/06) NOAA-TM-AFSC-168 (last visited June 29: http://www.nmfs.noaa.gov/ pr/ pdfs/sars/ak2006seri.pdf).

As a general matter, when it comes to NMFS assessing the various stocks of marine mammals under the MMPA it cannot use out-dated data – i.e., "abundance estimates older than 8 years" - because of the "decline in confidence in the reliability of an aged abundance estimate," Angliss, R. P., and B. M. Allen. 2008. HARBOR PORPOISE (Phocoena phocoena): Bering Sea Stock Assessment. (3/31/2008) (last visited June 29: http://www.nmfs.noaa.gov/pr/pdfs/sars/ak2008poha-be.pdf) – and the agency is thus, unable to reach certain conclusions. Similarly here, where data is out-dated or non-existent NMFS should decide it cannot reach the necessary determinations. These flaws in NMFS's analysis render the agency's preliminary determinations about the level of harassment and negligible impacts completely arbitrary.

Additionally, we are opposed to NMFS utilizing "survey data" gathered by industry while engaging in oil and gas related activities and efforts to document their take of marine mammals. As described in the section on mitigation measures in these comments, *see supra* at 17, such industry "monitoring" – like that proposed by Shell – is designed to document the level of take occurring from the operations. Putting aside whether the methodologies employed are adequate for this purpose, they certainly are not adequate for assessing the density or presence of marine mammals that typically avoid such operations. Research has documented that

> In general, bowheads react strongly and rather consistently to approaching vessels of a wide variety of types and sizes. Bowheads interrupt their normal behavior and swim rapidly away. Surfacing, respiration, and diving cycles are affected.

Richardson, W.J. *et al.* Marine Mammals and Noise. Academic Press. 1995: 268-270; *id.* ("Bowheads can be displaced by as much as a few kilometers while fleeing.") Thus, it is *completely arbitrary* to rely on data collected from the very vessels that marine mammals avoid in making density arguments and it is not surprising that such industry information consistently reports lower numbers for this reason. For these reasons, NMFS cannot rely on such industry information in calculating the density of marine mammals or determining whether certain species are present in the area without running afoul of the law.

Furthermore, NMFS fails to explain how and why it reaches various conclusions in calculating the marine mammal densities and what the densities are actually estimated to be, once calculated. One example is NMFS's reliance on Moore *et al.* 2000b in making its density determinations. This study documented sightings of marine mammals but did not estimate the total number of animals present. NMFS fails to explain the basis for its "conversion" of data on sightings to its density conclusions. The agency has also failed to account for the impacts from the strudel scour surveys in the spring of 2010 proposing only summer and fall density estimates. These practices have resulted in entirely arbitrary calculations of the level of take of marine mammals and whether such takes constitute "small numbers" or a "negligible impact" as a result of Shell's proposal.

3. NMFS's Preliminary "Small Takes" and "Negligible Impact" Determinations Are Arbitrary.

An authorization of incidental take of marine mammals from specified activities can only be issued if such take will be limited to "small numbers" and have a "negligible impact" on the

species or stock. 16 U.S.C. § 1371(a)(5)(D)(i)(I); 50 C.F.R. § 216.107. These are separate and distinct statutory requirements. *Id.* However, NMFS has adopted a regulatory definition of "small numbers" that conflates it with the "negligible impact" determination and impermissibly renders it meaningless. Thus, NMFS's implementation of the MMPA fails to comport with the plain language of the Act.

Moreover, despite NMFS assurances otherwise, Shell's IHA application does not meet either the "small numbers" or "negligible impact" requirements. NMFS has preliminarily determined that the impact of Shell conducting seismic surveys in the Chukchi Sea 2009-10 will have no more than a negligible impact on marine mammals. Neither the Federal Register notice nor Shell's application provides any support whatsoever for this "conclusion." Indeed, without knowing more about the status and number of species present in the Chukchi this conclusion cannot be supported.

Based on the density estimates Shell is predicting that an average of 692 and a maximum of 1,078 ringed seals may be exposed to seismic sounds. These are by no means "small numbers" of marine mammals that will be subjected to impacts as a result of Shell's operations.

In terms of negligible impacts, we incorporate our comments on NMFS's take assessment since both the total taking and negligible impact assessments suffer from the same flaws. Additionally, in preliminarily determining that the take of marine mammals from Shell's proposed operations is "negligible" NMFS neglected to consider several impacts.

First, the analysis of non-auditory physiological effects – namely stress – are not analyzed or quantified.

Second, the possibility of marine mammals being struck by the many vessels that will be involved in Shell's operations needs to be considered in light of scientific evidence of harm from ship traffic to marine mammals, *see, e.g.*, (George, 1994) (Attachment 8). Indeed, ships will use the Chukchi from late July to mid-October for transport, *see* (Arctic Council, Marine Shipping Assessment 2009 Report at 20 (available at: http://arcticportal.org/uploads/4v/cb/4vcbFSnnKFT8AB5lXZ9_TQ/AMSA2009Report.pdf)), thus, resulting in impacts to areas throughout the Arctic from vessel traffic.

Third, the very real impacts to marine mammal habitat, including pollution of the marine environment and the risk of "oil spills, toxic, and nontoxic waste" being discharged, Angliss, R. P., and B. M. Allen. BOWHEAD WHALE (Balaena mysticetus): Western Arctic Stock Assessment (4/1/2008) NOAA-TM-AFSC-193. (last visited June 29: http://www.nmfs.noaa.gov/pr/pdfs/sars/ak2008whbh-arw.pdf), all must be taken into account. NMFS cannot simply rely on the Environmental Protection Agency to regulate air and water pollution. NMFS is charged with protecting both marine mammals and subsistence use of them under the MMPA and must ensure marine resources and those who rely on them are not adversely impacted by pollution from oil and gas related activities.

Fourth, impacts to fish and other marine mammal food sources upon which marine mammals rely must also be analyzed. *See* (Nieukrik, 2004) (Attachment 3) ("Airgun activity in

shallow water has been shown to significantly damage the ears of fish (McCauley et al., 2000)"). NMFS recognizes that little is known about the effects of geophysical activities on fish and invertebrates but illogically still determines that there will only be a negligible impact on these resources. In particular, the effects of the project on fish, zoo plankton, krill, and other aspects of the marine food chain needs to be studied and assessed before a finding of only negligible impacts can be justified. Many local hunters have expressed concerns about the effects of seismic work on fish and lower-level animals – for both nearshore and offshore operations – and the ramifications to the ecosystem as a whole.

Fifth, impacts about the specific marine mammals that will be taken – including their "age, sex, and reproductive condition," 50 C.F.R. § 216.104(a)(6), needs to be accounted for. Again, this information is necessary because for example, baleen whale calves and their mothers are more sensitive to ocean noise and may suffer greater adverse impacts from vessel traffic and seismic operations. *See* (McCauley 2000) (Attachment 1) ("Cow/calf pairs are in the author's experience more likely to exhibit an avoidance response to man-made sounds they are unaccustomed to. Thus any management issues relating to seismic surveys should consider the cow/calf responses as the defining limits.").

Sixth, the impacts from the use of multiple airguns at one time has not been adequately addressed. *See* Shell MP at 4 (discussing "increasing the source levels from one air gun to the second air gun"). The impacts from air guns cannot simply be discounted by assuming that most of the energy is focused vertically and thus, the impacts horizontally are not great. *See* Shell Application at 45 (discussing directing "energy primarily down to the seabed"). Scientific research has shown otherwise. *See* (Nieukrik 2004) (Attachment 3) ("Although seismic air gun arrays are designed to direct the majority of emitted energy downward through the seafloor, their sound emission horizontally is also significant (NRC, 2003)").

For all these additional reasons, NMFS's preliminary negligible impacts determination is arbitrary.

D. Shell's Proposed Mitigation And Monitoring Are Not Sufficient.

1. Shell's Mitigation Is Inadequate.

The MMPA authorizes NMFS to issue a small take authorization only if it can first find that it has required adequate monitoring of such taking and all methods and means of ensuring the least practicable impact have been adopted. 16 U.S.C. § 1371(a)(5)(D)(ii)(I). In order to ensure that the impacts of Shell's operations are mitigated both the communities that depend upon the Chukchi and its resources must be protected as well as the marine mammals that reside in the Chukchi Sea.

As previously discussed, it is AEWC's position that Shell must agree to all the terms of the 2009 Open Water CAA in order to mitigate the effects of its proposed operations. The measures proposed by Shell are simply not adequate to protect marine mammals or subsistence hunters. For example, Shell is once again relying on Marine Mammal Observers ("MMOs") to detect marine mammals that may pass within safety zones and therefore be harmed by geophysical ac-

tivities. Data previously presented by Shell and ConocoPhillips from their seismic activities made clear that MMOs failed to detect many marine mammals that encroached within the designated safety zones. Indeed, Shell admits that night vision devices "are not nearly as effective as visual observation during daylight hours." Shell MP at 9. It is also AEWC's position that independent verification of offshore operators' compliance with IHA provisions must be required as part of the mitigation for the IHAs.

Additionally, Shell relies on an out-dated Notice to Lessees (NTL 2004-G01) in its proposed mitigation plan to supply some of its mitigation measures. *See* Shell MP at 2. Not only has this notice has been superceded, *see* NTL 2007-G02 ("This NTL supersedes and replaces NTL No. 2004-G01"), but it is based on requirements stemming from a NMFS's Biological Opinion for a lease sale in the Gulf of Mexico. The conditions in the Notice are not designed for Alaskan operations or the specific and unique needs of the Arctic. *See* MMS Environmental Studies Program: Ongoing Studies – Seismic Survey Mitigation Measures and Marine Mammal Observer Reports. Thus, Shell's reliance on this Notice in crafting its mitigation measures is arbitrary.

Finally, if NMFS relies on mitigation included in an IHA to find an activity will have only a negligible level of impact, that finding is "subject to such mitigating measures being *successfully* implemented." *See* 50 C.F.R. § 216.104 (emphasis added). The simple existence of a measure is not enough. Shell must be able to demonstrate that measures will and can be implemented, thus, ensuring that impacts to bowheads remain "negligible." As Shell's proposed mitigation currently stands, this is a difficult if not impossible determination for NMFS to make.

2. Shell's Proposed Monitoring Is Not Adequate And Has Not Been Subjected To Independent Peer Review As Required By Congress In The MMPA.

In Section 101(a)(5)(D) of the MMPA, Congress specifically requires the Secretary to subject all monitoring plans accompanying an application for take by incidental harassment to independent peer review. The independent peer review process followed for arctic IHA's since this language was added to the MMPA in 1994 has been the annual Open Water Peer Review Meeting, hosted by NMFS. The Open Water Meeting provides both for scientific peer review of proposed monitoring plans and for local knowledge input by the AEWC. The latter component is key to the success of monitoring and research design in the Arctic, as the hunters have critical direct knowledge of animal behavior – both typical behavior and behavioral changes related to industrial activities and other factors, such as climate change.

As NMFS is aware, AEWC whaling captains trained the scientists who developed the bowhead whale census relied upon by the U.S. in its work at the International Whaling Commission. Similarly, AEWC whaling captains first alerted federal agencies and offshore operators to the fact that migrating bowhead whales deflect around and change swimming and breathing behavior in the wake of industrial operations. This information was ignored for a number of years and even contradicted by scientific studies. It was only with the advent of the Open Water Meeting and the scientific/stakeholder peer review it provides that this issue ultimately was resolved, with stakeholder peer reviewed monitoring plans leading to research that in fact confirmed the

whaling captains' observations.

Inexplicably, however, in recent years NMFS has issued IHAs without following the peer review process through to the end, as has been past practice. And this year conducted the Open Water Season Peer Review Meeting without requiring companies actually to submit monitoring plans for review.

NMFS may not issue an IHA to any company whose monitoring plan has not been cleared through independent peer review. Because of the critical information provided through the direct observations of AEWC hunters, this peer review process must include AEWC representatives.

As part of its application Shell is required to suggest its proposed "means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species" and document "the level of taking or impacts on populations of marine mammals . . .." 50 C.F.R. § 216.104(a)(13). One of the reasons for this monitoring is for NMFS to "ensure that authorizations over time have only a negligible impact on species or stocks of marine mammals and no unmitigable adverse impact on the availability of species or stocks for taking for subsistence uses." 60 Fed. Reg. at 28,381. Thus, monitoring is critical to the proper functioning of the MMPA. For this reason NMFS has previously explained that:

> the applicant would be required to include a site-specific plan to monitor the effects on stocks of marine mammals that are expected to be present while conducting activities. This plan, whose adequacy must be approved by NMFS, at a minimum, would have to include information regarding: (1) The survey techniques, and/or other methods to be used, to determine whether the behavior (including, if appropriate, vocalizations) of marine mammals near the activity site is being affected, and (2) how the number of marine mammals affected (i.e., taken by harassment) by the planned activity would be determined, including the expected precision of that estimated number.

60 Fed. Reg. at 28,381

However, Shell has failed to adequately describe its monitoring plans. For example, Shell fails to disclose its ethograms for studying marine mammal behavior or describe how data will be collected to "to estimate the 'take' of marine mammals by harassment." *See* Shell MP at 2. Without this detailed information AEWC cannot comment on the adequacy of Shell's monitoring plan or make suggestions for study design so that the data collected can easily be used by AEWC and others.

Moreover, inasmuch as Shell describes its monitoring plans, its focus clearly is on "reporting" the level of take and not "monitoring" marine mammals. The monitoring plan is designed to attempt to document the take of marine mammals and fails to include proactive monitoring beyond that necessary for attempting to assess the level of take that occurs. Especially given the lack of data that exists on marine mammal use of the Chukchi, Shell should be required to conduct basic presence and absence surveys and collect density data utilizing vessels and other

tools that will minimally disturb marine life and scientifically recognized data collection techniques.

In addition, Shell should be required to engage in monitoring activities that are separate and apart from its oil and gas activities. *See* 50 C.F.R. § 216.104(a)(14) (the applicant must describe how it will "learn[] of" research opportunities or how it will "encourage[e]" or "coordinat[e]" any research related activities.). Once again, these activities must be separate from Shell's proposed oil and gas related operations, since any data from such operations is skewed in light of marine mammals' avoidance of the vessels and seismic noise.

IV. Other Legal Violations That Warrant Denial Of Shell's Application

A. NMFS Must Undertake Sufficient Review Of The Impacts Of Seismic Operations In The Chukchi Under The National Environmental Policy Act.

With respect to the National Environmental Policy Act ("NEPA"), NMFS simply states that it is "currently conducting an analysis" and that this "analysis will be completed prior to the issuance or denial of" Shell's application. 74 Fed. Reg. at 26,233. It would appear from these statements that NMFS has decided to entirely cut the public out of the NEPA process, which is in direct contravention of the law. One of the express purposes of NEPA is to ensure that "environmental information is available to public officials and citizens *before decisions are ma*de and before actions are taken . . . [because] public scrutiny [is] essential to implementing NEPA." 40 C.F.R. § 1500.1(b) (emphasis added).

In addition, in light of the impacts discussed above it is clear that Shell's IHA application warrants review in an Environmental Impact Statement ("EIS") given the potential for significant impacts. *See* 40 C.F.R. § 1508.27. Thus, a draft EIS must be put out for public comment and the comments must be analyzed and the EIS finalized before NMFS makes it final decision on Shell's application.

Furthermore, in 2007 MMS prepared a draft programmatic EIS on the impacts of seismic surveys in the Beaufort and Chukchi Seas. MMS has not responded to comments from the public on this document nor finalized it. It is AEWC's position that this analysis must be finalized before any other seismic activities are authorized in the Chukchi or Beaufort Seas. It is imperative that the overall impacts from the recent increase in offshore oil and gas related activities in the Arctic be fully analyzed before any such activities are permitted to occur.

B. NMFS's Must Consult On The Impacts Of The IHA Under The Endangered Species Act.

NMFS has stated its belief "that Shell's proposed activities . . . are adequately analyzed in the 2008 Biological Opinion" and that NMFS "does not plan to conduct a new section 7 consultation." 74 Fed. Reg. at 26,233. This is in direct contravention of the Endangered Species Act ("ESA"), which requires federal agencies to consult with NMFS and FWS "on any prospective agency action . . . if the applicant has reason to believe that an endangered species or a threatened species may be present in the area affected by his project and that implementation of

such action will likely affect such species." 16 U.S.C. § 1536(a)(3); *see also id.* § 1536(a)(2). Both Shell and NMFS readily acknowledge that several endangered species will be impacted by Shell's proposed operations. Therefore, under the plain language of the statute, the IHA must be consulted on pursuant to section 7 of the ESA.

Moreover, in light of our changing climate and the increased activity in the Arctic (both from oil and gas related activities as well as other industries), it is essential that NMFS continue to *consult on authorized activities* so that *the baseline* used in making jeopardy /no-jeopardy determinations *remains current. See* 50 C.F.R. § 402.02 ("Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that *will be added to the environmental baseline*. The *environmental baseline* includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration." (emphasis added)).

CONCLUSION

Thank you again for the opportunity to comment. It is our hope that due to the lack of compliance with NMFS's regulatory requirements for IHA applications as well as the serious concerns Shell's activities raise for marine mammals that NMFS will deny Shell's application. Please feel free to contact my staff or me if you would like clarification of any of our comments.

Sincerely,

ALASKA ESKIMO WHALING COMMISSION

Janice Meadows

Janice Meadows, Executive Director

Attachments

2009 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT (Attachment A).

McCauley, R.D. *et al.* 2000. Marine seismic surveys—a study of environmental implications. APPEA Journal: 692-708. (Attachment 1).

Richardson, J.W. 2004. Marine Mammals versus Seismic and Other Acoustic Surveys: Introduction to the Noise Issues. Polarforschung 72 (2/3), 63-67. (Attachmenmt 2).

Nieukrik, S.L. *et al.* 2004. Low-frequency whale and seismic airgun sounds recorded in the mid-Atlantic Ocean. J. Acoust. Soc. Am. 115 (4): 1832–1843. (Attachment 3).

Rosa, C. 2009. A summary of dead, stranded bowhead whales reported in the Chukchi and Beaufort Seas over the last twenty-five years. SC/61/E12. (Attachment 4).

Erbe, C. 2002. Hearing Abilities of Baleen Whales. DRDC Atlantic CR 2002-065. (Attachment 5).

Gailey, G. *et al.* 2007. Abundance, behavior, and movement patterns of western gray whales in relation to a 3-D seismic survey, Northeast Sakhalin Island, Russia. Environ Monit Assess (2007) 134: 75-91. (Attachment 6).

ICES. 2005. Report of the Ad-hoc Group on Impacts of Sonar on Cetaceans and Fish (AGISC) CM 2006/ACE: 25pp. (Attachment 7).

George, J.C. *et al.* 1994. Frequency of Killer Whale (Orcinus orca) Attacks and Ship Collisions Based on Scarring on Bowhead Whales (Balaena mysticetus) of the Bering-Chukchi-Beaufort Seas Stock. Arctic VOL. 47, NO. 3 (SEPTEMBER 1994) P. 247–255. (Attachment 8).

FINAL 06-15-2009

2009 OPEN WATER SEASON
PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT

BETWEEN

BP EXPLORATION (ALASKA), INC.
CONOCOPHILLIPS ALASKA, INC.
ENI US OPERATING COMPANY, INC.
EXXON MOBIL
PGS ONSHORE
PIONEER NATURAL RESOURCES ALASKA, INC.
SHELL OFFSHORE, INC

AND

THE ALASKA ESKIMO WHALING COMMISSION
THE BARROW WHALING CAPTAINS' ASSOCIATION
THE KAKTOVIK WHALING CAPTAINS' ASSOCIATION
THE NUIQSUT WHALING CAPTAINS' ASSOCIATION
THE PT. HOPE WHALING CAPTAINS' ASSOCIATION
THE PT. LAY WHALING CAPTAINS' ASSOCIATION
THE WAINWRIGHT WHALING CAPTAINS' ASSOCIATION

Final for Signature
June 15, 2009

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TITLE I – GENERAL PROVISIONS

SECTION 101. APPLICATION.

Titles I and II apply to all Participants.

Title III applies to those Participants who operate barge or transit vessels in the Beaufort Sea or Chukchi Sea.

Titles IV and V apply only to those Participants who engage in oil and gas operations.

SECTION 102. PURPOSE.

The purpose of this Agreement is to provide:

(1) Equipment and procedures for communications between Subsistence Participants and Industry Participants;

(2) Avoidance guidelines and other mitigation measures to be followed by the Industry Participants working in or transiting the vicinity of active subsistence whaling crews, in areas where subsistence whaling crews anticipate hunting, or in areas that are in sufficient proximity to areas expected to be used for subsistence hunting that the planned activities could potentially affect the subsistence hunt through effects on migrating bowhead whale behavior;

(3) Measures to be taken in the event of an emergency occurring during the term of this Agreement; and

(4) Dispute resolution procedures.

SECTION 103. DEFINITIONS.

(a) Defined Terms.

For the purposes of this Agreement:

(1) The term “Agreement” means this 2009 Open Water Season Programmatic Conflict Avoidance Agreement and any attachments to such agreement.

(2) The term “at-sea oil and gas operations” does not include fixed platform developments located near shore (for example Northstar or Oooguruk).

(3) The term “barge” means a non-powered vessel that is pushed or towed, and the accompanying pushing or towing vessel, that is used solely to transport materials through the Beaufort Sea or Chukchi Sea. Such term does not include any vessel used to provide supplies or support to at-sea oil and gas operations.

(4) The term “Com-Center” means a communications systems coordination center established under Section 203.

(5) The term “geophysical activity” means any activity the purpose of which is to gather data for imaging the marine environment, sea floor, or subsurface, including but not limited to use of air guns, sonar, and other equipment used for seismic exploration or shallow hazard identification.

(6) The term “Industry Participants” means all parties to this Agreement who are not Subsistence Participants.

(7) The term “Marine Mammal Observer / Inupiat Communicator” or “MMO/IC” means an observer hired by an Industry Participant for the purpose of spotting and identifying marine mammals in the area of that Industry Participant’s operations during the Open Water Season. The MMO/IC also serves as the on-board Inupiat communicator who can communicate directly with whaling crews.

(8) The term “Near Shore Operations Support Vessels” means vessels (including aircraft) used to support related activities (such as supply, re-supply, crew movement, and facility maintenance) for near shore oil and gas operations by an Industry Participant.

(9) The terms “NSB” and “NSB DWM” mean the North Slope Borough and the North Slope Borough Department of Wildlife Management, respectively.

(10) The term “oil and gas operations” means all oil and gas exploration, development, or production activities (including, but not limited to, geophysical activity, exploratory drilling, development activities (such as dredging or construction), production drilling, or production, and related activities (such as supply, re-supply, crew movements, and facility maintenance) by or for any Industry Participant, including aircraft and vessels of whatever kind used in support of such activities, occurring in the Beaufort Sea or Chukchi Sea, whether occurring near shore or offshore, but does not include barge or transit vessel traffic by or for any Participant.

(11) The term “Open Water Season” means the period of the year when ice conditions permit navigation or oil and gas operations to occur in the Beaufort Sea or Chukchi Sea, as appropriate.

(12) The term “Participants” means all parties identified in this Agreement by name and whose representative(s) has signed the Agreement, and all contractors of such parties. When used alone the term includes both Industry Participants and Subsistence Participants.

(13) The term “Subsistence Participants” means the Alaska Eskimo Whaling Commission (AEWC) and its members, including the whaling captains’ associations identified on the cover of this Agreement, as well as any individual members of those associations.

(14) The term “transit vessel” means a powered vessel that is used solely to transport materials through the Beaufort Sea or Chukchi Sea. Such term does not include a vessel used to provide supplies or other support to at-sea oil and gas operations.

(b) Geographically Limited Terms.

For the purposes of this Agreement:

(1) The term “Beaufort Sea” means all waters off the northern coast of Alaska from Point Barrow to the Canadian border.

(2) The term “Chukchi Sea” means all waters off the western and northern coasts of Alaska from Cape Prince of Wales to Point Barrow.

SECTION 104. TERM, SCOPE, AND LIMITATIONS.

(a) Term.

The term of this Agreement shall commence with the signing of this document by the Participants and shall terminate upon completion of the Nuiqsut, Kaktovik, Barrow, Wainwright, Pt Lay, and Pt. Hope Fall Bowhead Hunts or the Beaufort Sea Post Season Meeting required under Section 108(a) and Chukchi Sea Post-Season Meetings in Barrow, Wainwright, Pt. Lay, and Pt. Hope required under Section 108(b), whichever is later.

(b) Scope.

The Participants agree that, unless otherwise specified:

(1) The mitigation measures identified in this Agreement, which are intended to mitigate the potential impacts of oil and gas operations and barge and transit vessel traffic on bowhead whales and the Alaskan Eskimo subsistence hunt of bowhead whales, are designed to apply to all activities of each Participant during the 2009 Open Water Season, whether referenced specifically or by category, and to all vessels and locations covered by this Agreement, whether referenced specifically or by category.

(2) This Agreement is intended to apply to all oil and gas operations and barge and transit vessel traffic during the 2009 Open Water Season in the Beaufort Sea or Chukchi Sea.

(3) Vessels and locations covered by this Agreement include those identified in the Agreement, as well as any other vessels or locations that are employed by or for the Industry Participants in the Beaufort Sea or Chukchi Sea during the 2009 Open Water Season.

(c) Limitations of Obligations.

The following limitations apply to this Agreement.

(1) No cooperation among the Participants, other than that required by this Agreement, is intended or otherwise implied by their adherence to this Agreement. In no event shall the signatures of any representative of the Alaska Eskimo Whaling Commission (AEWC), or of the Barrow, Nuiqsut, Kaktovik, Wainwright, Pt. Hope, or Pt. Lay Whaling Captains' Associations, or of any other Whaling Captains' Association be taken as an endorsement of any Arctic operations or Beaufort Sea or Chukchi Sea OCS operations by any oil and/or gas operator or contractor.

(2) Adherence to the procedures and guidelines set forth in this Agreement does not in any way indicate that any Inupiat or Siberian Yupik whalers or the AEWC agree that industrial activities are not interfering with the bowhead whale migration or the bowhead whale subsistence hunt. Such adherence does not represent an admission on the part of the Industry Participants or their contractors that the activities covered by this Agreement will interfere with the bowhead whale migration or the bowhead whale subsistence hunt.

(3) No member of the oil and gas industry or any contractor has the authority to impose restrictions on the subsistence hunting or any other activities of the AEWC, residents of the Villages of Nuiqsut, Kaktovik, Barrow, Wainwright, Pt. Lay, or Pt. Hope, or residents of any other village represented by the AEWC.

(4) In the event additional parties engage in oil and gas operations in the Beaufort Sea or Chukchi Sea during the summer or fall of 2009 the Participants shall exercise their good-faith efforts to encourage those parties to enter into this Agreement. Should additional parties enter into this Agreement at a date subsequent to the date of the signing of this document and before the termination of the 2009 bowhead whale subsistence hunting season, the AEWC will provide to all Participants a supplement to this document containing the added signatures.

(5) No Participant is responsible for enlisting additional parties to adhere to the terms and conditions of the Agreement. Similarly, **THE AEWC IS NOT RESPONSIBLE FOR, OR A PARTY TO, ANY AGREEMENT AMONG THE INDUSTRY PARTICIPANTS** concerning the apportionment of expenses necessary for the implementation of this Agreement.

(6) In adhering to this Agreement, none of the Participants waives any rights existing at law. All Participants agree that the provisions of this document do not establish any precedent as between them or with any regulatory or permitting authority.

(7) **PARTICIPANTS' OBLIGATIONS SHALL BE SEPARABLE**: All Participants to this Agreement understand that each Participant represents a separate entity. The failure of any Participant to adhere to this Agreement or to abide by the terms and conditions of this Agreement shall not affect the obligation of other Participants to adhere to this Agreement and to proceed accordingly with all activities covered by this Agreement. Nor shall any Participant's adherence to this Agreement affect that Participant's duties, liabilities, or other obligations with respect to any other Participant beyond those stated in this Agreement.

SECTION 105. REGULATORY COMPLIANCE.

(a) United States Coast Guard Requirements.

The Participants shall comply with all applicable United States Coast Guard requirements for safety, navigation, and notice.

(b) Environmental Regulations and Statutes.

The Participants shall comply with all applicable environmental regulations and statutes.

(c) Other Regulatory Requirements.

The Participants shall comply with all applicable federal, state, and local government requirements.

SECTION 106. DISPUTE RESOLUTION.

Subject to the terms of Section 104(c)(7) of this Agreement, all disputes arising between any Industry Participants and any Subsistence Participants shall be addressed as follows:

(1) The dispute shall first be addressed between the affected Participant(s) in consultation with the affected village Whaling Captains' Association and the Industry Participant(s)' Local Representative.

(2) If the dispute cannot be resolved to the satisfaction of all affected Participants, then the dispute shall be addressed with the affected Participants in consultation with the AEWC.

(3) If the dispute cannot be satisfactorily resolved in accordance with paragraphs (1) and (2) above, then the dispute shall be addressed with the AEWC and the Participants in consultation with representatives of NOAA Fisheries.

(4) All Participants shall seek to resolve any disputes in a timely manner, and shall work to ensure that requests for information or decisions are responded to promptly.

SECTION 107. EMERGENCY AND OTHER NECESSARY ASSISTANCE.

(a) Emergency Communications.

ALL VESSELS SHOULD NOTIFY THE APPROPRIATE COM-CENTER IMMEDIATELY IN THE EVENT OF AN EMERGENCY. The appropriate Com-Center operator will notify the nearest vessels and appropriate search and rescue authorities of the problem and advise them regarding necessary assistance. (See attached listing of local search and rescue organizations in Attachment I.)

(b) Emergency Assistance for Subsistence Whale Hunters.

Section 403 of Public Law 107-372 (16 U.S.C. 916c note) provides that "Notwithstanding any provision of law, the use of a vessel to tow a whale, taken in a traditional subsistence whale hunt permitted by Federal law and conducted in waters off the coast of Alaska is authorized, if such towing is performed upon a request for emergency assistance made by a subsistence whale hunting organization formally recognized by an agency of the United States government, or made by a member of such an organization, to prevent the loss of a whale." Industry participants will advise their vessel captains that, under the circumstances described above, assistance to tow a whale is permitted under law when requested by a Subsistence Participant. Under the circumstances described above, Industry Participants will provide such assistance upon a request for emergency assistance from a Subsistence Participant, if conditions permit the Industry Participant's vessel to safely do so.

SECTION 108. POST-SEASON REVIEW / PRESEASON INTRODUCTION.

(a) Beaufort Sea Post-Season Joint Meeting.

Following the end of the fall 2009 bowhead whale subsistence hunt and prior to the 2010 Pre-Season Introduction Meetings, the Industry Participant that establishes the Deadhorse and Kaktovik Com Centers will offer to the AEWC Chairman to host a joint meeting with all whaling captains of the Villages of Nuiqsut, Kaktovik and Barrow, the Marine Mammal Observer / Inupiat Communicators stationed on the Industry Participants' vessels in the Beaufort Sea, and with the Chairman and Executive Director of the AEWC, at a mutually agreed upon time and place on the North Slope of Alaska, to review the results of the 2009 Beaufort Sea Open Water Season, unless it is agreed by all designated individuals or their representatives that such a meeting is not necessary.

(b) Chukchi Sea Post-Season Village Meetings.

Following the completion of 2009 Chukchi Sea Open Water Season and prior to the 2010 Pre-Season Introduction Meetings, the Industry Participants involved, if requested by the AEWC or the Whaling Captain's Association of each village, will host a meeting in each of the following villages: Wainwright, Pt. Lay, Pt. Hope, and Barrow (or a joint meeting of the whaling captains from all of these villages if the whaling captains agree to a joint meeting) to review the results of the 2009 operations and to discuss any concerns residents of those villages might have regarding the operations. The meetings will include the Marine Mammal Observer / Inupiat Communicators stationed on the Industry Participants' vessels in the Chukchi Sea. The Chairman and Executive Director of the AEWC will be invited to attend the meeting(s).

(c) Pre-season Introduction Meetings.

(1) Immediately following each of the above meetings, and at the same location, the Industry Participants will provide a brief introduction to their planned operations for the 2010 Open Water Season. Each Industry Participant should provide hand-outs explaining their planned activities that the whaling captains can review.

(2) Subsistence Participants understand that any planned operations discussed at these Pre-Season Introduction Meetings, and the corresponding maps, will represent the Industry Participant's best estimate at that time of its planned operations for the coming year, but that these planned operations are preliminary, and are subject to change prior to the 2010 Open Water Season Meeting.

(d) Map of Planned Industry Participant Activities.

The Industry Participants, jointly, shall prepare and provide the AEWC with a large-scale map of the Beaufort and Chukchi Seas showing the locations and types of oil and gas and barge and transit activities planned by each Industry Participant. This map will be for use by the AEWC and Industry Participants during the 2010 CAA Meeting.

TITLE II -- OPEN WATER SEASON COMMUNICATIONS

SECTION 201. MARINE MAMMAL OBSERVERS / INUPIAT COMMUNICATORS.

(a) Marine Mammal Observer / Inupiat Communicator Required.

(1) In General. Each Industry Participant agrees to employ a Marine Mammal Observer / Inupiat Communicator (MMO/IC) on board each vessel owned or operated by such Industry Participant in the Beaufort Sea or Chukchi Sea.

(2) Special Rule for Inside Beaufort Sea Barrier Islands. Industry Participants whose seismic acquisition operations are limited to an area exclusively within the barrier islands need employ an MMO/IC on its sound source vessel only.

(3) Near Shore Operations Support Vessels. Industry Participants are not required to employ an MMO/IC on Near Shore Operations Support Vessels.

(b) Duties of Marine Mammal Observer / Inupiat Communicator.

(1) Each MMO/IC is to be employed as an observer and Inupiat communicator for the duration of the 2009 Open Water Season on the vessel on which he or she is stationed.

(2) As a member of the crew, the MMO/IC will be subject to the regular code of employee conduct on board the vessel and will be subject to discipline, termination, suspension, layoff, or firing under the same conditions as other employees of the vessel operator or appropriate contractor.

(3) Once the source vessel on which the MMO/IC is employed is in the vicinity of a whaling area and the whalers have launched their boats, the MMO/IC's primary duty will be to carry out the communications responsibilities set out in this Title.

(4) At all other times, the MMO/IC will be responsible for keeping a lookout for bowhead whales and/or other marine mammals in the vicinity of the vessel to assist the vessel captain in avoiding harm to the whales and other marine mammals.

