



Incidental Harassment Authorization

SAExploration, Inc. (SAE), 8240 Sandlewood Place, Anchorage, Alaska 99507, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1371(a)(5)(D)) and 50 CFR 216.107 to take, by Level A and Level B harassments only, small numbers of marine mammals incidental to conducting open-water 3D ocean bottom node (OBN) seismic surveys in the U.S. Beaufort Sea, contingent upon the following conditions:

1. This Authorization is valid from July 1 through October 15, 2015.
2. This Authorization is valid only for activities associated with open-water 3D OBN seismic surveys and related activities in the Beaufort Sea. The specific areas where SAE's survey will be conducted are within the Beaufort Sea, Alaska, as shown in Figure 1-1 of SAE's IHA application.
3. (a) The species authorized for incidental harassment takings, Level A and Level B harassments only, are: beluga whales (*Delphinapterus leucas*); bowhead whales (*Balaena mysticetus*); gray whales (*Eschrichtius robustus*); bearded seals (*Erignathus barbatus*); spotted seals (*Phoca largha*); and ringed seals (*P. hispida*).

(b) The authorization for taking by harassment is limited to the following acoustic sources and from the following activities:
 - (i) 620-in³ and 1,240-in³ airgun arrays and other acoustic sources for 3D open-water seismic surveys; and
 - (ii) Vessel activities related to open-water seismic surveys listed in (i).
(c) The taking of any marine mammal in a manner prohibited under this Authorization must be reported within 24 hours of the taking to the Alaska Regional Administrator (907-586-7221) or his designee in Anchorage (907-271-3023), National Marine Fisheries Service (NMFS) and the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at (301) 427-8401, or her designee (301-427-8418).
4. The holder of this Authorization must notify the Chief of the Permits and Conservation Division, Office of Protected Resources, at least 48 hours prior to the start of collecting seismic data (unless constrained by the date of issuance of this Authorization in which case notification shall be made as soon as possible).



5. Prohibitions

(a) The taking, by incidental harassment only, is limited to the species listed under condition 3(a) above and by the numbers listed in Table 2. The taking by serious injury or death of these species or the taking by harassment, injury or death of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this Authorization.

(b) The taking of any marine mammal is prohibited whenever the required source vessel protected species observers (PSOs), required by condition 7(a)(i), are not onboard in conformance with condition 7(a)(i) of this Authorization.

6. Mitigation

(a) Establishing Exclusion and Disturbance Zones

- (i) Establish and monitor with trained PSOs exclusion zones surrounding the 10 in³ and 620 in³ airgun arrays on the source vessel where the received level would be 180 and 190 dB (rms) re 1 µPa for cetaceans and pinnipeds, respectively. The sizes of these zones are provided in Table 1 below.

Table 1. Summary of airgun array source levels and proposed exclusion zone and zones of influence radii

Array size (in ³)	190 dB radius (m)	180 dB radius (m)	160 dB radius (m)
10	54	188	1,050
620	195	635	1,820
1,240*	250	910	5,200

*Denotes modelled source level that need to be empirically measured before the seismic survey.

- (ii) Establish and monitor with trained PSOs preliminary exclusion zones surrounding the 1,240 in³ airgun arrays on the source vessel where the received level would be 180 and 190 dB (rms) re 1 µPa for cetaceans and pinnipeds, respectively. For purposes of the field verification test, described in condition 7(e)(i), these zones are estimated to be 250 m and 910 m from the seismic source for 190 and 180 dB (rms) re 1 µPa, respectively.
- (iii) Establish zones of influence (ZOIs) surrounding the 10 in³ and 620 in³ airgun arrays on the source vessel where the received level would be 160 (rms) re 1 µPa. The sizes of these zones are provided in Table 1.
- (iv) Establish the ZOI surrounding the 1,240 in³ airgun arrays on the source vessel where the received level would be 160 dB (rms) re 1 µPa for

marine mammals. For purposes of the field verification test, described in condition 7(e)(i), the zone is estimated to be 5,200 m from the source.

