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

AUG 11 2009

Meagan Cummings
Marine Environmental & Safety Coordinator
Lamont-Doherty Earth Observatory
61 Route 9W
P.O. Box 1000
Palisades, New York 10964-8000

Dear Ms. Cummings:

Enclosed is an Incidental Harassment Authorization (IHA) issued to the Rice University, under the authority of Section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*), to harass species of marine mammals incidental to the R/V *Endeavor*'s low-energy seismic survey in the Northwest Atlantic Ocean during August, 2009.

You are required to comply with the conditions contained in the IHA. In addition, you must cooperate with any Federal, state, or local agency monitoring the impacts of your activity and submit a report to the National Marine Fisheries Service's (NMFS) Office of Protected Resources within 90 days of the completion of the cruise. The IHA requires monitoring of marine mammals by qualified individuals before, during, and after seismic activities and reporting of marine mammal observations, including species, numbers, and behavioral modifications potentially resulting from this activity.

If you have any questions concerning the IHA or its requirements, please contact Howard Goldstein or Jolie Harrison, Office of Protected Resources, NMFS, at 301-713-2289.

Sincerely,

James H. Lecky
Director
Office of Protected Resources

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
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DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL MARINE FISHERIES SERVICE

Incidental Harassment Authorization

Rice University (Rice), Department of Earth Science, 6100 Main Street, MS 126, Houston, Texas 77005, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1371(a)(5)(D)) and 50 CFR 216.107, to harass small numbers of marine mammals incidental to a low-energy marine seismic survey conducted by the R/V *Endeavor* (*Endeavor*) in the Northwest Atlantic Ocean, August, 2009:

1. This Authorization is valid from August 12, 2009 through September 12, 2009.

2. This Authorization is valid only for the *Endeavor*'s activities associated with low-energy seismic survey operations that will occur in the area 39.8 to 41.5° N, 69.8 to 70.6° W within the Exclusive Economic Zone of the United States, as specified in Rice's Incidental Harassment Authorization application and Environmental Assessment.

3. Species Authorized and Level of Takes

(a) The incidental taking of marine mammals, by Level B harassment only, is limited to the following species in the waters off of Nantucket and Martha's Vineyard:

(i) Mysticetes – see Table 2 (attached) for authorized species and take numbers.

(ii) Odontocetes – see Table 2 for authorized species and take numbers.

(iii) Pinnipeds – see Table 2 for authorized species and take numbers.

(iv) If any marine mammal species are encountered during seismic activities that are not listed in Table 2 (attached) for authorized taking and are likely to be exposed to SPLs greater than or equal to 160 dB re 1 μPa (rms), then the Holder of this Authorization must alter speed or course, power-down or shut-down the airguns to avoid take.

(b) The taking by Level A harassment (injury, serious injury or death), of any of the species listed in 3(a) above or the taking of any kind of any other species of marine

mammal is prohibited and may result in the modification, suspension or revocation of this Authorization.

4. The taking of any marine mammal in a manner prohibited under this Authorization must be reported immediately to the Office of Protected Resources, National Marine Fisheries Service (NMFS), at 301-713-2289.

5. The Authorization for taking by Level B harassment is limited to the following acoustic sources without an amendment to this Authorization:

(i) a single GI airgun array with a total capacity of 45 in^3;
(ii) a two GI airgun array with a total capacity of 90 in^3;
(iii) a sparker system;
(iv) a single 15 in^3 watergun;
(v) an echosounder; and
(vi) a sub-bottom profiler.

6. The Holder of this Authorization is required to cooperate with NMFS and any other Federal, state or local agency monitoring the impacts of the activity on marine mammals.

7. Mitigation and Monitoring Requirements

The Holder of this Authorization is required to:

(a) Utilize two NMFS-qualified, vessel-based marine mammal visual observers (MMVOs) (except during meal times, when at least one MMVO will be on watch) to survey and monitor for marine mammals near the seismic source vessel during daytime airgun operations (from civil twilight-dawn to civil twilight-dusk) and before and during start-ups of airguns day or night. The *Endeavor*'s vessel crew will also assist in detecting marine mammals, when practicable. MMVOs will have access to reticle binoculars (7x50 Fujinon), and night vision devices. MMVO shifts will last no longer than 4 hours at a time. MMVOs will also make observations during daytime periods when the seismic system is not operating for comparison of animal abundance and behavior, when feasible.

(b) MMVOs will conduct monitoring while the airgun array and streamers are being deployed or recovered from the water.

(c) Record the following information when a marine mammal is sighted:

(i) species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from seismic vessel, sighting cue, apparent reaction to the airguns or vessel (e.g., none, avoidance, approach, paralleling, etc., and including responses to ramp-up), and behavioral pace; and

(ii) time, location, heading, speed, activity of the vessel (including number of airguns operating and whether in state of ramp-up or power-down), sea state, visibility, cloud cover, and sun glare; and

(iii) the data listed under 7(c)(ii) will also be recorded at the start and end of each observation watch and during a watch whenever there is a change in one or more of the variables.