(5) It is the MMO/IC's responsibility to call the appropriate Com-Center as set out in Sections 202 and 203.

(6) The MMO/IC will be responsible for all radio contacts between vessels owned or operated by each of the Industry Participants and whaling boats covered under Section 207 of this Agreement and shall interpret communications as needed to allow the vessel operator to take such action as may be necessary pursuant to this Agreement.

(7) The MMO/IC shall contact directly subsistence whaling boats that may be in the vicinity to ensure that conflicts are avoided to the greatest possible extent.

(8) The MMO/IC will maintain a record of his or her communications with each Com-Center and the subsistence whaling boats.

SECTION 202. COM-CENTER GENERAL COMMUNICATIONS SCHEME.

(a) Reporting Positions for Vessels Owned or Operated by the Industry Participants.

(1) All vessels (other than barge and transit vessels covered under section 302) shall report to the appropriate Com-Center at least once every six hours commencing with a call at approximately 06:00 hours. Each call shall report the following information:

(A) Vessel name, operator of vessel, charter or owner of vessel, and the project the vessel is working on.

(B) Vessel location, speed, and direction.

(C) Plans for vessel movement between the time of the call and the time of the next call. The final call of the day shall include a statement of the vessel's general area of expected operations for the following day, if known at that time.

EXAMPLE: This is the Arctic Endeavor, operated by _____ for _____ at Chukchi Sea prospect. We are currently at ___'___ north ___'___ west, proceeding SE at ____ knots. We will proceed on this course for ___ hours and will report location and direction at that time.

(2) The appropriate Com-Center shall be notified if there is any significant change in plans, such as an unannounced start-up of operations or significant deviations from announced course, and such Com-Center shall notify all whalers of such changes. A call to the appropriate Com-Center shall be made regarding any unsafe or unanticipated ice conditions.

(3) In the event that the Industry Participant's operation includes seismic data acquisition, the operator reserves the right to restrict exact vessel location information and provide more general location information.

(b) Reporting Positions for Subsistence Whale Hunting Crews.

(1) All subsistence whaling captains shall report to the appropriate Com-Center at the time they launch their boats from shore and again when they return to shore.

(2) All subsistence whaling captains shall report to such Com-Center the initial GPS coordinates of their whaling camps.

(3) Additional communications shall be made on an as needed basis.

(4) Each call shall report the following information:

(A) The crew's location and general direction of travel.

EXAMPLE: This is _____. We are just starting out. We will be traveling north-east from _____ to scout for whales. I will call if our plans change.

(B) The presence of any vessels or aircraft owned or operated by any of the Industry Participants, or their contractors, that are not observing the specified guidelines set forth in Title V on Avoiding Conflicts.

(C) The final call of the day shall include a statement of the whaling captain's general area of expected operations for the following day, if known at the time.

(5) Any subsistence whale hunter preparing to tow a caught whale shall report to the appropriate Com-Center before starting to tow.

EXAMPLE: This is Archie Ahkiviana. I am ___'___ north, ___'___ west. I have a whale and am towing it into _____.

(6) Each time a subsistence whaling camp is moved, it shall be reported promptly to the appropriate Com-Center, including the new GPS coordinates.

(7) Subsistence whale hunters shall notify the appropriate Com-Center promptly if, due to weather or any other unforeseen event, whaling is not going to take place that day.

(8) Subsistence whaling captains shall contact the appropriate Com-Center promptly and report any unexpected movements of their vessel.

(c) Responsibilities of Participants.

(1) Monitoring VHF Channel 16.

All vessels covered by Sections 207, 301, and 401 of this Agreement shall monitor marine VHF Channel 16 at all times.

(2) Avoidance of Whale Hunting Crews and Areas

It is the responsibility of each vessel owned or operated by any of the Industry Participants and covered by Sections 301 or 401 of this Agreement to determine the positions of all of their vessels and to exercise due care in avoiding any areas where subsistence whale hunting is active.

(3) Vessel-to-Vessel Communication

After any vessel owned or operated by any of the Industry Participants and covered by Sections 301 or 401 of this Agreement has been informed of or has determined the location of subsistence whale hunting boats in its vicinity, the Marine Mammal Observer / Inupiat Communicator shall contact those boats in order to coordinate movement and take necessary avoidance precautions.

SECTION 203. THE COMMUNICATIONS SYSTEM COORDINATION CENTERS (COM-CENTERS).

(a) Chukchi Lead System Included in Com-Center Coverage.

In addition to the Beaufort Sea and Chukchi Sea, the communications scheme shall apply in the Chukchi Sea lead system, as identified and excluded from leasing in the current MMS Five-Year Leasing Program, 2008-2012.

(b) Set Up and Operation.

(1) Subject to the terms of Section 104(c) of this Agreement, the Industry Participants conducting operations in:

(A) the Beaufort Sea jointly will arrange for the funding of Com-Centers in Deadhorse and Kaktovik; and

(B) the Chukchi Sea jointly will arrange for the funding of Com-Centers in Barrow, Wainwright, Pt. Lay, and Pt. Hope.

(2) All six Com-Centers will be staffed by Inupiat operators. **GROUND TRANSPORTATION MUST BE PROVIDED FOR COM-CENTER OPERATIONS IN KAKTOVIK FOR POLAR BEAR AND BROWN BEAR SAFETY**. The Com-Centers will be operated 24 hours per day during the 2009 subsistence bowhead whale hunt. One Industry Participant in the Beaufort Sea and one Industry Participant in the Chukchi Sea, or their respective contractor, will be designated as the operator of the Com-Centers for that Sea, in consultation with the AEWC.

(3) Each Industry Participant shall contribute to the funding of the Com-Centers covering the areas in which it conducts oil and gas operations. The level of funding for the Com-Centers provided by each of the Industry Participants is intended to be in proportion to the scale of their respective activities, and shall be mutually agreed by the Industry Participants.

(4) The procedures to be followed by the Com-Center operators are set forth in subsection (d) below.

(c) Staffing.

(1) Each Com-Center shall have an Inupiat operator ("Com-Center operator") on duty 24 hours per day from August 15 until the end of the bowhead whale subsistence hunt in:

(A) Kaktovik for the Kaktovik Com-Center;

(B) Nuiqsut for the Deadhorse Com-Center;

(C) Barrow for the Barrow Com-Center;

(D) Wainwright for the Wainwright Com-Center.

(E) Pt. Lay for the Pt. Lay Com-Center, which will be located in the Pt. Lay Whaling Captains' Association building; and

(F) Pt. Hope for the Pt. Hope Com-Center, which will be located in the Pt. Hope Whaling Captains' Association building.

(3) All Com-Center staff shall be local hire.

(d) Duties of the Com-Center Operators.

(1) The Com-Center operators shall be available to receive radio and telephone calls and to call vessels as described below. A record shall be made of all calls from every vessel covered by Sections 207, 301, and 401 of this Agreement. The record of all reporting calls should contain the following information:

(A) Industry Participant Vessel:

(i) Name of caller and vessel.

(ii) Vessel location, speed, and direction.

(iii) Time of call.

(iv) Anticipated movements between this call and the next report.

(v) Reports of any industry or subsistence whale hunter activities.

(B) Subsistence Whale Hunting Boat:

(i) Name of caller.

(ii) Location of boat or camp.

(iii) Time of call.

(iv) Plans for travel.

(v) Any special information such as caught whale, whale to be towed, or industry vessel conflicts with whale or whaler.

(2) Report of Industry/Subsistence Whale Hunter Conflict:

In the event an industry/subsistence whale hunter conflict is reported, the appropriate Com-Center operator shall record:

(A) Name of industry vessel.

(B) Name of subsistence whaling captain.

(C) Location of vessels.

(D) Nature of conflict.

(3) If all vessels and boats covered by Sections 207, 301, and 401 of this Agreement have not reported to the appropriate Com-Center within one hour of the recommended time, that Com-Center operator shall attempt to call all non-reporting vessels to determine the information set out above under the Duties of the Com-Center operator.

(4) As soon as location information is provided by a vessel covered by Sections 207, 301, or 401 of this Agreement, the appropriate Com-Center operator shall plot the location and area of probable operations on the large map provided at the Com-Center.

(5) If, in receiving information or plotting it, a Com-Center operator observes that operations by Industry Participants might conflict with subsistence whaling activities, such Com-Center operator should attempt to contact the industry vessel involved and advise the Industry Participant's Local Representative(s) and the vessel operators of the potential conflict.

SECTION 204. STANDARDIZED LOG BOOKS.

The Industry Participants will provide the Com-Centers and Marine Mammal Observer / Inupiat Communicators with identical log books to assist in the standardization of record keeping associated with communications procedures required pursuant to this Agreement.

SECTION 205. COMMUNICATIONS EQUIPMENT.

(a) Communications Equipment to be Provided to Subsistence Whale Hunting Crews.

(1) In General. The Industry Participants will provide (or participate in the provision of) the communications equipment described in paragraphs (4) and (6) of this subsection and subsection (b) of this section.

(2) Beaufort Sea. The Industry Participants funding Com-Centers in Deadhorse and Kaktovik will fund the provision of communications equipment for the whaling captains of Kaktovik and Nuiqsut in the same proportion as they fund those Com-Centers.

(3) Chukchi Sea. The Industry participants conducting operations in the Chukchi Sea will coordinate with each other to participate in funding the provision of communications equipment for the whaling captains of Barrow, Wainwright, Pt. Hope, and Pt. Lay.

(4) All-Channel, Water-Resistant VHF Radios.

These VHF radios are specifically designed for marine use and allow monitoring of Channel 16 while using or listening to another channel.

(A) Kaktovik Subsistence Whaling Boats: 8

(B) Kaktovik Base and Search and Rescue: 2

(C) Nuiqsut Subsistence Whaling Boats: 12

(D) Nuiqsut Base and Search and Rescue: 3

(E) Barrow Base and Search and Rescue: 2

(F) Wainwright Base and Search and Rescue: 2

(G) Wainwright Subsistence Whaling Boats: 4

(H) Pt. Hope Base and Search and Rescue: 2

(I) Pt. Hope Subsistence Whaling Boats: 10

(J) Pt. Lay Base and Search and Rescue: 2

(K) Pt. Lay Subsistence Whaling Boats: 4

(5) Specific VHF Channels For Each Village.

The whaling boats from each of the villages have been assigned individual VHF channels for vessel-to-vessel and vessel-to-Com-Center communications as follows:

(A) Nuiqsut whaling crews will use Channel 68.

(B) Kaktovik whaling crews will use Channel 69.

(C) Barrow whaling crews will use Channel 72.

(D) Wainwright Whaling Crews will use Channel 12.

(E) Pt. Lay Whaling Crews will use Channel 72.

(F) Pt. Hope Whaling Crews will use Channel 68.

(6) Satellite Telephones.

The satellite telephones are to be used as backup for the VHF radios. The satellite telephones for use on subsistence whaling boats are for emergency use only and should be programmed for direct dial to the nearest Com-Center.

A. Kaktovik Base Phones: 2

B. Kaktovik Subsistence Whaling Boats: 8

C. Nuiqsut Base Phones: 2

D. Nuiqsut Subsistence Whaling Boats: 12

E. Barrow Subsistence Whaling Boats: 2

F. Wainwright Subsistence Whaling Boats: 4

G. Pt. Lay Subsistence Whaling Boats: 2

(7) Distribution and Return of Equipment.

The distribution of the VHF radios and satellite telephone equipment to whaling captains for use during the 2009 fall bowhead subsistence whale hunting season shall be completed no later than August 15, 2009. All such units and telephone equipment provided under this Agreement, whether in this section or otherwise, will be returned promptly by the Subsistence Participants to the Industry Participant or the person providing such units and equipment at the end of each Village's 2009 fall bowhead whale subsistence hunt.

(b) Communications Equipment on Vessels Owned or Operated by the Industry Participants and/or their Contractors.

The Marine Mammal Observer / Inupiat Communicators onboard source vessels owned or operated by the Industry Participants and/or their contractors will also be supplied with all-channel VHF radios. The MMO/ICs have been assigned Channel 7 for their exclusive use in communicating with the Com-Center. Such radios shall be returned upon the completion or termination of the MMO/IC's assignment.

(c) Radio Installation and User Training.

The Whaling Captains of Nuiqsut, Kaktovik, Barrow, Wainwright, Pt. Lay, and Pt. Hope, with assistance from the Industry Participants, will be responsible for the installation of the VHF radio equipment. The Industry participants will provide (or participate in the provision of) on-site user training for the VHF equipment on or before August 15, 2009, as scheduled by the Whaling Captains' Associations of Nuiqsut, Kaktovik, Barrow, Wainwright, Pt. Lay, and Pt. Hope, and the Industry Participant operating the Beaufort Sea Com-Centers or Chukchi Sea Com-Centers**,** as appropriate.

SECTION 206. INDIVIDUALS TO CONTACT.

Listed below are the primary contact names and phone numbers for each of the Participants.

(1) BP Exploration (Alaska), Inc.'s (BP) Local Representative

LOWRY BROTT will be BP's local representative on the North Slope during the Term of this Agreement and will be stationed at Norhtstar Island and will be available by telephone at (907)670-3520 and when Mr. Brott is not available, his alternate, Dan Ferriter, will be stationed at Northstar Island and will be available by telephone at the above number.

(2) ConocoPhillips' Local Representative

Jim Darnell (907) 265-6240
Heather Collins-Ballot (907) 265-6213
Field Rep TBD (Jeff Hastings, Fairweather)

(3) ENI's Local Representative

TBD

(4) Exxon Mobil's Local Representative

TBD

(5) PGS Onshore's Local Representative

CHUCK ROBINSON, Area Manager, will be PGS Onshore, Inc.'s local representative during the Term of this Agreement and will be available by telephone at (907) 569-4049.

(6) Pioneer Natural Resources' (Pioneer) Local Representative

PAT FOLEY will be Pioneer's local representative during the Term of this Agreement and will be stationed in Anchorage and will be available by telephone at (907) 343-2110.

(7) Shell Offshore Inc.'s (Shell) Local Representatives

BOB ROSENBLADT and PETER LITTLEWOOD will be Shell's local representatives on the North Slope during the Term of this Agreement and will be stationed at Barrow during Chukchi Sea operations and at Deadhorse during Beaufort Sea operations and will be available by telephone at (907) 770-3700.

(8) Veritas

TBD

(9) The Village of Kaktovik

For purposes of this Agreement, the individuals to contact for the Village of Kaktovik will be: JOSEPH KALEAK at (907) 640-6213 or 640-6515, and FENTON REXFORD at (907) 640-2042 (Home) or (907) 640-6419 (Work).

(10) The Village of Nuiqsut

For purposes of this Agreement, the individuals to contact for the Village of Nuiqsut will be: ISAAC NUKAPIGAK at (907) 480-6220 (Work); (907) 480-2400 (Home), and ARCHIE AHKIVIANA at (907) 480-6918 (Home).

(11) The Village of Barrow

For purposes of this Agreement, the individuals to contact for the Village of Barrow will be: HARRY BROWER, JR. at (907) 852-0350 (Work), and EUGENE BROWER at (907) 852-3601.

(12) The Village of Wainwright

For purposes of this Agreement, the individuals to contact for the Village of Wainwright will be: ROSSMAN PEETOOK at (907) 763-4774, and WALTER NAYAKIK at (907)763-2915 (Work).

(13) The Village of Pt. Hope

For purposes of this Agreement, the individuals to contact for the Village of Pt. Hope will be: RAY KOONUK, SR. at (907)368-2120 (Home), 368-3117 (Work); 368-2618 (Fax), JACOB LANE, JR. at (907) 368-3812 (Home), (907) 368-2334 (Work), (907) 368-5402 (Fax) .

(14) The Village of Pt. Lay

For purposes of this Agreement, the individuals to contact for the Village of Pt. Lay will be: JULIUS REXFORD (907) 833-4592 (Home), (907) 833-2214 (Work), (907) 833-2320 (Fax), THOMAS NUKAPIAK (907) 833-6467 (Home), (907) 833-3838

(15) The AEWC

For purposes of this Agreement, the individuals to contact for the AEWC shall be: HARRY BROWER, JR. at (907) 852-0350 (Work) and JANICE MEADOWS at (907) 852-2392.

SECTION 207. SUBSISTENCE WHALE HUNTING BOATS.

The following is a list of the number of boats each of the Subsistence Participants plan to use:

(1) Boats Owned/Used by Whaling Captains of Nuiqsut (NWCA)

The subsistence whaling crews of the Village of Nuiqsut plan to use (12) twelve boats for subsistence whale hunting during the late summer and fall of 2009.

(2) Boats Owned/Used by Whaling Captains of Kaktovik (KWCA)

The subsistence whaling crews of the Village of Kaktovik plan to use (8) eight boats for subsistence whale hunting during the late summer and fall of 2009.

(3) Boats Owned/Used by Whaling Captains of Barrow (BWCA)

The subsistence whaling crews of the Village of Barrow plan to use (40) forty boats for subsistence whale hunting during the late summer and fall of 2009.

(4) Boats Owned/Used by Whaling Captains of Wainwright (WWCA)

The subsistence whaling crews of the Village of Wainwright plan to use (4) four boats for subsistence whale hunting during the fall of 2009.

(5) Boats Owned/Used by Whaling Captains of Pt. Hope (Pt. HWCA)

The subsistence whaling crews of the Village of Pt. Hope plan to use (10) ten boats for subsistence whale hunting during the late fall of 2009.

(6) Boats Owned/Used by Whaling Captains of Pt. Lay (Pt. LWCA)

The subsistence whaling crews of the Village of Pt. Lay plan to use (4) four boats for subsistence whale hunting during the fall of 2009.

If any additional boats are put in use by subsistence whaling crews, the industry Participants will be notified promptly through the Com-Center.

TITLE III – BARGE AND TRANSIT VESSEL OPERATIONS

SECTION 301. IN GENERAL.

A Participant may employ barges or transit vessels to transport materials through the Beaufort Sea or Chukchi Sea during the term of this Agreement. Any Industry Participant who employs a barge or transit vessel to transport materials through the Beaufort Sea or Chukchi Sea during the term of this Agreement shall require the barge or transit vessel operator to comply with Sections 201 and 302 of this Agreement while providing services to that Industry Participant.

SECTION 302. BARGE AND TRANSIT VESSEL OPERATIONS.

(a) Reporting Positions for Barge or Transit Vessels Owned or Operated by industry Participants.

(1) All barge or transit vessels shall report to the appropriate Com-Center at least once every six hours commencing with a call at approximately 06:00 hours. Each call shall report the following information:

(A) Barge or transit vessel name, operator of vessel, charter or owner of vessel, and the project or entity the vessel is transporting materials for.

(B) Barge or transit vessel location, speed, and direction.

(C) Plans for barge or transit vessel movement between the time of the call and the time of the next call. The final call of the day shall include a statement of the barge or transit vessel's general area of expected operations for the following day, if known at that time.

EXAMPLE: This is the Arctic Endeavor, operated by _____ for _____ in the Chukchi Sea. We are currently at ___'___ north ___'___ west, proceeding SE at ____ knots. We will proceed on this course for ___ hours and will report location and direction at that time.

(2) The appropriate Com-Center also shall be notified if there is any significant change in plans, such as an unannounced start-up of operations or significant deviations from announced course, and such Com-Center shall notify all whalers of such changes. A call to the appropriate Com-Center shall be made regarding any unsafe or unanticipated ice conditions.

(b) Operator Duties.

All barge and transit vessel operators are responsible for the following requirements.

(1) Monitoring VHF Channel 16. All barge and transit vessel operators shall monitor marine VHF Channel 16 at all times.

(2) Avoidance of Whale Hunting Crews and Areas. It is the responsibility of each Industry Participant and barge or transit vessel operator to determine the positions of their barge or transit vessels and to exercise due care in avoiding any areas where subsistence whale hunting is active.

(3) Vessel-to-Vessel Communication. After any barge or transit vessel owned or operated by any Industry Participant has been informed of or has determined the location of subsistence whale hunting boats in its vicinity**,** the Marine Mammal Observer / Inupiat Communicator shall contact those boats in order to coordinate movement and take necessary avoidance precautions.

(c) Routing Barges and Transit Vessels.

(1) All barge and transit vessel routes shall be planned so as to minimize any potential conflict with bowhead whales or subsistence whaling activities. All barges and transit vessels shall avoid areas of active or anticipated whaling activity, as reported pursuant to Section 202.

(2) Beaufort Sea. Vessels transiting east of Bullet Point to the Canadian border should remain at least five (5) miles offshore during transit along the coast, provided ice and sea conditions allow.

(3) Chukchi Sea. Vessels should remain as far offshore as weather and ice conditions allow, and at all times at least five (5) miles offshore during transit.

(d) Vessel Speeds.

Barges and transit vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs, and to make any other potential conflicts with bowhead whales or whalers unlikely. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.

(e) Vessels Operating in Proximity of Migrating Bowhead Whales.

If any barge or transit vessel inadvertently approaches within 1.6 kilometers (1 mile) of observed bowhead whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the bowhead whales by taking one or more of the following actions, as appropriate:

(1) reducing vessel speed to less than 5 knots within 900 feet of the whale(s);

(2) steering around the whale(s) if possible;

(3) operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;

(4) operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and

(5) checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

(f) Sound Signature and Marine Mammal Sighting Data.

Industry Participants whose operations are limited exclusively to barge or vessel traffic will submit to the AEWC and NSB DWM sound signature data for each vessel over 5 net tons they are using and all marine mammal sighting data.

TITLE IV – VESSELS, TESTING, AND MONITORING

SECTION 401. INDUSTRY PARTICIPANT VESSELS AND EQUIPMENT.

(a) List of Vessels and Equipment Required.

Each Industry Participant engaged in oil and gas operations shall provide a list identifying all vessels or other equipment (including but not limited to boats, barges, aircraft, or similar craft) that are owned and/or operated by, or that are under contract to the Industry Participants, for use in the Beaufort Sea or Chukchi Sea for oil and gas operations or for implementation of such Industry Participant's monitoring plan. Vessels and equipment used for oil and gas operations shall be listed in Attachment II, and vessels and equipment used for monitoring plans shall be listed in Attachment III.

(b) Only Listed Vessels and Equipment May Be Used.

(1) **NONE OF THE INDUSTRY PARTICIPANTS INTENDS TO OPERATE ANY VESSEL OR EQUIPMENT NOT IDENTIFIED IN THE LISTS REQUIRED UNDER SUBSECTION (a) DURING THE TERM OF THIS AGREEMENT.**

(2) Notwithstanding paragraph 1, if any Industry Participant decides to use different vessels or equipment or additional vessels or equipment, such vessels and equipment shall be used only for purposes identified in Attachments II or III; and the AEWC and the whaling captains of Nuiqsut, Kaktovik, Barrow, Wainwright, Pt. Hope, and Pt. Lay shall be notified promptly through the appropriate Com-Center, as identified in Section 203 of this Agreement, and in writing, of their identity and their intended use, including location of use.

SECTION 402. PRE-SEASON SOUND SIGNATURE TESTS.

(a) Test Required Within 72 Hours of Initiating Operations.

For purposes of obtaining a sound signature for Industry Participants' sound sources, the Industry Participants shall have initiated a test of both the geophysical equipment and the vessels identified in Attachments II and III to this Agreement, within 72 hours of initiating or having initiated operations in the Beaufort Sea or Chukchi Sea. If more than one sound source will be used on an individual vessel, a cumulative test of all sound sources used on that vessel will be conducted. Industry Participants are not required to conduct sound signature tests of Near Shore Operations Support Vessels.

(b) Mutual Agreement on Site for Testing; Advance Notice Required.

(1) In General. Each sound signature test shall be conducted at a site mutually agreed upon by the Industry Participant conducting such test and the AEWC. Each Industry Participant conducting such sound signature test(s) will provide a minimum of seven days notice of its intent to perform each test to the AEWC.

(2) Beaufort Sea Testing. For sound signature tests conducted in the Beaufort Sea, the Industry Participant conducting such tests shall provide transportation for an appropriate number of representatives from: the AEWC, the whaling captains of the Villages of Barrow, Nuiqsut, and Kaktovik, and the NSB DWM to observe the sound signature tests.

(3) Chukchi Sea Testing. For sound signature tests conducted on vessels to be used in the Chukchi Sea, the Industry Participant(s) conducting such tests will invite the AEWC and the NSB DWM to observe such tests and transportation will be provided by the appropriate Industry Participant(s).

(4) Subsistence Participants. In order to facilitate the participation of interested Subsistence Participants and the NSB DWM in any sound signature test(s), the Industry Participant(s) will make a good faith effort to provide three weeks notice of its intent to perform each test.

(c) Sound Signature Data to be Made Available.

(1) Within seven (7) days of completing the the sound signature data calculations from the field tests, each Industry Participant and/or its contractor conducting such test(s) will make all data collected during the sound signature test(s) available upon request to the AEWC and the NSB DWM and will provide the AEWC and the NSB DWM the preliminary analysis of that data, as well as any other sound signature data that is available and that the AEWC, the NSB DWM, and the Industry Participant agree is relevant to understanding the potential noise impacts of the proposed operations to migrating bowhead whales or other affected marine mammals.

(2) Once completed the final data analysis will be provided to the AEWC and the NSB DWM upon request.

(3) Any Industry Participant who prepares a model of the sound signature of its vessels and operations, whether before or after the Pre-Season Sound Signature Test, will provide copies of those models and any related analysis to the AEWC and the NSB DWM upon request.

SECTION 403. MONITORING PLANS.

(a) Monitoring Plan Required.

(1) Each Industry Participant agrees to prepare and implement a noise impact monitoring plan to collect data designed to determine the effects of its oil and gas operations on fall migrating bowhead whales and other affected marine mammals.

(2) The Monitoring Plans shall be designed in cooperation with the AEWC, the NSB DWM, NOAA Fisheries, the U.S. Minerals Management Service, and any other entities or individuals designated by one of these organizations.

(b) Beaufort Sea Monitoring Plans.

In the Beaufort Sea, the monitoring plans shall include an investigation of noise effects on fall migrating bowhead whales as they travel past the noise source, with special attention to changes in calling behavior, deflection from the normal migratory path, where deflection occurs, and the duration of the deflection.

(c) Chukchi Sea Monitoring Plans.

In the Chukchi Sea, the monitoring plans should focus on the identity, timing, location, and numbers of marine mammals and their behavioral responses to the noise source.

(d) Use of Prior Information and Peer Review Required.

(1) Prior impact study results shall be incorporated into the monitoring plans prepared by each Industry Participant.

(2) Each monitoring plan shall be subject to peer review by stakeholders at the 2009 Open Water Season Peer Review Meeting, convened by NOAA Fisheries. Draft plans will be submitted to the NSB DWM and AEWC three weeks prior to the Open Water Meeting. Peer review and acceptance of each monitoring plan through this process shall be completed prior to the commencement of each Industry Participants' 2009 operations in the Beaufort Sea or Chukchi Sea.

(e) Raw Data, Communication, and Summary Required.

(1) Each Industry Participant conducting site-specific monitoring will:

(A) make raw data, including datasheets, field notes, and electronic data, available to the NSB DWM at the end of the season.

(B) permit and encourage open communications among their contractors and the AEWC and NSB DWM.

(2) Each Industry Participant will submit a summary of monitoring plan results and progress to the AEWC and NSB DWM every two weeks during the operating season.

SECTION 404. CUMULATIVE NOISE IMPACTS STUDY.

Each Industry Participant further agrees to provide its monitoring plan and sound signature data, for use in a cumulative effects analysis of the multiple sound sources and their possible relationship to any observed changes in marine mammal behavior, to be undertaken pursuant to a Cumulative Noise Impacts Study.

The study design for the Cumulative Impacts Study shall be developed through a Cumulative Impacts Workshop to be organized by the North Slope Borough in the fall of 2009. The results of this workshop will be presented at the 2010 Open Water Meeting.

TITLE V – AVOIDING CONFLICTS DURING THE OPEN WATER SEASON

Industry Participants are reminded that Sections 101(a)(5)(A) and (D) of the Marine Mammal Protection Act provide, among other things, that the Secretary can authorize the incidental taking of small numbers of marine mammals of a species or population stock if the Secretary finds, among other things, that the total of such takings during the authorized period **will not have an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses.**

The following Operating Guidelines apply in the Beaufort Sea and Chukchi Sea, except as otherwise specified and in all cases with due regard to environmental conditions and operational safety. These Operating Guidelines are in addition to any permit restrictions or stipulations imposed by the applicable governmental agencies.

SECTION 501. GENERAL PROVISIONS FOR AVOIDING INTERFERENCE WITH BOWHEAD WHALES OR SUBSISTENCE WHALE HUNTING ACTIVITIES.

(a) Routing Vessels and Aircraft.

(1) All vessel and aircraft routes shall be planned so as to minimize any potential conflict with bowhead whales or subsistence whaling activities. All vessels shall avoid areas of active or anticipated whaling activity (as reported pursuant to Section 202).

(2) Beaufort Sea. Vessels transiting east of Bullen Point to the Canadian border should remain at least five (5) miles offshore during transit along the coast, provided ice and sea conditions allow.

(3) Chukchi Sea. Vessels should remain as far offshore as weather and ice conditions allow, and at all times at least five (5) miles offshore during transit.

(b) Aircraft Altitude Floor and Flight Path.

(1) AIRCRAFT SHALL NOT OPERATE BELOW 1500 FEET unless the aircraft is engaged in marine mammal monitoring, approaching, landing or taking off, or unless engaged in providing assistance to a whaler or in poor weather (low ceilings) or any other emergency situations. Aircraft engaged in marine mammal monitoring shall not operate below 1500 feet in areas of active whaling; such areas to be identified through communications with the Com-Centers.

(2) Except for airplanes engaged in marine mammal monitoring, aircraft shall use a flight path that keeps the aircraft at least five (5) miles inland until the aircraft is directly south of its offshore destination, then at that point it shall fly directly north to its destination.

(c) Vessel Speeds.

Vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs, and to make any other potential conflicts with bowhead whales or whalers unlikely. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.

(d) Vessels Operating in Proximity of Migrating Bowhead Whales.

If any vessel inadvertently approaches within 1.6 kilometers (1 mile) of observed bowhead whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the bowhead whales by taking one or more of the following actions, as appropriate:

(1) reducing vessel speed to less than 5 knots within 900 feet of the whale(s);

(2) steering around the whale(s) if possible;

(3) operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;

(4) operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and

(5) checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

SECTION 502. GEOPHYSICAL ACTIVITY LIMITATIONS.

The following operating limitations are to be observed and the operations are to be accompanied by a monitoring plan as set forth in Section 403 and Attachment III of this Agreement.

(a) Limit on Number of Simultaneous Geophysical Activity Operations.

Only two (2) geophysical activity operations will occur at any one time in either the Beaufort Sea or the Chukchi Sea. The Industry Participants conducting geophysical activity operations agree to coordinate the timing and location of such operations so as to reduce, by the greatest extent reasonably possible, the level of noise energy entering the water from such operations at any given time and at any given location.

(b) Limitations on Geophysical Activity in the Beaufort Sea.

All geophysical activity in the Beaufort Sea shall be confined as set forth below.

(1) Kaktovik: No geophysical activity from the Canadian Border to the Canning River (146 deg. 4 min. W) from 25 August to close of the fall bowhead whale hunt in Kaktovik and Nuiqsut.[1] From August 10 to August 25, Industry Participants will communicate and collaborate with AEWC on any planned vessel movement in and around Kaktovik and Cross Island to avoid impacts to whale hunt.

(2) Nuiqsut:

A. Pt. Storkerson(~148 deg. 42 min. W) to Thetis Island (~150 deg. 10.2 min. W)**.**

(i) *Inside the Barrier Islands*: No geophysical activity prior to August 5. Geophysical activity is allowed from August 5 until completion of operations[2]

(ii). *Outside the Barrier Islands:* No geophysical activity from August 25 to close of fall bowhead whale hunting in Nuiqsut. Geophysical activity is allowed at all other times.

b. Canning River (~146 deg. 4 min. W) to Pt. Storkerson (~148 deg. 42 min. W): No geophysical activity from August 25 to the close of bowhead whale subsistence hunting in Nuiqsut.

(3) Barrow: No geophysical activity from Pitt Point on the east side of Smith Bay (~152 deg. 15 min. W) to a location about half way between Barrow and Peard Bay (~157 deg. 20 min. W) from September 15 to the close of the fall bowhead whale hunt in Barrow.

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[1] The bowhead whale subsistence hunt will be considered closed for a particular village when the village Whaling Captains' Association declares the hunt ended or the village quota has been exhausted (as announced by the village Whaling Captains' Association or the AEWC), whichever occurs earlier.

[2] Geophysical activity allowed in this area after August 25 shall include a source array of no more than 12 air guns, a source layout no greater than 8 m x 6 m, and a single source volume no greater than 880 in^3.

(c) Limitations on Geophysical Activity in the Chukchi Sea.

All geophysical activity in the Chukchi Sea shall be conducted in accordance with the terms set forth below.

(1) Geophysical activity shall not be conducted within 60 miles of any point on the Chukchi Sea coast.

(2) Safe harbor will be at sites selected by the Industry Participants and the AEWC. Safe harbor sites will be agreed upon no later than July 1 and shall be listed in Attachment IV.

(3) Any vessel operating within 60 miles of the Chukchi Sea coast will follow the communications procedures set forth in Title II of this Agreement. All vessels will adhere to the conflict avoidance measures set forth in Section 501 of this Agreement.

(4) If a dispute should arise, the resolution process set forth in Section 106 of this Agreement shall apply.

SECTION 503. DRILLING AND PRODUCTION.

The following operating limitations are to be observed and the operations are to be accompanied by a Monitoring Plan as set forth in Section 403 and Attachment III of this Agreement.

(a) Zero Discharge of Drilling Mud, Cuttings, Ballast Water, and Produced Water.[3]

(1) Beafort Sea. For all drilling operations, whether for exploration, development, or production, in the Beaufort Sea habitat of the bowhead whale, zero volume discharge of drilling mud, cuttings, ballast water, or produced water shall be allowed into the marine environment. All such material shall be disposed of through re-injection or backhaul for onshore disposal.

(2) Chukchi Sea. For all drilling operations, whether for exploration, development, or production, in the Chukchi Sea habitat of the bowhead whale, zero harmful discharge of drilling muds, cuttings, ballast water, or produced water shall be allowed into the marine environment. Any harmful material shall be disposed of through re-injection or backhaul for onshore disposal.

(b) Sampling of Drilling Mud and Cuttings.

