



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Incidental Harassment Authorization

ION Geophysical (ION), 2105 City West Boulevard, Building III, Suite 900, Houston, Texas 77042, 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 harassment, small numbers of marine mammals incidental to conducting in-ice seismic surveys in the Alaskan Beaufort and Chukchi Seas, contingent upon the following conditions:

1. This Authorization is valid from October 17, 2012, through December 15, 2012.
2. This Authorization is valid only for activities associated with in-ice seismic surveys and related activities in the Beaufort and Chukchi Seas, as indicated in Figure 1 of ION's IHA application.
3. (a) The species authorized for incidental harassment takings, Level B harassment only, are:
 - beluga whales (*Delphinapterus leucas*);
 - harbor porpoises (*Phocoena phocoena*);
 - bowhead whales (*Balaena mysticetus*);
 - gray whales (*Eschrichtius robustus*);
 - minke whales (*Balaenoptera acutorostrata*);
 - bearded seals (*Erignathus barbatus*);
 - spotted seals (*Phoca largha*);
 - ringed seals (*P. hispida*); and
 - ribbon seals (*P. fasciata*).
- (b) The species authorized for incidental harassment taking, Level A harassment, are:
 - one individual of bowhead whale;
 - three individuals of beluga whale; and
 - four individuals of ringed seal.
- (c) The authorization for taking by harassment is limited to the following acoustic sources and from the following activities:
 - (i) 28 Sercel G-gun airguns, of which 26 are active with a total discharge volume of 4,450 in³.
 - (ii) Individual airgun sizes range from 70 to 380 in³.



- (d) 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 his 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 IHA is issued less than 48 hours before scheduled start time, in which case ION will provide an estimated start time upon receipt of the IHA.).

5. Prohibitions

- (a) The taking, by incidental harassment only, is limited to the species listed under conditions 3(a) and (b) above. The taking by serious injury or death of these species or the taking by harassment, injury, serious 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) Exclusion Zones:
 - (i) Establish and monitor with trained Protected Species Observers (PSOs) a preliminary exclusion zone for cetaceans and pinnipeds surrounding the airgun array on the source vessel where the received level would be 180 dB (for cetaceans) and 190 dB (for pinnipeds) re 1 μ Pa (rms), respectively. For purposes of the sound source verification test, described in condition 7(d)(i), the modeled exclusion zones at areas of different depth are shown in Table 1 below.

Table 1: Marine mammal exclusion zones for specific categories based on the water depth

rms (dB re. 1 μ Pa)	Exclusion and disturbance zones (meters)		
	Depth less than 100 m	Depth 100 m-1,000 m	Depth more than 1,000 m
190	600	180	180
180	2,850	660	580
160	27,800	42,200	31,600

- (ii) Immediately upon completion of data analysis of the sound source verification measurements required under condition 7(d)(i) below, the new

180-dB and 190-dB re 1 μ Pa (rms) marine mammal exclusion zones shall be established based on the sound source verification.

(b) Speed or Course Alteration

- (i) If a marine mammal (in water) is detected outside the exclusion zone and, based on its position and the relative motion, is likely to enter the exclusion zone, the vessel's speed and/or direct course shall be modified to the maximum extent possible consistent with safety of the ship .
- (ii) Avoid concentrations or groups of whales by all vessels under the direction of ION. Operators of vessels should, at all times, conduct their activities at the maximum distance possible from such concentrations of whales.
- (iii) All vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs. If any barge or transit vessel approaches within 1.6 km (1 mi) of observed whales, the vessel operator shall take reasonable precautions to avoid potential interaction with the whale(s) by taking one or more of the following actions:
 - (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.
- (iv) Vessel Transit
 - (A) Vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.
 - (B) If any vessel inadvertently approaches within 1.6 kilometers (1 mile) of observed whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions (as outlined in Condition 6(b)(iii)) to avoid potential interaction with the whales.
- (v) In the event that any aircraft (such as helicopters) are used to support the planned survey, the mitigation measures below would apply:

- (A) Under no circumstances, other than an emergency, shall aircraft be operated at an altitude lower than 1,000 feet above sea level (ASL) when within 0.3 mile (0.5 km) of groups of whales.
 - (B) Helicopters shall not hover or circle above or within 0.3 mile (0.5 km) of whales.
- (c) Ramp-up:
 - (i) 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.
 - (ii) Ramp up procedures from a cold start shall be delayed if a marine mammal is sighted within the exclusion zone during the 30-minute period prior to the ramp up. The delay shall last until the marine mammal(s) has been observed to leave the exclusion zone or until the animal(s) is not sighted for at least 15 or 30 minutes. The 15 minutes applies to small toothed whales and pinnipeds, while a 30 minute observation period applies to baleen whales and large toothed whales.
 - (iii) A ramp up, following a shutdown, can be initiated if the marine mammal(s) for which the shutdown occurred has been observed to leave the exclusion zone or until the animal(s) is not sighted for at least 15 minutes (small toothed whales and pinnipeds) or 30 minutes (baleen whales and large toothed whales).
 - (iv) 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. Only if the PSO watch has been suspended, 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.
 - (v) The seismic operator and PSOs shall maintain records of the times when ramp-ups start and when the airgun arrays reach full power.
- (d) Power-down/Shutdown:
 - (i) 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 airgun.

- (ii) If a marine mammal is already within the exclusion zone when first detected, the airguns shall be powered down immediately.
 - (iii) Following a power-down, ramp up to 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 (pinnipeds or small toothed whales) or 30 minutes (baleen whales or large toothed whales).
 - (iv) If a marine mammal is sighted within or about to enter the 190 or 180 dB (rms) applicable exclusion zone of the single airgun, the airgun array shall be shutdown.
 - (v) If a marine mammal on ice is detected by PSOs within the exclusion zones it will be watched carefully in case it enters the water. In the event the animal does enter the water and is within an applicable exclusion zone of the airguns during seismic operations, a power down or shut-down shall immediately be implemented.
 - (vi) Airgun activity shall not resume until the marine mammal has cleared the exclusion zone of the full array. The animal will be considered to have cleared the exclusion zone as described above under ramp up procedures.
- (e) Poor Visibility Conditions:
- (i) If during foggy conditions, heavy snow or rain, or darkness, the full 180 dB exclusion zone is not visible, the applicant shall not commence a ramp-up of the airguns from a full shut-down.
 - (ii) 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.
 - (iii) Airguns shall not be fired during long transits when exploration activities are not occurring, including the common firing of one airgun (also referred to as the “mitigation gun” in past IHAs). This does not apply to turns when starting a new track line.
- (f) Mitigation Measures for Subsistence Activities:
- (i) ION shall fully implement the following measures, consistent with the 2012 Plan of Cooperation (POC):

- (A) Not begin the seismic survey in the eastern survey area prior to the completion of Kaktovik bowhead whaling;
 - (B) Schedule the seismic survey so that seismic operations in the western survey area do not begin until completion of Barrow fall bowhead whaling (expected to be approximately November 1, 2012).
 - (C) Plan the survey to proceed from the eastern to western U.S. Beaufort Sea to avoid, as much as possible, any remaining migratory animals and associated subsistence activities.
- (ii) ION shall maintain a Communication Center (Com Center) that is staffed 24 hours a day, 7 days a week, during the seismic survey operational window. Each Com Center shall have an Inupiat operator on duty 24 hours per day during the 2012 subsistence bowhead whale hunt.
- (iii) Vessels shall report in to the Com Center a minimum of every 6 hours commencing with a call at approximately 06:00 hours and provide information about the vessel's location, speed, and direction. The 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, or any potentially unsafe or unanticipated conditions (e.g., weather, ice conditions). Such Com Center shall notify all whalers of such changes.
- (iv) Vessel Transit
- (A) Routing Vessels
 - All vessel routes within 40 miles of the Alaska coast 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.
 - Beaufort Sea: Vessels transiting east of Bullen Point to the Canadian border shall remain at least five (5) miles offshore during transit along the coast, provided ice and sea conditions allow.
 - Chukchi Sea: Vessels shall remain as far offshore as weather and ice conditions allow, and at all times at least five (5) miles offshore during transit.
 - (B) 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.