- (v) Upon completion of data analysis of the field verification measurements required under condition 7(e)(i) below, the measurements of the new 160-dB, 180-dB, and 190-dB marine mammal ZOI and exclusion zones for the 1,240 in³ airgun array shall be reviewed by NMFS Office of Protected Resources before the measured zones are formally established as ZOI and exclusion zones.

(b) Vessel Movement Mitigation:

- (i) Avoid concentrations or groups of whales by all vessels under the direction of SAE. Operators of support vessels should, at all times, conduct their activities at the maximum distance possible from such concentrations or groups of whales.
- (ii) If any vessel approaches within 1.6 km (1 mi) 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:
 - (A) Reducing vessel speed to less than 5 knots within 300 yards (900 feet or 274 m) of the whale(s);
 - (B) Steering around the whale(s) if possible;
 - (C) Operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;
 - (D) Operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and
 - (E) Checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.
- (iii) When weather conditions require, such as when visibility drops, adjust vessel speed accordingly, but not to exceed 5 knots, to avoid the likelihood of injury to whales.

(c) Mitigation Measures for Airgun Operations

- (i) Ramp-up:

- (A) A ramp up, following a cold start, can be applied if the exclusion zone has been free of marine mammals for a consecutive 30-minute period. The entire exclusion zone must have been visible during these 30 minutes. If the entire exclusion zone is not visible, then ramp up from a cold start cannot begin.
 - (B) If a marine mammal(s) is sighted within the exclusion zone during the 30-minute watch prior to ramp up, ramp up will be delayed until the marine mammal(s) is sighted outside of the exclusion zone or the animal(s) is not sighted for at least 15 minutes for pinnipeds, or 30 minutes for cetaceans.
 - (C) If, for any reason, electrical power to the airgun array has been discontinued for a period of 10 minutes or more, ramp-up procedures shall be implemented. If the PSO watch has been suspended during that time, a 30-minute clearance of the exclusion zone is required prior to commencing ramp-up. Discontinuation of airgun activity for less than 10 minutes does not require a ramp-up.
 - (D) The seismic operator and PSOs shall maintain records of the times when ramp-ups start and when the airgun arrays reach full power.
- (ii) Power-down/Shutdown:
- (A) The airgun array shall be immediately powered down whenever a marine mammal is sighted approaching close to or within the applicable exclusion zone of the full array, but is outside the applicable exclusion zone of the single mitigation airgun.
 - (B) If a marine mammal is already within or is about to enter the exclusion zone when first detected, the airguns shall be powered down immediately.
 - (C) Following a power-down, firing of the full airgun array shall not resume until the marine mammal has cleared the exclusion zone. The animal will be considered to have cleared the exclusion zone if it is visually observed to have left the exclusion zone of the full array, or has not been seen within the zone for 15 minutes for pinnipeds, or 30 minutes for cetaceans.
 - (D) If a marine mammal is sighted within or about to enter the 190 or 180 dB (rms) applicable exclusion zone of the single mitigation airgun, the airgun array shall be shutdown.
 - (E) Firing of the full airgun array or the mitigation gun shall not resume until the marine mammal has cleared the exclusion zone of

the full array or mitigation gun, respectively. The animal will be considered to have cleared the exclusion zone as described above under ramp up procedures.

- (F) SAE shall refrain from initiating or cease seismic activities if an aggregation of bowhead or gray whales (i.e., 12 or more whales of any age/sex class that appear to be engaged in a non-migratory, significant biological behavior (e.g., feeding, socializing)) is observed within the Level B harassment Zones.

(iii) Poor Visibility Conditions:

- (A) If during foggy conditions, heavy snow or rain, or darkness, the full 180 dB exclusion zone is not visible, the airguns cannot commence a ramp-up procedure from a full shut-down.
- (B) If one or more airguns have been operational before nightfall or before the onset of poor visibility conditions, they can remain operational throughout the night or poor visibility conditions. In this case ramp-up procedures can be initiated, even though the exclusion zone may not be visible, on the assumption that marine mammals will be alerted by the sounds from the single airgun and have moved away.