For all drilling operations, whether for exploration, development, or production, in the Beaufort Sea or Chukchi Sea habitat of the bowhead whale, the operator shall cooperate with the AEWC and North Slope Borough in the design and implementation of a program to monitor all discharged materials and impacts to migratory resources from any materials that might be discharged into the marine environment.
.

[3] The intent of this subsection is to apply the same discharge standards that are applicable to Industry Participants that conduct oil and gas operations off Norway. The standard for the Beaufort Sea is to be the same as that applied by Norway in the Barents Sea, and the standard in the Chukchi Sea is to be the same as that applied by Norway in waters south of the Barents Sea. The “harmful” discharges that are prohibited are those classified by Norway as “red” or “yellow” (above certain amounts); discharge of material classified by Norway as “green” is allowed under the zero harmful discharge standard.

(c) Monitoring of Gray Water, Black Water, and Heated Water.

For all exploratory drilling operations in the Beaufort Sea or Chukchi Sea habitat of the bowhead whale, the operator shall cooperate with the AEWC and North Slope Borough in the design and implementation of a program to monitor the composition or temperature and the fate of all discharged materials and impacts to migratory resources from any materials dumped into the marine environment.

(d) Drilling Operations in the Beaufort Sea East of Cross Island.

No drilling equipment or related vessels shall be onsite at any offshore drilling location east of Cross Island from 25 August until the close of the bowhead whale hunt in Nuiqsut and Kaktovik. However, such equipment may remain within the Beaufort Sea in the vicinity of 71 degrees 25 minutes N and 146 degrees 4 minutes W., or at the edge of the Arctic ice pack, whichever is closer to shore.

(e) Drilling Operations in the Beaufort Sea West of Cross Island.

No drilling equipment or related vessels shall be moved onsite at any location outside the barrier islands west of Cross Island until the close of the bowhead whale hunt in Barrow.

(f) Oil Spill Mitigation.

Unless otherwise agreed with the AEWC, Industry Participants engaged in oil production or in drilling operations in the Beaufort Sea or Chukchi Sea agree to adhere to the AEWC/NSB/Inupiat Community of the Arctic Slope oil spill contingency agreement.

SECTION 504. SHORE-BASED SERVICE AND SUPPLY AREAS.

Shore-based service and supply areas used by Industry Participants shall be located and operated so as to ensure compliance with the terms of this Agreement.

TITLE VI – PARTICIPANTS

This Agreement shall be binding and effective when signed by the duly authorized representatives of the Participants. Signatures may be by facsimile on separate pages.

_____
Harry Brower
Chairman, AEWC
Dated: _____

_____
Harry Brower
AEWC Commissioner for Barrow
Dated: _____

_____
Archie Ahkiviana
AEWC Commissioner for Nuiqsut
Dated: _____

_____
Joe Kaleak
AEWC Commissioner for Kaktovik
Dated: _____

_____
Rossman Peetook
AEWC Commissioner for Wainwright
Dated: _____

_____
Ray Koonook
AEWC Commissioner for Pt. Hope
Dated: _____

_____
Julius Rexford
AEWC Commissioner for Pt. Lay.
Dated: _____

_____
Name:
BP Exploration (Alaska) Inc.
Dated: _____

_____
Name:
ENI
Dated: _____

_____
Name:
Shell Offshore, Inc.
Dated: _____

_____
Name:
ConocoPhillips Alaska
Dated: _____

_____
Name:
Exxon Mobil
Dated: _____

_____
Chuck Robinson
PGS Onshore, Inc.
Dated: _____

_____
Name:
Pioneer Natural Resources Alaska
Dated: _____

ATTACHMENT I

LOCAL SEARCH AND RESCUE ORGANIZATIONS - CONTACT PERSONS

(IN EMERGENCIES, ALWAYS DIAL 911)

North Slope Borough			
Search and Rescue (Pilots)			
Director Richard Patterson		852-2822 WK	852-2496 Home
Hugh Patkotak		852-2822 WK	852-4844 Home
Barrow Volunteer			
Search and Rescue Station			852-2808 OFS
President	Oliver Leavitt	852-7032 WK	852-7032 Home
Vice-Pres.	Price Brower	852-8633 WK	852-7848 Home
Secretary	Lucille Adams	852-0250 Wk	852-7200 Home
Treasurer	Eli Solomon	852-2808 Wk	852-6261 Home
Coordinator	Arnold Brower, Jr.	852-0290 WK	852-5060 Home
Director	Jimmy Nayakik	852-0200 WK	852-JENS Home
Director	Johnny Adams	852-0250 WK	852-7724 Home
Nuiqsut Volunteer			
Search and Rescue Station		480-6613 (Fire Hall)	
Kaktovik Volunteer			
Search and Rescue Station		640-6212 (Fire Hall)	
President	Lee Kayotuk	640-5893 Wk	640-6213 Home
Vice-Pres.	Tom Gordon	640-	
Secretary	Nathan Gordon	640-6925	
Treasurer	Don Kayotuk	640-2947	
Fire Chief	George T. Tagarook	640-6212 WK	640-6728 Home

Wainwright Volunteer Search and Rescue

President	Joe Ahmaogak Jr.	763-2826 Home
Vice President	John Hopson, Jr.	763-3464 Home
Secretary	Raymond Negovanna	763-2102 Home
Treasurer	Ben Ahmaogak, Jr.	763-3030 Home
Director	Artic Kittick	763-2534 Home
Director	John Akpik	Unlisted

Pt. Hope Volunteer Search and Rescue

Coordinator	Andrew Tooyak Jr.	368-2071 Home
Fire Chief	Willard Hunnicutt	368-2774 Wk (Note: Only contact for Pt. Hope)

North Slope Borough Disaster Relief Coordinator

Frederick Brower	852-0284 OFS

ATTACHMENT II

VESSELS TO BE USED FOR AND IN SUPPORT OF INDUSTRY PARTICIPANTS' OPERATIONS AS IDENTIFIED IN SECTION 401(b)(1)(B)

[ALL VESSELS TO BE IDENTIFIED BY COMPANY]

NOTE:
COPY OF PRESENTATION OF THE INDUSTRY PARTICIPANT ATTACHED IDENTIFYING VESSELS TO BE USED FOR AND IN SUPPORT OF THE INDUSTRY PARTICIPANTS' OPERATIONS.

ATTACHMENT III

VESSELS TO BE USED FOR AND IN SUPPORT OF THE INDUSTRY PARTICIPANTS MONITORING PLANS AS IDENTIFIED IN SECTION 401(b)(1)(B)

[ALL VESSELS TO BE IDENTIFIED BY COMPANY]

NOTE:
COPY OF PRESENTATION OF THE INDUSTRY PARTICIPANT ATTACHED IDENTIFYING VESSELS TO BE USED FOR AND IN SUPPORT OF THE INDUSTRY PARTICIPANTS' MONITORING PLAN.

ATTACHMENT IV

SAFE HARBOR

ALASKA WILDERNESS LEAGUE – CENTER FOR BIOLOGICAL DIVERSITY – DEFENDERS OF WILDLIFE – EARTHJUSTICE – NATURAL RESOURCES DEFENSE COUNCIL – NORTHERN ALASKA ENVIRONMENTAL CENTER – PACIFIC ENVIRONMENT – SIERRA CLUB – THE WILDERNESS SOCIETY – WORLD WILDLIFE FUND

July 1, 2009

P. Michael Payne, Chief
Permits, Conservation and Education Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Re: Small Takes of Marine Mammals Incidental to Specified Activities; Open Water Marine Survey Program in the Chukchi Sea, Alaska During 2009-2010, 74 Fed. Reg. 26,217 (June 1, 2009)

The undersigned groups submit the following comments on the National Marine Fisheries Service's ("NMFS") proposed authorization of incidental take of marine mammals from seismic surveying in the Chukchi Sea by Shell Offshore Inc. and Shell Gulf of Mexico Inc. (collectively, "Shell"). Shell has applied for an incidental harassment authorization ("IHA") pursuant to the Marine Mammal Protection Act ("MMPA") based on proposed shallow hazard / site clearance surveying and a strudel scour survey during the open water seasons of 2009-2010. On June 1, 2009, NMFS issued a proposed authorization for public comment. 74 Fed. Reg. 26,217 (June 1, 2009).

As an initial matter, NMFS should not authorize marine mammal harassment incident to oil and gas-related seismic surveying until NMFS and other agencies complete a comprehensive review of both the industrial activities and the marine resources of the Arctic. This review should ensure that critical information gaps relating to the Arctic are filled and that decisions made about Arctic activities are made in the context of a comprehensive plan for the region. Previously, NMFS has called for the initiation of a wide-ranging research program for the Chukchi Sea before opening the area to additional exploration. The same precautionary approach should be applied to all oil and gas activities across the entire Alaskan outer continental shelf. In the interim, NMFS should not facilitate further potentially harmful seismic activity.

In addition, NMFS should not authorize the proposed harassment because the shallow hazard surveys will take place on legally flawed leases acquired through lease sale 193. In April 2009, the D.C. Circuit Court of Appeals vacated the Outer Continental Shelf Lands Act five-year plan that allowed the Chukchi Sea 193 lease sale. The decision specifically faulted the administration for failing to adequately consider the environmental sensitivity of the Arctic Ocean and found that the approach used was "irrational." *See Ctr. for Biological Diversity v. U.S. Dep't of the Interior*, Nos. 07-1247 & 07-1344, slip op. (D.C. Cir. Apr. 17, 2009). In

addition, lease sale 193 has also been directly challenged in federal district court in Alaska by a number of conservation and Alaska Native groups for failing to analyze and disclose the impacts of oil and gas activities, including seismic surveying, on wildlife and subsistence. *See Native Village of Point Hope v. Salazar*, No. 1:08-cv-00004-RRB (D. Alaska, filed Jan. 31, 2008). NMFS should not, therefore, authorize harassment for activities on these leases until the legal infirmities identified in the five year plan and the Chukchi Sea lease sale are resolved.

As to the issues raised specifically by the proposed IHA, and that we discuss in more detail below, we are concerned about the impact of the proposed surveying on a number of marine mammals including bowhead whales, gray whales, harbor porpoise, and beluga whales, as well as the potential effects on Alaska Native communities. We urge NMFS not to issue an IHA to Shell until NMFS can ensure that mitigation measures are in place that truly avoid adverse impacts to all species and their habitats and has conducted a full environmental review of the direct and cumulative impacts of such activities.

I. NATIONAL ENVIRONMENTAL POLICY ACT

In 2006, following an upsurge in seismic activity and based on a determination that the increased seismic activity presented a threat of significant impacts to the environment, NMFS and the Minerals Management Service ("MMS") jointly began a programmatic EIS process to determine the long-term effects of increased seismic surveying in the Arctic. In February 2007, the agencies issued a draft programmatic EIS, but to date, the agencies have not responded to comments received on the draft, completed their analysis, or published a final version. In violation of NEPA, the previous administration continued to authorize seismic surveying in the Arctic Ocean during the open water seasons of 2007 and 2008 even though it had not completed the programmatic EIS. NMFS should not repeat the same error this year.

At the Open Water meeting in April, NMFS acknowledged that the information in the 2007 draft programmatic EIS is now dated and indicated that the agency expects to conduct another round of public comment before issuing a final EIS. We agree with both propositions: the information has become stale and once the draft is updated, additional public comment is appropriate for that reason alone. In particular, the programmatic EIS should consider the multiple exploration plans that have been submitted to MMS and the existing efforts to develop a new nationwide five-year leasing plan for 2010-2015 and to revise the recently vacated five-year plan.

The draft EIS also suffered from a number of fundamental flaws – detailed in the comments submitted in 2007 – that require significant review and revision. Among other failings, it evaluated only alternatives that contemplate up to 12 concurrent 2D / 3D surveys in the Arctic Ocean. Both the Environmental Protection Agency and the Fish and Wildlife Service recommended that the programmatic EIS incorporate alternatives that reduce the number of surveys. The draft also did not adequately analyze the implications of not requiring a "safety zone" for fall migrating cow-calf pairs. Both NMFS and MMS imposed the additional protection during the 2006 seismic surveying season to protect this vulnerable segment of the population. The draft EIS relied heavily on the imposition of exclusion zones that are of questionable value given the inherent limitations of observers attempting to locate animals – often submerged – at great distances and during times of poor visibility. More analysis on the

efficacy of exclusion zones is necessary. Once critical issues such as these are addressed, an additional round of public review will be essential.

At the same time, a programmatic overview is urgently needed given the increasing levels of activity in the Arctic. Shell intends to conduct exploration drilling in both seas, and ConocoPhillips has announced plans to engage in exploration drilling in the Chukchi. Other activities, such as production from the Northstar facility in the Beaufort Sea, is ongoing. State waters may also see leasing and exploration. There is likely to be increased shipping in the Arctic as the summer sea ice retreats further. Species with migratory paths that include both seas, such as bowhead and beluga whales, could encounter these multiple sources of disturbance in a single year and over consecutive years. Even within the Chukchi alone, species may be exposed to repeated disturbances from multiple sources.

Council on Environmental Quality regulations limit new activities that are otherwise covered by a programmatic EIS during the period in which the environmental review is in progress. 40 C.F.R. § 1506.1(c). Before the final EIS is issued, therefore, federal actions that would otherwise fall within its purview, such as the 2009 surveying, should not go forward. This requirement implements NEPA's demand that agencies weigh the full scope of any activity to determine the potential for significant effects. Allowing surveying to continue avoids the broader look at potential impacts and could prejudice the agency's decision making. The programmatic review could also provide a catalyst for efforts to take a broader look at the environmental resources of the Arctic.

II. MARINE MAMMAL PROTECTION ACT

NMFS's proposed authorization to Shell for the take of marine mammal species incidental to planned seismic surveys in the Chukchi Sea does not comply with the requirements of the MMPA. Congress enacted the MMPA in 1972 in response to widespread concern that "certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man's activities[.]" 16 U.S.C. § 1361(1). The legislative history states that the purpose of the MMPA is to manage marine mammals "for their benefit and not for the benefit of commercial exploitation." H. Rep. No. 92-707, *reprinted in* 1972 U.S.C.C.A.N., 1972, pp. 4144-45. The primary mechanism by which the MMPA protects marine mammals is through the implementation of a "moratorium on the taking" of marine mammals. 16 U.S.C. § 1371(a). Under the MMPA, the term "take" is broadly defined to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." *Id.* §1362(13). "Harass" is further defined to include acts of "torment" or "annoyance" that have the "potential" to injure a marine mammal or marine mammal stock in the wild or have the potential to "disturb" them "by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." *Id.* § 1362(18); 50 C.F.R. § 216.3 (defining "Level A" and "Level B" harassment).

The MMPA provides several narrow exceptions to the moratorium on take. Relevant here, NMFS may, upon request, authorize take in the form of harassment by an IHA for a period of not more than one year, provided certain conditions are met. To receive such take authorization, an activity (i) must be "specified" and limited to a "specific geographical region," (ii) must result in the incidental take of only "small numbers of marine mammals of a species or

population stock," (iii) can have no more than a "negligible impact" on species and stocks, and (iv) will not have "an unmitigatable adverse impact on the availability of such species or stock for taking for subsistence uses" by Alaska Natives. Furthermore, in issuing an authorization, NMFS must provide for the monitoring and reporting of such takings and must prescribe methods and means of effecting the "least practicable impact" on the species or stock and its habitat. 16 U.S.C. § 1371(a)(5)(D). Finally, for an IHA to issue, the activity cannot have the "potential to result in serious injury or mortality[.]" 50 C.F.R. § 216.107. As discussed below, NMFS has not demonstrated that the proposed IHA will meet the standards imposed by the MMPA and its governing regulations.

A. Small Numbers / Negligible Impact

The conclusion that Shell's proposed seismic surveying will take only small numbers of marine mammals and will have no more than a negligible impact is not justified by the information provided in the Federal Register notice. NMFS has not adequately considered whether marine mammals may be harassed at received levels significantly lower than 160 dB, and it has not considered the high degree of uncertainty associated with authorizing the harassment of marine mammals incident to the proposed surveying.[1] We also raise a number of comments specific to particular marine species.

1. Calculating Harassment

An activity constitutes harassment if it has even the "potential" to affect marine mammal behavior. The MMPA defines harassment to include any act of pursuit, torment or annoyance that

> 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.

16 U.S.C. § 1362(18)(A)(ii).

Here, NMFS calculated harassment from Shell's proposed surveying based on the exposure of marine mammals to sounds at or above 160 dB. *See* 74 Fed. Reg. at 26,225. This uniform approach to harassment, however, does not take into account known reactions of marine mammals in the Arctic to levels of noise far below 160 dB.

For example, species such as harbor porpoise and beluga whales are particularly responsive to sound. *See* attached statement of Dr. David Bain at 4-5, 10-11 & 13 ("Bain statement"). *See also* Natural Resources Defense Council, Sounding the Depths II: The Rising Toll of Sonar, Shipping, and Industrial Ocean Noise on Marine Life, at 5-6 & 30 (Nov. 2005) ("Sounding the Depths") (noting that harbor porpoise are "notoriously sensitive" to sound and will flee tens of miles to escape, endangering themselves in the process); 38 (noting that belugas in the Arctic have responded "dramatically" to ships and icebreakers); 74 Fed. Reg. at 26,226

[1] Unless otherwise stated, sound measurements are given as RMS (root mean square) sound pressure levels, *i.e.*, dB re μPa (rms).

(noting data suggesting that "some belugas might be avoiding the seismic operations" at distances of 10–20 kilometers).[2] The Federal Register notice does not adequately consider whether the acute sensitivities of harbor porpoise and beluga whales should lead to a lower harassment threshold, and NMFS should recalculate its estimation in order to accurately depict likely potential responses in the wild. *See also* MMS, Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea, at IV- 149 (May 2007) ("LS 193 EIS") (noting sensitivity of toothed whales to high-frequency sounds).[3]

The Federal Register notice does include the potential for behavioral disturbance to endangered bowhead based on exposures to sound levels "at or near" 130 dB, referencing studies that found migrating bowheads avoided seismic activities at distances of 20-30 kilometers. 74 Fed. Reg. at 26,226. This "potential disturbance" fits squarely within the MMPA's definition of harassment. If bowhead whales are deflected from their migratory route, it can lead to adverse impacts, as they may miss important feeding and resting opportunities and expend greater energy as they swim farther than they would otherwise. The resultant energetic loss could impair the reproductive fitness or survival of individuals in the bowhead population. Indeed, the statutory definition of harassment specifically encompasses the potential disruption of marine mammal migration.

The Federal Register notice indicates, however, that bowheads may not be harassed based on industry survey results from 2007 showing some bowhead whales did not avoid the sound sources at distances equivalent to a 120-dB zone. This approach disregards the MMPA's focus "on *potential* harassment," a phrasing that supports the notion that all of the animals in a population are harassed "if there is the potential for the act to disrupt the behavioral patterns of the most sensitive individual in the group." *NRDC v. Evans*, 279 F.Supp.2d 1129, 1157 (N.D. Cal. 2003). Recent amendments to the MMPA emphasize this point by requiring a stronger showing of disturbance for only two specified categories of activities. 16 U.S.C. §1362(18)(B)(ii) (defining harassment for a military readiness activity or scientific research activity as one that "disturbs or is likely to disturb" marine mammals to a point that natural behavioral patterns are "abandoned or significantly altered"). NMFS also acknowledges that bowhead calling behavior was likely affected in 2007, raising the question of whether any bowhead whales that were not deflected were nevertheless harassed.

In an Environmental Assessment NMFS prepared to evaluate the impacts of noise from Shell's previous plans for offshore drilling, the agency made clear the potential for harassment from seismic surveying and the need for mitigation that includes a protective 120-dB exclusion zone:

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[2] The report can be found at http://www.nrdc.org/wildlife/marine/sound/contents.asp.

[3] At one point, NMFS implies that the 160-dB threshold might result in an overestimate of harassment because some marine mammals may show avoidance reactions at lower received levels. 74 Fed. Reg. at 26,225. This, however, ignores whether the act of avoidance itself constitutes harassment. Successful flight from a disturbance requires significant energy and can move animals away from optimal habitat. *See* Bain statement at 3-4. The 120-dB zone for Shell's surveying is estimated to extend 24 kilometers outward.

> NMFS considers the feeding, socializing and migration of bowhead whales during the fall westward migration to be critical to bowhead whale survival. The reason for the 120-dB-related conditions and the requirement for two aerial surveys is that preliminary information from a Canadian seismic survey in 2006 indicates that a tagged bowhead whale migrating westward ceased its migration until the seismic survey ended. This reaction is of concern to NMFS principally because one animal's response to seismic sounds is a likely indicator that a larger population of bowheads could exhibit the same response to seismic sound and possibly even drilling noise.

NMFS, Environmental Assessment for the Shell Offshore, Inc. Incidental Harassment Authorization to Take Marine Mammals Incidental to an Offshore Drilling Project in the U.S. Beaufort Sea Under the Marine Mammal Protection Act, at 9 (October 2007).

Finally NMFS must also consider the effects of disturbances in the context of other activities occurring in the Arctic. Of particular interest, this season, BP Exploration plans 2D and 3D seismic surveying in the Canadian Beaufort using a vessel towing 48 airguns – in two arrays with volumes of 4,450 cubic inches each – that would produce peak sound pressure levels of up to 261 dB. *See* National Energy Board, Draft Environmental Screening Report, BP Exploration Pokak 3D Seismic Program (June 3, 2009).[4] The Northstar facility in the Beaufort Sea also continues its operations and shipping – including the use of icebreakers – is on the rise. As bowhead whales migrate westward across the Arctic Ocean in the fall 2009, they are potentially subject to multiple sources of disturbance, adding to the total stress on the species and increasing the potential impact of even lower levels of sound.

2. Uncertainty

In its comments on the proposed 193 lease sale in the Chukchi Sea, NMFS stated that without "current and thorough data which describe the habitat use and function of these waters," and without information on the seasonal presence and distribution patterns of marine mammals, the agency would find it challenging to meet its obligations under the MMPA. NMFS explained that, lacking such information,

> it will be very difficult to permit and conduct seismic surveys in a manner than has no more than a negligible impact to the stock and minimizes disturbance and harassment to the extent practicable.

NMFS Comments on MMS Draft EIS for Chukchi Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea, at 2 (Jan. 30, 2007) ("NMFS LS 193 Comments"). MMS agreed in its final EIS that much remains unknown. Information is limited on the bowhead fall migration through the Chukchi and the feeding that takes place during that time. *See* LS 193 EIS at III-51-52. Basic data are still needed for other species as well, including gray whales, beluga whales, and harbor porpoises. Gray whales rely on the Chukchi Sea as one of their primary feeding grounds, and they have been shown to abandon habitat in response to anthropogenic noise. *See id*. at III-79. Beluga whales – an important subsistence resource for Alaska Native

[4] The documentation is available at http://www.neb-one.gc.ca/clf-nsi/rthnb/pblcrgstr/bpxplrtnpkk/drftnvrnmntlscrnngrprt20090603.pdf.

communities – and harbor porpoises – unexpectedly spotted during recent industry surveys in the Chukchi – are both known to be particularly susceptible to noise, as explained above. As NMFS predicted, the Federal Register notice for Shell's proposed IHA does not adequately address the potential effects on these species.

In more recent Arctic lease sale comments, NMFS reiterated its position that more information is needed to avoid difficulties making the findings required by the MMPA. NMFS Comments on MMS Draft EIS for the Beaufort Sea and Chukchi Sea Lease Sales 209, 212, 217, and 221 (March 27, 2009) ("NMFS Multi-Sale Comments"). The agency also specifically observed that activities "occurring near productive forage areas such as the Hanna Shoal" or "along migratory corridors" are most likely to encounter and impact marine mammals. *Id*. at 4. Shell's proposed surveying for 2009 will likely take place proximate to the Hanna Shoal and within the pathway for migrating bowheads.[5]

It is generally recognized that there is much unknown about the range of potential effects of sound on marine mammals, especially long-term sublethal effects and the impact of exposure to increasing levels of noise year after year. NMFS noted in both sets of lease sale comments that the "continued lack of basic audiometric data for key marine mammal species" that occur throughout the Chukchi Sea inhibits the "ability to determine the nature and biological significance of exposure to various levels of both continuous and impulsive oil and gas activity sounds." NMFS LS 193 Comments at 2; NMFS Multi-Sale Comments at 4. Again, NMFS stressed that additional data should be obtained for the agency to consider authorizing incidental taking under the MMPA and the Endangered Species Act ("ESA").

The need for more information regarding the effects of sound – and the appropriate mitigation measures – was emphasized in a recent report issued by an interagency task force led by a representative from the National Oceanic and Atmospheric Administration:

> There is considerable scientific uncertainty regarding the nature and magnitude of the actual impacts of anthropogenic sound on the marine environment, as well as the most appropriate and effective mitigation measures where effects have been demonstrated or are likely.

Joint Subcommittee on Ocean Science & Technology, "Addressing the Effects of Human-Generated Sound on Marine Life: An Integrated Research Plan for U.S. Federal Agencies," at 1 (Jan. 2009) ("JSOST").

This lack of critical information runs up against the precautionary nature of the MMPA. In making its "negligible impact" determinations, NMFS must give the benefit of the doubt to the species. As the D.C Circuit has repeatedly stated, "it is clear that '[t]he Act was to be administered for the benefit of the protected species rather than for the benefit of commercial exploitation.'" *Kokechik Fishermen's Ass'n v. Secretary of Commerce*, 839 F.2d 795, 800 (D.C.

[5] The Federal Register notice states in passing that no areas of concentrating feeding "occur within or near" the planned area of operations. 74 Fed. Reg. 26,234. More is needed in order to justify this statement.

Cir. 1988) (quoting *Comm. for Humane Legislation, Inc. v. Richardson*, 540 F.2d 1141, 1148 (D.C. Cir. 1976)).

The court in *Committee for Humane Legislation* quoted the MMPA's legislative history in support of the idea that the Act was "deliberately designed to permit takings of marine mammals only when it was known that that taking would not be to the disadvantage of the species":

> In the teeth of this lack of knowledge of specific causes, and of the certain knowledge that these animals are almost all threatened in some way, it seems elementary common sense to the Committee that legislation should be adopted to require that we act conservatively – that no steps should be taken regarding these animals that might prove to be adverse or even irreversible in their effects until more is known. As far as could be done, we have endeavored to build such a conservative bias into the legislation here presented.

540 F.2d at 1150 (quoting H.R. Rep. No. 92-707). Nor can NMFS claim the lack of available information justifies its decisions. NMFS has an affirmative obligation to find that impacts are no more than "negligible" and limited to the harassment of only "small numbers" of marine mammals.

We are also concerned about the lack of specificity regarding the timing and location of the surveys. As noted in the proposed IHA, actual locations of site clearance and shallow hazard surveys "have not been definitively set[.]" 74 Fed. Reg. at 26,219. Instead, Shell's application provides a map of what appears to be all of the blocks leased by the company through lease sale 193. The range of possible locations is quite large – the sites are found along the 100 miles from Wainwright to Point Hope and begin approximately 70 miles from the coast and extend well offshore. Potential surveying may take place proximate to the Hanna Shoal, an established feeding ground for gray whales and walrus.

Moreover, the IHA as proposed will cover a full year, from August 2009 through July 2010. This is a particular concern given that the Federal Register's assessment of effects on bowhead whales apparently relies in part on the surveys ending before the peak of the bowhead fall migration through the Chukchi Sea. Shell indicates that it will require a maximum of 50 days of "active data acquisition," but it is noteworthy that this estimate expressly excludes any unplanned downtime. 74 Fed. Reg. at 26,219. Shell also states that the vessel may be used for

other activities, and this time is also not included in the estimate. *Id*. Consequently, Shell could need to survey well into the month of October, and the IHA as proposed would allow it to do so.[6]

Finally, we question the rationale for issuing an IHA that extends well into 2010. A one-year IHA is clearly not compelled by the MMPA, and an authorization that includes a portion of the next open water season only invites later confusion. *See* 16 U.S.C. § 1371(a)(5)(D)(i) (stating that an IHA may be issued for "not more than" one year). Here, Shell's 2008 IHA provided coverage through August 18, 2009. 73 Fed. Reg. 66,106, 66,106 (Nov. 6, 2008). In its recent application, Shell sought authorization permitting marine mammal harassment from August 20, 2009, through August 19, 2010. The June Federal Register notice maintains that the existing IHA is valid through August 19 "or until a new IHA is issued to Shell, whichever is earlier." 74 Fed. Reg. at 26,218.[7] Although NMFS's analysis of impacts to marine mammals appears to consider the entire 50 days of shallow hazard surveying, the process leaves open the possibility of an unjustifiably segmented MMPA evaluation, looking only at a portion of the surveying that will take place in a single season. NMFS should take steps to avoid such results.[8]

3. Specific Marine Mammals

a. Bowhead Whales

First, the methodology used to determine the number of harassed bowhead whales does not withstand scrutiny, as discussed in more detail in the attached statement of Dr. David Bain. Bain statement at 7-10. Second, NMFS's proposed mitigation is insufficient considering the potential impacts to bowhead whale cow-calf pairs.

We question NMFS's use of a "density" measure in determining take in the Chukchi Sea during the bowhead migration. NMFS has recognized in the past that using density is inappropriate for determining bowhead take from seismic activities in the Beaufort Sea during the fall. *See* 73 Fed. Reg. at 66,115. As succinctly stated in Shell's original IHA application, during the fall, "most bowhead whales will be migrating" in the Beaufort, "so it is not accurate to assume that the same individuals would be present in or near the survey area from one day to the next." Shell App. at 32. The same holds true for fall surveying in the Chukchi Sea.

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[6] The language in the Federal Register notice wanders on this point. *See* 74 Fed. Reg. at 26,219 (surveying from August through October); *id*. at 26,225 (surveying from August through September); *id*. at 26,227 (surveying from August through September). Shell's December 2008 application states that Chukchi site clearance and shallow hazard surveying would take place through October 2009. Application for IHA for Non-Lethal Taking of Whales and Seals in Conjunction with a Proposed Open Water Marine Survey Program in the Chukchi and Beaufort Seas, Alaska, During 2009-2010 ("Shell App."), at 12 (Dec. 2008). Shell's Table 6-7 in its second addendum, however, estimates take based on "summer (Aug.) and fall (Sept.), 2009."

[7] In what seems to be a slight discrepancy, the 2008 Federal Register notice states that Shell's IHA applies through August 18, 2009, rather than August 19, as Shell and NMFS assume.

[8] Shell's proposed strudel scour surveys will not take place until 2010. There is no reason to authorize that activity at this time, particularly given that no pipeline shore crossings have been identified and the full extent of concurrent activity in the Chukchi Sea one year from now is unknown.

It is not clear on what basis NMFS abandons an approach that would estimate migrating whales in the Chukchi Sea. Although NMFS evidently accepts that Shell's surveying will take place before the bulk of the bowhead migration, there is no suggestion that surveying in the fall would avoid migrating whales altogether. *Compare* 74 Fed. Reg. at 26,224 (stating that bowheads linger in the Beaufort Sea during migration and most will travel through the Chukchi Sea after Shell's activities are complete) *with* 26,227 (noting that migrating bowheads will coincide with the latter portion of the survey). *See also* LS 193 EIS at III-52 (stating that bowheads are in the Chukchi as part of the fall migration "from about mid-September through October"). Moreover, the assumption that surveying will avoid the peak of the migration is not well founded: neither the timing of the bowhead migration nor the timing of Shell's activities are fixed, as NMFS appears to presume. In its 2008 biological opinion, NMFS recognized that in some years bowheads begin migrating into the Alaskan Beaufort in early September, rather than the typical mid-September start. NMFS, Oil and Gas Leasing and Exploration Activities in the U.S. Beaufort and Chukchi Seas, Alaska, and Authorization of Small Takes Under the Marine Mammal Protection Act, at 13-14 (July 17, 2008) ("BiOp"). And, as has already been noted, Shell's surveying could take place well into October, despite NMFS's underlying assumption. *Cf*. 74 Fed. Reg. at 26,225 (stating that "the other half of the trackline is planned to be surveyed in September"). Using a density calculation artificially reduces the number of bowheads that will likely impacted from Shell's surveying, and does not represent the best available science. *See* 50 C.F.R. § 216.104(c).[9]

Even accepting a density approach for the fall, we do not believe that the 95% discount applied by NMFS is appropriate. NMFS's .05 "correction factor" rests on three grounds: 1) the narrower migration pathway in the Beaufort; 2) feeding that takes place around Barrow; and 3) a claimed northward tilt in the bowhead migration pathway in the Chukchi. 74 Fed. Reg. at 26,224. As discussed in the attached statement of Dr. Bain, these assertions do not justify such a severe reduction. Indeed, the study cited by NMFS (Quakenbush 2007), to support a northward migration indicates that a tagged whale travelled directly through the area proposed for surveying.

Equally important is the lack of reasoning to support the final result. Although NMFS has provided some information as to *why* it applied a discount factor, it has not explained *how* it arrived at the precise figure. While some adjustment may be appropriate, NMFS does not include adequate information to demonstrate the basis for determining that such a sharp reduction is requierd. At a minimum, NMFS must reveal how it developed its calculations. A court will uphold agency decisionmaking only if it is "'based on a consideration of relevant factors,'" *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1211 (9th Cir. 1998) (citation omitted), a difficult task when the agency's reasoning is wholly obscured. *See Northwest Coalition for Alternatives to Pesticides v. EPA*, 544 F.3d 1043, 1052 n.7 (9th Cir.

[9] Nor is it clear that NMFS adequately considered the migration of beluga whales in the Chukchi and whether a density approach in that instance is equally inappropriate.

2008) (noting that a court's function is "'to ascertain whether the agency's actions were complete, reasoned, and adequately explained'" (citation omitted)).[10]

As to the proposed mitigation, additional measures are needed to address vulnerable cow-calf pairs. When assessing the potential impacts of noise, NMFS and MMS have recognized that bowhead cow-calf pairs merit special consideration. *See, e.g.*, LS 193 EIS at IV-81. Bowhead whales are a long-lived, late maturing species with relatively low reproductive rates and extremely high maternal investment in the young. Studies reveal that female baleen whales show a heightened response to noise and disturbance and that fall migrating bowheads demonstrate greater avoidance than bowheads engaged activities such as feeding. The 2005 report by the National Research Council cautioned that "[v]ery low thresholds should be considered for any disturbance that might separate a dependant infant from its caregivers." National Research Council, Marine Populations and Ocean Noise, at 82-83 (Box 4-1) (2005) ("NRC").