- (C) 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 bowhead whale(s);
 - Steering around the bowhead whale(s) if possible;
 - Operating the vessel(s) in such a way as to avoid separating members of a group of bowhead whales from other members of the group;
 - Operating the vessel(s) to avoid causing a bowhead whale to make multiple changes in direction; and
 - Checking the waters immediately adjacent to the vessel(s) to ensure that no bowhead whales will be injured when the propellers are engaged.

7. Monitoring:

(a) Daytime Vessel Monitoring:

- (i) Protected Species Observers (PSOs): The holder of this Authorization must designate biologically-trained, on-site individuals (PSOs) to be onboard the source vessel and icebreaker, who are approved in advance by NMFS, to conduct the visual monitoring programs required under this Authorization and to record the effects of seismic surveys and the resulting noise on marine mammals.
- (A) PSO teams shall consist of Inupiat observers and experienced field biologists. An experienced field crew leader will supervise the PSO team onboard the survey vessel. New observers shall be paired with experienced observers to avoid situations where lack of experience impairs the quality of observations.
- (B) Crew leaders and biologists serving as observers in 2012 will 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.
- (C) PSOs shall complete a two or three-day training session on marine mammal monitoring, to be conducted shortly before the anticipated start of the 2012 open-water season. The training session(s) will be conducted by qualified marine mammalogists with extensive crew-leader experience during previous vessel-based monitoring programs. The marine mammal observers' handbook, adapted for

the specifics of the planned survey program will be reviewed as part of the training.

- (D) If there are Alaska Native PSOs, the PSO training that is conducted prior to the start of the survey activities shall be conducted with both Alaska Native PSOs and biologist PSOs being trained at the same time in the same room. There shall not be separate training courses for the different PSOs.
 - (E) 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 rampdown or shutdown if a marine mammal enters the exclusion zone (or exclusion zone).
 - (F) 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.
 - (G) 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.
 - (H) ION shall train its PSOs to follow a scanning schedule that consistently distributes scanning effort according to the purpose and need for observations. For example, the schedule might call for 60% of scanning effort to be directed toward the near field and 40% at the far field. All PSOs should follow the same schedule to ensure consistency in their scanning efforts.
 - (I) PSOs shall be trained in documenting the behaviors of marine mammals. PSOs should simply 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.
- (ii) PSOs shall be on duty for four (4) consecutive hours or less, although more than one four-hour shift per day is acceptable, with a maximum of 12 hours of watch time per PSO.
 - (iii) Three PSOs shall be stationed aboard the icebreaker Polar Prince to take advantage of this forward operating platform and provide advanced notice of marine mammals to the PSOs on the survey vessel. Three PSOs shall be stationed aboard the survey vessel Geo Arctic to monitor the exclusion zones centered on the airguns and to request mitigation actions when necessary.
 - (iv) At all times, the crew must be instructed to keep watch for marine mammals. If any are sighted, the bridge watch-stander must immediately

notify the PSO(s) on-watch. If a marine mammal is within or closely approaching its designated exclusion zone, the seismic acoustic sources must be immediately powered down or shutdown (in accordance with condition 6(d) above).