(iv) Use of a Small-volume Airgun During Turns and Transits

- (A) Throughout the seismic survey, during turning movements and short transits, SAE will employ the use of the smallest-volume airgun (i.e., "mitigation airgun") to deter marine mammals from being within the immediate area of the seismic operations. The mitigation airgun would be operated at approximately one shot per minute and would not be operated for longer than three hours in duration (turns may last two to three hours for the proposed project).
- (B) During turns or brief transits (i.e., less than three hours) between seismic tracklines, one mitigation airgun will continue operating. The ramp up procedures described above will be followed when increasing the source levels from the one mitigation airgun to the full airgun array. However, keeping one airgun firing during turns and brief transits allow SAE to resume seismic surveys using the full array without having to ramp up from a "cold start," which requires a 30-minute observation period of the full exclusion zone and is prohibited during darkness or other periods of poor visibility. PSOs will be on duty whenever the airguns are firing

during daylight and during the 30-minute periods prior to ramp-ups from a “cold start.”

(d) Mitigation Measures for Subsistence Activities:

- (i) For the purposes of reducing or eliminating conflicts between subsistence whaling activities and SAE’s survey program, the holder of this Authorization will participate with other operators in the Communication and Call Centers (Com-Center) Program. Com-Centers will be operated to facilitate communication of information between SAE and subsistence whalers. The Com-Centers will be operated 24 hours/day during the 2015 fall subsistence bowhead whale hunt.
- (ii) All vessels shall report to the appropriate Com-Center at least once every six hours, commencing each day with a call at approximately 06:00 hours.
- (iii) The appropriate Com-Center shall be notified if there is any significant change in plans. The appropriate Com-Center also shall be called regarding any unsafe or unanticipated ice conditions.
- (iv) Upon notification by a Com-Center operator of an at-sea emergency, the holder of this Authorization shall provide such assistance as necessary to prevent the loss of life, if conditions allow the holder of this Authorization to safely do so.
- (v) SAE shall monitor the positions of all of its vessels and exercise due care in avoiding any areas where subsistence activity is active.
- (vi) Routing barge and transit vessels:
 - (A) Vessels transiting in the Beaufort Sea east of Bullen Point to the Canadian border shall remain at least 5 miles offshore during transit along the coast, provided ice and sea conditions allow. During transit in the Chukchi Sea, vessels shall remain as far offshore as weather and ice conditions allow, and at all times at least 5 miles offshore.
 - (B) From August 31 to October 31, vessels in the Chukchi Sea or Beaufort Sea shall remain at least 20 miles offshore of the coast of Alaska from Icy Cape in the Chukchi Sea to Pitt Point on the east side of Smith Bay in the Beaufort Sea, unless ice conditions or an emergency that threatens the safety of the vessel or crew prevents compliance with this requirement. This condition shall not apply to vessels actively engaged in transit to or from a coastal community to conduct crew changes or logistical support operations.

- (C) Vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs, and to make any other potential conflicts with bowheads or whalers unlikely. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.
- (D) 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:
- Reducing vessel speed to less than 5 knots within 900 feet of the whale(s);
 - Steering around the whale(s) if possible;
 - Operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;
 - Operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and
 - Checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

(vii) Limitation on seismic surveys in the Beaufort Sea

- (A) Kaktovik: No seismic survey from the Canadian Border to the Canning River from August 25 to close of the fall bowhead whale hunt in Kaktovik and Nuiqsut. From around August 10 to August 25, based on the actual hunt date, SAE will communicate and collaborate with the Alaska Eskimo Whaling Commission (AEWC) on any planned vessel movement in and around Kaktovik and Cross Island to avoid impacts to whale hunting.
- (B) Nuiqsut:
- Pt. Storkerson to Thetis Island: No seismic survey prior to July 25 inside the Barrier Islands. No seismic survey from around August 25 to close of fall bowhead whale hunting

outside the Barrier Island in Nuiqsut, based on actual hunt dates.