NMFS acknowledged in 2008 that more information is needed about the potential effects of even a single seismic survey on the health of females and young calves. Supplemental Environmental Assessment for the Issuance of IHAs, at 38 (July 2008). Collectively, these factors led NMFS to require a safety zone tailored to protect multiple migrating cow-calf pairs for the surveying that took place in both seas in 2006 and for the subsequent surveying in the Beaufort Sea in 2007 and 2008. These same factors compel a 120-dB safety zone for migrating cow-calf pairs during Shell's proposed surveying in the Chukchi Sea in 2009.

b. Gray Whales

There is insufficient information in the Federal Register notice related to gray whales to justify NMFS's MMPA conclusions. Gray whales rely on the Northern Bering Strait and Chukchi Sea as primary feeding grounds. LS 193 EIS at III-79. In the Chukchi, they typically favor coastal areas and offshore shoals and have increasingly been found around the Hanna Shoal, as MMS recognized in its response to comments submitted on the draft EIS for lease sale 193. *See also* Shell App. at 20 (noting that gray whales have clustered in offshore waters northwest of Point Barrow at Hanna Shoal). Their numbers have declined since removal from ESA protections in 1994, and there is speculation that the population is responding to environmental limitations. LS 193 EIS III-79. Gray whales have also been shown to abandon habitat in response to anthropogenic noise. NRC at 14. Recently, scientists documented dramatically reduced numbers of Western Gray Whales feeding in their primary (nearshore) feeding area adjacent to Piltun Bay, Sakhalin Island, Russia following increased oil and gas activity in the area. *See* International Union for Conservation of Nature, Report of the Western Gray Whale Advisory Panel at its Sixth Meeting, 21-24 April, 2009.[11] In response, Sakhalin Energy (operated largely by Royal Dutch/Shell) agreed to cancel planned seismic activities in the area this year. It is not clear that NMFS considered the proximity of Shell's proposed survey areas to the Hanna Shoal or other potential eastern gray whale feeding areas.

[10] Shell's application includes the .05 correction, Shell App. at 27, but it is equally unilluminating as to how the figure was calculated.

[11] Available at http://cmsdata.iucn.org/downloads/wgwap_6_report_final.pdf.

NMFS has proposed an exclusion zone for 12 or more gray – and bowhead whales – within the 160 dB range, extending 1,400 meters out from the seismic vessel. As noted, however, there are serious concerns with the efficacy of mitigation measures such as exclusion zones, particularly when visibility is poor to non-existent. *Cf.* LS 193 EIS at IV-151 (finding that "[w]ithout appropriate mitigation" displacement is possible). Moreover, NMFS has not indicated that it will require a fixed number of marine mammal observers to be on duty, and Shell states that the number of observers during any period depends on multiple factors including berthing availability and lifeboat space. Marine Mammal Monitoring and Mitigation Plan for Site Clearance and Shallow Hazards Data Acquisition in the Alaskan Chukchi Sea, 2009, at 5 ("4M Plan"). If Shell ultimately relies on single observers located on the source vessel only, monitoring the full 1,400 meter radius for aggregations of whales will present a considerable challenge. *See* Bain statement at 14-16.[12]

c. Harbor Porpoise

Harbor porpoise sightings were unexpectedly high during recent industry surveys, "commonly recorded" in the Chukchi Sea during summer and early autumn. 74 Fed. Reg. at 26,224. As stated in Shell's application, the harbor porpoise "is likely to be one of the most abundant cetaceans encountered throughout the Chukchi Sea[.]" Shell App. at 17. In order to determine take, densities were estimated using industry data collected during 2006 surveys.[13]

In order to comply with MMPA directives, however, NMFS must first address what is generally understood to be an arbitrary division of the harbor porpoise population. As acknowledged in the lease sale 193 EIS, the recommended "Bering Sea stock" of harbor porpoise is based on "arbitrarily set geographic boundaries" and lacks sufficient supporting biological data. LS 193 EIS at III-78 - III-79. *See also* Shell App. at 17 (noting that separate harbor porpoise stocks have not been identified but have been divided into three "groups"). This Bering Sea grouping results in an estimated population of over 60,000 animals. In contrast, recent harbor porpoise stock assessments completed elsewhere have identified multiple small stocks numbering the 1000s from what had been considered a single large stock. *See* Bain statement at 10-11.

[12] Without committing to additional observers, Shell appears to recognize that more than one will be necessary to effectively monitor the 160-dB zone. 4M Plan at 5 (noting that safety zones of "less than 500 m can adequately be monitored" by one observer).

[13] NMFS should clarify the calculation for the estimated number of harassed harbor porpoise To determine take, NMFS relied on the densities provided by Shell in its original application. 74 Fed. Reg. at 26,225. Shell's application uses a density of .0056 / square kilometer for August and .0021 / square kilometer for September. Shell App. at 28-29 (Tables 6.1 and 6.2). The industry 2006 Joint Monitoring Report, however, indicates that for offshore estimates the .0056 / square kilometer is relevant through September 25. Joint Monitoring Program in the Chukchi and Beaufort Seas, July – November 2007, at 3-7 & 3-42 (Table 3.25) (November 2007). Further, for any surveying from September 25 through October 25, the estimate should be .034 / square kilometer. *Id*. As has been repeatedly noted, there is no certainty that Shell will complete its surveying before October.

NMFS must base its determination of negligible impact on the "best available scientific evidence." 50 C.F.R. § 216.104(c); *id*. § 216.102(a). In *Brower v. Evans*, 257 F.3d 1058, 1070 (9th Cir. 2001), the court found that ESA caselaw "provides insightful and analogous provisions and analysis" when considering a best available science requirement. NMFS should carefully evaluate the reasoning employed in *Center for Biological Diversity v. Lohn*, 296 F.Supp.2d 1223 (W.D. Wash. 2003), *vacated as moot*, 511 F.3d 960 (9th Cir. 2007), in which the court remanded NMFS's decision not to list Southern Resident orca whales under the ESA. NMFS relied on an outdated definition of the orca taxon – that included all whales worldwide – despite its own scientists' agreement that the classification is inaccurate. *See id*. at 1238 (finding that when the best available science indicates that the "standard taxonomic distinctions" are wrong, then NMFS must apply that best available science). Here too NMFS is employing an admittedly over-inclusive, arbitrary definition in concluding that Shell's surveying will result in the harassment of only small numbers of harbor porpoise and lead to no more than a negligible impact to the stock. While NMFS is not required to develop a definitive stock assessment, it cannot rely on concededly inaccurate information in order to comply with its MMPA obligations.

B. Serious Injury

In the Arctic, an IHA pursuant to 16 U.S.C. § 1371(a)(5)(D) is only available if the activity has no potential to result in serious injury or mortality to a marine mammal. 50 C.F.R. § 216.107 ("Except for activities that have the potential to result in serious injury or mortality, which must be authorized under § 216.105, incidental harassment authorizations may be issued[.]"). If such injury or mortality is possible, take can only be authorized pursuant to a Letter of Authorization ("LOA") consistent with regulations promulgated pursuant to 16 U.S.C. § 1371(a)(5)(A) and 50 C.F.R. § 216.105. Because NMFS has not promulgated any such regulations related to seismic surveys, and because such surveys and associated activities carry the potential for serious injury or death to marine mammals, neither an IHA nor an LOA can be issued for Shell's proposed activities.

In promulgating the regulations that govern IHAs in the Arctic, NMFS acknowledged that permanent hearing loss – or permanent threshold shift ("PTS") – qualifies as serious injury:

> Serious injury for marine mammals, such as permanent hearing or eyesight loss, or severe trauma, could lead fairly quickly to the animal's death. NMFS does not believe that Congress intended to allow "incidental harassment" takings to include injuries that are likely to result in mortality, even where such incidental harassment involves only small numbers of marine mammals.

60 Fed. Reg. 28,379, 28,380 (May 31, 1995). Therefore, "if the acoustic source at its maximum level had the potential to cause a permanent threshold shift in a marine mammal's hearing ability," that activity would be considered "capable of causing serious injury to a marine mammal and would therefore not be appropriate for an incidental harassment authorization." *Id*. at 28,381.

In this instance, while the airguns proposed by Shell are smaller than those associated with typical 2D / 3D deep marine surveys, the noise they produce is still considerable, as evidenced by the estimated 120-dB radii that extends out to 24 kilometers. Indeed, NMFS does

not rule out the possibility of animals incurring PTS. The Federal Register notice indicates that PTS "might occur" at received levels several decibels above that inducing mild temporary threshold shifts if the animal is exposed to the strong sound pulses with rapid rise time. 74 Fed. Reg. at 26,222. Although NMFS characterizes the possibility as unlikely, it nevertheless relies on mitigation measures, such as ramp ups and exclusion zones, to "minimize" the "already-minimal" probability of PTS. *Id*.

The standard for determining whether an IHA is appropriate is exceptionally protective. If there is even the possibility of serious injury, NMFS must establish that the "potential for serious injury can be *negated* through mitigation requirements[.]" 60 Fed. Reg. at 28,380 (emphasis added). Reports from previous surveys, however, indicate that, despite monitored exclusion zones, marine mammals routinely stray too close to the airguns. *See, e.g.*, Marine Mammal Monitoring and Mitigation During Open Water Seismic Exploration by ConocoPhillips Alaska, Inc. in the Chukchi Sea, July-October 2006, at 5-11-5-12 (January 2007) (identifying 50 marine mammals likely exposed to potentially injurious sound levels); Marine Mammal Monitoring and Mitigation During Open Water Seismic Exploration by Shell Offshore Inc. in the Chukchi and Beaufort Seas, July-September 2006: 90-Day Report, at 6-13 (January 2007) (identifying 24 seals likely exposed to potentially injurious sound levels); Marine Mammal Monitoring and Mitigation During Open Water Seismic Exploration by Shell Offshore Inc. in the Chukchi and Beaufort Seas, July–November 2007: 90-Day Report, at 5-43 (January 2008) (identifying 26 sightings of 50 walrus within the exclusion zone); Marine Mammal Monitoring and Mitigation During Open Water Seismic Exploration by Shell Offshore Inc. in the Chukchi and Beaufort Seas, July–October 2008: 90-Day Report, at 7-14 (January 2009) ("Shell 2008 90-day Report") (identifying 44 powerdowns involving 45 marine mammals).

Perhaps more importantly, the documented exposures were recorded only because conditions were such that the marine mammals could be observed. But this only represents a fraction of the time that airguns are operating. Observers cannot see animals at the surface when it is dark, and even during the day, visually detecting marine mammals from the deck of a vessel may be inhibited due to glare, fog, rough seas, the small size of animals such as seals, and the large proportion of time that animals spend submerged. Shell has acknowledged that reported sightings are only "minimum" estimates of the number of animals potentially affected by surveying: animals move away or remain underwater and compromised visibility and high seas "are often significant limiting factors." Shell 2008 90-Day Report at 5-17. Although NMFS recognizes that infra-red goggles and night-vision binoculars are of "limited" effectiveness when visibility is low, its only response for Shell's 2009 surveying is that marine mammal observers are relieved of monitoring the exclusion zones at night, except during periods before and during ramp ups. 74 Fed. Reg. at 26,230.

The shortcomings of monitoring were reiterated by the interagency task force:

> visual monitoring under the best of conditions may detect less than 50 percent of most marine mammals and only 1-10 percent of some deep-diving mammals . . . . In poor weather and at night those percentages are reduced to effectively zero.

JSOST at 58.

NMFS appears to simply presume that marine mammals will naturally avoid airguns when they are operating at full strength, removing the need for monitoring when conditions prevent observers from effectively watching for intrusions into the exclusion zones. That premise, however, is belied by the survey data indicating that shutdowns and powerdowns have repeatedly proven necessary. In other words, if all marine mammals avoid airguns at distances great enough to eliminate the potential for harm, then the imposition of exclusion zones would not result in the number of shutdowns and powerdowns that are recorded each year. The requirement for ramp ups rests on the same foundation – that marine mammals will leave an affected area as a result of increasing noise. Yet, as the JSOST report noted, although ramp up is a widely imposed practice, "there has never been a demonstration that it works as intended." *Id*.[14]

Because NMFS has not negated the possibility of serious injury from Shell's 2009 seismic surveying, it may not issue an IHA.

C. Impact on Subsistence Uses

The MMPA also requires that any incidental take authorized will not have "an unmitigatable adverse impact on the availability of such species or stock for taking for subsistence uses" by Alaska Natives. 16 U.S.C. § 1371(a)(5)(D)(i)(II). NMFS must ensure that Shell's activities do not reduce the availability of any affected population or species to a level insufficient to meet subsistence needs. 50 C.F.R. § 216.103. Bowhead whales and beluga whales are hunted by Alaska Native communities and both will be effected by Shell's surveying.

Before concluding that subsistence uses will not suffer an unmitigatable adverse impact, NMFS must place Shell's surveying into the appropriate context. Any IHA must consider BP Exploration's planned 2D and 3D seismic surveying in the Canadian Beaufort and other activities that will take place in 2009, such as the operation of the Northstar facility and vessels engaged in shipping or icebreaking. As discussed above, NMFS must also evaluate the following: the susceptibility of bowhead and beluga whales to disturbance from levels of noise below 160 dB, the potential impacts of future activities in both oceans, the acknowledged uncertainty regarding the effects of seismic activity, and the lack of baseline biological data for the Chukchi Sea. For these reasons, NMFS has not adequately supported its MMPA finding as to subsistence resources. *See* 50 C.F.R. § 216.104(c) (best available science standard for subsistence finding).

D. Least Practicable Impact

Pursuant to the MMPA, an IHA must prescribe "means of effecting the least practicable impact" on a species or stock and its habitat. 16 U.S.C. § 1371(a)(5)(D)(ii)(I). As is clear from the language chosen by Congress, the emphasis is on reducing the impact to the lowest level

[14] In the lease sale 193 EIS, MMS – with NMFS as a cooperating agency – acknowledged that measures such as ramp ups are "not empirically proven," relying instead on "anecdotal evidence" and "professional reasoning." LS 193 EIS at II-25. The EIS does not expressly consider the industry survey results.

possible. Given the established inadequacies of monitored exclusion zones, NMFS should prohibit surveying at night and at times of low visibility to achieve this mandate. At a minimum, NMFS must require multiple observers working simultaneously in order to effectively monitor the 160-dB zone.

The Federal Register notice includes little more than conclusory statements to justify the finding that NMFS has prescribed means to effectuate the "least practicable impact." See 74 Fed. Reg. at 26,232 (asserting that Shell's proposed mitigation "will be sufficient to reduce impacts on marine mammals to the lowest level practicable"). More is needed for NMFS to satisfy its burden under the MMPA. There is no indication that NMFS considered, for example, passive acoustic monitoring to detect vocally active species. Specifically, NMFS should expressly consider measures that Shell has previously agreed to in the context of future seismic surveying around Sakhalin Island, including restrictions during low visibility.

III. ENDANGERED SPECIES ACT

NMFS's 2008 programmatic biological opinion for oil and gas exploration activities does not contain an incidental take statement ("ITS"). The document states that upon issuance of an MMPA harassment authorization, "NMFS will amend this opinion to include an incidental take statement." BiOp at 118. In the Federal Register notice, NMFS states only that it "does not plan to conduct a new section 7 consultation." 74 Fed. Reg. at 26,233. In the past, NMFS has issued subsequent ITSs when authorizing seismic activity, and we assume it will timely do the same here. We note, however, that at least one court has cast doubt on the practice of issuing programmatic biological opinions that lack an ITS. *See Center for Biological Diversity v. U.S. Fish and Wildlife Service*, No. C 08-01278 (N.D. Cal. June 8, 2009).

IV. CONCLUSION

For the above reasons, we believe Shell's request for an IHA for marine mammal harassment incident to surveying activities in the Chukchi Sea should be denied. Thank you for your consideration of these comments.

Respectfully,

Michael Mayer
Project Attorney
Earthjustice

Trish Rolfe
Alaska Field Organizing Manager
Sierra Club

Eleanor Huffines
Alaska Regional Director
The Wilderness Society

Whit Sheard
Alaska Program Director
Pacific Environment

Charles M. Clusen
Director, Alaska Project
Natural Resources Defense Council

Pamela A. Miller
Arctic Program Director
Northern Alaska Environmental Center

Rebecca Noblin
Staff Attorney
Center for Biological Diversity

Karla Dutton
Director, Alaska Office
Defenders of Wildlife

David Dickson
Western Arctic & Oceans Program Director
Alaska Wilderness League

Layla Hughes
Sr. Program Officer for Oil, Gas and Shipping Policy
Bering Sea /Arctic Ecoregion
World Wildlife Fund

STATEMENT REGARDING NMFS'S PROPOSAL TO ISSUE AN IHA TO SHELL FOR MARINE MAMMAL TAKES IN THE CHUKCHI SEA (74 Federal Register 26,217, June 1, 2009)

by David E. Bain, Ph.D.

I have over 30 years experience working on marine mammal acoustics. I have a B.A. in Biology and Psychobiology with Physics and a Ph.D. in Biology from the University of California at Santa Cruz. I have worked as contractor for government agencies including the National Marine Fisheries Service, US Geological Survey, Minerals Management Service, and National Research Council, as well as for non-governmental organizations and the University of Washington and the University of California at Davis. I have received grants from the National Science Foundation and National Academy of Sciences. My work experience includes field research on marine mammal behavior in the presence of both large airgun arrays and a small airgun, as well as mid-frequency sonar. I have extensively studied the effects of vessel traffic on killer whales. I have conducted studies on killer whale hearing. I have studied the use of noise to displace killer whales from unsuitable habitat. I have studied sound propagation in both shallow and deepwater habitats. I have been an observer shipboard line transect surveys. I have conducted research at night using a variety of light enhancement and infrared imaging devices, as well as passive acoustic monitoring equipment. I have worked with sick and injured stranded cetaceans. The comments below are based on my training and experience and a review of the application and relevant texts.

General comments

The methods employed by NMFS for calculating marine mammal density are confusing. The proposal addresses data in Moore *et al.* (2000), as corrected following Richardson and Thomson (2002). Although additional industry surveys are referenced, the estimates of Funk *et al.* (2006) are ignored. Further, in some cases (e.g., bowheads), although corrected data from Moore *et al.* (2006) are available, they are ignored in favor of model results, which have no empirical support. It is not clear how corrections were made, as the application indicated species specific values for g(0) and f(0) were used. However, these values are dependent on the species *and* the observation platform used *and* sighting conditions involved, not just the species. While no on-effort sightings during surveys were reported for some species, the probability of detecting any individuals given the effort level and assumed density was not reported.

As NMFS noted, there is no reason to believe maximum density is likely to be twice the mean density. For gregarious animals like odontocetes, actual densities can easily be zero or well over 100 times the mean density in a given area at a given time. While the mean density may be used in some cases to calculate a best estimate of take, maximum estimates should be considered as well to ensure worst case scenarios do not pose an unacceptable threat to a population.

Seismic surveys and shallow hazard surveys may impact marine life through a variety of mechanisms (Gordon *et al.* 2003). NMFS distinguishes two types of takes: Level A, in which there is immediate injury or death; and Level B, in which there is no immediate injury, but cumulative exposure may lead to harm at the population level. However, in certain contexts, Level B harassment may lead to Level A takes through indirect mechanisms.

The population effects of Level A takes on populations are relatively easy to assess, as individuals that are killed are obviously removed from the population, and those that are injured are more likely to die whenever the population is next exposed to stress.

Calculating the population effects of Level B takes is a topic of contemporary research (Trites and Bain 2000). For example, Bain (2002a) explored using energetic consequences of behavior change in conjunction with population dynamics models to estimate population effects of Level B takes. Stress concurrent with Level B harassment would have additional population consequences. Stress may occur in the absence of behavioral change, or the absence of change in significant behavioral patterns such as foraging or nursing, or exclusion from optimal habitat. Lusseau *et al.* (2006) concluded disturbance caused a decline in and posed a significant threat to the survival of the bottlenose dolphin population in Doubtful Sound, New Zealand. While they noted vessel strikes were occurring (Level A takes), cumulative behavioral effects (Level B takes) were believed to be the primary threat to the population. That is, the population declined without being exposed to noise above 160 dB.

It is likely that different magnitudes of effect, whether physical harm, behavioral change that leads to physical harm, disruption of significant behavioral activities, or behavioral changes that pose negligible risk to populations when they occur only rarely but can become significant when exposure is prolonged or repeated, will have different relationships to noise. The different magnitudes of takes will have different population consequences. Further, the population consequences can depend on the health of the population (Bain 2002a). All these factors need to be considered when evaluating the environmental consequences of exposing marine mammals to noise.

Unconditional Effects

Richardson *et al.* (1995) addressed the concept of zones of influence. The zone of most concern is the one in which there is risk of immediate injury or death. Three primary mechanisms have been proposed to be of concern. One is damage to the ears that causes permanent threshold shifts (PTS) (Syka and Popelar 1980, Blakeslee *et al.* 1978, Nielsen *et al.* 1978, Solecki and Gerken 1990, Clark 1991, McCauley *et al.* 2003). There is great uncertainty over received levels that may cause this. Estimates have been based on research on a handful of terrestrial mammals, birds, and fish. An often stated assumption is that the threshold for PTS must be higher than the threshold for Temporary Threshold Shift (TTS), which has been addressed in a few marine mammal species (Nachtigall *et al.*

2003, Kastak *et al.* 2005, Finneran *et al.* 2002 and 2005). However, in humans, chronic exposure to levels of noise too low to generate a TTS can result in PTS (Henderson *et al.* 1991, OSHA 2007). Animal models (e.g., rats, cats, monkeys, chinchillas) have been used for tests of noise causing permanent physical harm (Henderson *et al.* 1991, Gao *et al.* 1992, Blakeslee *et al.* 1978, Clark 1991). Damage to hearing from noise exposure is an example of unconditional injury from noise. OSHA (2007) requires limiting human exposure to noise at 115 dB above threshold (equivalent to 145 dB re 1 μPa for killer whales, Szymanski *et al.* 1999) to 15 minutes. Although the reference levels for sound in air and water are different, this difference is taken into account when determining thresholds.

While OSHA's standards are for continuous noise and assume multi-year exposure, surveys employ multiple intermittent sources, which, in a reverberant environment, have the potential to become nearly continuous, much like the noise generated by the survey vessel itself. While individual projects will cause limited exposure to individual marine mammals, these individuals will accumulate exposure from natural sources (e.g., wind noise) as well as all human activities (e.g., other seismic sources, vessel traffic) conducted over the course of their lifetime.

While high levels of noise lead to TTS and PTS that impair hearing even after exposure to noise has ended, hearing ability can also be impaired by masking during exposure to low levels of noise. Masking can lead to increased risk of predation and reduced foraging efficiency (see Au *et al.* 1988, Bain and Dahlheim 1994, Fisheries and Oceans Canada 2008).

Stress reactions are another available index (e.g., Romano *et al.* 2004). Ayres (personal communication) found evidence suggesting that whale watching results in increased levels of stress hormones in wild killer whales.

Conditional Effects

Changes in behavior resulting from noise exposure could result in indirect injury in the wild. A variety of mechanisms for Level B harassment to potentially lead to Level A takes have been identified.

Flight may lead to injury in some species. Exhaustion from rapid flight leading to heart or other muscle damage (Williams and Thorne 1996) could also account for increased mortality such as was observed in harbor porpoises following sonar exercises in Juan de Fuca and Haro Straits in April and May of 2003. Harbor porpoises, in contrast to Dall's porpoises, rarely engage in sustained high energy activities such as rapid swimming or bow riding, and hence are less adapted to long distance flight responses.

Even successful flight may have negative survival consequences. Although many noise exposure protocols consider movement of animals out of the area an acceptable outcome, as the animals are not exposed to high levels of noise, such movement requires

expenditure of significant amounts of energy. Assuming animals were in optimal habitat, moving out of that habitat is likely to have consequences such as reduced foraging efficiency. This is of particular importance in the Arctic, where nutrients from fresh water sources, ice cover, bottom topography, currents, and other factors influence prey density (NRC 2003a, MMS 2004). Such factors vary temporally, resulting in the location of patches of high quality habitat varying through time. Feeding studies noted that prey density averaged 230 mg/m^3, while feeding appears to require a density of 800 mg/m^3 for bowheads (MMS 2004). Such highly productive patches are likely to be rare, so displacement from these areas would negatively affect individuals. While large whales can go extended periods of time without eating much, small cetaceans (e.g., harbor porpoises), along with individuals in poor condition, face a risk of death if they are unable to feed for periods as short as 48-72 hours (personal observation). They may also move into habitat where they face increased risk of predation.

Separation of individuals from social units is another consequence of noise exposure that may lead to mortality. In 2003 in Haro Strait, some killer whales responded to mid-frequency sonar by seeking shelter behind a reef. Others chose to flee, resulting in splitting of a pod that historically spent all of its time together as a single unit. While no deaths resulted from this particular incident, other killer whales have been observed separated from their social units resulting in death prior to reunion or requiring human intervention to restore the individual to its social unit (Schroeder *et al.* 2007).

TTS may conditionally lead to harm. Impaired hearing ability increases vulnerability to ship strike. In 2003, blunt force trauma was identified as a cause of death in the investigation of harbor porpoise mortalities following exposure to mid-frequency sonar in Washington State. A minke whale was nearly struck by a research vessel in the area where one had been observed fleeing mid-frequency sonar exposure. These species are familiar with boats in that area, and normally avoid them by a wide margin when they can hear them coming (personal observation).

Impaired auditory ability may also increase predation risk. For example, Dahlheim and Towell (1994) reported an attack by killer whales on white-sided dolphins. The approach by the whales went undetected due to the noise of the research vessel. Further, impaired hearing may impair foraging ability and communication (Bain and Dahlheim 1994).

Relationship of Noise Level to Impact

Major behavioral changes appear to be associated with received levels of around 135 dB in killer whales. Bain and Dahlheim (1994) observed major behavioral changes in a captive killer whale exposed to 135 dB (in a band below 5 kHz), and Bain (1995) used noise with a received level of around 135 dB (with a predominant frequency at 300 Hz) to drive killer whales from Barnes Lake, where two individuals in the group had previously died rather than leave. Killer whale watching guidelines prohibit close approaches that would result in received levels exceeding approximately 135 dB (Bain 2001). Olesiuk *et al.* (2002) found noise from acoustic harassment devices with a source

level of 195 dB excluded harbor porpoises within a radius of 3 km (individuals may have been kept farther away, but porpoises are difficult to see at all beyond that range), where received levels probably dropped below 135 dB. Belugas have been observed to respond to icebreakers by swimming rapidly away at distances of up to 80 km, where received levels were between 94 and 105 dB. Bowheads appeared to be displaced to distances of about 20-30 km when seismic devices were inactive, and distances of 30-40 km when airguns were active (Miller *et al.*1999), suggesting major behavioral effects to noise in the 105-125 dB range (NRC 2003b). Morton and Symonds (2002) found the same type of acoustic harassment devices as studied by Olesiuk *et al.* (2002) not only excluded killer whales from the area around the devices, they kept them from accessing the area beyond the devices. It is reasonable to conclude that site clearance surveys could similarly prevent various whale species from accessing areas around the surveys.

Minor behavioral changes can occur at received levels from 90-110 dB re 1 µPa or lower. Porpoises avoid pingers with source levels of about 130 dB at distances of from 100-1000 m, depending on experience and environmental context (Bain 2002b, Barlow and Cameron 1999, Cameron 1999, Cox *et al.* 2001, Gearin *et al.* 1996 and 2000, Kraus *et al.* 1997, Laake *et al.* 1997, 1998, 1999). Kastelein *et al.* (1997, 2001) found behavioural responses to even lower levels. Bain *et al.* (2006ab) and Williams *et al.* (2002ab, 2009) found killer whales exhibited behavioral changes in the presence of a single vessel producing a received level in the neighborhood of 105-110 dB re 1 µPa. Belugas exhibited minor behavioral changes such as changes in vocalization, dive patterns and group composition at distances up to 50 km (NRC 2003b), where received levels were likely around 120 dB. It should be further noted that these behavioral responses occurred where noise was barely detectable above ambient noise, suggesting that noise whose total level is below ambient but occurs at a frequency where ambient noise is low may have effects. In addition, the range at which effects are observed would be expected to vary with natural ambient noise, with effects occurring at greater ranges on quiet days and shorter distances on noisy days. North Atlantic right whales exhibited changes in diving behavior when exposed to noise below 135 db (Nowacek *et al.* 2004).

It is clear from the above review that marine mammals respond to noise at levels far below 160 dB. Thus implications of takes must be considered at far lower received levels of noise, which will occur over much larger areas, and hence affect much greater numbers of individuals than when 160 dB or higher is set as the threshold for concern. There are three main ways that minor behavioral changes, when experienced by numerous individuals for extended periods of time, can affect population growth. These include increased energy expenditure, reduced food acquisition, and stress (Trites and Bain, 2000).

Whales typically are active part of the time and rest part of the time. Traveling around a noise source replaces resting with active time. Marine mammals typically have a metabolic scope of about 6. That is, energy consumption at rest is about 6 times lower than fast travel. In killer whales, travel at moderate speeds requires expenditure of about twice the energy as resting (Kriete 1995).

When whales are displaced from optimal habitat, rates of energy acquisition are reduced. As noted above, whales typically forage where prey density is at least four times higher than average prey density. Thus displacement from optimal foraging habitat may result in a four-fold reduction in food intake.

The actual situation may be worse, as foraging may be abandoned altogether when conditions are poor. For example, killer whales are 40% less likely to forage at all when vessels are nearby (Lusseau *et al.* 2009), perhaps because vessel noise masks echoes from prey, making the probability of foraging successfully negligible (Bain and Dahlheim 1994). This likely reduction in food intake is significant to food limited populations (e.g., killer whales: Ford *et al.* 2005, Olesiuk *et al.* 2005, Fisheries and Oceans Canada 2008).

These energetic consequences are most significant to a population approaching carrying capacity, as bowheads are (Angliss and Outlaw 2008). The increased competition with conspecifics that consume more energy than they would if undisturbed, and reduced effective carrying capacity due to inaccessibility of prey protected by anthropogenic noise could be used in conjunction with population dynamics models to calculate the net change in population growth rate resulting from reduced fecundity and increased mortality (Bain 2002a).

In addition to energetic consequences, stress can increase mortality rates through impairing the immune system and reduce calf production through abortion of fetuses or prevention of conception (Rolland *et al.* 2006).

Sound Sources

Sound sources are typically divided into continuous and pulsed categories. This recognizes the different mechanisms for injury. Direct injury is typically related to the cumulative exposure. This depends on the total duration of the sounds. Intermittent sounds produce effects while signals are received, but not in the "silence" between pulses.

However, behavioral effects are related to received level rather than cumulative sound energy. That is, behavioral effects last beyond noise exposure. As long as the next pulse is received before behavior returns to normal, the behavioral effects are likely to be independent of the repetition rate and duty cycle, and depend primarily on the duration of the survey.

The exception to this is when masking causes behavior changes. In this case, reverberation becomes important. Intermittent pulses can result in continuously received noise when sound arrives via multiple paths. That is, sound that bounces between the bottom and the surface will take longer to reach an animal than sound traveling via a direct path. If the range of travel times is longer than the interval between pulses, the sound will effectively be continuous. In fact, noise can mask signals for a brief period

before and after it is received, meaning an almost continuous received noise can mask signals continuously.

Another characteristic of pulsed sources is known as the "time-bandwidth" product. That is, any sound with a finite duration (that is, any real-world sound) contains additional frequencies to the nominal frequency. That is, pulsed sources that nominally have a frequency that is too low or too high to hear, may, in fact, be audible, as the source may contain other frequencies that are detectable. Similarly, directional sources and arrays produce significant energy in directions other than their primary direction.

Number of Takes

Underestimate of Bowhead Takes

In addition to overestimating the noise threshold for takes, NMFS has underestimated the number of bowheads likely to be taken for two reasons. First, during migration, the number of whales likely to be exposed to noise is higher than during the feeding season. Second, NMFS has used models to estimate density in the Chukchi from data in the Beaufort that underestimate the numbers observed empirically.

Takes during migration versus feeding

When estimating number of takes, it is important to know whether individuals have little net movement, as would be the case for individuals in a feeding area, or are passing through as would be the case for migrating individuals.

In the case where there is little natural movement, the number of individuals in the ensonifed area is an index of the number of takes. Exposed individuals can accumulate noise exposure or move out of the area. Assuming optimal foraging, displaced individuals will move to poorer feeding areas or compete with individuals for food in comparable habitat. When competition outside the ensonified area occurs, the fitness of all individuals involved will be reduced, although only those exposed to noise are typically counted as taken.

However, when individuals are migrating through an area, new individuals are exposed to noise as they approach the noise source. Rather than estimating takes based on density in the ensonified area, it is more appropriate to draw a line across the ensonified area and estimate the number of individuals that would be expected to cross that line during the survey.

For example, Funk *et al.* (2006) estimated bowhead density at 3 / 100 km^2 in offshore waters in mid-season. The 120 dB contour is at about 23 km, giving a diameter of the ensonified area (1661 km^2) of about 46 km. Initially, 50 whales would be in the

ensonified area, and this would be an estimate of takes if whales and sound source were relatively stationary.

A 46 km by 4.5 km box (the diameter of the ensonified area by the one hour travel time at a typical migration speed for bowheads reported by Koski *et al.* [2002]) on average would contain 6 whales in area of about 200 km^2. At a migration speed of 4.5 km/h, it would take an hour for these 6 whales to pass the sound source. In the same time, on average, another 6 whales would enter the area. How many whales would approach the sound source depends on how long the survey operated during the migration. For example, in 24 hours, approximately 144 whales would enter the ensonified area or be deflected to avoid it. In 21 days, over 3,000 individuals (21 days times 144 / day) would be exposed. As can be seen, the number of migrating whales exposed is far higher than would be the case if the sound source and whales were relatively stationary. These calculations are not intended to be exact. The longer the overlap between the survey and the migration, the more whales will be taken. The timing of the survey and migration will be important as the average density of bowheads is ten times higher in mid-season than early season (Funk *et al.* 2006). Location and speed of migration vary from year to year and also will be important. For example, numbers approaching the ensonified area would be highest at the peak of the migration, along the core of the migration route, and when migration speed is high. The numbers used here are well within the range of possibilities and serve to illustrate that far more whales might be exposed during migration than during a feeding season. As noted in the application, whales are expected to be migrating during much of the survey period.