- (v) 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.
- (vi) PSO(s) shall watch for marine mammals from the best available vantage point on the survey vessels, typically the bridge. The observer(s) shall scan systematically with the unaided eye and 7×50 reticle binoculars, supplemented during good visibility conditions with 20×60 image-stabilized Zeiss Binoculars or Fujinon 25×150 “Big-eye” binoculars, a thermal imaging (FLIR) camera, and night-vision equipment when needed.
- (vii) When marine mammal is sighted, information to be recorded by PSOs shall include the following information:
 - (A) species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if determinable), bearing and distance from observer, apparent reaction to activities (e.g., none, avoidance, approach, etc.), closest point of approach, and pace;
 - (B) additional details for any unidentified marine mammal or unknown observed;
 - (C) time, location, speed, and activity of the vessel, sea state, ice cover, visibility, and sun glare; and
 - (D) the positions of other vessel(s) in the vicinity of the observer location.
- (viii) The ship’s position, speed of the vessel, water depth, sea state, ice cover, visibility, airgun status (ramp up, mitigation gun, or full array), and sun glare shall be recorded at the start and end of each observation watch, every 30 minutes during a watch, and whenever there is a change in any of those variables.
- (ix) ION shall work with its observers to develop a means for recording data that does not reduce observation time significantly.
- (x) PSOs shall attempt to maximize the time spent looking at the water and guarding the exclusion radii. 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.

- (xi) PSOs are required to 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.
 - (xii) Additional details about unidentified marine mammal sightings, such as “blow only”, mysticete with (or without) a dorsal fin, “seal splash”, etc., shall be recorded.
- (b) At Night and Poor Visibility Visual Monitoring
- (i) Night-vision equipment (Generation 3 binocular image intensifiers, or equivalent units) shall be available for use at night and poor visibility if visual monitoring is conducted.
 - (ii) A forward looking thermal imaging (FLIR) camera system mounted on a high point near the bow of the icebreaker shall also be available to assist with detecting the presence of seals and polar bears on ice and in the water ahead of the airgun array.
 - (iii) FLIR and NVD Monitoring Protocols
 - All PSOs shall monitor for marine mammals according to the procedures outlined in the Marine Mammal Observer handbook.
 - One PSO will be responsible for monitoring the FLIR system (IR-PSO) during most darkness and twilight periods. The on-duty IR-PSO shall monitor the IR display and alternate between the two search methods described below. If a second PSO is on watch, they shall scan the same area as the FLIR using the NVDs for comparison. The two PSOs shall coordinate what area is currently being scanned.
 - The IR-PSO should rotate between the search methods (see below) every 30 minutes in the following routine:
 - 00:00-00:30: Method I
 - 00:30-01:00: Method II, Port side
 - 01:00-01:30: Method I
 - 01:30-02:00: Method II, Starboard side
 - (iv) FLIR and NVD Search Methods – the FLIR and NVD search methods shall be conducted as follows:
 - (A) Method I: Set the horizontal tilt of the camera to an angle that provides an adequate view out in front of the vessel and also provides good resolution to potential targets. Pan back and forth

across the forward 180° of the vessels heading at a slow-scanning rate of approximately 1-2°/sec, as one would with binoculars.

- (B) Method II: Set the horizontal tilt of the camera to an angle that provides an adequate view out in front of the vessel, and then set the camera at a fixed position that creates a swath of view off the bow and to one side of the vessel.
- (c) Field Data-Recording, Verification, Handling, and Security
- (i) PSOs shall record their observations on datasheets or in handheld computers. During periods between watches and periods when operations are suspended, those data shall be entered into a laptop computer running a custom computer database.
 - (ii) The accuracy of the data entry shall be verified in the field by computerized validity checks as the data are entered, and by subsequent manual checking of the database printouts.
 - (iii) Quality control of the data shall be facilitated by
 - (A) the start-of-season training session,
 - (B) subsequent supervision by the onboard field crew leader, and
 - (C) ongoing data checks during the field season.
 - (iv) Data shall be backed up regularly onto CDs and/or USB disks, and stored at separate locations on the vessel.
 - (v) Observation effort data shall be designed to capture the amount of PSO effort itself, environmental conditions that impact an observer's ability to detect marine mammals, and the equipment and method of monitoring being employed. These data shall be collected every 30 minutes or when an effort variable changes (e.g., change in the equipment or method being used to monitor, on/off-signing PSO, etc.), and shall be linked to sightings data.
 - (vi) Effort and sightings data forms shall also include fields to capture information specific to monitoring in darkness and to more accurately describe the observation conditions. These fields include the following:
 - (A) Observation Method: FLIR, NVD, spotlight, eye (naked eye or regular binoculars), or multiple methods. This data is collected every 30 minutes with the Observer Effort form and with every sighting.
 - (B) Cloud Cover: Percentage. This can impact lighting conditions and reflectivity.
 - (C) Precipitation Type: Fog, rain, snow, or none.