- Canning River to Pt. Storkerson: No seismic survey from around August 25 to the close of bowhead whale subsistence hunting in Nuiqsut, based on actual hunt dates.
- (C) Barrow: No seismic survey from Pitt Point on the east side of Smith Bay to a location about half way between Barrow and Peard Bay from September 15 to the close of the fall bowhead whale hunt in Barrow.
- (viii) SAE shall complete operations in time to allow such vessels to complete transit through the Bering Strait to a point south of 59 degrees North latitude no later than November 15, 2015. Any vessel that encounters weather or ice that will prevent compliance with this date shall coordinate its transit through the Bering Strait to a point south of 59 degrees North latitude with the appropriate Com-Centers. SAE vessels shall, weather and ice permitting, transit east of St. Lawrence Island and no closer than 10 miles from the shore of St. Lawrence Island.

7. Monitoring:

(a) Vessel-based Visual Monitoring:

- (i) Vessel-based visual monitoring for marine mammals shall be conducted by NMFS-approved PSOs throughout the period of survey activities.
- (ii) PSOs shall be stationed aboard the seismic survey vessels and mitigation vessel through the duration of the surveys.
- (iii) A sufficient number of PSOs shall be onboard the survey vessel to meet the following criteria:
 - (A) 100% monitoring coverage during all periods of survey operations in daylight;
 - (B) At least two PSOs conducting vessel-based visual monitoring from both vessels during all time;
 - (C) Maximum of 4 consecutive hours on watch per PSO; and
 - (D) Maximum of 12 hours of watch time per day per PSO.
- (iv) The vessel-based marine mammal monitoring shall provide the basis for real-time mitigation measures as described in (6)(c) above.

- (v) Results of the vessel-based marine mammal monitoring shall be used to calculate the estimation of the number of “takes” from the marine surveys and equipment recovery and maintenance program.
- (vi) **Dedicated Monitoring Vessel:**
If SAE decides to use the 1,240 in³ airgun array, an additional dedicated visual monitoring vessel will be employed to assist marine mammal monitoring due to the larger exclusion zones and zone of influence from this larger airgun array. A minimum of 2 PSOs will be positioned on this dedicated monitoring vessel.

(b) Protected Species Observers and Training

- (i) PSO teams shall consist of Inupiat observers and NMFS-approved field biologists.
- (ii) Experienced field crew leaders shall supervise the PSO teams in the field. New PSOs shall be paired with experienced observers to avoid situations where lack of experience impairs the quality of observations.
- (iii) Crew leaders and most other biologists serving as observers in 2015 shall be individuals with experience as observers during recent seismic or shallow hazards monitoring projects in Alaska, the Canadian Beaufort, or other offshore areas in recent years.
- (iv) Resumes for PSO candidates shall be provided to NMFS for review and acceptance of their qualifications. Inupiat observers shall be experienced in the region and familiar with the marine mammals of the area.
- (v) All observers shall complete a NMFS-approved observer training course designed to familiarize individuals with monitoring and data collection procedures. The training course shall be completed before the anticipated start of the 2015 open-water season. The training session(s) shall be conducted by qualified marine mammalogists with extensive crew-leader experience during previous vessel-based monitoring programs.
- (vi) Training for both Alaska native PSOs and biologist PSOs shall be conducted at the same time in the same room. There shall not be separate training courses for the different PSOs.
- (vii) Crew members should not be used as primary PSOs because they have other duties and generally do not have the same level of expertise, experience, or training as PSOs, but they could be stationed on the fantail of the vessel to observe the near field, especially the area around the

airgun array, and implement a power-down or shutdown if a marine mammal enters the safety zone (or exclusion zone).

- (viii) If crew members are to be used as PSOs, they shall go through some basic training consistent with the functions they will be asked to perform. The best approach would be for crew members and PSOs to go through the same training together.
- (ix) PSOs shall be trained using visual aids (e.g., videos, photos), to help them identify the species that they are likely to encounter in the conditions under which the animals will likely be seen.
- (x) SAE shall train its PSOs to follow a scanning schedule that consistently distributes scanning effort according to the purpose and need for observations. All PSOs should follow the same schedule to ensure consistency in their scanning efforts.
- (xi) PSOs shall be trained in documenting the behaviors of marine mammals. PSOs should record the primary behavioral state (i.e., traveling, socializing, feeding, resting, approaching or moving away from vessels) and relative location of the observed marine mammals.