(d) Visually observe the entire extent of the safety radius (190 dB for pinnipeds, 180 dB for cetaceans; see Table 1 [attached] for distances) using NMFS-qualified MMVOs, for at least 30 minutes prior to starting the airgun (day or night). If the MMVO finds a marine mammal within the safety zone, Rice must delay the seismic survey until the marine mammal(s) has left the area. If the MMVO sees a marine mammal that surfaces, then dives below the surface, the observer shall wait 30 minutes. If the MMVO sees no marine mammals during that time, they should assume that the animal has moved beyond the safety zone. If for any reason the entire radius cannot be seen for the entire 30 minutes (min) (i.e., rough seas, fog, darkness), or if marine mammals are near, approaching, or in the safety radius, the airguns may not be started up.

(e) Establish 180 dB and 190 dB safety zones for cetaceans and pinnipeds, respectively, before the single and two GI airgun array (45 in^3 and 90 in^3) is in operation. The relevant safety zones for the two GI airgun array will be used for the sparker system and watergun. See Table 1 (attached) for distances and safety radii.

(f) Alter speed or course during seismic operations if a marine mammal, based on its position and relative motion, appears likely to enter the relevant safety zone. If speed or course alteration is not safe or practicable, or if after alteration the marine mammal still appears likely to enter the safety zone, further mitigation measures, such as a shut-down, will be taken.

(g) Power-down or shut-down the airgun(s), watergun, and/or sparker if a marine mammal is detected within, approaches, or enters the relevant safety radius (as defined in Table 1, attached). A shut-down means the operating airgun is turned off. The relevant safety radii for the two GI airguns (90 in^3) will be used for the watergun (15 in^3) or sparker. A power-down means reducing the number of operating airguns to a single operating (45 in^3) airgun, which reduces the safety radius to the degree that the animal(s) is outside of it.

(h) During operations using the two GI airgun array, a single 45 in^3 GI airgun will be operated during turns between successive survey lines. The continued operation of one airgun is intended to alert marine mammals to the presence of the survey vessel in the area.

(i) Following a power-down, if the marine mammal approaches the smaller designated safety radius, the airguns must then be completely shut-down. Airgun activity shall not resume until the marine mammal has cleared the safety zone, which means it was visually observed to have left the safety zone, or has not been seen within the safety zone for 10 min for species with shorter dive durations (small odontocetes and pinnipeds) or 15 min for species with longer dive durations (mysticetes and large odontocetes, including sperm, pygmy sperm, dwarf sperm, killer, and beaked whales).

(j) Low-energy marine seismic surveys may continue into night and low-light hours if such segment(s) of the survey is initiated when the entire relevant safety zones are visible and can be effectively monitored.

(k) No initiation of airgun array or other sound source operations is permitted from a shut-down position at night or during low-light hours (such as in dense fog or heavy rain) when the entire relevant safety zone cannot be effectively monitored by the MMVOs on duty.

(l) When operating the sound source(s), minimize approaches to slopes, submarine canyons, seamounts, and other underwater geologic features, if possible, to avoid possible beaked whale habitat.

(m) If concentrations or groups of humpback (*Megaptera novaeangliae*), fin (*Balaenoptera physalus*), blue (*B. musculus*), sei (*B. borealis*), and sperm whales (*Physeter macrocephalus*) are observed (by visual detection) prior to or during the airgun operations, and do not appear to be traveling (i.e., feeding, socializing, breeding), then those operations will be powered-down, shut-down, delayed, and/or moved to another location, if possible, based on recommendations by the on-duty MMVO aboard the *Endeavor*. A typical concentration or group of whales for this survey consists of three or more individuals visually sighted. If the concentration or group of whales appears to be traveling, then Rice will power-down or shut-down seismic operations and wait for approximately 30 min for the individuals to move out of the study area before re-initiating seismic operations.

(n) If a North Atlantic right whale (*Eubalaena glacialis*) is visually sighted, the airgun array, watergun, or sparker will be shut-down regardless of the distance of the animal(s) to the sound source. The array will not resume firing until 30 min after the last documented whale visual sighting.

(o) To the maximum extent practicable, seismic surveys (especially inshore) will be conducted from the coast (inshore) and proceed towards the sea (offshore) in order to avoid trapping marine mammals in shallow water.

8. Reporting Requirements

The Holder of this Authorization is required to:

(a) Submit a draft report on all activities and monitoring results to the Office of Protected Resources, NMFS, within 90 days of the completion of the *Endeavor*'s cruise. This report must contain and summarize the following information:

(i) Dates, times, locations, heading, speed, weather during, sea conditions (including Beaufort Sea State and Wind Force), and associated activities during all seismic operations and marine mammal sightings;

(ii) Species, number, location, distance from the vessel, and behavior of any marine mammals, as well as associated seismic activity (number of shut-downs), observed throughout all monitoring activities.