- (D) Precipitation Reduced Visibility: Confirms whether or not visibility is reduced due to precipitation. This will be compared to the visibility distance (# km) to determine when visibility is reduced due to lighting conditions versus precipitation.
 - (E) Daylight Amount: Daylight, twilight, dark. The addition of the twilight field has been included to record observation periods where the sun has set and observation distances may be reduced due to lack of light.
 - (F) Light Intensity: Recorded in footcandles (fc) using an incident light meter. This procedure was added to quantify the available light during twilight and darkness periods and may allow for light-intensity bins to be used during analysis.
- (d) Acoustic Monitoring
- (i) Sound Source Verification:
 - (A) ION shall use measurements of the same airgun source taken in the Canadian Beaufort Sea in 2010, along with sound velocity measurements taken in the Alaskan Beaufort Sea at the start of the 2012 survey to update the propagation model and estimate new exclusion zones, or conduct onsite seismic survey if ice conduction allows.
 - (B) 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 re 1 μ Pa (rms) for the airgun array(s). The configurations of airgun arrays shall include at least the full array and the operation of a single source that will be used during power downs.
 - (C) The test results shall be reported to NMFS within 5 days of completing the test.
 - (ii) Seismic Hydrophone Streamer Recordings of Vessel Sounds: ION shall use the hydrophones in the seismic streamer to monitor the icebreaker noise.
 - (A) Collection of background sound: ION shall cease operating its airguns for two consecutive intervals once every hour in order to collect background sounds, including the sounds generated by the vessels.
 - (B) Measuring sound energy level: ION shall generalize previous measurements of icebreakers and add to the data collected during this project to estimate sound energy over a larger range of frequencies..
 - (iii) Over-winter Acoustic Recorders

- (A) ION shall collaborate with other industry operators to deploy acoustics recorders in the Alaskan Beaufort Sea in fall of 2012, to be retrieved during the 2013 open-water season.
- (B) Acoustic data from the over-winter recorders shall be analyzed to address the following objectives:
 - Characterize the sounds and propagation distances produced by Ion's source vessel, icebreaker, and airguns on and to the edge of the U.S. Beaufort Sea shelf,
 - Characterize ambient sounds and marine mammal calls during October and November to assess the relative effect of ION's seismic survey on the background conditions, and to characterize marine mammal calling behavior, and
 - Characterize ambient sound and enumerate marine mammal calls through acoustic sampling of the environment from December 2012 through July 2013, when little or no anthropogenic sounds are expected.

8. Reporting:

- (a) Sound Source Verification Report: A report on the preliminary results of the acoustic verification measurements, including as a minimum the measured 190-, 180-, 160-, and 120-dB re 1 μ Pa (rms) radii of the airgun arrays will be submitted within 120 hr after collection and analysis of those measurements at the start of the field season. This report shall specify the distances of the exclusion zones that were adopted for the marine survey activities.
- (b) Field Reports: Throughout the survey program, the observers shall prepare a report each day summarizing the recent results of the monitoring program. The field reports shall summarize the species and numbers of marine mammals sighted. These reports shall be provided to NMFS and to the survey operators.
- (c) Technical Report: The results of the vessel-based monitoring, including estimates of "take by harassment", shall be presented in the 90-day and final technical reports within 90 days after the conclusion of the in-ice seismic survey. Reporting will address the requirements established by NMFS in the IHA. The technical report will include:
 - (i) summaries of monitoring effort: total hours, total distances, and distribution of marine mammals through the study period accounting for sea state and other factors affecting visibility and detectability of marine mammals;
 - (ii) methods, results, and interpretation pertaining to all acoustic characterization work and vessel-based monitoring;