(c) Marine Mammal Observation Protocol

- (i) PSOs shall watch for marine mammals from the best available vantage point on the survey vessels, typically the bridge.
- (ii) Observations by the PSOs on marine mammal presence and activity shall begin a minimum of 30 minutes prior to the estimated time that the seismic source is to be turned on and/or ramped-up. Monitoring shall continue during the airgun operations and last until 30 minutes after airgun array stops firing.
- (iii) For comparison purposes, PSOs shall also document marine mammal occurrence, density, and behavior during at least some periods when airguns are not operating
- (iv) PSOs shall scan systematically with the unaided eye and 7 x 50 reticle binoculars, supplemented with 20 x 60 image-stabilized binoculars or 25 x 150 binoculars, and night-vision equipment when needed.
- (v) Personnel on the bridge shall assist the marine mammal observer(s) in watching for marine mammals.
- (vi) PSOs aboard the marine survey vessel shall give particular attention to the areas within the marine mammal exclusion zones around the source

vessel, as noted in (6)(a)(i) and (ii). They shall avoid the tendency to spend too much time evaluating animal behavior or entering data on forms, both of which detract from their primary purpose of monitoring the exclusion zone.

- (vii) Monitoring shall consist of recording of the following information:
 - (A) The species, group size, age/size/sex categories (if determinable), the general behavioral activity, heading (if consistent), bearing and distance from seismic vessel, sighting cue, behavioral pace, and apparent reaction of all marine mammals seen near the seismic vessel and/or its airgun array (e.g., none, avoidance, approach, paralleling, etc);
 - (B) The time, location, heading, speed, and activity of the vessel (shooting or not), along with sea state, visibility, cloud cover and sun glare at (I) any time a marine mammal is sighted (including pinnipeds hauled out on barrier islands), (II) at the start and end of each watch, and (III) during a watch (whenever there is a change in one or more variable);
 - (C) The identification of all vessels that are visible within 5 km of the seismic vessel whenever a marine mammal is sighted and the time observed;
 - (D) Any identifiable marine mammal behavioral response (sighting data should be collected in a manner that will not detract from the PSO's ability to detect marine mammals);
 - (E) Any adjustments made to operating procedures; and
 - (F) Visibility during observation periods so that total estimates of take can be corrected accordingly.
- (vii) Distances to nearby marine mammals will be estimated with binoculars (7 x 50 binoculars) containing a reticle to measure the vertical angle of the line of sight to the animal relative to the horizon. Observers may use a laser rangefinder to test and improve their abilities for visually estimating distances to objects in the water.
- (viii) PSOs shall understand the importance of classifying marine mammals as "unknown" or "unidentified" if they cannot identify the animals to species with confidence. In those cases, they shall note any information that might aid in the identification of the marine mammal sighted. For example, for an unidentified mysticete whale, the observers should record whether the animal had a dorsal fin.

- (ix) Additional details about unidentified marine mammal sightings, such as “blow only,” mysticete with (or without) a dorsal fin, “seal splash,” etc., shall be recorded.
- (x) When a marine mammal is seen approaching or within the exclusion zone applicable to that species, the marine survey crew shall be notified immediately so that mitigation measures described in (6) can be promptly implemented.
- (xi) SAE shall use the best available technology to improve detection capability during periods of fog and other types of inclement weather. Such technology might include night-vision goggles or binoculars as well as other instruments that incorporate infrared technology.

(d) Field Data-Recording and Verification

- (i) PSOs aboard the vessels shall maintain a digital log of seismic surveys, noting the date and time of all changes in seismic activity (ramp-up, power-down, changes in the active seismic source, shutdowns, etc.) and any corresponding changes in monitoring radii in a software spreadsheet.
- (ii) PSOs shall utilize a standardized format to record all marine mammal observations and mitigation actions (seismic source power-downs, shutdowns, and ramp-ups).
- (iii) Information collected during marine mammal observations shall include the following:
 - (A) Vessel speed, position, and activity
 - (B) Date, time, and location of each marine mammal sighting
 - (C) Number of marine mammals observed, and group size, sex, and age categories
 - (D) Observer’s name and contact information
 - (E) Weather, visibility, and ice conditions at the time of observation
 - (F) Estimated distance of marine mammals at closest approach
 - (G) Activity at the time of observation, including possible attractants present
 - (H) Animal behavior