Failure of density models

NMFS modeled takes in the Chukchi in September based on sightings in the Beaufort. However, the model is demonstrably inaccurate based on existing data from the Chukchi. Further, NMFS misinterpreted the data that form the basis of their extrapolation.

NMFS cites three reasons for believing densities would be 20 times lower in the survey area than in the Beaufort in September. First, NMFS claims the migration corridor is narrower in the Beaufort. While this may be true to some degree, this is irrelevant. The reported density for the Beaufort depends on how well the survey design identifies the corridor boundary. Regardless of whether the average density is correctly identified, the density will vary across the corridor. That is, when the corridor widens, the average density will decline, but concentrations may still occur, as appears to be the case for the survey area (see plot in Moore *et al.* 2000).

Second, NMFS maintains that bowheads are more likely to migrate non-stop through the Chukchi, in contrast to the Beaufort where they sometimes linger. As discussed in detail above, this will increase rather than decrease the number of whales taken.

Third, NMFS states that most of the whales will migrate north of the survey area. To the contrary, the survey area is in the center of the migration route. Quakenbush (2007)

tagged two bowheads. The tag worked well on one and provided a detailed track (see Figure 1). The other bowhead was tagged near the first in Alaska, and gave some locations near the first in Russia. However, the tag did not work well on the second, so there is no record of the path actually taken from the Chukchi to Russia. As can be seen in Figure 1, the first whale passed directly through the survey area. In addition, Moore *et al.* (2000) plotted bowhead sightings in autumn. These are also shown in Figure 1. At the longitudes of the survey area, the bulk of the sightings are the same distance offshore as the survey area, not north of it. Finally, Funk *et al.* (2006) found many bowheads nearshore, not north of the survey area as anticipated by NMFS.

Since the assumptions upon which NMFS based its model are faulty, one would expect available data to contradict the model, and this is, in fact, the case. The model estimated offshore abundance in September to be between 0.0011 and 0.0021 / km^2 depending on ice cover. However, Funk *et al.* (2006), using more recent data from the Chukchi than the data in Richardson and Thomson (2002) from the Beaufort used by NMFS, found mid-season offshore densities to be 0.03156 / km^2. That is, NMFS' model underestimates density by a factor of almost 30 for the latter part of the survey season.

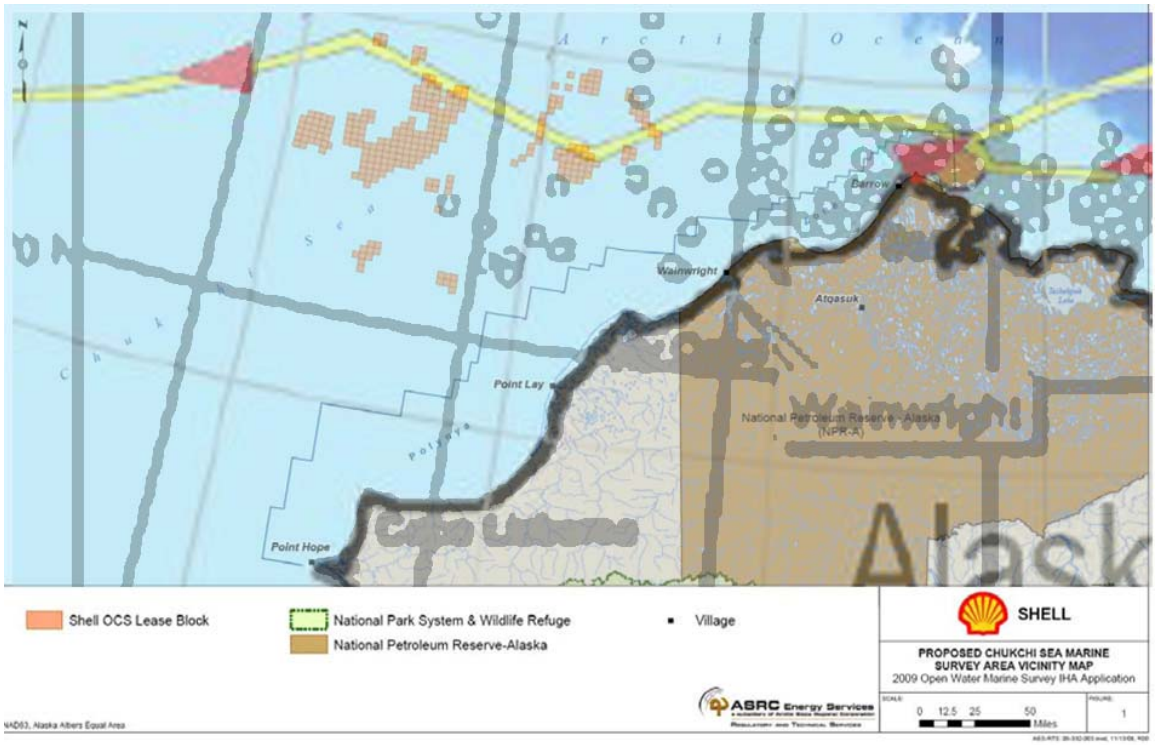

Figure 1. Bowhead use of the survey area. Lease blocks in the survey area are shown as pink squares (Ireland *et al.* 2009). The yellow line with pink triangles shows the migration route of a satellite tagged bowhead (Quakenbush 2007). Dark circles are autumn bowhead sightings from Moore *et al.* (2000).

NMFS used a second model for estimating August densities. Although no bowheads were sighted in formal surveys in the Chukchi summarized in Moore *et al.* (2000), NMFS calculated density as though one whale was seen. The model performs a little better than the September model. It predicts densities will range from 0.0004 to 0.0008 / km^2. Observed early season densities were 0.00309 (Funk *et al.* 2006), or about 7.5 times higher than predicted by NMFS.

The reason this model fails is that it assumes only one bowhead was missed. Even if NMFS concluded estimating abundance from missed sightings rather than existing sighting data were the best approach, the assumption of one missed sighting is the wrong methodology. Rather, NMFS should identify the lowest density which would result in a small probability that all whales would be missed (scientists typically use 0.05, 0.01, or 0.001 as the definition of a "small probability").

Richardson and Thomson (2002) noted whales might be missed because they are underwater, the whales are at the surface near the track line but are not noticed, and they are at the surface but are hard to see because they are not close enough to be easily seen. Further, sighting conditions such as sea state, glare, fog, etc. can increase the chance that whales will be missed. While these factors can be incorporated in corrections when calculating abundance, adverse sighting conditions reduce the chance that any individuals will be sighted during a survey.

In summary, the models used for estimating bowhead density are based on faulty assumptions and underestimate bowhead density by an order of magnitude.

Underestimate of Effects on Harbor Porpoises

Two main factors have contributed to the underestimate of the effects of the proposed survey on harbor porpoises. First, harbor porpoises are far more easily disturbed by noise than the default marine mammal. Second, it is likely that the affected harbor porpoise stock is far smaller than currently recognized. In addition, it is possible that levels of takes from other sources are higher than currently recognized, and that density estimates are too low.

As noted above, Olesiuk *et al.* (2002) found noise from acoustic harassment devices with a source level of 195 dB excluded 95% of harbour porpoises within a radius of 3 km (individuals may have been kept farther away, but porpoises are difficult to see at all beyond that range), where received levels probably dropped below 135 dB.

Behavioral changes, including exclusion from an area, can occur at received levels from 90-110 dB re 1 µPa or lower. Porpoises avoid pingers with source levels of about 130 dB at distances of from 100-1000 m (received levels around 70-90 dB), depending on experience with the noise source and environmental context (Bain 2002a, Barlow and Cameron 1999, Cameron 1999, Cox *et al.* 2001, Gearin *et al.* 1996 and 2000, Kraus *et al.* 1997, Laake *et al.* 1997, 1998, 1999). Kastelein *et al.* (1997, 2001) found behavioural

responses to even lower levels. That is, porpoises are likely to exhibit short-term (weeks) exclusion to the 70 dB contour, and long-term exclusion to the 90 dB contour (throughout the survey period).

Ireland *et al.* (2009) reported received levels from 2 x 10 in^3 and 4 x 10 in^3 arrays (p. 3-73). They provided equations that fit the data, which allows calculation of received level contours. Takes were calculated based on the location of the 160 dB contour, which occurs at about 750-1250 m depending on array size and propagation conditions.

However, biologically significant behavioral changes can occur at far lower levels. The 90 dB contour will be at 55-60 km, covering an area roughly 2500 times larger than that used for calculating takes. The 70 dB contour would be at 80-90 km, an area roughly 5,000-10,000 times the area used to calculate takes.

While it is possible that distance as well as received level should be considered when predicting whether porpoises will avoid a noise source, I've observed harbor porpoises moving away from a large array at a distance of over 60 km (Bain and Williams 2006), so even though the small arrays are quieter, it is realistic that porpoises would be displaced at tens of kilometers, disrupting feeding behavior.

This sensitivity to noise is compounded by the over-inclusive division of the harbor porpoise population. Angliss and Allen (2009) noted, "In areas outside of Alaska, studies have shown that stock structure is more fine-scale than is reflected in the Alaska Stock Assessment Reports. At this time, no data are available to reflect stock structure for harbor porpoise in Alaska. However, based on comparisons with other regions, smaller stocks are likely. Should new information on harbor porpoise stocks become available, the harbor porpoise Stock Assessment Reports will be updated." That is, the stock to be affected by the survey is likely to be far smaller than currently recognized. The implication is that the population is far less able to tolerate takes than expected based on the current stock definition.

Another point of concern is that NMFS is reviewing new data on other sources of takes, but will not complete the analysis until next year (Allen and Angliss in prep.). These data are needed to assess the cumulative effects of the proposed survey and other factors that impact the population.

Finally, the density estimates for harbor porpoises may be low. The values used in the application appear to be based on observer sightings. While efforts were made to equalize data quality (Funk *et al.* 2006), it is unlikely the data are as reliable as data from dedicated surveys, and small species like harbor porpoises are easily missed.

Impact on Gray Whales

The Chukchi Sea is an important feeding habitat for gray whales. As can be seen in Figure 2, the distance offshore and water depth of the survey area is prime gray whale habitat (Rugh *et al.* 1999, Moore *et al.* 2000).

Gray whale movement is known to be affected by noise levels of 120 dB (Richardson *et al.* 1995), which is far lower than the 160 dB used in calculating takes. The 120 dB contour would occur about 23 km from the survey vessel.

The significance of the survey to the gray whale population depends in part on its true conservation status. Following decades of recovery from commercial whaling, gray whales were removed from the endangered species list in 1994, and their population continued to increase through 1997. However, the population then proceeded to decline by about one-third in less than 10 years. The most recent population count is below the number when the species was delisted (Ireland *et al.* 2009).

This raises the question of whether gray whales should be re-listed as threatened under the Endangered Species Act, since their population has a negative trend and is at a level that was considered threatened even when it was increasing.

One implication of re-listing would be a change in the Recovery Factor for calculating Potential Biological Removal. Using the value for an ESA listed species would reduce PBR to 42. Subsistence harvest in Russia alone exceeds this number. Thus additional threats, such as habitat loss due to disturbance from seismic surveys, would result in further jeopardy to the survival of the species. Feeding habitat loss due to climate change has been identified as a threat to this species (Angliss and Allen 2009), so habitat loss due to disturbance would be a threat as well. Thus it is clear that a careful evaluation of the status of this species is needed before activities that disturb gray whales are allowed.

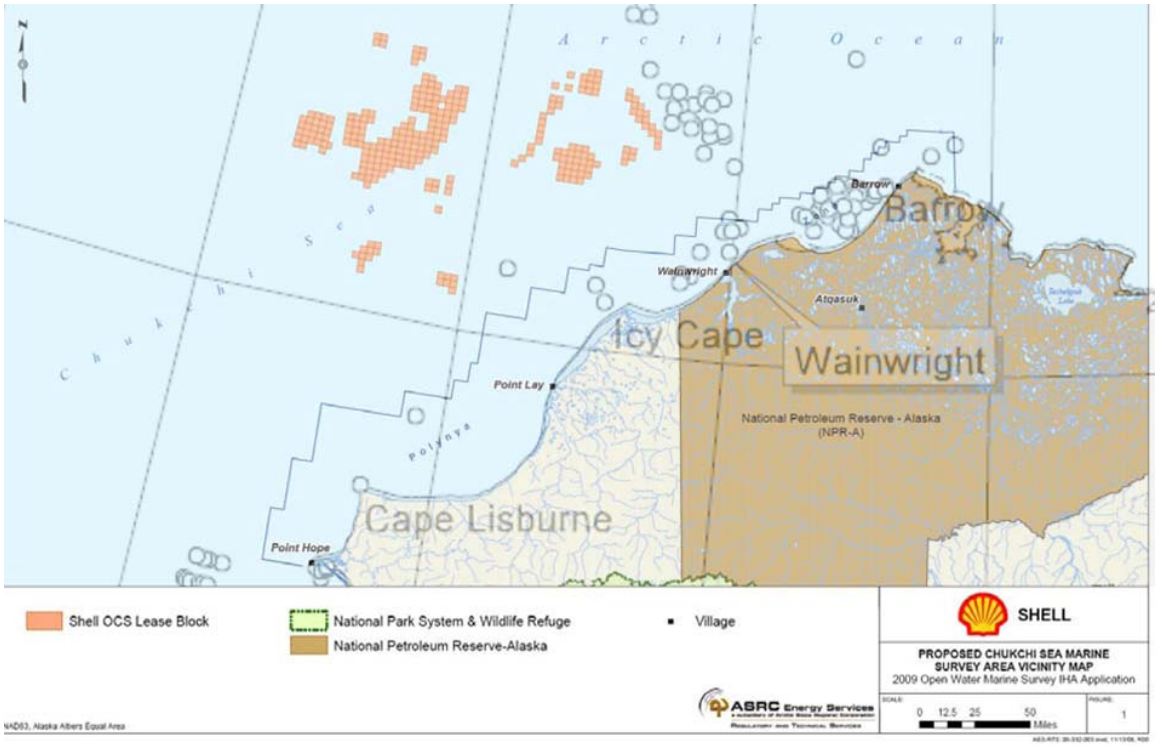

Figure 2. Autumn Gray Whale Distribution. Gray whale sightings (dark circles) are from Moore *et al.* (2000) and the survey area (pink squares) is from the Shell application (Ireland *et al.* 2009. Note the concentration of gray whales adjacent to the survey area.

Belugas

As with bowheads, it appears belugas will be present in the survey area in small numbers at the start of the proposed survey, but their numbers will increase later in the season as they migrate through the survey area. Studies have also demonstrated the sensitivity of belugas to levels of noise below 160 dB, as discussed above.

As with bowheads, increased takes due to migration should have been taken into account. The number of takes would also depend strongly on the timing of the migration (Moore *et al.* 2000, Angliss and Allen 2009) relative to the actual timing of the survey.

Summary

NMFS has acknowledged it lacks the data necessary to determine the significance of the effects of the proposed survey on harbor porpoises. It knows neither stock boundary nor stock size nor population trends. A careful review of the status of gray whales is also needed to assess the significance on them. NMFS also lacks the high quality data needed to accurately estimate effects on bowheads.

In addition, NMFS has misinterpreted the available data, resulting in serious underestimates of takes. Systematic errors include: underestimating bowhead density with poor models, while ignoring existing data; underestimating the number of bowheads exposed by failing to consider migration; failing to consider consequences of behavioral changes caused by noise levels below 160 dB; failing to carefully consider the overlap in distribution of the species with the survey area.

Further, bowheads and belugas increase their use of the survey area in September and October. NMFS failed to consider the increases in takes if there are delays in the work resulting in its completion at the end of the period covered by the application (end of October) rather than at the time given for the best case scenario (late September).

Mitigation

A fundamental assumption in noise mitigation in general is that animals will move away from the noise source (horizontal avoidance). However, this is not a good assumption. Some species may exhibit vertical avoidance rather than horizontal avoidance (see Williams 1999). Other species may try to find shelter (e.g., rockfish Skalski *et al.* 1992, Pearson *et al.* 1992, and killer whales, personal observation). Local minima in the sound field may be found near shore, near the surface, and near the bottom. However, remaining in a sheltered location only provides temporary protection. An additional problem is that many species are sedentary, territorial, or have strong tendencies toward site fidelity (e.g., Eisenhardt *et al.* 2002, Pearson *et al.* 1992, Skalski *et al.* 1992). These species are unlikely to move away from a noise source. A related problem is that many predators are used to experiencing pain during feeding, and hence tolerate pain rather than abandon their prey (e.g., many marine mammals involved in fishery-interactions (Reeves *et al.* 1996, Norberg and Bain 1994, Yano and Dahlheim 1995, Whitehead 2003).

MMOs can be helpful. However their ability to give full attention is limited. A common work schedule where consistent effort is required is 40 minutes on, 40 minutes off (recording rather than observing), 40 minutes on, two hours off (resting), three times a day (e.g., Forney and Barlow 1998, Dahlheim and Towell 1994, Barlow and Forney 2007). Thus to have two observers on duty full time, an observation team of six would be required to cover a twelve hour day. Twelve observers would be required to cover a 24 hour period. Further, observers working shifts longer than 40 minutes cannot be expected to have the same sighting efficiency as those working in dedicated surveys, making it questionable to use sighting efficiencies from dedicated surveys to predict effectiveness of MMOs, and to use dedicated survey parameters to extrapolate density estimates from MMO data.

Even with well-rested, dedicated observers, on a ship that is frequently outfitted for marine mammal surveys, a high proportion of marine mammals will be missed.

Factors affecting sightability include the duration of dives, duration of surface intervals, group size and synchrony, and propensity for conspicuous behavior. Forney and Barlow (1998) estimated that from 10 to 44% of cetacean groups directly on the track line were missed in ship-based surveys. The probability of detecting groups 1 km off to the side was about 1/4 that of groups directly on the track line (~20-30%). Similarly, Richardson and Thomson (2002) estimated that in aerial surveys 40% of bowheads at the surface near the trackline will be missed, even in good conditions. Since NMFS' proposed mitigation does not require the two observers employed in the Forney and Barlow (1998) study, detection rates could be as low as half those reported while the observer is still fresh. As the observer fatigues, detection rates would become even lower. That is, the potential to mitigate impact through the use of observers is far from realized with the proposed implementation.

For pinnipeds, sighting efficiency is likely to be even lower. Richardson *et al.* (1999) compared sighting rates with one versus two observers. If each observer sighted 10% of the seals present at the surface, then 9% of seals would only be sighted by the first observer, 9% would only be sighted by the second, and 1% would be sighted by both. That is, if the sighting rate were .2/hr for one observer, the predicted sighting rate for two observers would be .38/hr. This agrees well with the data, suggesting that when monitoring is carried out by one observer, 90% of seals will be missed, and with two observers, 81% of seals would be missed (not counting seals that remained submerged when the vessel was within sighting range). That is, relying on observers to see seals and shut down the airguns is likely to fail the vast majority of the time.

Another approach to estimating sighting efficiency is to assume density is constant and comparing sighting rates. With the annuli increasing in radius by 50 m, the area in successive annuli used by Richardson *et al.* (1999) will increase and hence the expected number of sightings would increase. That is, the ring from 350-400 should have 15 times as many sightings as the number of sightings within 50 m. The actual number of sightings was only about 1% of this number. Even the 51-100 ring, which should have three times as many sightings, had fewer sightings than the number within 50 m, suggesting sighting efficiency was already down by at least a factor of 3.

Even with limited sighting efficiency, industry surveys reveal that seals were sighted within the safety zone. This indicates that seals cannot be counted on to move out of the way. It appears some seals move to the surface to minimize their received level, but being at the surface makes them unable to swim rapidly away. As a result, the airgun arrays can approach them closely.

Many species are capable of diving for more than 30 minutes. Richardson and Thomson (2002) estimated that 85% of bowheads would be missed in aerial surveys because they are underwater. Even if animals are at the surface, they are likely to be missed (Forney and Barlow 1998, Wade *et al.* 2003, Cox *et al.* 2006). Groups more than 1 km away are unlikely to be seen, but survey vessels typically travel farther than this during the course of a long dive.

Visibility can further reduce sighting efficiency. Rain, snow, fog, and glare all impair sighting efficiency. Wind (and resulting waves) also impairs the ability to sight animals, particularly small ones (Forney and Barlow 1998). Sightings with the unaided eye become nearly impossible at night (personal observation).

As acknowledged by NMFS, the effectiveness of infra-red or night vision gear in compensating for reduced visibility is limited. A number of technologies are in fact available, including light enhancement, illumination, and thermal infrared. Light enhancement is ineffective in offshore areas, because even with enhancement dark animals do not reflect enough light to be seen (personal observation). Some devices attempt to overcome this through the use of infrared lasers to illuminate the scene. However, high humidity in the marine environment results in backscatter that obscures the view (personal observation). Thermal infrared can result in successful visual detection of marine mammals at night (Perryman *et al*. 1999, Bain personal observation). However, images need to be sufficiently magnified to distinguish the animal from noise and marine debris, and there also needs to be sufficient resolution to allow animals to be recognized. Existing sensors offer limited numbers of pixels (typically 0.25 - 1% the number offered by digital cameras designed to replace film), and the necessary magnification limits the field of view. As a result, the probability of pointing the device in the right direction while animals are at the surface is small (personal observation). The probability of seeing animals at night is far lower than during the day, even with the best of night vision gear. Nevertheless, thermal infrared imaging is better than not observing at all, and is likely to be more effective with large marine mammals like bowheads than small marine mammals like porpoises.

Passive acoustic monitoring is another technique that could be applied, although it is another technique that is likely to have limited effectiveness. Even with vocally active species like sperm (Forney and Barlow 1998) and killer whales (personal observation), all individuals in groups can be silent for hours at a time. Other species are even less likely to vocalize. Further, once noisy operations begin, species may respond by becoming silent (e.g., none were heard even though many acoustic measurements were made in close proximity to marine mammals during the SHIPS seismic survey, Brocher *et al.* 1999, Calambokidis *et al.* 1998, personal observation). Nonetheless, species like blue, right and bowhead whales are frequently acoustically detected in areas where they are not sighted by vessel or shore-based observers (Širović 2006, Wade *et al.* 2006), so it would be worth using this approach.

Even if marine mammals are sighted, it is not clear that effective mitigation can result from that, as it will take time to communicate the need to shut down and carry out the steps needed to terminate sound generation.

Monitoring

The literature on effects of noise on Arctic marine mammals have produced inconsistent results. This emphasizes the importance of a monitoring program both to measure actual

effects and to better relate noise exposure to effects. Important information to gather include: individual identifications of individuals actually exposed to noise; measurement of actual received levels both near the noise sources and distant from them; and measurement of fecal stress hormones.

Identification of individuals exposed to noise will allow comparison of population dynamics of exposed and non-exposed individuals. It would also allow identification of individuals repeatedly exposed to noise, both under this IHA and other IHA's in the region.

Limiting observations to individuals near the noise source biases results, as data can be collected from exceptionally noise tolerant individuals, but not from individuals that avoid the source at a distance (Bain and Williams 2006). Estimating takes based only on noise tolerant individuals may seriously underestimate the number of individuals taken.

Noise exposure is known to cause stress reactions in captive cetaceans (Romano *et al.* 2004). Fecal sampling to monitor stress and reproduction has proven a valuable tool for conservation of North Atlantic right whales (Reeves *et al.* 2001). Adrenal hormone metabolites can be used to measure psychological stress. Other metabolites can be used to measure nutritional stress. Reproductive hormones can be used to determine reproductive status (Rolland *et al.* 2006). Combined with re-sightings of these individuals in the subsequent year, this information can be used to assess whether stress from noise exposure can lead to reproductive failure.

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July 1, 2009

Via Electronic Mail

Michael Payne
Permits, Office of Protected Resources
National Marine Fisheries Service
1315 East-West highway
Silver Spring, MD 20910-3225
PR1.0648-XP00@noaa.gov
PR1.0648-XPOO@noaa.gov

Re: Take of Marine Mammals During Open-water Marine Survey Program in the Chukchi Sea, Alaska during 2009-2010. 74 Fed. Reg. 26,217 (June 1, 2009).

Dear Mr. Payne:

These comments are submitted on behalf of the Inupiat Community of the Arctic Slope (ICAS). We appreciate the opportunity to comment under the Marine Mammal Protection Act (MMPA) on Shell Offshore Inc. and Shell Gulf of Mexico Inc. (hereafter Shell) application for an Incidental Harassment Authorization (IHA) to the National Marine Fisheries Service (NMFS) for oil and gas related activities in the Chukchi Sea. *See* 74 Fed. Reg. 26,217 (June 1, 2009). ICAS is the regional tribal government for eight villages on the North Slope that depend upon the marine mammals that live and migrate through the Chukchi and Beaufort Seas. The threat to marine life from Shell's proposed operations also threatens the ability of North Slope residents to sustain themselves.

The Chukchi Sea is a valuable and unique place that we still have much to learn about. For this reason, we have worked hard to protect the Chukchi and its natural resources. Shell's proposal is for activities that support exploration or production of areas in Lease Sale 193, which we oppose and that is currently the subject of a court case pending in the Ninth Circuit Court of Appeals. Despite this still active lawsuit, Shell's IHA application is for activities that only further the corporation's work in Lease Sale 193 areas. Until the controversy surrounding this lease sale has been resolved, it is ICAS's position that NMFS should not be authorizing work in or associated with these lease blocks.

Additionally, ICAS points out that Native communities in Alaska have long been ignored in the race to find and develop offshore oil and gas resources. Despite a multitude of local knowledge of marine species gained from both subsistence users (such as whaling crews) and local scientists and wildlife departments, the U.S. government has consistently failed to comply with legal requirements that require consultation with local Native communities *as* proposals are being developed that affect native environments. Instead, both federal agencies and the entities they permit make only token gestures at consultations with Native groups offering them only the

opportunity for involvement *after* proposals are developed and *after* local knowledge would serve a useful purpose.

It is the policy of the United States that "[w]hen undertaking to formulate and implement policies that have tribal implications, agencies shall . . . consult with tribal officials as to the need for Federal standards and any alternatives that would limit the scope of Federal standards or otherwise preserve the prerogatives and authority of Indian tribes." Executive Order 13175 § 3(c)(3). Despite this explicit government-to-government consultation requirement, NMFS has failed to consult with governing bodies of Native people who will be and have been affected by the decisions NMFS is making under the MMPA. NMFS must explain why it has neglected to sit down with Native governing bodies when making decisions that directly impact the ability of communities to sustain themselves. NMFS must meet with ICAS and local Native villages on a government-to-government basis to discuss the proposed IHA as well as appropriate mitigation and monitoring requirements.

ICAS incorporates by reference the comments submitted by the Alaska Eskimo Whaling Commission (AEWC) with respect to the rest of the issues raised by Shell's IHA application and NMFS's preliminary findings. Thank for your consideration of these comments. Please contact me if you have any questions or are willing to meet with ICAS on a government-to-government basis.

Sincerely,

George Edwardson

MARINE MAMMAL COMMISSION
4340 EAST-WEST HIGHWAY, ROOM 700
BETHESDA, MD 20814-4447

6 July 2009

Mr. P. Michael Payne, Chief
Permits, Conservation, and Education Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application from Shell Offshore, Inc., and Shell Gulf of Mexico, Inc., for an incidental harassment authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act. The applicant is seeking authorization to take by harassment small numbers of marine mammals incidental to conducting seismic surveys in the Chukchi Sea during open-water seasons between August 2009 and July 2010. The potentially affected species are bowhead, fin, gray, humpback, minke, killer, and beluga whales, harbor porpoises, and ringed, spotted, bearded, and ribbon seals. The Commission also has reviewed the National Marine Fisheries Service's 1 June 2009 *Federal Register* notice (74 Fed. Reg. 26217) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions. Based on its review of these documents, the Commission offers the following recommendations and rationale.

RECOMMENDATIONS

With respect to the requested incidental harassment authorization, the Marine Mammal Commission recommends that the National Marine Fisheries Service—

- require Shell to describe in detail how it adjusted the data in Moore et al. (2000) to estimate cetacean densities in the Chukchi Sea in the fall;
- require Shell and other applicants to develop and implement a biologically realistic study design for estimating take levels;
- prior to issuing the requested incidental harassment authorization, establish explicit and specific mitigation measures for bowhead and beluga whales that will ensure that the proposed activities do not affect these species in ways that will make them less available to subsistence hunters. Such measures should (1) reflect the provisions of any conflict avoidance agreements between Alaska Native hunters and the applicant and (2) meet the requirements of the Marine Mammal Protection Act;
- require the applicant to undertake the studies needed to verify observer proficiency (including the number of observers needed to monitor entire safety zones and the presence of marine mammals near or within those zones, particularly when operations are being conducted 24 hours a day) and provide additional rationale for allowing seismic surveys to continue under nighttime conditions when observer proficiency is severely compromised. In addition, the Service should require that the applicant supplement its mitigation measures by using passive acoustic monitoring. Such monitoring will enhance marine mammal detection

PHONE: (301) 504-0087
FAX: (301) 504-0099

capabilities under all conditions, but particularly at night and when visibility is otherwise poor. The Service also should require the same of other applicants conducting seismic work in the Arctic;

- require the applicant to collect and analyze data pertaining to the efficacy of ramp-up as a mitigation measure. The Service also should require this of other applicants proposing to use ramp-up procedures during the conduct of seismic and other acoustic studies; and
- require that operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury might be attributable to the applicant's activities. Any suspension should remain in place until the Service (1) has reviewed the situation and determined that further deaths or serious injuries are unlikely to occur or (2) has issued regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act.

With regard to the possible cumulative effects of the proposed activity and other industrial activities in the Arctic, the Marine Mammal Commission recommends that the National Marine Fisheries Service—

- conduct a more extensive analysis of the potential or likely effects of currently authorized and proposed oil and gas activities, climate change, and additional anthropogenic risk factors (e.g., industrial operations) and the possible cumulative effects of all of these activities over time;
- together with the applicant, other holders of incidental harassment authorizations for work in the Arctic, and appropriate agencies and organizations develop a comprehensive population monitoring and impact assessment program to assess whether these activities, in combination with other risk factors, are (1) individually or cumulatively having any significant adverse population-level effects on marine mammals or (2) having an unmitigable adverse effect on the availability of marine mammals for subsistence use by Alaska Natives. Such a monitoring program should focus initially on the need to collect adequate baseline information to allow for future analyses of effects; and
- sponsor a workshop or workshops to facilitate the development of a comprehensive population monitoring and impact assessment program. As noted in our previous letters, the Commission would be willing to co-sponsor such a workshop with the Service.

RATIONALE

Background

The Service issued an incidental harassment authorization to Shell on 20 August 2008 to take marine mammals during seismic surveys in the Beaufort and Chukchi Seas during portions of the 2008 and 2009 Arctic open-water seasons. Shell is seeking authorization to continue a portion of those activities (i.e., site clearance and shallow hazards and strudel scour surveys) during the 2009 and 2010 open-water seasons in the Chukchi Sea. The company has cancelled its 2009–2010 planned

ice gouge survey in the Chukchi Sea. It also has cancelled its entire planned 2009–2010 marine seismic survey program in the Beaufort Sea.

The Service has preliminarily determined that the impact of conducting the proposed site clearance and shallow hazards and strudel scour surveys in the Chukchi Sea during the 2009 and 2010 open-water seasons will (1) result only in the temporary modification in behavior of small numbers of 12 species of marine mammals, (2) have no more than a negligible impact on the affected marine mammal species or stocks, and (3) have no unmitigable adverse impact on the availability of marine mammal species or stocks for subsistence use. The Service bases these determinations on the information provided in several documents, including the application from Shell Offshore, Inc.; Shell's responses to the Service's request for supplemental information regarding the proposed activities; the final report of the Joint Monitoring Program in the Chukchi and Beaufort Seas, Open Water Seasons, 2006–2007 (Ireland et al. 2009); and the preliminary draft report of the Joint Monitoring Program in the Chukchi and Beaufort Seas, open water seasons, 2006–2008. The last of these provides data and analyses from a number of industry monitoring and research studies carried out in the Chukchi and Beaufort Seas during in 2008.

Estimating cetacean density

Shell's application indicates that the company relied on Moore et al. (2000) to estimate fall (September–October) densities of bowhead whales, beluga whales, and gray whales in the Chukchi Sea area. However, a review of the Moore et al. paper reveals that the authors provide density estimates only for the gray whale in the Chukchi Sea, and those data apply to the summer period. Thus, Shell must have adjusted the data in Moore et al. (2000) to estimate densities for these species, but the adjustments are not described and thus are not possible to evaluate. Therefore, the Marine Mammal Commission recommends that the Service require Shell to describe in detail how it adjusted the data in Moore et al. (2000) to estimate cetacean densities in the Chukchi Sea in the fall.

Estimating take levels

The applicant will base estimates of the minimum number of marine mammals taken by harassment on the numbers of animals directly seen within the relevant safety radii by observers on the source vessel or on nearby support vessels during survey activities. The Commission is concerned that this method of estimation may be misleading because (1) the minimum estimate will depend on the portion of time observers are on duty (e.g., operations or observations at night may not be included), (2) it does not account for observer sighting proficiency (e.g., the ability to sight cetaceans versus pinnipeds), and (3) it does not account for behavioral responses of animals outside the so-called safety zones. The applicant's maximum take estimate is likewise problematic because it fails to take into account the movement patterns of these species, which could greatly bias maximum estimates of take by harassment. Absent reasonable corrections for these factors, the minimum and maximum estimates may be potentially useless or misleading, with potentially adverse consequences. The Marine Mammal Commission therefore recommends that the Service require Shell and other applicants to develop and implement a biologically realistic study design for estimating take levels.

Potential impacts on subsistence hunting

The Service's *Federal Register* notice states that Shell's proposed spatial and temporal operational strategy for its Chukchi Sea operations should minimize impacts on subsistence hunters (e.g., Shell will begin operations after the close of the spring bowhead hunt and will closely coordinate with subsistence advisors to avoid impacts on beluga whale and walrus hunts). The Service also states that the timing (late summer and fall) of the proposed surveys and their distance from shore (113 km, or 70 mi), as well as the low-volume airguns that are proposed to be used and the proposed mitigation measures, are expected to mitigate any adverse effects of the surveys on the availability of marine mammals for subsistence uses. Further, the notice states that Shell has (1) prepared and will implement a draft plan of cooperation for its proposed 2009 activities to mitigate and avoid any unreasonable interference of the planned activities with North Slope subsistence uses and resources; (2) met with and will continue to meet with the affected communities and organizations, including the Alaska Eskimo Whaling Commission, Eskimo Walrus Commission, Alaska Beluga Whale Committee, Alaska Ice Seal Committee, and the Alaska Nanuuq Commission, throughout 2009 to avoid potential conflicts; and (3) begun preparing additional mitigation measures to avoid potential conflicts. The Marine Mammal Commission supports these efforts but recommends that issuance of the requested incidental harassment authorization be contingent on the Service establishing explicit and specific mitigation measures for bowhead and beluga whales that will ensure that the proposed activities do not affect these species in ways that will make them less available to subsistence hunters. Such measures should (1) reflect the provisions of any conflict avoidance agreements between Alaska Native hunters and the applicant and (2) meet the requirements of the Marine Mammal Protection Act.