- (iii) analyses of the effects of various factors influencing detectability of marine mammals including sea state, number of observers, and fog/glare;
- (iv) species composition, occurrence, and distribution of marine mammal sightings including date, water depth, numbers, age/size/gender categories, group sizes, and ice cover; and
- (v) analyses of the effects of survey operations:
 - sighting rates of marine mammals during periods with and without airgun activities (and other variables that could affect detectability);
 - initial sighting distances versus airgun activity state;
 - closest point of approach versus airgun activity state;
 - observed behaviors and types of movements versus airgun activity state;
 - numbers of sightings/individuals seen versus airgun activity state;
 - distribution around the survey vessel versus airgun activity state; and
 - estimates of “take by harassment”.
- (vi) to better assess impacts to marine mammals, data analysis should be separated into periods when a seismic airgun array (or a single airgun) is operating and when it is not. Final and comprehensive reports to NMFS should summarize and plot: (A) Data for periods when a seismic array is active and when it is not; and (B) The respective predicted received sound conditions over fairly large areas (tens of km) around operations.
- (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) results from all hypothesis tests should include estimates of the associated statistical power when practicable.
- (ix) estimate and report uncertainty in all take estimates. Uncertainty could be expressed by the presentation of confidence limits, a minimum-maximum, posterior probability distribution, etc.; the exact approach would be selected based on the sampling method and data available.
- (x) The report should clearly compare authorized takes to the level of actual estimated takes.

- (xi) The draft report will 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.

9. Notification of Injured or Dead Marine Mammals

- (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 an injury (Level A harassment), serious injury or mortality (e.g., ship-strike, gear interaction, and/or entanglement), ION shall immediately cease survey operations and immediately report the incident to the Supervisor of Incidental Take Program, 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, loud 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).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with ION to determine what is necessary to

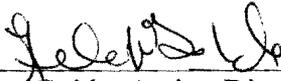
minimize the likelihood of further prohibited take and ensure MMPA compliance. ION may not resume their activities until notified by NMFS via letter, email, or telephone.

- (b) In the event that ION 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), ION will immediately report the incident to the Supervisor of the Incidental Take Program, 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 ION to determine whether modifications in the activities are appropriate.
- (c) In the event that ION 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), ION shall report the incident to the Supervisor of the Incidental Take Program, 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. ION shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. ION can continue its operations under such a case.

10. 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.
11. 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.
12. 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.

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

OCT 17 2012



Helen Golde, Acting Director
Office of Protected Resources
National Marine Fisheries Service

Date

Table 1. Species/stocks and numbers of marine mammals allowed to be taken incidental to under this IHA.

Species / Stocks	Take Allowed*
<i>Beluga whale / Eastern Chukchi Sea</i>	5,232
<i>Harbor porpoise / Bering Sea</i>	23
<i>Bowhead whale / Bering-Chukchi-Beaufort Sea</i>	284
<i>Gray whale / Eastern North Pacific</i>	23
<i>Minke whale / Alaska</i>	23
<i>Bearded seal / Alaska</i>	95
<i>Ribbon seal / Alaska</i>	23
<i>Ringed seal / Alaska</i>	60,574
<i>Spotted seal / Alaska</i>	23

- Take estimates are based on calculation of marine mammal summer/fall densities, which are overestimates. The actual takes are expected to be much lower.