- (I) Description of the encounter
 - (J) Duration of encounter
 - (K) Mitigation action taken
- (iv) Data shall be recorded directly into handheld computers or as a back-up, transferred from hard-copy data sheets into an electronic database.
 - (v) A system for quality control and verification of data shall be facilitated by the pre-season training, supervision by the lead PSOs, and in-season data checks, and shall be built into the software.
 - (vi) Computerized data validity checks shall also be conducted, and the data shall be managed in such a way that it is easily summarized during and after the field program and transferred into statistical, graphical, or other programs for further processing.

(e) Passive Acoustic Monitoring

- (i) Sound Source Measurements: Using a hydrophone system, the holder of this Authorization is required to conduct sound source verification tests for the 1,240 in³ seismic airgun array, if this array is involved in the open-water seismic surveys.
 - (A) Sound source verification shall consist of distances where broadside and endfire directions at which broadband received levels reach 190, 180, 170, 160, and 120 dB (rms) re 1 μ Pa for the airgun array(s).
 - (B) The test results shall be reported to NMFS within 5 days of completing the test.
- (ii) SAE shall conduct Passive Acoustical Monitoring (PAM) using stationary underwater acoustic sensors with a minimum sampling rate at 64 kHz to collect continuous acoustic data in the vicinity of the survey area.
 - (A) The acoustic sensors to be deployed shall be calibrated and their mooring designs tested prior to deployment.
 - (B) PAM shall be deployed at least three days before the seismic surveys till three days after the seismic survey in order to collect data for comparison the sound field before, during, and after the seismic survey.

- (C) At least two acoustic sensors should be deployed at each of the four corners of the study area (total of 8 acoustic sensors).
- (D) SAE shall develop a more compact mooring design for acoustic sensors to be deployed in shallow waters;
- (A) Collect information on the occurrence and distribution of marine mammals that may be available to subsistence hunters near villages located on the Beaufort Sea coast and to document their relative abundance, habitat use, and migratory patterns; and
- (B) Measure the ambient soundscape throughout the Beaufort Sea coast and to record received levels of sounds from industry and other activities

(g) SAE shall engage in consultation and coordination with other oil and gas companies and with federal, state, and borough agencies to ensure that they have the most up-to-date information and can take advantage of other monitoring efforts.

8. Data Analysis and Presentation in Reports:

(a) Estimation of potential takes or exposures shall be improved for times with low visibility (such as during fog or darkness) through interpolation or possibly using a probability approach. Those data could be used to interpolate possible takes during periods of restricted visibility.

(b) SAE shall provide a database of the information collected, plus a number of summary analyses and graphics to help NMFS assess the potential impacts of SAE's survey. Specific summaries/analyses/graphics would include:

- (i) Sound verification results, including isopleths of sound pressure levels plotted geographically;
- (ii) A table or other summary of survey activities (i.e., did the survey proceed as planned);
- (iii) A table of sightings by time, location, species, and distance from the survey vessel;
- (iv) A geographic depiction of sightings for each species by area and month;
- (v) A table and/or graphic summarizing behaviors observed by species;
- (vi) A table and/or graphic summarizing observed responses to the survey by species;

- (vii) A table of mitigation measures (e.g., power-downs, shutdowns) taken by date, location, and species;
- (viii) A graphic of sightings by distance for each species and location;
- (ix) A table or graphic illustrating sightings during the survey versus sightings when the airguns were silent; and
- (x) A summary of times when the survey was interrupted because of interactions with marine mammals.

(c) To help evaluate the effectiveness of PSOs and more effectively estimate take, if appropriate data are available, SAE shall perform analysis of sightability curves (detection functions) for distance-based analyses.

(d) SAE shall collaborate with other industrial operators in the area to integrate and synthesize monitoring results as much as possible (such as submitting "sightings" from their monitoring projects to an online data archive, such as OBIS-SEAMAP) and archive and make the complete databases available upon request.