Monitoring and mitigation

The Commission notes that the Service is proposing to include in the incidental harassment authorization the additional mitigation and monitoring measures that were included in authorizations issued to Shell Offshore in 2006, 2007, and 2008. The Marine Mammal Commission supports these proposed mitigation and monitoring measures and recommends that they be incorporated in the incidental harassment authorization, if issued. However, the Commission continues to believe that the Service and the industry are overestimating the performance and utility of various monitoring and mitigation strategies. The performance of these strategies has not been tested and validated. The Commission believes that, absent an evaluation by the oil and gas industry of its monitoring and mitigation measures, the effects of the industry's activities will remain uncertain. The Marine Mammal Commission therefore recommends that the Service require Shell and other companies conducting seismic work in the Arctic to undertake the studies needed to verify observer proficiency (including the number of observers needed to monitor entire safety zones and the presence of marine mammals near or within those zones, particularly when operations are being conducted 24 hours a day) and provide additional rationale for allowing seismic surveys to continue under nighttime conditions when observer proficiency is severely compromised. The Marine Mammal Commission also recommends that the applicant be required to supplement its mitigation measures by using passive acoustic monitoring. Such monitoring will enhance marine

mammal detection capabilities under all conditions, but particularly at night and when visibility is otherwise poor.

As a related matter, the Commission cannot determine from the information provided in the application whether Shell plans to collect data during ramp-up procedures to test the assumption that animals are able to, and will, move away from an increasingly loud noise to avoid harmful effects. The Marine Mammal Commission reiterates its recommendation that the Service require Shell and other applicants using ramp-up procedures to collect and analyze data pertaining to the efficacy of ramp-up as a mitigation measure.

Lethal Taking and Serious Injury

In addition, the Marine Mammal Commission recommends that the incidental harassment authorization, if issued, require that operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and if that death or injury could be attributable to the applicant's activities. Any suspension should remain in place until the Service (1) has reviewed the situation and determined that further deaths or serious injuries are unlikely to occur or (2) has issued regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act.

Cumulative impacts

As stated in its letters to the Service regarding previous applications to conduct similar activities in the Chukchi Sea during the Arctic open-water season, the Commission continues to be concerned about the potential cumulative impacts of climate-related ecosystem changes occurring in the Arctic and the anticipated increase in the level of seismic and other oil and gas-related activities in the region.

According to the Service's *Federal Register* notice and Shell's proposed marine mammal monitoring and mitigation plan, Shell intends to prepare a comprehensive report following the 2009 open-water season that describes and analyzes its acoustic and vessel-based monitoring programs. The Service and Shell state that the report will, to the extent possible, integrate the results into a broad-based assessment of industry activities and their impacts on marine mammals in the Chukchi Sea during 2009, although Shell notes that "to truly capture 'cumulative' effects of offshore activities would involve collecting data on operations supporting North Slope Borough villages, research vessels, and other activities occurring in the Chukchi Sea." Shell suggests that data from the comprehensive report could be presented and discussed at a workshop on cumulative effects associated with offshore activities if such a workshop could be organized. It notes that such a forum "would provide an opportunity for all stakeholders to engage in the development of a cumulative effects strategy for future activities."

The Commission concurs with Shell's points concerning the various sources of data needed to adequately assess the potential cumulative effects of oil and gas-related activities in the Chukchi Sea. The Commission also concurs with Shell's suggestion that a workshop would be useful to

facilitate the development of a cumulative effects strategy. The Marine Mammal Commission reiterates its recommendation that the Service conduct a more extensive analysis of the potential or likely effects of currently authorized and proposed oil and gas activities, climate change, and additional anthropogenic risk factors (e.g., industrial operations) and the possible cumulative effects of all of these activities over time. The Marine Mammal Commission also recommends that the Service, together with the applicant, other holders of incidental harassment authorizations for seismic work in the Arctic, and appropriate agencies and organizations, develop a comprehensive population monitoring and impact assessment program to assess whether these activities, in combination with other risk factors, are (1) individually or cumulatively having any significant adverse population-level effects on marine mammals or (2) having an unmitigable adverse effect on the availability of marine mammals for subsistence use by Alaska Natives. Such a monitoring program should focus initially on the need to collect adequate baseline information to allow for future analyses of effects. Finally, the Marine Mammal Commission recommends that the Service sponsor a workshop or workshops to facilitate the development of a comprehensive population monitoring and impact assessment program. As noted in our previous letters, the Commission would be willing to co-sponsor such a workshop with the Service.

Please contact me if you or your staff has questions about these comments and recommendations.

Sincerely,

Timothy J. Ragen

Timothy J. Ragen, Ph.D.
Executive Director

Literature Cited

Ireland, D. S., D. W. Funk., R. Rodrigues, and W. R. Koski (eds). 2009. Joint Monitoring Program in the Chukchi and Beaufort seas, open water seasons, 2006–2007. LGL Alaska Report P971-2. Report from LGL Alaska Research Associates, Inc., Anchorage, AK, LGL Ltd., Environmental Research Associates, King City, Ont., JASCO Research, Ltd., Victoria, BC and Greenridge Sciences, Inc., Santa Barbara, CA, for Shell Offshore, Inc., Anchorage, AK, ConocoPhillips Alaska, Inc., Anchorage, AK, the National Marine Fisheries Service, Silver Spring, MD, and the U.S. Fish and Wildlife Service, Anchorage, AK. 485 pp + appendices.

Moore, S. E., D. P. DeMaster, and P. K. Dayton. 2000. Cetacean habitat selection in the Alaskan Arctic during summer and autumn. Arctic 53(4):432–447.

North Slope Borough

OFFICE OF THE MAYOR

P.O. Box 69
Barrow, Alaska 99723
Phone: 907 852-2611 or 0200
Fax: 907 852-0337 or 2595
email: edward.itta@north-slope.org

Edward S. Itta, Mayor

July 1, 2009

P. Michael Payne
Permits, Office of Protected Resources
National Marine Fisheries Service
1315 East-West highway
Silver Spring, MD 20910-3225

Via Electronic Mail
PR1.0648-XP00@noaa.gov

Re: Take of Marine Mammals during Open-water Marine Survey Program in the Chukchi Sea, Alaska during 2009-2010. 74 Fed. Reg. 26,217 (June 1, 2009).

Dear Mr. Payne:

Thank you for the opportunity to comment on the National Marine Fisheries Service's (NMFS) proposed authorization of incidental take of marine mammals from seismic surveying in the Chukchi Sea by Shell Offshore Inc. and Shell Gulf of Mexico Inc. (collectively, Shell).

The species impacted by the proposed authorization are critical to our subsistence harvest. Although many of our residents are engaged in wage employment, we continue to depend heavily on the subsistence harvest for food. Traditional foods are far more nutritious than many types of imported "store-bought" food, and their continued consumption has repeatedly been shown to be critical to the health of our people.[1] Subsistence activities also provide spiritual and

[1] The subsistence diet protects against obesity and diabetes, and associated problems such as hypertension and cardiovascular disease. Restricted access to subsistence foods therefore places the community at increased risk for these problems. If subsistence use in the region is reduced, very significant increases in obesity and diabetes in the impacted communities would predictably ensue. *See*

Ebbesson SO, Kennish J et al. Diabetes is Related to Fatty Acid Imbalance in Eskimos. *International Journal of Circumpolar Health.* 58: 108-119. 1999.

Shephard R and Rode A. The Health Consequences of Modernization: Evidence from Circumpolar Peoples. Cambridge University Press. 1996

cultural affirmation, and are crucial for passing skills, knowledge and values from one generation to the next, thus ensuring cultural continuity and vibrancy.

With this is mind, we are concerned that NMFS's proposed authorization to Shell for the take of marine mammal species incidental to planned open-water seismic surveys and associated activities in the Chukchi Sea, in its current form, does not comply with the requirements of the Marine Mammal Protection Act (MMPA) and threatens the subsistence lifestyle of the North Slope Borough's (NSB) Inupiat population.

Shell's application does not fulfill applicable statutory and regulatory application requirements and has otherwise not demonstrated that its proposed activities comport with the requirements for issuing an IHA.[2] At the agency level, NMFS also did not issue a draft authorization for public review and comment, has accepted many of Shell's assertions regardless of whether they are underpinned by scientific research and agency experience, and has otherwise failed to follow the letter of the law.

The plain language of both the MMPA and NMFS's implementing regulations require that NMFS provide the opportunity for public comment on the "proposed incidental harassment *authorization*," 50 C.F.R. § 216.104(b)(1)(i) (emphasis added); 16 U.S.C. § 1371(a)(5)(D)(iii), and not just on the application itself as NMFS has done here. The authorization itself must prescribe certain requirements such as "permissible methods for taking by harassment," "means of effecting the least practicable impact on such species," measures to "ensure no unmitigable adverse impact on the availability of the species or stock for taking for subsistence use,"

Curtis T, Kvernmo S et al. Changing Living Conditions, Lifestyle, and Health. *International Journal of Circumpolar Health*. 64(5) 442-450
Jorgensen M, Bjerregaard P et al. Diabetes and impaired glucose tolerance among the Inuit of Greenland. *Diabetes Care*. 26: 1766-1771. 2002.
Ebesson S, Schraer C et al. Diabetes and impaired glucose tolerance in three Alaskan Eskimo Populations. *Diabetes Care*. 21: 563-569. 1998.
Hogan P et al. Economic Costs of Diabetes in the U.S. in 2002. *Diabetes Care*. 2003. 26: 917-932.

[2] The following is a partial list of information that appears to be missing from Shell's application:
- A "description of what measures the applicant has taken and/or will take to ensure that proposed activities will not interfere with subsistence whaling or sealing," 50 C.F.R. § 216.104(a)(12)(iii);
- Information on how it will "learn[] of" research opportunities or how it will "encourage[e]" or "coordinat[e]" any research related activities, 50 C.F.R. § 216.104(a)(14);
- A description of the "specified activities," 16 U.S.C. § 1371(a)(5)(D)(i);
- A description of the "specified geographic region," 16 U.S.C. § 1371(a)(5)(D)(i);
- A description of the "age, sex, and reproductive condition" of the marine mammals that will be impacted. 50 C.F.R. § 216.104(a)(6).
- A 2009 Plan of Cooperation (POC) or "information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses," 50 C.F.R. § 216.104(a)(12);

requirements pertaining to "monitoring and reporting" and for "independent peer review" of such monitoring and reporting if the taking may affect subsistence use. 16 U.S.C. § 1371(a)(5)(D)(ii). NMFS's regulations further provide that "[a]ny preliminary finding of 'negligible impact' and 'no unmitigable adverse impact' shall be proposed for public comment along with . . . the proposed incidental harassment authorization . . .." 50 C.F.R. § 216.104(c).

Without a complete draft authorization and accompanying findings, the NSB cannot provide meaningful comments on Shell's proposed activities, ways to mitigate the impacts of those activities on marine mammals, and measures that are necessary to protect subsistence uses and sensitive resources. Moreover, based on the limited information provided by NMFS there is no way to determine whether Shell's monitoring and reporting plans were subjected to independent peer review as required by the MMPA. NSB's participation in Open Water meetings and other public processes have provided every indication to the contrary. Unless NMFS can demonstrate compliance with the MMPA and its own regulations, it cannot issue an IHA to Shell.

We also have concerns with the timing of IHA applications for work in Arctic waters. As the system currently works, MMPA authorizations terminate in the middle of the open water season. Thus, the full spectrum of activities that may be authorized for any given year are never analyzed together and the quality of the applications and the public process suffer as a result. At the outset, we ask the following:
(1) that only one authorization be issued per calendar year or per operating season for work associated with a specific project (and that Shell therefore be denied an additional permit for the 2009 open water season in the Chukchi);
(2) that NMFS ensure that complete IHA applications are submitted a minimum of one month prior to the April Open Water Meetings or comparable peer review meetings that may ultimately replace such meetings. This is essential to ensure that our affected Native community will receive copies of draft plans of cooperation and proposed mitigation measures sufficiently in advance of these meetings to allow for meaningful discussion of any identified major flaws, evaluation of suggested improvements that draw upon our particular local expertise, and consideration of appropriate peer reviewers; and
(3) related to the foregoing, that NMFS change the expiration date for authorizations so that a single calendar year is authorized rather than activities in the latter part of one calendar year and the early part of the following year.

We submit the following additional comments for your consideration.

The Marine Mammal Protection Act (MMPA)

In enacting the MMPA, Congress noted that "marine mammals have proven themselves to be resources of great international significance, esthetic and recreational as well as economic" and "that they should be protected and encouraged to develop . . .." 16 U.S.C. § 1361(6). The MMPA protects marine mammals through the implementation of a "moratorium on the taking" of marine mammals. 16 U.S.C. § 1371(a). Within the MMPA, "take" is broadly defined to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." *Id.* § 1362(13). "Harass" is defined to include acts of "torment" or "annoyance" that have the "potential" to injure a marine mammal or marine mammal stock in the wild or have the potential to "disturb" them "by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." *Id.* § 1362(18); 50 C.F.R. § 216.3 (defining "Level A" and "Level B" harassment).

The MMPA provides several narrow exceptions to the moratorium on take. NMFS may, upon application, authorize take in the form of harassment by an IHA for a period of not more than one year, provided certain conditions are met. To receive such take authorization for an action such as is currently proposed, an activity (i) must be "specified" and limited to a "specified geographical region," (ii) must result in the incidental take of only "small numbers of marine mammals of a species or population stock" and can have no more than a "negligible impact" on species and stocks, and (iii) will not have "an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses." Nonetheless, in issuing an authorization, NMFS must provide for the monitoring and reporting of such takings and must prescribe methods and means of causing the "least practicable impact" on the species or stock and its habitat. 16 U.S.C. § 1371(a)(5)(D); 50 C.F.R. § 216.107.

In addition to these exceptions, Congress recognized the central role of subsistence hunting in specifically exempting the activities of the Inupiat, and other coastal dwelling Alaska Natives, from the general prohibitions against take of marine mammals. 16 U.S.C. § 1371(b). Thus, subsistence activities are given special recognition under the MMPA. As discussed below, NMFS has not demonstrated that the proposed IHA will meet these standards.

i. The specified activities, their duration and their specific geographic region analysis are inadequately identified.

We are concerned about the lack of specificity regarding the timing and location of the proposed surveys, as well as the lack of specificity regarding the surveys themselves. The Marine Mammal Protection Act allows take authorization only for "specified activities" within a "specified geographic region." 16 U.S.C. § 1371(a)(5)(D)(i). As an initial matter, Shell did not provide adequate information on either of these requirements. With regard to its "activities"

Shell's application contains numerous statements indicating the corporation's uncertainty about its activities a few short months from now. *See, e.g.,* Shell Application at 3, 4 (uncertain which vessel will be used for the work and dispersing and collecting underwater hydrophones).

Shell also does not disclose the full spectrum of activities in which it will engage. For example, Shell mentions support vessels and other equipment in its application but such machinery is not disclosed among Shell's activities. Shell has also changed the air gun array it planned to use after submitting its application, *see* 74 Fed. Reg. at 26,218, but did not conduct any new analysis of the impacts from this change thus negating its analysis of the impacts from the original air gun array. Shell needs to adequately specify the activities and impacts of all the actions that will be undertaken in the Chukchi.

Similarly, it is unclear where Shell will be specifically conducting its activities. *See, e.g.*, Shell Application at 3, 4 ("Actual locations of site clearance and shallow hazards surveys have not been definitively set"). The assertion that the activities will take place "on leases that were acquired in Outer Continental Shelf (OCS) Lease Sale 193" but that "[a]ctual locations of site clearance and shallow hazards surveys have not been definitively set" but "will occur within . . . [the] lease blocks shown in Figure 1 of Shell's application," 74 Fed. Reg. at 26,219, fails to provide the public with sufficient information about the activities that may be authorized. The "Figure 1" referenced in this statement simply shows a multitude of Shell OCS lease blocks in the Chukchi Sea; it certainly does not document any "specific sites" (much less dates and duration) where Shell's activities will occur. This is alarming because potential surveying may take place proximate to the Hanna Shoal, an established feeding ground for gray whales and walrus.

Moreover, the strudel scour surveys will not take place in the lease sale areas, but in unspecified locations between the lease sale blocks and the coast. *See* 74 Fed. Reg. at 26,219 ("Areas that have strudel scour identified during the aerial survey will be verified and surveyed with a marine vessel after the breakup of nearshore ice" likely sometime "in July through mid-August 2010."). The NSB recommends that Shell also be required to disclose more specifically where nearshore marine strudel scour surveys will be conducted, how vast the areas that will be surveyed, and the acreage that will be subjected to "multi-beam bathymetric sonar," "side-scan sonar," and "single beam bathymetric sonar." 74 Fed. Reg. at 26,219.

Moreover, as indicated above, the IHA as proposed will cover a full year, from August 2009 through July 2010. This is a particular concern given that the Federal Register's assessment of effects on bowhead whales relies in part on the surveys ending before the bulk of the bowhead fall migration through the Chukchi Sea. Shell indicates that it will require a maximum of 50

days of "active data acquisition," but this estimate expressly excludes any unplanned downtime. 74 Fed. Reg. at 26,219. Shell also states that the vessel may be used for other activities, and this time is also not included in the estimate. *Id.* Consequently, Shell could need to survey well into the month of October, and the IHA as proposed would allow it to do so.[3]

The IHA extends well into 2010, despite Shell's stated intent to complete its surveying in the fall of 2009. A one-year IHA is clearly not compelled by the MMPA, and an authorization that includes a portion of the next open water season only invites later confusion. *See* 16 U.S.C. § 1371(a)(5)(D) (stating that an IHA may be issued for "not more than" one year). Here, Shell's 2008 IHA provided coverage through August 18, 2009. 73 Fed. Reg. 66,106, 66,106 (Nov. 6, 2008).

In its recent application, Shell sought authorization permitting marine mammal harassment from August 20, 2009 through August 19, 2010. The June Federal Register notice confirms that the existing IHA is valid through August 19 "or until a new IHA is issued to Shell, whichever is earlier." 74 Fed. Reg. at 26,218. Although NMFS's analysis of impacts to marine mammals appears to consider the entire 50 days of active surveying, the process leaves open the possibility of an unjustifiably segmented evaluation of survey activity, looking only at a portion of the surveying that will take place in a single season. NMFS should take steps to avoid such results.

ii. The proposed activities do not assure the incidental take of only "small numbers of marine mammals of a species or population stock" and is not demonstrated to result in no more than a "negligible impact" on species or stock.

In general, this IHA, as currently proposed, is based on uncertainties and that are not allowed under the MMPA. In its comments on the proposed Lease Sale 193 in the Chukchi Sea, NMFS stated that without "current and thorough data which describe the habitat use and function of these waters," and without information on the distribution patterns of marine mammals, the agency would find it challenging to meet its obligations under the MMPA. NMFS explained that, lacking such information,

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[3] The language in the Federal Register notice inconsistently states the potential duration of the activities. *See* 74 Fed. Reg. at 26,219 (surveying from August through October); *id.* at 26,225 (surveying from August through September); *id.* at 26,227 (surveying from August through September). Shell's December 2008 application states that Chukchi site clearance and shallow hazard surveying would take place through October 2009. Application for IHA for Non-Lethal Taking of Whales and Seals in Conjunction with a Proposed Open Water Marine Survey Program in the Chukchi and Beaufort Seas, Alaska During 2009-2010 ("Shell App"), at 12 (Dec. 2008).

> *"it will be very difficult to permit and conduct seismic surveys in a manner that has no more than a negligible impact to the stock and minimizes disturbance and harassment to the extent practicable."*

NMFS Comments on MMS's Draft EIS for Chukchi Sea Lease Sale 193 (Jan. 30, 2007). MMS agreed in its final EIS that much remains unknown. Information is limited on the bowhead fall migration through the Chukchi and the feeding that takes place during that time. *See* LS 193 EIS at III-51-52. Basic data are still needed for other species as well, including gray whales, beluga whales, and harbor porpoises. Gray whales rely on the Chukchi Sea as one of their primary feeding grounds, and they have been shown to abandon habitat in response to anthropogenic noise. *See* LS 193 EIS at III-79. Beluga whales – an important subsistence resource for Alaska Native communities – and harbor porpoises – are both known to be particularly susceptible to noise, as explained above. As contemplated at the time of Lease Sale 193, the current Federal Register notice for Shell's proposed IHA does not adequately address the potential effects on these species.

In more recent Arctic lease sale comments, NMFS reiterated its position that more information is needed to avoid difficulties making the findings required by the MMPA. NMFS Comments on MMS Draft EIS for the Beaufort Sea and Chukchi Sea Lease Sales 209, 212, 217, and 221 (March 27, 2009). The agency also specifically observed that activities "occurring near productive forage areas such as the Hanna Shoal" or "along migratory corridors" are most likely to encounter or harm marine mammals. *Id.* at 4. Shell's proposed surveying for 2009 will likely take place proximate to the Hanna Shoal and within the pathway for migrating bowheads.

NMFS also noted in its comments on lease sale 193 that the "continued lack of basic audiometric data for key marine mammal species" that occur throughout the Chukchi Sea inhibits the "ability to determine the nature and biological significance of exposure to various levels of both continuous and impulsive oil and gas activity sounds." Again, NMFS stressed that additional data "must be obtained" for the agency to consider authorizing incidental taking under the MMPA and the ESA.

Small Numbers / Negligible Impact

The conclusion that Shell's proposed seismic surveying will take only small numbers of marine mammals and will have no more than a negligible impact is not justified by the information provided in the Federal Register notice. NMFS has not adequately considered whether marine mammals may be harassed at received levels significantly lower than 160 dB, and in addition to

the general uncertainties reference above it has not considered the possible serious injuries associated with authorizing the proposed surveying.

Harassment

An activity constitutes harassment if it has even the "potential" to affect marine mammal behavior. The MMPA defines harassment to mean any act of pursuit, torment or annoyance that 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. 16 U.S.C. § 1362(18)(A)(ii).

Here, NMFS calculated harassment from Shell's proposed surveying based on the exposure of marine mammals to sounds at or above 160 dB. *See* 74 Fed. Reg. at 26,225. This uniform approach to harassment, however, does not take into account known reactions of marine mammals in the Arctic to levels of noise far below 160 dB.

In an Environmental Assessment NMFS prepared to evaluate the impacts of noise from Shell's previous plans for offshore drilling, the agency made clear the potential for harassment from seismic surveying and the need for mitigation that includes a protective 120-dB exclusion zone:

> *"NMFS considers the feeding, socializing and migration of bowhead whales during the fall westward migration to be critical to bowhead whale survival. The reason for the 120-dB-related conditions and the requirement for two aerial surveys is that preliminary information from a Canadian seismic survey in 2006 indicates that a tagged bowhead whale migrating westward ceased its migration until the seismic survey ended. This reaction is of concern to NMFS principally because one animal's response to seismic sounds is a likely indicator that a larger population of bowheads could exhibit the same reaction to seismic sound and possibly even drilling noise."*

NMFS, Environmental Assessment for the Shell Offshore, Inc. Incidental Harassment Authorization to Take Marine Mammals Incidental to an Offshore Drilling Program in the U.S. Beaufort Sea Under the Marine Mammal Protection Act, at 9 (October 2007).

NMFS must also consider the effects of disturbances in the context of other activities occurring in the Arctic that may affect bowhead. Of particular interest, this season, BP Exploration plans 2D and 3D seismic surveying in the Canadian Beaufort using a vessel towing 48 airguns – in two arrays with volumes of 4,450 cubic inches each – that would produce peak sound pressures levels of up to 261 dB. National Energy Board, Draft Environmental Screening Report, BP

Exploration Pokak 3D Seismic Program (June 3, 2009).[4] The Northstar facility in the Beaufort Sea also continues its operations. As bowhead whales migrate westward across the Arctic Ocean in the fall 2009, they are potentially subject to multiple sources of disturbance, adding to the total effect on the species.

Finally, NMFS should also consider global warming induced changes relating to the oceanic acoustical environment, such as the relationship with acidification. Hester, et al (2008, See Attachment A) show that ocean acidification from fossil fuel CO2 invasion and reduced ventilation will result in significant decreases in ocean sound absorption.

Serious Injury Potential

An IHA pursuant to 16 U.S.C. § 1371(a)(5)(D) is only available if the activity has no potential to result in serious injury or mortality to a marine mammal. 50 C.F.R. § 216.107 ("Except for activities that have the potential to result in serious injury or mortality, which must be authorized under § 216.105, incidental harassment authorizations may be issued[.]"). If such injury or mortality is possible, take can only be authorized pursuant to a Letter of Authorization ("LOA") consistent with regulations promulgated pursuant to 16 U.S.C. § 1371(a)(5)(A) and 50 C.F.R. § 216.105. Because NMFS has not promulgated any such regulations related to seismic surveys, and because such surveys and associated activities carry the potential for serious injury or death to marine mammals, neither an IHA nor an LOA can be issued for Shell's proposed activities.

In promulgating the regulations that govern IHAs in the Arctic, NMFS acknowledged that permanent hearing loss – or permanent threshold shift ("PTS") – qualifies as serious injury:

> *"Serious injury for marine mammals, such as permanent hearing or eyesight loss, or severe trauma, could lead fairly quickly to the animal's death. NMFS does not believe that Congress intended to allow "incidental harassment" takings to include injuries that are likely to result in mortality, even where such incidental harassment involves only small numbers of marine mammals."*

60 Fed. Reg. 28,379, 28,380 (May 31, 1995). Therefore, "if the acoustic source at its maximum level had the potential to cause a permanent threshold shift in a marine mammal's hearing ability," that activity would be considered "capable of causing serious injury to a marine

[4] The documentation is available at http://www.neb-one.gc.ca/clf-nsi/rthnb/pblcrgstr/bpxplrtnpkk/drftnvrnmntlscrnngrprt20090603.pdf.

mammal and would therefore not be appropriate for an incidental harassment authorization." *Id.* at 28,381.

In this instance, while the airguns proposed by Shell are smaller than those associated with typical 2D / 3D deep marine surveys, the noise they produce is still considerable, as evidenced by the estimated 120 dB radii that extends out to 24 kilometers. NMFS does not rule out the possibility of animals incurring PTS. The Federal Register notice indicates that PTS "might occur" at received levels several decibels above that inducing mild temporary threshold shifts if the animal is exposed to the strong sound pulses with rapid rise time. 74 Fed. Reg. at 26,222. Although NMFS characterizes the possibility as unlikely, it nevertheless relies on mitigation measures, such as ramp ups and exclusion zones, to "minimize" the "already-minimal" probability of PTS. *Id.*

The standard for determining whether an IHA is appropriate is exceptionally protective. If there is even the possibility of serious injury, NMFS must establish that the "potential for serious injury can be *negated* through mitigation requirements[.]" 60 Fed. Reg. at 28,380 (emphasis added). Reports from previous surveys, however, indicate that, despite monitored exclusion zones, marine mammals routinely stray too close to the airguns. *See, e.g.* Marine Mammal Monitoring and Mitigation During Open Water Seismic Exploration by ConocoPhillips Alaska, Inc. in the Chukchi Sea, July-October 2006, at 5-11-5-12 (January 2007) (identifying 50 marine mammals likely exposed to potentially injurious sound levels); Marine Mammal Monitoring and Mitigation During Open Water Seismic Exploration by Shell Offshore Inc. in the Chukchi and Beaufort Seas, July-September 2006: 90-Day Report, at 6-13 (January 2007) (identifying 24 seals likely exposed to potentially injurious sound levels); Marine Mammal Monitoring During Open Water Seismic Exploration by Shell Offshore in the Chukchi and Beaufort Seas, July – November 2007, at 5-43 (January 2008) (identifying 26 sightings of 50 walrus within the exclusion zone); Marine Mammal Monitoring and Mitigation During Open Water Seismic Exploration by Shell Offshore Inc. in the Chukchi and Beaufort Seas, July –October 2008: 90-Day Report, at 7-14 (January 2009) ("Shell 2008 90-day Report") (identifying 44 powerdowns involving 45 marine mammals). *See also* attached letters from NMFS and NSB regarding the flawed survey design of last year's monitoring program. (Attachments D and E).

Perhaps more importantly, the documented exposures were recorded only because conditions were such that the marine mammals could be observed. But this only represents a fraction of the time that airguns are operating. Observers cannot see animals at the surface when it is dark, and even during the day, visually detecting marine mammals from the deck of a seismic vessel may be inhibited due to glare, fog, rough seas, the small size of animals such as seals, and the large proportion of time that animals spend submerged. Shell has acknowledged that reported

sightings are only "minimum" estimates of the number of animals potentially affected by surveying, as compromised visibility and high seas "are often significant limiting factors." Shell 2008 90-Day Report at 5-17. Although NMFS recognizes that infra-red goggles and night-vision binoculars are of "limited" effectiveness when visibility is low, its only response for Shell's 2009 surveying is that marine mammal observers are relieved of monitoring the exclusion zones at night, except during periods before and during ramp ups. 74 Fed. Reg. at 26,230.

The shortcomings of monitoring were reiterated by the interagency task force:

> *"[V]isual monitoring under the best of conditions may detect less than 50 percent of most marine mammals and only 1-10 percent of some deep-diving mammals . . . In poor weather and at night those percentages are reduced to effectively zero."*

Joint Subcommittee on Ocean Science & Technology, "Addressing the Effects of Human-Generated Sound on Marine Life: An Integrated Research Plan for U.S. Federal Agencies," at 58 (Jan. 2009) ("JSOST").

NMFS appears to simply presume that marine mammals will naturally avoid airguns when they are operating at full strength, removing the need for monitoring when conditions prevent observers from effectively watching for intrusions into the exclusion zones. That premise, however, is not supported by the survey data indicating that shutdowns and powerdowns have repeatedly proven necessary. In other words, if all marine mammals avoid airguns at distances great enough to eliminate the potential for harm, then the imposition of exclusion zones would not result in the number of shutdowns and powerdowns that are recorded each year. The requirement for ramp ups rests on the same foundation – that marine mammals will leave an affected area as a result of increasing noise. Yet, as the JSOST report noted, although ramp up is a widely imposed practice, "there has never been a demonstration that it works as intended." *Id.*[5] Because NMFS has not negated the possibility of serious injury from Shell's 2009 seismic surveying, it may not issue an IHA.

Increases in carcasses/stranding also indicate the potential for injury.

Stranded marine mammals or their carcasses are also a sign of potential injury. NMFS states in its notice that it "does not expect any marine mammals will . . . strand as a result of the proposed

[5] In the lease sale 193 EIS, MMS – with NMFS as a cooperating agency – acknowledged that measures such as ramp ups are "not empirically proven"; its value instead relies on "anecdotal evidence" and "professional reasoning." LS 193 EIS at II-25. The EIS does not expressly consider the industry survey results.

survey." 74 Fed. Reg. at 26,222. In reaching this conclusion, NMFS claims that strandings have not been recorded for the Beaufort and Chukchi Seas. This is inaccurate. NSB has completed a study documenting twenty-five years worth of stranding data and showing that five dead whales were reported in 2008 alone in comparison with the five dead whales that were reported in the same area over the course of twenty-five years. (Rosa, 2009) (See Attachment B): *see also* NMFS stranding response (See Attachment C). The study points to "[a]nthropogenic activities such as oil and gas development, commercial fishing, and shipping" which "create disturbance, noise, and chemical pollution, all of which have been shown to have detrimental effects on wildlife, including whales" as a potential cause for the recent increase in stranded whales documented by the NSB. *Id.*[6]

In light of the increase in seismic operations in the Arctic since 2006, the NSB's study raises serious concerns about the impacts of these operations and their "potential to injure a marine mammal." *See* 16 U.S.C. § 1362(18)(A)(i). While we think this study taken together with the June, 2008 stranding of "melon headed whales off Madagascar that appears to be associated with seismic surveys," 74 Fed. Reg. at 26,222, demonstrate that seismic operations have the potential to injure marine mammals beyond beaked whales (and that Shell needs to apply for an LOA for its operations), certainly the NSB's study shows that direct injury of whales is on-going. These direct impacts must be analyzed and explanations sought out before additional activities with the potential to injure marine mammals are authorized.

Thus, NMFS must explain how, in light of this new information, Shell's application does not have the potential to injure marine mammals. The agency must also require Shell to report the numbers and species of dead animals it encounters and require necropsies to be performed on dead marine mammals found during Shell's operations.

(iii) will not have "an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses."

The MMPA requires that any incidental take authorized will not have "an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses" by Alaska Natives. 16 U.S.C. § 1371(a)(5)(D)(i)(II). For the reasons discussed herein such a conclusion cannot be adequately supported.

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[6] This report provides the "new information" that NMFS requires in order to address the issue of stranding with respect to seismic operations in the Chukchi Sea. *See* 74 Fed. Reg. at 26,222 ("NMFS has addressed this information several times now, and, without new information, does not believe this issue warrants further discussion.").

Under the MMPA, in order for impacts to be mitigated the measures must be "*successfully* implemented." *See* 50 C.F.R. § 104(c) (emphasis added). Thus, Shell cannot on the one hand rely on mitigation to claim its activities will not adversely impact subsistence use, but on the other hand fail to commit to mitigating the impacts of its action or ensuring the public has the opportunity to comment on the mitigation measures.

For example, Shell acknowledges there "could be an adverse impact on the Inupiat bowhead subsistence hunt" but claims the impact "is mitigated" despite the fact the mitigation measures upon which Shell relies, such as the Plan of Cooperation (POC), have yet to even be established. Moreover, Shell states only that "[a]daptive mitigation measures *may be employed* during times of active scouting and whaling," Shell Application at 43 (emphasis added), but makes no definitive commitment to such measures.

Shell's application is far too amorphous for NMFS to be able to actually determine what the impact to subsistence uses will be let alone whether any adverse impacts can or cannot be mitigated. Shell only provides ranges of dates in months and estimates the number of days its activities might last. *See, e.g.*, 74 Fed. Reg. at 26,219 (the "activity is proposed to occur during August-October 2009" and "will last a maximum of 50 days"); *See also supra* n. 3. As discussed above, for the strudel scour survey, no information is provided on the geographic region that will be impacted beyond the surveys occurring in the Chukchi and near the shore. *See, e.g.* 74 Fed. Reg. at 26219 (noting that helicopter overflights will take place and that "[a]reas that have strudel scour identified during the aerial survey will be verified and surveyed with a marine vessel"). Stating the dates and durations of activities in such uncertain terms makes it impossible for NMFS to assess whether Shell's activities will interfere with subsistence hunting, migration, or feeding or marine mammals. Without this detailed information, NMFS is making arbitrary determinations about the actual impacts of Shell's activities on subsistence uses in the Chukchi Sea.

Additionally, what discussion Shell does provide of the impacts to subsistence use is far too limited in scope. Shell looks only at the direct impacts from its activities on active scouting and whaling but does nothing to quantify the overall impacts to subsistence users from on-going oil and gas activities throughout the whales' migration routes in the Beaufort and Chukchi Seas and beyond. The analysis that is provided regarding bowhead whales also assumes their migrations through the Chukchi follow a narrow path thus, further curtailing the scope of potential impacts to the whales. As discussed later in these comments, insufficient data exists about bowhead whale and other species' use of the Chukchi and Shell should not be authorized to operate in this sensitive area until further information has been collected.

Monitoring and Mitigation

Shell's proposed monitoring and mitigation are not sufficient to ensure that no adverse unmitigable impacts on marine mammal species or stock for the subsistence hunt will result. The MMPA authorizes NMFS to issue a take authorization only if it first finds that there will be adequate monitoring of such taking, and that all methods and means of ensuring the least practicable impact have been adopted. 16 U.S.C. § 1371(a)(5)(D)(ii)(I). As detailed below in specific comments by the NSB Department of Wildlife, Shell's proposed monitoring and mitigation measures are insufficient to protect against adverse impacts on the availability of the species or stock for subsistence use. Thus, NMFS should not issue an IHA for the proposed activities until adequate monitoring and mitigation techniques for avoiding adverse impacts to the marine mammals and subsistence hunting are developed.

Other Legal Requirements for Consideration by NMFS

A. National Environmental Policy Act.

With respect to the National Environmental Policy Act (NEPA), NMFS simply states that it is "currently conducting an analysis" and that this "analysis will be completed prior to the issuance or denial of" Shell's application. 74 Fed. Reg. at 26,233. It would appear from these statements that NMFS has decided to exclude the public from the NEPA process, which is in direct contravention of the law. One of the express purposes of NEPA is to ensure that "environmental information is available to public officials and citizens *before decisions are ma*de and before actions are taken . . . [because] public scrutiny [is] essential to implementing NEPA." 40 C.F.R. § 1500.1(b) (emphasis added). The public should be included in whatever environmental analysis NMFS conducts in order to determine the significance of the impacts associated with the proposed activities.

Furthermore, in 2007 MMS prepared a draft programmatic EIS on the impacts of seismic surveys in the Beaufort and Chukchi Seas. MMS has not responded to comments from the public on this document nor finalized it. This analysis must be finalized before any other seismic activities are authorized in the Chukchi or Beaufort Seas. It is imperative that the overall cumulative impacts from the recent increase in offshore oil and gas related activities in the Arctic be fully analyzed before any such activities are permitted to occur.

Cumulative effects have not been considered appropriately. As stated numerous times in the past by the NSB Department of Wildlife Management: the cumulative impacts of all these activities

must be factored into any negligible impact determination. NMFS has not done so and therefore the proposed IHA should not be issued.

B. Endangered Species Act.

NMFS has stated its belief "that Shell's proposed activities . . . are adequately analyzed in the 2008 Biological Opinion" and that NMFS "does not plan to conduct a new section 7 consultation." 74 Fed. Reg. at 26,233. This is in direct contravention of the Endangered Species Act ("ESA"), which requires federal agencies to consult with NMFS and FWS "on any prospective agency action . . . if the applicant has reason to believe that an endangered species or a threatened species may be present in the area affected by his project and that implementation of such action will likely affect such species." 16 U.S.C. § 1536(a)(3); *see also id.* § 1536(a)(2). Both Shell and NMFS readily acknowledge that several endangered species will be impacted by Shell's proposed operations. Therefore, under the plain language of the statute, the IHA must be consulted on pursuant to section 7 of the ESA.

Moreover, in light of our changing climate and the increased activity in the Arctic (both from oil and gas related activities as well as other industries), it is essential that NMFS continue to *consult on authorized activities* so that *the baseline* used in making jeopardy /no-jeopardy determinations *remains current. See* 50 C.F.R. § 402.02 ("Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that *will be added to the environmental baseline.* The *environmental baseline* includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration." (emphasis added)).

Other General and Technical IHA and 4MP comments from the NSB Department of Wildlife Management:

Transit Routes Shell's IHA application indicates that several vessels will be involved in the 2009-10 period, involving various transit routes that are to be used to reach the Arctic survey sites. There is an absence of discussion of impacts and "takes" that may occur upon these transit routes. Shell needs to consider and state these impacts sufficiently.

Strudel Scour Surveys NMFS should not issue Shell an IHA for the strudel scour surveys in 2010. Those surveys are substantially different from the shallow hazards and site clearance surveys. Additionally, it is not clear what other activities might be occurring in 2010. Thus, it is not possible to evaluate the potential cumulative impacts from multiple activities that might occur in 2010. If NMFS does issue Shell an IHA for that survey, estimated takes and monitoring is needed. Currently, Shell is not estimating how many migrating bowheads or other marine mammals may be disturbed by its helicopter surveys. Additionally, no monitoring is proposed for those spring surveys.

Sound Levels In recent years, Shell has consistently focused on the 160 dB (rms) isopleth as the zone where take by harassment might occur. This is not appropriate, as we have stated on many previous occasions. When bowheads are feeding, they are less responsive to industrial sounds than when they are migrating. The best available data suggest that migrating whales may deflect away from industrial activities at sounds levels of 120 dB (rms) or possibly lower. Shell states that there is no evidence that bowheads are foraging in the vicinity of its leases in the Chukchi Sea but are just migrating through. Therefore, Shell must use the 120 dB isopleths for estimating impacts and monitoring. Also, Shell provides evidence from the Canadian Beaufort Sea that belugas are also very sensitive to industrial sounds. Traditional knowledge also shows that belugas respond to low levels of anthropogenic sounds.

Areas of Monitoring It appears that Shell wants to survey in areas other than Burger. If this is the case, NMFS needs to require additional and appropriate monitoring. As part of its application Shell is required to suggest its proposed "means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species" and document "the level of taking or impacts on populations of marine mammals . . . ." 50 C.F.R. § 216.104(a)(13). One of the reasons for this monitoring is for NMFS to "ensure that authorizations over time have only a negligible impact on species or stocks of marine mammals and no unmitigable adverse impact on the

availability of species or stocks for taking for subsistence uses." 60 Fed. Reg. at 28,381. Thus, monitoring is critical to the proper functioning of the MMPA.

Adequacy of MMOs Currently Shell's primary monitoring approach is through the use of marine mammal observers (MMOs) on the source vessel. As Shell has shown in reports from previous seasons, MMOs are not adequate for monitoring the 160 and 120 dB isopleths. Shell is intending to conduct intensive acoustic monitoring near the Burger and Klondike prospects. This will be useful for measuring takes of marine mammals and examining behavioral responses to site clearance and shallow hazards surveys. Other areas that Shell intends to explore with airguns, should also be monitored with intensive acoustic arrays or with another suitable monitoring technique such as aerial surveys. Detailed monitoring of marine mammal behavior and density is needed.

Cumulative Effects Cumulative effects have not been considered appropriately. As stated numerous times in the past by the NSB-DWM: the cumulative impacts of all these activities must be factored into any negligible impact determination. NMFS has not done so and therefore the proposed IHA should not be issued.

Specific Comments

Pg. 1, 3rd paragraph, last sentence: Shell states that "These types of surveys, collectively and individually, have not resulted in impacts of biological significance to marine mammals of the Arctic...." Shell does not have data to support this statement, as Shell and other oil and gas companies have yet to examine whether there have been impacts of biological significance from exploration activities n the Beaufort and Chukchi Seas. Determination of the biological significance of impacts from oil and gas activities (beyond just behavioral deflection) is needed. Further, "biological significance" must be defined.

Pg. 1, 4th paragraph: As stated in previous comments, the NSB opposes the issuance of an IHA extending across two calendar years. It is not possible to assess impacts from multiple activities from multiple companies if NMFS does not restrict IHA's to a single exploratory season during the open water period.

Pg. 3, Chukchi Sea site clearance and shallow hazards surveys: What are the locations of shallow hazards/site clearance surveys? Shell has extensive leases in the Chukchi Sea. If Shell doesn't provide specific locations of planned activities, how can NMFS or the public assess the usefulness of monitoring and mitigation plans?

As required by 50 CFR 216.104(a)(2) – the application must include "The date(s) and duration of such activity and the specific geographical region where it will occur." The application, however, does not seem to indicate with specificity the location of its site clearance surveys. There is no clear identification of what these small specific areas are. The attached maps (Figures 1 and 2 of the application only reference the entire lease holding of the Chukchi and Beaufort) and does seem to indicate small specific areas.

Pg. 4, Figure 1 "Chukchi Sea Proposed Area Vicinity Map."

The map includes a key that purports to identify "National Park System & Wildlife Refuges." However, the Figure fails to identify the Alaska Maritime National Wildlife Refuge north of Point Lay. Please revise.

Pg. 7, "Description of the Activity": Plans for low flying helicopter activity- Shell needs to coordinate with local villages regarding interference with spring seal hunts/other hunts.

Pg. 10, Strudel Scours: Shell needs to coordinate with local walrus, seal and bowhead hunters to avoid impacting these hunts.

Pg. 11, Table 1-1, Notional operational time frames: these operational dates are somewhat misleading, as above it is stated that the helicopter surveys first start in mid- May/June. Also, the use of the word "notional" is curious, as dictionaries variously define it to mean "hypothetical, imaginary, or unreal." Perhaps a better term would be "projected."

Pg. 12, Shell does not indicate the dates and duration of such activity and the specific geographic locations where it will occur. Shell's leases are enclosed by an area that is approximately 15,000 square miles (see Figure 1 of Shell's IHA application, pg. 4). Shell states that it will shoot its 4 x 10 cu. inch airgun array (or the 1 x 10 in^3 mitigation gun) over a total of 600 km (360 miles; Addendum 2 to Shell's application). Where within the 15,000 square mile block will Shell be conducting the activities, including firing the airgun? Without specific information on where Shell will be conducting its surveys, it is not possible for decision makers or the public to assess whether the monitoring and mitigation programs are sufficient.

Pg. 12, Strudel Scour Survey (Chukchi Sea): Shell proposes to use helicopters over 4 days in mid-May to early June 2010. It is not clear how it (1) estimated the number of marine mammals that would be taken during these surveys, (2) will monitor the impacts of its activities to marine mammals, especially migrating and calving bowhead whales, from

these helicopter surveys, and (3) avoid impacts to subsistence hunting that occurs during the spring. Additional information is needed from Shell about the possible impacts to marine mammals, monitoring plans, and mitigation measures from helicopter surveys over the sea ice. NMFS needs to make this additional information available to the public and decision makers for review and comment before it issues an IHA to Shell for strudel scour surveys in 2010.

Pg. 12, Strudel Scour Surveys: The number of days of operation (i.e., helicopter work) is not consistent with earlier text notations.

Pg. 13, last paragraph, 3rd sentence: Shell contends that "Animal [marine mammal] densities are generally expected to be lower in deep water, and at locations far-offshore". Shell does not provide references to support this statement. It is possible that the statement is based on visual surveys in offshore areas conducted from boats during the past three years. (Shell's nearshore surveys were conducted by plane.) Because of the impact from boat sounds, including 3D seismic surveys, to marine mammals, and the limited efficacy of marine mammal observers, it is not appropriate to compare density estimates from the nearshore and offshore areas using these two different methods. Moreover, Shell's 2008 report on the "Joint Monitoring Program" showed that in some cases, the number of marine mammal calls detected was greater in offshore areas compared to nearshore areas.

Pg. 14, Table 4-1: This table should be organized based on the NMFS accepted stocks of marine mammals. Shell categorizes by species but the appropriate management unit is stocks. For example, beluga whales should be evaluated for the Beaufort Sea stock and the eastern Chukchi Sea stock. Population estimates (including nmin, point estimate for stock size, and confidence interval around that point estimate) should be given for each stock. NMFS and the subsistence hunters manage by these agreed upon stocks. Grouping by species is misleading and inappropriate.

Furthermore, Shell separates out numbers of marine mammals by offshore vs. nearshore/ice edge. This approach is confusing, inappropriate for the Chukchi Sea and needs to be refined. The Chukchi Sea is a shallow sea and the shelf extends from Alaska to Russia. Marine mammals occur and migrate across the entire area. Designating a separate abundance for offshore and nearshore is not appropriate and is not helpful for evaluating the potential for small takes of marine mammals. The Beaufort Sea is different from the Chukchi Sea in that it contains a shelf, a shelf break, and the deeper offshore areas. Belugas in particular, have been shown to use these habitats in different

ways. They tend to use the shelf break and deeper waters compared to the shelf. On the other hand, bowheads often use the shelf for feeding and migration.

The pinniped section of this table is also misleading. All four species occur in areas other than sea ice. Shell's surveys show that all species can occur in open water areas. Spotted seals use land haulouts along the Chukchi and Beaufort seas coasts during the summer. They travel offshore to feed and return to coastal haulouts. Shell's estimate of the number of spotted seals is incorrect. The estimate they provide is from a MMS document and is only for the Beaufort Sea. It is known that thousands of spotted seals use the Chukchi Sea haulouts (Frost, et al.). That information should be provided in the IHA application.

Pg. 15, "For the proposed project, only the Beaufort Sea stock and eastern Chukchi Sea stock may be encountered." Impacts of ship transit need to be discussed. Depending upon where the ships come from, they may encounter other stocks of beluga (i.e., Bristol Bay).

Pg. 16, last paragraph of section on belugas: This paragraph is incomplete. Decision makers and the public need to be aware that the entire Beaufort and Chukchi Seas populations of belugas migrate through the Chukchi Sea during the autumn. This information is necessary because Shell's proposed work is in the Chukchi Sea and may impact beluga whales. Therefore, appropriate monitoring and mitigation plans are needed for the central Chukchi Sea.

Pg. 16, Narwhals: The NSB has recorded observations of narwhals by Northern Alaska hunters over recent years. Male narwhals are being seen regularly, perhaps annually in the Beaufort and Chukchi Seas. Thus, impacts to narwhals are appropriately being considered.

Pg. 18, Bowheads: Shell fails to point out that there is limited information about how bowheads use the Chukchi Sea especially during the autumn migration or during early winter. Recent satellite tracking (Quakenbush et al., ADFG, unpublished data) shows that bowheads migrate through the areas where Shell plans its shallow hazard and site clearance work. Further, Shell recorded numerous bowhead calls in the central Chukchi Sea, near Shell's leases, during November and December. This information is vital for decision makers and the public to understand as they evaluate potential impacts and mitigation measure to protect bowhead whales from Shell's planned activities.

Pg. 18, Bowheads, 3rd paragraph: Statements regarding bowheads summering in the Chukchi Sea and feeding in the Beaufort Sea are incomplete. Moore and Clark sighted bowheads in the summer in the Chukchi Sea suggesting that a portion of the population summered there. Furthermore, hunters have regularly reported the presence of bowhead whales near Barrow throughout the summer, providing additional information that not all bowheads migrate to the eastern Beaufort Sea in the summer. Lowry et al. and others have shown that bowheads regularly use the Alaskan Beaufort Sea for feeding during autumn migration. This information is needed by decision makers and the public to better assess the potential impacts from oil and gas activities on bowheads.

Pg. 19, 2nd paragraph: The most recently accepted population size at the IWC 2009 is 11,800.

Pg. 19, 3rd paragraph: Shell states that it will work with the communities to "eliminate disturbance to subsistence whaling activities in the Beaufort and Chukchi Seas." Shell needs to provide the details of how it intends to "eliminate disturbance". Shell has expressed increasing unwillingness to sign a conflict avoidance agreement with the AEWC to protect subsistence hunting of bowheads. If they are planning on only using POCs, developed in village meeting that are often poorly attended and without dialogue about details of mitigation measure, Shell must provide details of the plans to "eliminate disturbance". Additionally, details are needed about how Shell will avoid impacts to hunting of other marine mammals, especially belugas and walrus.

Pg. 20, 2nd paragraph: Shell discusses results from its aerial surveys and states that gray whales were most abundant near shore between Barrow and Wainwright. This statement is misleading because Shell did not conduct aerial surveys in offshore areas, including in the proposed operation area. Shell's visual observations in offshore areas came solely from observers on boats. It is not reasonable to compare aerial and vessels surveys to conclude that gray whale are mostly using nearshore areas. Scientific information on how gray whales are using offshore areas should be considered limited at this time.

Pg. 21, Information on minke whales gathered in 1982 is not appropriate for use in this document. Sightings made during industry vessel based surveys (i.e., seismic surveys) are likely to give a gross underestimate of number, since, by Shell's logic, the surveys should be "clearing the zone of impact". Additionally, speculation on the presence of minke whales in the Beaufort cannot be made until surveys are conducted that are designed to detect them.

Pg. 22 and 23, Bearded Seals: Relatively little information is known about the numbers of bearded seals or how they use the Chukchi Sea. Their distribution and use of the Chukchi and Beaufort Seas during open water periods may be changing due to global warming and increased retreat of sea ice during the summer. These unknowns make it very difficult to predict or mitigate potential impacts from Shell's proposed activities. NMFS must be cautious in permitting Shell's activities because of the many unknowns related to bearded seals, especially in light of the potential listing of bearded seals under the Endangered Species Act.

Pg. 23, last paragraph: Shell states that very few spotted seals were seen in the central Beaufort Sea by its marine mammal observers during seismic operations to support their assertion that few spotted seals use the Beaufort Sea. It needs to be pointed out that many of the observer sightings were of unidentified pinnipeds or of ringed/spotted seals. Therefore, it is very feasible that a much greater number of spotted seals are using the Beaufort Sea than suggested by Shell. Furthermore, they failed to mention the haulout in Dease Inlet. Fifty or more seals can use this haulout regularly (NSB unpublished data). If the haulout data (6.8% of the time hauled out; see Shell's IHA application) from satellite tracking studies from the Chukchi Sea are applicable to the Beaufort Sea, 500 or more spotted seals might use the Dease Inlet haulout. Appropriate and current surveys are needed of spotted seal haulouts in the Chukchi and Beaufort Seas. These surveys should be a component of Shell's monitoring plan, especially since NMFS is evaluating the possibility of listing spotted seals.

Pg. 24, Ringed Seals: The rapidly changing ice conditions of the Chukchi and Beaufort Seas may have dramatic consequences to ringed seals, especially when considered together with potential impacts from oil and gas activities. Additional information is needed about how ringed seals use the Chukchi Sea, especially in the leased area, and how that use is changing with changing environmental conditions.

Pg. 24, "among 2,679 seal sightings" – there is no indication of if these sightings were identified to species or were "unidentified seals". This is important to know, as there has been a problem with Shell MMOs identifying seals to species in the past.

Pg. 25, Type of Incidental Take Authorization Requested: Shell states that "no take by serious injury is anticipated" and that "no lethal takes are expected". NMFS must carefully consider this assertion (and the parenthetical statement in Section 6 of the IHA) given the recent sightings of whale carcasses in areas that oil companies have been conducting seismic surveys since 2006. Koski (LGL, Shell's contractor) recently stated that ~100

carcass sightings were made in the past three years in the Chukchi Sea. While many of these sightings may be of the same carcasses, it is troubling that so many carcasses are being seen, including a bowhead carcass with a gash on its side. This gash suggests it might have been struck by a large vessel, the most numerous in the Chukchi Sea being those of oil and gas industry. *See* Attachment B. Necropsies of any marine mammal carcasses found by Shell are needed to verify cause of death. This should be a part of Shell's required monitoring program.

Pg. 25, How are these mitigations measures being evaluated for efficacy? Shell asserts that mitigation measures are designed to protect animals from injurious takes, but it is not clear that these mitigation measures are effective. In data previously presented by Shell and ConocoPhillips from their seismic activities, it was clear that many marine mammals were not detected in the safety zones. Marine Mammal Observers (MMOs) detected most of the marine mammals close to the source vessel and few animals were seen at farther distances. In essence the MMOs were not able to observer marine mammals in the entire safety zones. Thus, the safety zones do not provide adequate mitigation from physical harm to marine mammals. It is unclear how NMFS and MMS can permit Shell to conduct seismic operation when industry is not adequately monitoring safety zones, which are designed to protect marine mammals from physical harm or death.

Pg. 25, last paragraph: Shell proposes to use density estimates from Bengtson et al (2005) for bearded and ringed seals. This is not appropriate because Bengtson et al. surveys were conducted during the spring of seals basking on the ice. It is very likely that estimates of seals during the open water period are much different than spring surveys. Shell should be required to conduct surveys to appropriately estimate densities of these two seal species that are being considered for listing. Additionally, Shell states that it uses ship board estimates of some marine mammals to estimate densities for estimating takes in the Chukchi Sea. This is inappropriate because it will underestimate densities. A cursory comparison of Shell's density estimate from shipboard and aerial surveys reveals that ship board estimates are biased low (see Shell's annual reports). Therefore estimates of takes by harassment will be biased low for any time that density estimates from ships are used.

Pg. 26, 1st paragraph: Shell's approach to estimating densities of beluga and bowhead whales is problematic. They are using densities from aerial surveys. These estimates would be appropriate if bowheads and belugas were more or less stationary. In reality, the entire bowhead population and both stocks of belugas (eastern Chukchi and Beaufort) migrate through the area Shell proposes its 2009 exploration activities. Thus, many more

bowheads and belugas may potentially be taken during Shell's operations than what they have estimated. NMFS should carefully evaluate, and modify as appropriate, the approach Shell has used for estimating takes.

Pg. 27, 1st paragraph: Though these species may not occur in "meaningful numbers" (which is questionable in itself due to lack of decent population data), Shell still needs to consider impacts on these species.

Pg. 27, penultimate paragraph: Shell suggested that most of the bowheads will migrate north of the areas where shallow hazards and site clearance survey will occur. In the absence of specific locations of where activities will occur, it is not clear whether bowheads will actually be migrating north of the areas. Furthermore, recent satellite tracking data show that many of the tagged whales migrated through the areas that have been leased by Shell. Shell also estimates how many whales will be exposed to 160 dB sound levels. Estimates should be extended to the 120 dB isopleth. Shell has stated that most of the bowheads migrating through the Chukchi Sea are not feeding. Based on the best available science, we know that bowheads are very sensitive to low sound levels while they are migrating. Therefore it is appropriate to use the larger 120 dB isopleths for estimating takes of bowheads in 2009. Shell's estimate of how many bowheads must be evaluated and modified.

Pg. 29, Harbor porpoise: "*Harbor Porpoise* densities were estimated from industry data collected during 2006 activities in the Chukchi Sea." While this may be "best or only available data", these industry surveys were not designed to count harbor porpoise and cannot be relied upon as good estimates of density

"Although there is evidence of the occasional occurrence of these species in the Chukchi Sea, it is unlikely that more than a few individuals will be encountered during the proposed survey." This should be removed, as it is speculation.

"Small numbers of minke and humpback whales were observed during industry activities in 2006 and 2007 (Ireland et al. 2008)." If marine mammals were expected to flee from the industry operations/disturbance, then the numbers of animals actually seen would likely be a gross underestimate

Pg. 30, 1st paragraph: "Ribbon seals have been reported in very small numbers within the Chukchi Sea by observers on industry vessels (Ireland et al. 2007a, Patterson et al. 2007)

so minimal values have been used for expected densities." This is entirely inappropriate logic and is unacceptable for density estimation.

Pg. 32, 1st paragraph: "During the fall, most bowhead whales will be migrating past the ice gouge survey area, so it is not accurate to assume that the same individuals would be present in or near the survey area from one day to the next." This depends on where the ice gouge surveys are (and we have not been provided these data). If the area is important to feeding, it IS possible for the same individuals to remain in the area from one day to the next.

Pg. 34, Potential number of takes by harassment: Shell must use the 120 dB isopleth for estimating the number of bowheads that might be taken by harassment. As mentioned above, migrating bowheads are very sensitive to anthropogenic sound. Shell has stated that bowheads mostly migrate through their proposed survey area and there is no evidence that they feed there. Therefore, using the best available science, the estimated number of bowheads taken should be based on 120 dB and not 160 dB. Throughout this section, Shell uses density estimates for calculating takes, although they appear to allow for some allowance for migrating bowheads. Allowance for migration of the other species of marine mammals is also needed.

Pg. 34, 4th paragraph: "Excessive amounts of repeated exposure can lead to overestimation of the number of animals potentially exposed through double counting." This can also cause greater harm in animals exposed multiple times/chronically

Pg. 34, 5th paragraph: "Shallow hazards and site clearance surveys in the Chukchi Sea are planned to occur along ~480 km of survey lines (plus ~120 km of mitigation gun activity between survey lines) from Aug – Sep exposing ~900 km2 of water to ≥160 dB…"This information is of minimal use without specifics on where the surveys will happen: will this be a block of exposed area or strung out islands of exposure? This affects the total area that gets impacted.

Pg. 35, 1st paragraph: "Under this assumption, densities of marine mammals expected to be observed in or near ice margin areas have been applied to 10% of the proposed survey trackline." NSB requests more information on how these estimates were developed.

Pg. 35, 5th paragraph. This would assume that Shell's MMO's would need to visualize 283 bowhead whales in the 160 dB isopleth. Such numbers of whales have not been seen in the past.

Pg. 40, Table 6-13: There are several references to the lack of evidence for damage to auditory mechanisms of several marine mammals, as well as references to no conclusive evidence that bowhead whales have been displaced from feeding activity by seismic noise. First, a lack of data does not amount to a lack of evidence. Shell needs to provide actual citations that show a lack of damage. These citations must be from studies of baleen whales, beluga and pinnipeds that were focused on the assessment of this type of damage. But this information does not exist for the noise produced typical of arctic open water seismic operations. In fact, the basic anatomy of the bowhead whale auditory apparatus has not been investigated. Second, regarding feeding displacement, as discussed in the scientific committee meeting of the 2008 International Whaling Commission: the lack of displacement during seismic operations of bowheads on feeding grounds is not necessarily evidence of lack of disturbance. On the contrary, these animals may be tolerating and exposing themselves to dangerous levels of sound in order to perform vital biological activities (i.e., feeding).

Pg. 41, paragraph 5, "Belugas will likely occur in small numbers in the Chukchi Sea during the survey period and few will likely be affected by the survey activity. In the Beaufort Sea belugas generally occur further offshore than the proposed survey area and are also not likely to be affected by survey activities." There is not enough existing information to make this statement.

Pg. 41, last paragraph: "The latter is ~2% of the Bering–Chukchi–Beaufort population". This is a large percentage of the population. How many will be calves? They are likely to be more sensitive. How is this being monitored?

Pg. 42, Shell states that "the number of migrating bowhead whales exposed to sounds ≥120 dB by the proposed surveys would be 8.5× the number estimated at ≥160 dB . Actual numbers should be included. By our calculation, this is 2405 whales, almost a fifth of the BCBS Stock of bowhead whales, exposed at 120 dB. Harassment of this many whales in this stock should not be permissible.

Pg. 43, Number seven: impacts are expected from vessel movements and airgun operations. Shell needs to include a plan of reporting/communicating the presence of floating dead marine mammals within the zone of industrial exploration. A number of carcasses were noted in 2008, but none were marked (to prevent re-counting, which obscures true carcass counts) and often these reports did not reach the institution with response capabilities until well after the sightings (days later). From discussions at the 2009 Open

Water Meeting, industry stated that they were interested in working with NMFS and the NSB on getting a plan together for these response activities—which would work to sample these animals, at a minimum, for genetics (i.e., skin sample) or at a maximum, for a gross necropsy for determination of cause of death (when possible). Shell often says that there have been no impacts to marine mammals from their offshore exploratory activities. However, these statements are misleading- if no one is looking for them, impacts of this sort will not be found.

Pg. 43, Number eight: The mitigation measures outlined in the 4MP are not clearly stated. Monitoring is not mitigation. NSB request the opportunity to review the POC referred to in this paragraph.

Pg. 43, Number nine: "Any effects would be temporary and of short duration at any one place." It is difficult, if not impossible to judge this statement from the information included in this IHA.

Pg. 44, "…concluded that mortality rates caused by exposure to sounds are so low compared to natural mortality that issues relating to stock recruitment should be regarded as insignificant." What about these effects in addition to natural mortality?

Pg. 44, "In the absence of important feeding areas, the potential diversion of a small number of bowheads is not expected to have any significant or long-term consequences for individual bowheads or their population. Bowheads, gray, or beluga whales are not predicted to be excluded from any habitat." If these whales are avoiding the 160 dB and potentially the 120 dB isopleths, and the logic that is used for use of the mitigation gun is that the sound "clears" the area, then, yes, they will most certainly be excluded from part of their habitat.

Pg. 45, "Aerially" is still a visual sighting and from what is listed in the 4MP, no aerial monitoring is being proposed. This term should be removed, as it may mislead the reader into thinking that Shell is using planning on using aerial monitoring this season.

Pg. 45 and 46, Section 12, i: NSB appreciates the chance to review a POC, although such review alone does not necessarily allow for acceptance or agreement by the potentially affected communities. If NMFS is going to rely on a POC so there are no unmitigable adverse impacts to subsistence hunting of marine mammals, there must be some process by which the communities can formally agree and accept the POC. The AEWC's Conflict Avoidance Agreement (CAA) has worked very well over the past 15 years, in part,

because all parties formally agree to mitigation measures. A formal agreement approach should continue to be used.

Pg. 46, Section iii, 1: Transit of Shell's vessels should not occur before 15 July instead of the stated date of 1 July. The villages of Point Lay and Wainwright hunt beluga whales during late June or July (or sometimes early August). Transiting vessels through the Chukchi Sea might cause belugas to avoid their traditional congregation areas near shore and thus impact subsistence hunting. The Native Village of Point Lay and the Alaska Beluga Whale Committee have previously asked Shell to not move through the Chukchi Sea until 15 July.

Marine Mammal Monitoring and Mitigation Plan (4MP) General Comments:

Mitigation Measures There are descriptions of zones of impact within this document; however, there is no clear statement of mitigation measures associated with these zones of impact. Monitoring does not equate to mitigation. There must be a clear action that results from monitoring and these actions should go further than just "power downs." Clear indications of when mitigation measures are triggered and what results will occur are needed in this document.

Safety and disturbance zones:

Data collected by Shell and other companies in 2006 revealed that MMOs were not able to adequately monitor the safety zones. It is likely that marine mammals entered the safety zones and were exposed to sound levels that could have resulted in physiological damage to marine mammal ears. Shell and NMFS should modify the monitoring techniques so that MMOs can monitor the entire safety zones or cease operations when this is not possible. With regard to night-time and poor visibility conditions, Shell proposes essentially no limitations on operations, even though they acknowledge that the likelihood of observers seeing marine mammals in such conditions is low. The obvious solution, not analyzed by Shell or NMFS, is to simply prohibit seismic surveying when conditions prevent observers for detecting all marine mammals in the safety zone.

Shell will conduct exploratory operations in the Chukchi from approximately mid-July to late August and in the Beaufort from approximately late August to October. If NMFS relies on mitigation included in an IHA to find an activity will have only a negligible level of impact, that finding is "subject to such mitigating measures being *successfully* implemented." The issue of Shell operating in the Beaufort in October presents a situation where NMFS should adhere to this statutory command. Weather and darkness interfere with the mitigation and monitoring.

Impacts to bowheads may occur. Yet without the measures being implemented with some degree of regularity, ensuring that impacts to bowhead remain "negligible" is difficult if not impossible. Additionally, there is no clear and effective way of determining if these measures are successful.

As discussed at the 2009 Open Water Meeting, NSB would like to work with industry to determine cause of death and perform other biological sampling from carcasses noted in areas of industrial activity. There are no provisions within this 4MP that facilitate these objectives. Additionally, NSB has asked industry to work with NMFS to develop a plan to mark carcasses so that they are not re-counted and a more definitive count of dead, floating marine mammals within the industry zone of operations can be made. This is not included here.

Aerial Surveys:

Shell should conduct aerial surveys in 2009 to help contribute to the understanding of the baseline conditions. Conducting surveys in 2009 would be especially helpful because little exploration activity will be occurring in 2009. Understanding marine mammal behavior and distribution in a year with little activity will provide an important comparison for years with additional seismic, exploratory drilling, production activities, or production.

Pg. 4, Ramp-up, Power downs and shut downs: Data need to be collected to better understand the effectiveness of these mitigation measures.

Pg. 5, MMO: Marine mammal observers provide an important mitigation measure for reducing the potential for Level A takes from seismic surveys. However, they are not effective at monitoring the larger area where Level B takes might occur. Sightability curves provided in the past by Shell show that MMOs are not able to detect marine mammals effectively in the more distance portions of the 160 dB and certainly the 120 dB isopleths, 1400 m and 24000 m (Table 1), respectively. Therefore, MMOs will not provide a reasonable measure of how many marine mammals are exposed to sounds produced by site clearance and shallow hazards surveys. Additional monitoring approaches, such as intensive acoustic monitoring, chase vessels, or aerial surveys are needed.

Pg. 10, last paragraph: Shell states, "Nearshore manned aerial overflights conducted in 2006-2008 have not revealed significant patterns of marine mammal distribution or behavior despite extensive programs of 2D and 3D seismic acquisition by multiple parties." The NSB has previously asked for this analysis to be completed, most recently at the open water meeting in April 2009. Shell did not present the analysis or even hint that it had been completed. We would like to see the details of this analysis.