9. Reporting:

(a) Sound Source Verification Report: A report on the preliminary results of the sound source verification measurements, including the measured 190, 180, 160, and 120 dB (rms) radii of the 1,240 in³ airgun array, shall be submitted within 14 days after collection of those measurements at the start of the field season. This report will specify the distances of the exclusion zones that were adopted for the survey.

(b) Throughout the survey program, PSOs shall prepare a report each day, or at such other interval as is necessary, summarizing the recent results of the monitoring program. The reports shall summarize the species and numbers of marine mammals sighted. These reports shall be provided to NMFS.

(c) Weekly Reports: SAE will submit weekly reports to NMFS no later than the close of business (Alaska Time) each Thursday during the weeks when seismic surveys take place. The field reports will summarize species detected, in-water activity occurring at the time of the sighting, behavioral reactions to in-water activities, and the number of marine mammals exposed to harassment level noise.

(d) Monthly Reports: SAE will submit monthly reports to NMFS for all months during which seismic surveys take place. The monthly reports will contain and summarize the following information:

- (i) Dates, times, locations, heading, speed, weather, sea conditions (including Beaufort Sea state and wind force), and associated activities during the seismic survey and marine mammal sightings.

- (ii) Species, number, location, distance from the vessel, and behavior of any sighted marine mammals, as well as associated surveys (number of shutdowns), observed throughout all monitoring activities.
- (iii) An estimate of the number (by species) of:
 - (A) Pinnipeds that have been exposed to the seismic surveys (based on visual observation) at received levels greater than or equal to 160 dB re 1 μ Pa (rms) and/or 190 dB re 1 μ Pa (rms) with a discussion of any specific behaviors those individuals exhibited; and
 - (B) Cetaceans that have been exposed to the geophysical activity (based on visual observation) at received levels greater than or equal to 160 dB re 1 μ Pa (rms) and/or 180 dB re 1 μ Pa (rms) with a discussion of any specific behaviors those individuals exhibited.

(e) Seismic Vessel Monitoring Program: A draft report will be submitted to the Director, Office of Protected Resources, NMFS, within 90 days after the end of SAE's 2015 open-water seismic surveys in the Beaufort Sea. The report will describe in detail:

- (i) Summaries of monitoring effort (e.g., total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of marine mammals);
- (ii) Summaries that represent an initial level of interpretation of the efficacy, measurements, and observations, rather than raw data, fully processed analyses, or a summary of operations and important observations;
- (iii) Summaries of all mitigation measures (e.g., operational shutdowns if they occur) and an assessment of the efficacy of the monitoring methods;
- (iv) Analyses of the effects of various factors influencing detectability of marine mammals (e.g., sea state, number of observers, and fog/glare);
- (v) Species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover;
- (vi) Data analysis separated into periods when an airgun array (or a single airgun) is operating and when it is not, to better assess impacts to marine mammals;
- (vii) Sighting rates of marine mammals during periods with and without airgun activities (and other variables that could affect detectability), such as:

- (A) Initial sighting distances versus airgun activity state;
 - (B) Closest point of approach versus airgun activity state;
 - (C) Observed behaviors and types of movements versus airgun activity state;
 - (D) Numbers of sightings/individuals seen versus airgun activity state;
 - (E) Distribution around the survey vessel versus airgun activity state; and
 - (F) Estimates of take by harassment;
- (viii) Reported results from all hypothesis tests, including estimates of the associated statistical power, when practicable;
 - (ix) Estimates of uncertainty in all take estimates, with uncertainty expressed by the presentation of confidence limits, a minimum-maximum, posterior probability distribution, or another applicable method, with the exact approach to be selected based on the sampling method and data available;
 - (x) A clear comparison of authorized takes and the level of actual estimated takes;
 - (xi) A sightability curve for marine mammal observations by species, if enough data are collected to allow such analysis; and
 - (xii) A complete characterization of the acoustic footprint resulting from various activity states, with results on basic acoustic characteristics of the identified noise sources that include spectral content and received levels in different metrics such as RMS dB, cSEL 24h, dB peak to peak, and 1/3 octave bands.

(d) The draft report shall be subject to review and comment by NMFS. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS. The draft report will be considered the final report for this activity under this Authorization if NMFS has not provided comments and recommendations within 90 days of receipt of the draft report.

10. (a) In the unanticipated event that survey operations clearly cause the take of a marine mammal in a manner prohibited by this Authorization, such as a serious injury or mortality (e.g., ship-strike, gear interaction, and/or entanglement), SAE shall immediately cease survey operations and immediately report the incident to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to

Jolie.Harrison@noaa.gov and Shane.Guan@noaa.gov and the Alaska Regional Stranding Coordinators (Aleria.Jensen@noaa.gov and Barbara.Mahoney@noaa.gov). The report must include the following information:

- (i) Time, date, and location (latitude/longitude) of the incident;
- (ii) The name and type of vessel involved;
- (iii) The vessel's speed during and leading up to the incident;
- (iv) Description of the incident;
- (v) Status of all sound source use in the 24 hours preceding the incident;
- (vi) Water depth;
- (vii) Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- (viii) Description of marine mammal observations in the 24 hours preceding the incident;
- (ix) Species identification or description of the animal(s) involved;
- (x) The fate of the animal(s); and
- (xi) Photographs or video footage of the animal (if equipment is available).

(b) Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with SAE to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. SAE may not resume their activities until notified by NMFS via letter, email, or telephone.

(c) In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), SAE will immediately report the incident to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Jolie.Harrison@noaa.gov and Shane.Guan@noaa.gov and the NMFS Alaska Stranding Hotline (1-877-925-7773) and/or by email to the Alaska Regional Stranding Coordinators (Aleria.Jensen@noaa.gov and Barabara.Mahoney@noaa.gov). The report must include the same information identified in Condition 10(a) above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with SAE to determine whether modifications in the activities are appropriate.

(d) In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in Condition 3 of this Authorization (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), SAE shall report the incident to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Jolie.Harrison@noaa.gov and Shane.Guan@noaa.gov and the NMFS Alaska Stranding Hotline (1-877-925-7773) and/or by email to the Alaska Regional Stranding Coordinators (Aleria.Jensen@noaa.gov and Barbara.Mahoney@noaa.gov), within 24 hours of the discovery. SAE shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. SAE can continue its operations under such a case.

11. Research and Collaboration:

(a) SAE shall make a best effort to coordinate and collaborate with other companies for monitoring the aggregated effects of all their activities on spotted seals, especially animals that may be hauled out.

(b) SAE shall make all environmental data (including PSO observations, acoustic monitoring, vessel track lines and timing of operations) available for valid scientific research.

12. Activities related to the monitoring described in this Authorization do not require a separate scientific research permit issued under section 104 of the Marine Mammal Protection Act.

13. The Plan of Cooperation outlining the steps that will be taken to cooperate and communicate with the native communities to ensure the availability of marine mammals for subsistence uses, must be implemented.

14. This Authorization may be modified, suspended, or withdrawn if the holder fails to abide by the conditions prescribed herein or if the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals, or if there is an unmitigable adverse impact on the availability of such species or stocks for subsistence uses.

15. A copy of this Authorization and the Incidental Take Statement must be in the possession of each seismic vessel operator taking marine mammals under the authority of this Incidental Harassment Authorization.

16. SAE is required to comply with the Terms and Conditions of the Incidental Take Statement corresponding to NMFS' Biological Opinion.

PURRY GAYAUD

JUL 01 2015

for

Donna S. Wieting, Director
Office of Protected Resources
National Marine Fisheries Service

Date

Table 2. Species/stocks and numbers of marine mammals allowed to be taken incidental to activities conducted under this IHA.

Species	Authorized Level B Harassment	Authorized Level A Harassment
Bowhead whale	452	1
Beluga whale (Beaufort Sea stock)	27	4
Beluga whale (E. Chukchi Sea stock)	27	4
Gray whale	2	0
Ringed seal	1,148	20
Spotted seal	500	20
Bearded seal	115	10