Pg. 13, last 2 paragraphs: Intensive acoustic arrays will be deployed around Burger and Klondike. Those arrays will be able to document locations of calling whales or other marine mammals. Are Shell's shallow hazards and site clearance surveys restricted to the Burger prospect or are they occurring in other areas too? If they are occurring in other areas, Shell should deploy intensive arrays around the areas they will be using their airguns. As mentioned previously, MMOs are not adequate for monitoring the impacts of the airguns on marine mammals. The MMOs cannot see the extent of the zone in which marine mammals might be disturbed or harassed. Thus, other monitoring techniques are needed. If intensive arrays are not deployed, then Shell should have chase boats monitoring in front of the seismic vessel, they should use aircraft to monitor, or they should employ another suitable technique for monitoring. This is especially important because little information has been provided by Shell in the past three years on the impacts from their activities on marine mammals in the Chukchi Sea. This additional information is needed to develop appropriate mitigation measures for the future. NMFS should require adequate monitoring in the areas where Shell will be doing shallow hazards and site clearance surveys. If the intensive arrays are restricted to Burger and Klondike, then Shell's exploration activities should be restricted to those areas.

In conclusion, I have also attached and incorporate by reference my letter to NMFS, as well as NMFS' response, asking for suspension and review of Shell's 2008-2009 IHA, wherein Shell was allowed to proceed with seismic activities despite what was acknowledged by NMFS to be a potentially flawed survey design. (See Attachments D and E). At that time, NSB asked that no more IHAs be issued until compliance with the MMPA could be demonstrated. Based on our review of NMFS' current proposed authorization of incidental take of marine mammals from seismic surveying in the Chukchi Sea during 2009-2010 by Shell, we do not see such a demonstration of compliance and thus do not support issuance of an IHA at this time.

Thank you for your consideration of these comments.

Sincerely,

Edward S. Itta

Edward S. Itta
Mayor

Attachments

cc:

Bessie O'Rourke, NSB Attorney
Gordon Brower, Acting Director, Planning
Taqulik Hepa, Director, NSB Department of Wildlife
Andy Mack, NSB Mayor's Office
Karla Kolash, NSB Mayor's Office

North Slope Borough
Office of the Mayor

P.O. Box 69
Barrow, Alaska 99723
☎ 907 852-2611 ext. 200
Fax: 907 852-0337

Edward S. Itta, Mayor

December 18, 2008

Jim Balsiger
Asst. Administrator for Fisheries
NOAA - NMFS
1315 East-West Highway
Silver Spring, MD 20910

Dear Mr. Balsiger;

We are writing to express our deep concern and to request immediate suspension and review of the Incidental Harassment Authorization (IHA) issued to Shell Offshore Oil (Shell) and the associated monitoring program for offshore oil and gas activities in the Beaufort and Chukchi Sea.

Shell, through its contractor WesternGeco, conducted shallow hazard and deep 3D seismic activity in the Beaufort Sea this season, pursuant to an Incidental Harassment Authorization (IHA) issued on August 19, 2008 from the National Marine Fisheries Service (NMFS/NOAA). One of the areas where Shell conducted seismic is in Camden Bay, near its Sivulliq and Torpedo prospects. Shell conducted seismic surveys in the same area last year. Pursuant to the IHA, Shell must employ certain monitoring and mitigation procedures, including aerial surveys to monitor impact zones. The Minerals Management Service (MMS) and NMFS are also conducting the annual Bowhead Whale Aerial Survey Project (BWASP), the purpose of which is to conduct surveys of bowhead whales during their fall migration through the Alaskan Beaufort Sea.

Based on deficiencies identified by NMFS regarding Shell's employed monitoring and mitigation procedures, and pursuant to the Marine Mammal Protection Act and its applicable regulations, NMFS has an obligation to suspend the IHA pending determination of whether Shell has substantially complied with its terms and/or whether more than a negligible impact to the species or stock is occurring.

We have discovered that on various occasions, the aerial surveys have overlapped in both time and area, and that Shell's aerial surveys are spotting fewer whales, especially calves, than the BWASP. It is unfortunate to learn that the Shell surveys may not be designed and/or conducted properly, and moreover, that in the event of conflicting information gathered from the two surveys, NMFS has determined that Shell's surveys alone are used to determine the need for mitigation.

This NMFS position is not consistent with the Marine Mammal Protection Act (MMPA). NMFS is responsible for ensuring that any permitted activity causes no more than a negligible impact to the species. Pursuant to 50 C.F.R. Sec. 216.107(f), we request that you immediately suspend all existing IHAs and refrain from issuing any new IHAs unless and until the monitoring and mitigation associated with these IHAs ensure compliance with the MMPA and protection of our people's most important natural resource.

I. Background

On September 18, 2008 the BWASP identified 8 cow/calf pairs in Camden Bay, near the location of Shell's seismic surveys.[1] Shell also conducted an aerial survey in the same general area on the same day, but only identified 2 cow/calf pairs.[2] During the day on the 19th, NMFS verified that the location of the cow/calf pairs spotted by BWASP "were well within the 120 zone, and close to or within the 160 zone." Email from Brad Smith to Ken Hollingshead et al., September 19, 2008. (See attached).

Shell states that it was not firing its airguns at the time the BWASP sightings were made (letter from Pete Slaiby to Harry Brower, Sept. 24, 2008). It is unclear whether Shell maintained its mitigation air gun, a device with untested efficacy, during the interruption of seismic activities. Shell states that it re-initiated acquisition of seismic data on September 19, 2008 prior to receiving the information from BWASP. *Id.* However, it is not clear precisely when Shell resumed the seismic shooting. Nor is it clear what steps Shell took before resuming seismic activity.

Shell claims that on September 19, it flew additional flights in the area to substantiate any sightings from BWASP, and that it observed 21 bowhead whales, 9 of which were within the 160 dB range, and 19 of which were within the 120 dB range. *Id.* Shell does not specify whether any of these 19 whales were cow/calf pairs. *Id.*

II. Was Shell abiding by the terms of the IHA when it resumed seismic shooting on September 19 and when it continued shooting after its aerial survey that day?

We request NMFS to determine whether Shell was abiding by the terms of the IHA when it resumed seismic testing and when it continued to shoot seismic after Shell's aerial survey on September 19.

At the commencement of seismic operations and anytime after the air gun array has been powered down for more than 10 minutes and the marine mammal observer (MMO) watch has

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[1] In a September 24 letter from Pete Slaiby to Harry Brower, Jr., Mr. Slaiby says 8 pairs were observed by the BWASP. However, in a September 19 email from Brad Smith to Ken Hollingshead, Mr. Smith says 8 calves were spotted in the BWASP, 4 of which were part of cow/calf pairs.

[2] In the September 24 letter from Pete Slaiby to Harry Brower, Mr. Slaiby says "[Shell's] observations at that time" were only 2 pairs. According to NMFS Brad Smith, "MMS reported that SHELL had also flown on the 18th, and had seen bowhead whales, including aggregations of 12 or more beyond the 160 isopleth, but had not seen calves." Friday, September 19, 2008 4:30 PM Email from Brad Smith to Ken Hollingshead et al.

been suspended, the operator must conduct a 30-minute period of marine mammal observations by at least one trained MMO. IHA 6(b)(v)(A). The MMO must ensure "no marine mammals are detected within the appropriate safety zones." IHA 6(b)(iv)(B). If no marine mammals are observed during this 30 minute period, the operator may ramp up arrays no greater than approximately 6 dB per 5-minute period starting with the smallest airgun in the array and then adding additional guns in sequence, until the full array is firing. IHA 6(b)(v)(C).[3] The "safety zone" is defined as the area ensonified to 120 dB for 4 or more cow/calf pairs and to 160 dB for aggregations of 12 or more whales. IHA 6(b)(iii)(E)(I).

Thus, if the mitigation airgun was powered down, Shell was required to ensure that there were fewer than 12 non-migratory mysticete whales within the 160 dB zone and fewer than 4 bowhead cow/calf pairs were within the 120 dB zone before it resumed shooting on September 19th.

After learning that Shell had ceased seismic activity but had resumed it on the 19th, Mr. Smith concluded that "SHELL appears to be in compliance with the IHA." Email from Brad Smith to Ken Hollingshead et al., Sept. 19, 2008.

However, it is not clear whether Mr. Smith determined whether the mitigation airgun remained active, and if not, whether the safety zones were cleared. It may therefore be arbitrary for NMFS to conclude that Shell was in compliance with the IHA when it resumed seismic testing.

In addition, Shell does not state whether any of the 19 whales spotted within the 160 dB zone by Shell's aerial survey on September 19th were cow/calf pairs. This information is essential to determine whether Shell was acting within the terms of the IHA when it continued to shoot seismic after its aerial survey on the 19th.

III. NMFS has the authority and obligation to revoke an IHA when the agency has reason to believe that the IHA's conditions and requirements are not being substantially complied with or if the authorized taking is having more than negligible impact on the bowhead whale

Under 50 C.F.R. Sec. 216.107(f), an incidental harassment authorization shall be modified, withdrawn, or suspended if, after notice and opportunity for public comment, the Assistant Administrator determines that:

(1) The conditions and requirements prescribed in the authorization are not being substantially complied with; or

(2) The authorized taking, either individually or in combination with other authorizations, is having, or may have, more than a negligible impact on the species or stock or,

[3] In the event that the complete safety radii are not visible for at least 30 minutes prior to ramp up, the operator can still begin ramp up but only if it has maintained a sound pressure level at the source during the interruption of seismic activity. IHA 6(b)(v)(B).

where relevant, an unmitigable adverse impact on the availability of the species or stock for subsistence uses.[4]

NMFS has the authority, and as shown below, the obligation to modify, withdraw or suspend an IHA because the authorized taking is having more than a negligible impact on the bowhead whale. Mr. Smith states that he did not require Shell to shut down its airguns upon learning of the BWASP survey because he did not believe NMFS had such authority.[5] Email from Brad Smith to Ken Hollingshead et al., Sept. 19, 2008. However, once NMFS learned of the existence of 4 or more cow/calf pairs in the area where Shell was permitted to shoot under the IHA, the agency was required to take action to ensure such activity did not cause more than negligible impact to the species.

The MMPA permits exceptions to its ban on the taking of marine mammals only if such taking will have a negligible impact on the species or stock. Thus, the IHA is valid and NMFS has the authority to issue it only if it contains restrictions on seismic activity that ensure the bowhead will not suffer more than negligible impact.

The IHA requires Shell to immediately shut down the seismic airguns whenever 4 bowhead whale cow/calf pairs are spotted within the 120 dB zone. IHA 6(b)(iii)(E)(II). Under the IHA, Shell is not permitted to resume activity until two consecutive aerial surveys confirm that there are not more than 3 cow/calf pairs within the area to be seismically surveyed within the next 24 hours. *Id.*

When NMFS confirmed that the whales spotted by BWASP were within the 120 dB range, NMFS was required to ensure that Shell immediately ceased seismic activity. It is true that the IHA provision establishing a safety zone for cow/calf pairs references "the aerial monitoring program" and its detection of the cow/calf pairs. However, it is arbitrary for NMFS to interpret this provision to preclude NMFS from having the authority to order a shut-down based on the BWASP information.

NMFS has a responsibility under the MMPA to ensure that permitted activities entail no more than negligible impact to the species. In order to fulfill this duty, the agency must interpret its IHAs to give effect to the mitigation they provide.

It is arbitrary to interpret the IHA to require that only information from the operator's aerial monitoring program can be used to trigger a seismic shut-down due to cow/calf presence. This conclusion disregards the possibility that an on-board MMO or a chase vessel could view 4 or more pairs, rather than an airplane. In that situation, it would certainly be arbitrary to interpret the IHA to allow seismic activity to continue. The same is thus true when the information comes from the agency's own independent aerial surveys. Thus, a rational reading of the IHA makes

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[4] 50 C.F.R. Sec. 216.107(g) waives the notice and opportunity for public review if the Assistant Administrator determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals concerned.

[5] Brad Smith noted that with respect to the shut-down requirements when 4 cow/calf pairs are observed, "A reading of the IHA makes it clear that the triggering of this condition is the responsibility of SHELL through its aerial monitoring program."

clear that it does not matter whether monitoring information comes from the operator or the agency's surveys.

NMFS states that it will rely on Shell's surveys rather than BWASP data to trigger mitigation because the surveys "provide real-time information to the source vessel," while "the BWASP information concerned the previous day." Email from Brad Smith to Ken Hollingshead et al., Sept. 19, 2008. This is not an acceptable interpretation of the cow/calf safety provision because it does not allow for the adequate protection of the species.

This interpretation of already weak IHA provisions does not adequately protect cow/calf pairs in part because Shell is allowed to conduct aerial surveys only once a day, weather permitting. IHA 7(c)(i)(B). Shell is thus permitted to continue shooting seismic between aerial surveys and even when surveys are cancelled because of weather. Thus, to the extent that Shell's aerial surveys act as mitigation; they are only partially effective and are hardly "real time." NMFS cannot point to this flaw in the IHA as the basis for allowing Shell to conduct seismic surveys in an area where 4 or more cow/calf pairs were identified.

In addition, Mr. Smith explains that at the time on the 19th that he viewed the map of the BWASP data overlain with Shell's position and determined that the whales were within the ensonification zones, "It was unknown whether SHELL was flying on the 19th." Email from Brad Smith to Ken Hollingshead et al., Sept. 19, 2008. Thus, when NMFS made the decision to allow Shell to continue shooting seismic, the most recent data from both Shell and BWASP were from the day before. Thus, there was no reason to ignore the agency's own information and rely on Shell's information instead.

Regardless of the terms of the IHA, NMFS has a responsibility under the MMPA to ensure that permitted activities entail no more than negligible impact to the bowhead. Thus, upon learning of the presence of the cow/calf pairs in the area, the agency was required to impose mitigation or suspend the IHA.

Decisions under the MMPA must be based on the best available science. Brower v. Evans, 257 F.3d 1058, 1070 (9th Cir. 2001). The BWASP data was the best available science, since the BWASP was better designed to actually identify the cow/calf pairs. The BWASP breaks off transect and circle sightings of whales to confirm group size and presence of cow/calf pairs while the Shell surveys do not. NMFS' own scientists called Shell's survey methodology into question and noted that it would be important for Shell's survey methodology to be modified such that cow/calf pairs could be identified. [6] Memo to James Lecky from Douglas DeMaster RE

[6] The Director noted that "aerial surveys supported by Shell were conducted at the same time and in roughly the same geographic area as aerial surveys conducted by the BWASP," and that a "qualitative comparison of the two surveys indicated that fewer bowhead whales, including calves, were seen during the industry-supported surveys compared to the BWASP surveys." *Id.* Mr. DeMaster determined that these differences were "most likely due to differences in survey methodology: the industry-supported surveys followed a strip transect protocol while the line transect protocol used by BWASP included breaking off the transect lines when whales were seen and circling sightings to confirm species, group size, and presence of cow/calf pairs." The Center concluded that the "comparison between the results of the two surveys highlights the need to leave the transect line and circle sightings in order to assess group size and composition. Thus, changes in the survey protocol for industry-sponsored surveys are recommended for 2008."

Recommended revisions to aerial surveys required for mitigation of seismic surveys 2008, July 11, 2008.

NMFS cannot rely on Shell's aerial flights alone to ensure compliance with the MMPA. The agency itself has acknowledged that Shell's methodology is not effective at identifying cow/calf pairs. Mitigation measures may not be designed in such a manner that they will not be triggered when harm occurs.

IV. Conclusion

In conclusion, we are extremely concerned about the manner in which NMFS has decided not to enforce the IHA. The IHAs are arbitrary if they are based on mitigation which is ineffective. NMFS cannot avoid its responsibility to protect the bowhead whale by relying on Shell's inadequate surveys and ignoring BWASP data. NMFS must revoke Shell's IHA and refrain from issuing any further IHAs until the agency can ensure that seismic activity is causing no more than a negligible effect on the bowhead whale.

Sincerely,

Mayor Edward S. Itta

attachments

cc: Jim Lecky (NMFS), Doug DeMaster (AFSC), and Mark Hodor (NOAA GC).

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Alaska Fisheries Science Center
7600 Sand Point Way N.E.
Bldg. 4, F/AKC
Seattle, Washington 98115-0070

JUL 11 2008

MEMORANDUM FOR: James H. Lecky
Director, Office of Protected Resources, Silver Spring

FROM: Douglas P. DeMaster, Ph.D.
Director, Alaska Fisheries Science Center, Alaska Region

SUBJECT: Recommended revisions to aerial surveys required for mitigation of seismic surveys in 2008

In 2007, as in many previous years, NMFS required industry-supported aerial surveys to monitor for and mitigate potential impacts of industry activities on cetaceans, particularly bowhead whales. According to NMFS managers at F/PR1 and AKR, various documents prepared by NMFS in 2007 to support the authorization issued to Shell allowing the take of marine mammals incidental to their operations made it clear that these aerial surveys were to be used by Shell to determine when there are 4 bowhead cow/calf pairs in an area and to determine when there are aggregations of 12 or more whales (see attached for specific language and citations). According to the IHA, if these thresholds were encountered, Shell was required to make certain changes in their operations (refer to the IHA and supplemental EA for details on the changes).

In 2007, aerial surveys supported by Shell were conducted at the same time and in roughly the same geographic area as aerial surveys conducted by the Bowhead Whale Aerial Survey Program (BWASP), which is supported by NMFS and MMS. A qualitative comparison of the two surveys indicated that fewer bowhead whales, including calves, were seen during the industry-supported surveys compared to the BWASP surveys. Brief discussions with the survey team leaders and comparison of survey protocols indicated that these differences were most likely due to differences in survey methodology: the industry-supported surveys followed a strip transect protocol while the line transect protocol used by BWASP included breaking off the transect lines when whales were seen and circling sightings to confirm species, group size, and presence of cow/calf pairs. This comparison between the results of the two surveys highlights the need to leave the transect line and circle sightings in order to assess group size and composition. Thus, changes in the survey protocol for industry-sponsored surveys are recommended for 2008 in order to meet the monitoring and mitigation requirements as stated in the IHA.

In 2008, if NMFS managers again intend to require changes in industry operations if a threshold involving the number of cow/calf pairs is met, or if an aggregation of whales is encountered, we recommend that NMFS require that when a large whale is sighted, the survey should break transect and circle the sighting at least twice to confirm species, group size, and composition. If additional sightings are made in the vicinity, these should also be circled to confirm species, group size, composition, and activity, if activity can be determined (such as feeding or

migrating). If there is uncertainty about whether a sighting is a large whale, the sighting should be circled, because in addition to bowhead whales, there are also gray whales and humpback whales in the U.S. Beaufort Sea, and sightings of any large whale species may be confused with a bowhead whale sighting. This change in survey protocol will greatly increase the efficacy of the surveys with regard to the stipulations of the IHA.

At the open water monitoring meeting in May, it became clear that industry is defining an aggregation of whales as a group of 12 whales observed within 5 body lengths of each other. After discussing this issue with NMML staff, it became evident that this is not a reasonable definition of a bowhead whale aggregation, especially as seen during an aerial survey, because expert opinion (Rugh, Moore, Angliss) indicates that this type of dense grouping is extremely rare for bowhead whales. Instead, an aggregation is better defined as a certain number of whales within acoustic contact. For instance, Clark discusses the concept of an "acoustic herd" whereby whales maintain contact with each other over 10-15 km by counter-calling (Wursig and Clark 1993: 189). More recently, Blackwell et al 2007 (p. 261-262) reported call sequences as a "series of repeated identical or similar calls presumably produced by an individual whale or an interacting group of whales." These call sequences were detectable over distances "up to 15km or more." Although determining an 'acoustic aggregation' would be impractical to assess during an aerial survey, we recommend that an aggregation of 12 bowhead whales be defined as 12 whales seen, either on transect or while circling, within a circular area with a diameter of 15km. Therefore, after a sighting is made, it should be circled sufficiently to check a 7.5 km radius around the area, and any subsequent sightings should be circled to see if they are within 15 km of the original sighting. The number of whales observed is often only a small portion of the number of whales in an area at any one time. According to Wursig et al. (1984), the mean proportion of time that bowheads are visible from the air in the eastern Beaufort Sea during summer is 0.38. Therefore, observations of 12 whales seen from an aircraft while on transect would likely represent over 30 whales, and these animals would certainly be sufficiently close to be in acoustic contact, so they could be moving and behaving as a group.

We also recommend a change to the requirement that the aggregation of 12 whales be "a feeding group." First, it is not always practical to recognize whale behavior from an aircraft, so the mitigation should focus simply on detecting when a group of 12 whales is in the area of interest; the animals' behavior should be irrelevant for purposes of mitigation. Second, because of the possible confusion of whale species when seen from a distance, the standard should be set for detection of a group of any large whales.

Finally, it is not clear at what airspeed industry-supported surveys are being flown, although subsequent discussions indicate that they may be flying at 120kts. Because detection of whales is in part a function of time spent viewing an area, using a slower airspeed is preferable to a faster airspeed. For instance BWASP surveys are generally conducted at 100kts and 1500 ft altitude, which is considered a good compromise between maximizing the time viewing an area and a safe airspeed. Therefore, it seems appropriate for industry-sponsored surveys to also conduct their surveys at 100kts where detection of whales relative to mitigation thresholds is important.

Thank you for considering these recommendations. Please contact myself or Robyn Angliss (206/526-4032) if you have questions or concerns.

cc. Hollingshead (F/PR1)
Smith, Wilder (NMFS/AKR)
Angliss, Moore, Clapham, Rugh (NMFS/NMML)
Lewandowski, Williams, Monnett (MMS)

References

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ATTACHMENT

Aerial surveys must be able to detect 4 cow/calf pairs within the 120dB safety zone in the Beaufort Sea

The Incidental Harassment Authorization for Shell seismic in 2007 states: "Whenever the aerial monitoring program . . . detects 4 bowhead whale cow/calf pairs within an acoustically-verified 120-dB monitoring zone, the holder of this Authorization must: (a) Immediately power-down the seismic airgun array and/or other acoustic sources to ensure that sound pressure levels are reduced by at least 50 percent; and (b) not proceed with ramping up the seismic airgun array until two consecutive aerial surveys confirm that there are no more than 3 bowhead cow/calf pairs within the area to be seismically surveyed within the next 24 hours."

Page 4 of the Finding of No Significant Impact statement at the end of the supplemental Environmental Assessment for the 2007 Open Water Seismic Survey Season states: ". . . (1) implementing a 120dB monitoring-safety zone for concentrations of migrating bowhead cow/calf pairs in the U.S. Beaufort Sea." Page 5 of the FONSI statement indicates that the threshold for the number of cow/calf pairs observed within the 120dB monitoring-safety zone is more than 3.

Aerial surveys must be able to detect an aggregation of 12 whales observed within the 160dB safety zone in the Beaufort Sea

The supplemental Environmental Assessment for the 2007 Open Water Seismic Survey Season identified a mitigation measure that requires the detection of an aggregation of whales (page 20): "Whenever an aggregation of bowhead whales or gray whales (12 or more whales of any age/sex class that appear to be engaged in a nonmigratory, significant biological behavior [e.g., feeding, socializing] are observed during an aerial or vessel monitoring program within the 160dB safety zone. . ." These requirements also appear in the Finding of No Significant Impact (pages 4, 5): "To prevent significant impacts during important life stages of the bowhead and gray whales, additional mitigation measures will be required. . .(1) implementing a . . . 160dB monitoring-safety zone for feeding concentrations of bowhead and gray whales in the Beaufort and Chukchi seas; . . . .(3) conducting aerial and vessel surveys in the Beaufort Sea for feeding concentrations of bowhead and gray whale in the 160dB monitoring-safety zone. . ."

From:	Robert Suydam
To:	Cheryl Rosa; Hughes, Layla; Jessica Lefevre (E-mail); Chris Winter (E-mail)
Subject:	FW: SHELL Seismic
Date:	Monday, September 22, 2008 14:05:04

Below is an email from Brad Smith about the monitoring associated with Shell's seismic and the BWASP surveys. This is a strange rationalization about not using the best available data for making decisions.

-----Original Message-----
From: Brad Smith [mailto:Brad.Smith@noaa.gov]
Sent: Friday, September 19, 2008 4:30 PM
To: Ken Hollingshead; Mark Hodor; Kaja Brix; Robyn Angliss; Phillip Clapham; Sloan, Pete; Monnett, Charles
Subject: SHELL Seismic

I received information via email at 7:00am on Sept. 19 regarding BWASP observations of Sept. 18 in the Beaufort. BWASP reported 4 sightings of 8 bowhead calves. Four (4) of thee were specifically identified as cow/calf pairs. Position data was included in the report. The SHELL IHA contains a condition requiring shut down of the seismic array if aerial monitoring detects 4 cow/calf pairs within the 120 dB isopleth.

I next tried to contact K. Hollingshead and M. Hodor regarding the situation, but both were unavailable.

I contacted Pete Sloan (MMS) who had also received this information and who agreed to map the sighting data relative to the SHELL program, whose current location is proprietary. I later went to MMS to view their mapping. This clearly showed these sightings within a fairly tight cluster southwest of the seismic patch being shot by SHELL. Their projection included both 160 and 120 dB isopleths. The calf and cow/calf pair sightings were well within the 120 zone, and close to or within the 160 zone.

A reading of the IHA makes it clear that the triggering of this condition is the responsibility of SHELL through its aerial monitoring program, which after Sept. 1 is to look for cow/calf pairs during normal survey activity. There is no provision for shut down due to observation by others. While at MMS, I discussed the situation with their Leasing and Exploration and Field Operations branches. MMS reported that SHELL had also flown on the 18th, and had seen bowhead whales, including aggregations of 12 or more beyond the 160 isopleth, but had not seen calves. It was unknown whether SHELL was flying on the 19th.

We discussed whether NMFS or MMS should seek to impose the shutdown of SHELL's operation from this information. Both I (for NMFS) and MMS recommended against doing so at this time for several reasons,including:

1) the IHA places responsibility for this determination with SHELL, 2) SHELL appears to be in compliance with the IHA, 3) While the SHELL surveys provide real-time information to the source vessel, the BWASP information concerned the previous day. The presence of the cow/calf pairs yesterday may not trigger shut down today, as we had no information these animals/conditions were still present, 4) the whales were to the south and west of the operation, which may have placed them "downstream" of the seismic work, assuming the migration progresses to the west and 5) it is unclear whether we (NMFS) have the authority to do

so.

I called Mike McCrander (SHELL) and recommended that SHELL be alerted to the BWASP sightings, and try to overfly the area in which these sightings occurred. The tight clustering and position of these whales this close to an active seismic vessel might indicate feeding behavior. In that case, the whales could remain in the general area for some time. I also provided SHELL with my home number for weekend contact. McCrander said they were aware of the reports and had flown surveys on the 19th, but did not yet have the daily report.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

FEB 19 2009

Edward S. Itta
Mayor, North Slope Borough
P.O. Box 69
Barrow, Alaska 99723

Dear Mayor Itta:

Thank you for your letter regarding your concerns surrounding Shell Offshore, Inc's (SOI) compliance with their Incidental Harassment Authorization (IHA) issued by the National Marine Fisheries Service (NMFS) on August 18, 2008. Specifically, you request that NMFS determine whether SOI was in compliance with conditions of their IHA when the company failed to detect an aggregation of bowhead whale cow/calf pairs, and implement a shutdown of the seismic source(s) on September 18, 2008. The whales in question were spotted during a separate Minerals Management Service (MMS)/NMFS Bowhead Whale Aerial Survey Program (BWASP) flight on the same date.

NMFS has reviewed the circumstances surrounding this event, and determined that SOI was in substantial compliance with their IHA during the 2008 seismic season. Your specific concern stems from a series of events that occurred on September 18, 2008, when the number of bowhead whales observed by the BWASP surveys exceeded those observed during the SOI aerial monitoring survey near the area in the Beaufort Sea where the SOI seismic vessel was operating.

At the time of this event, two aerial survey programs were occurring in the Beaufort Sea. NMFS and MMS were cooperatively conducting the BWASP survey in addition to the SOI monitoring survey. The BWASP survey is an on-going effort in the Beaufort Sea each fall to record the timing and location of the bowhead migration. The protocol includes line transects and when whales are detected, the plane breaks away from the transect line and circles the observed whales to confirm numbers present. SOI survey protocols are different from those of BWASP, and do not include line transects or circling. The IHA specifically states that SOI is required to comply with the aerial survey design described in their Beaufort Sea monitoring plan, which requires SOI to use standard aerial survey procedures for detecting marine mammals and take appropriate action when groupings of specific numbers and types of marine mammals are detected within pre-determined monitoring zones (e.g., 12 or more non-migratory mysticete whales or 4 or more bowhead cow/calf pairs). On September 18, 2008, both surveys saw one (1) cow/calf pair from the track line. However, BWASP broke away from the track line and circled during which the remaining sightings occurred. It is apparent that the difference in the number of whales observed on September 18 can be attributed to survey design.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

NMFS Alaska Region was notified of the September 18 BWASP observations by email on the morning following the event, September 19. SOI was made aware of these sightings and asked to closely survey this area during their surveys of September 19. SOI complied, and conducted additional overflights in the area to substantiate any sightings from BWASP. However, SOI observed only a single cow/calf pair but not the grouping of the previous day.
Given the information available, there is nothing to indicate that SOI knowingly violated its IHA, or that any other action taken by SOI was a substantial departure from the IHA's requirements. Consequently, SOI was not required or advised to power down or shut down the array during the events of September 18 and 19, 2008. Therefore, after this thorough review, the record continues to support NMFS' initial determination that SOI acted in compliance with their IHA.

NMFS exercises due diligence in the Marine Mammal Protection Act (MMPA) process by providing the public the opportunity to comment on proposed authorizations, including mitigation and monitoring, and in the case of seismic and other oil exploration activities in the Arctic, through annual "open water" meetings to review the results of monitoring plans and consider the design and adequacy of future monitoring plans. The failure to detect whales during an aerial monitoring survey may indicate a flaw in the survey design and not necessarily a violation of a condition of the IHA. However, NMFS will continue to look at the efficacy of industry monitoring and will continue to refine the process as necessary to ensure the objectives and requirements of the MMPA are satisfied. We intend to address this subject with stakeholders at the next Open Water Meeting, tentatively scheduled for early April 2009 in Anchorage.

I believe this addresses your concerns and the issues of August 18 and 19, 2008. I look forward to continued discussion of this, and other related matters at the Open-Water Meeting in Anchorage, Alaska. If you have further questions do not hesitate to contact Mr. Michael Payne, or Candace Nachman at (301) 713-2289.

Sincerely,

James W. Balsiger, Ph.D.
Acting Assistant Administrator
for Fisheries

Ocean Conservancy

OCEANA | Protecting The World's Oceans
175 South Franklin Street, Suite 418 +1.907.586.4050
Juneau, AK 99801 USA www.oceana.org

Submitted via first class mail and electronically to: PR1.0648–XP00@noaa.gov.

July 1, 2009

P. Michael Payne
Chief, Permits, Conservation and Education Division
Office of Protected Resources, National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910–3225

RE: Proposal to Issue an Incidental Harassment Authorization to Shell Offshore Inc. and Shell Gulf of Mexico Inc. for Seismic Activities in the Chukchi Sea During 2009–2010

Dear Mr. Payne:

Oceana and Ocean Conservancy appreciate the opportunity to comment on the National Marine Fisheries Service's ("NMFS") proposed issuance of an Incidental Harassment Authorization ("IHA") to Shell Offshore Inc. and Shell Gulf of Mexico Inc. (collectively, "Shell"). 74 Fed. Reg. 26,217 (June 1, 2009). Shell seeks approval to conduct seismic activities, including shallow hazard/site clearance surveying and a strudel scour survey in the Chukchi Sea. NMFS has proposed to issue an IHA authorizing harassment of marine mammals pursuant to those activities. The IHA, as proposed, would encompass a full year, from August 2009 through July 2010. These activities could substantially affect marine mammals in an area already impacted by climate change and particularly vulnerable to ocean acidification. Approving an IHA in these circumstances would be contrary to NMFS's responsibilities under the law.

The Arctic is at once one of the most beautiful and forbidding places on Earth and a critical component of the planet's ability to sustain life. Despite harsh conditions, the Arctic is home to vibrant communities and functioning ecosystems. It also provides important habitat for some of the world's most iconic wildlife species and helps regulate the planet's climate. Healthy oceans are critical to Arctic life and, despite its importance, the Arctic, especially the Arctic Ocean, is one of the least-understood regions on Earth. It is also now at a dramatic crossroads. The Arctic is warming at approximately twice the rate of the rest of the planet, and changes related to that warming—particularly the loss of sea ice—have created the potential for rapid industrialization. Arctic marine ecosystems also are particularly vulnerable to ocean acidification, and may experience substantial negative impacts sooner than many other areas of the ocean.

In the past, federal agencies have allowed industrial activities in the Arctic without a sufficient scientific understanding of the potential effects of those activities, and without a comprehensive plan to guide decisions about Arctic resources as part of a transition from oil and gas to renewable energy. NMFS should not continue that course. Rather than approving exploratory

activities with unknown consequences, NMFS must work to gain the necessary scientific information to understand fully the ramifications of these activities in a changing marine environment.

Shell's current application for an IHA must not be considered in a vacuum. The application comes on the heels of past seismic testing and signals Shell's desire to undertake future activities, including exploratory drilling. Comprehensive, science-based planning is needed to determine if these industrial activities should occur and, if so, when, where, and how. NMFS should work with the Department of Interior, Environmental Protection Agency, and other entities to ensure that such planning occurs before it authorizes activities like the seismic activities proposed here. By doing so, NMFS can ensure compliance with its obligations under the Marine Mammal Protection Act and other laws.

Further, the proposed seismic testing "will be conducted on leases that were acquired in Outer Continental Shelf (OCS) Lease Sale 193." *Id.* at 26,218-19. The Minerals Management Service conducted Lease Sale 193 pursuant to its 2007–2012 Five-Year Leasing Program. The United States Court of Appeals for the District of Columbia Circuit found that Leasing Program unlawful and vacated it. *See Ctr. for Biological Diversity v. U.S. Dep't of the Interior*, Nos. 07-1247 & 07-1344, slip op. (D.C. Cir. Apr. 17, 2009). In addition, the analyses supporting Lease Sale 193 are the subject of a separate challenge brought by Alaska Native and conservation groups in federal court in Alaska. *See Native Village of Point Hope v. Salazar*, No. 1:08-cv-00004-RRB (D. Alaska, filed Jan. 31, 2008). NMFS should not authorize activities on these leases until an appropriate evaluation and decisionmaking process, including the environmental sensitivity analysis required by the *Center for Biological Diversity* decision, is undertaken.

Finally, we agree with the concerns raised in the comment letter on this application submitted today by Earthjustice on behalf of its members and other concerned groups.

Thank you again, and we look forward to working with you on this and other issues.

Sincerely,

Jim Ayers
Vice President
Oceana

Janis Searles Jones
Vice President, Legal Affairs and General Counsel
Ocean Conservancy