(iii) An estimate of the number (by species) of marine mammals that: (A) are known to have been exposed to the seismic activity (based on visual observation) at received levels greater than or equal to 160 dB re 1 μPa (rms) and/or 180 dB re 1 μPa (rms) with a discussion of any specific behaviors those individuals exhibited; and (B) may have been exposed (based on modeling results) to the seismic activity at received levels greater than or equal to 160 dB re 1 μPa (rms) and/or 180 dB re 1 μPa (rms) with a discussion of the nature of the probable consequences of that exposure on the individuals that have been exposed.

(iv) A description of the implementation and effectiveness of the: (A) terms and conditions of the Biological Opinion's Incidental Take Statement (ITS) (attached); and (B) mitigation measures of the Incidental Harassment Authorization. For the Biological Opinion, the report will confirm the implementation of each term and condition, as well as any conservation recommendations, and describe their effectiveness, for minimizing the adverse effects of the action on listed marine mammals.

(b) Submit a final report to the Chief, Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, within 30 days after receiving comments from NMFS on the draft report. If NMFS decides that the draft report needs no comments, the draft report will be considered to be the final report.

9. In the unanticipated event that any taking of a marine mammal in a manner prohibited by this Authorization occurs, such as an injury, serious injury, or mortality, and are judged to result from these activities, Rice will immediately report the incident to the Chief of the Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-713-2289. Rice will postpone the research activities until NMFS is able to review the circumstances of the take. NMFS will work with Rice to determine whether modifications in the activities are appropriate and necessary, and notified the permit holder that they may resume sound source operations.

In the event that Rice discovers an injured or dead marine mammal that is judged to not have resulted from these activities, Rice will contact and report the incident to the Chief of the Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-713-2289 within 24 hours of the discovery.

10. Rice is required to comply with the Terms and Conditions of the ITS corresponding to NMFS' Biological Opinion issued to both NSF and NMFS' Office of Protected Resources (attached).

11. A copy of this Authorization and the ITS must be in the possession of all contractors and marine mammal monitors operating under the authority of this Incidental Harassment Authorization.

AUG 11 2009

James H. Lecky
Director
Office of Protected Resources
National Marine Fisheries Service

Date

Attachments

Attachment

Table 1. Safety Radii for Triggering Mitigation.

Source and Volume	Water Depth	Predicted rms Distances (m)		
		Shut-down Zone for Pinnipeds 190 dB	Shut-down Zone for Cetaceans 180 dB	Level B Harassment Zone 160 dB
Single GI Airgun (45 in^3)	Intermediate (100-1,000 m)	12	35	330
	Shallow (<100 m)	95	150	570
Two GI Airgun (90 in^3), Sparker, and Watergun (15 in^3)	Intermediate (100-1,000 m)	15	60	525
	Shallow (<100 m)	147	296	1,029

Table 2. Authorized Take Numbers for Each Marine Mammal Species in the Northwest Atlantic Ocean.

Species	Authorized Take in Northwest Atlantic Ocean
Mysticetes	
North Atlantic right whale (*Eubalaena glacialis*)	0
Humpback whale (*Megaptera novaeangliae*)	2
Minke whale (*Balaenoptera acutorostrata*)	0
Sei whale (*Balaenoptera physalus*)	0
Fin whale (*Balaenoptera borealis*)	11
Blue whale (*Balaenoptera musculus*)	0
Odontocetes	
Sperm whale (*Physeter macrocephalus*)	2
Pygmy sperm whale (*Kogia breviceps*)	0
Dwarf sperm whale (*Kogia sima*)	0
Unidentified *Kogia* sp. whale (pygmy and dwarf sperm whale)	0
Cuvier's beaked whale (*Ziphius cavirostris*)	0
Northern bottlenose whale (*Hyperodon ampullatus*)	0
True's beaked whale (*Mesoplodon mirus*)	0
Gervais' beaked whale (*Mesoplodon europaeus*)	0
Sowerby's beaked whale (*Mesoplodon bidens*)	0
Unidentified beaked whale	0
Bottlenose dolphin (*Tursiops truncatus*)	39
Pantropical spotted dolphin (*Stenella attenuata*)	0
Atlantic spotted dolphin (*Stenella frontalis*)	0

Striped dolphin (*Stenella coeruleoalba*)	0
Spinner dolphin (*Stenella longirostris*)	0
Short-beaked common dolphin (*Delphinus delphis*)	349
White-beaked dolphin (*Lagenorhynchus albirostris*)	0
Atlantic white-sided dolphin (*Lagenorhynchus albirostris*)	0
Risso's dolphin (*Grampus griseus*)	30
False killer whale (*Pseudorca crassidens*)	0
Killer whale (*Orcinus orca*)	0
Long-finned pilot whale (*Globicephala melas*)	-
Short-finned pilot whale (*Globicephala macrorhynchus*)	-
Unidentified pilot whale (*Globicephala* sp.)	50
Harbor porpoise (*Phocoena phocoena*)	0
Pinnipeds	
Harbor seal (*Phoca vitulina*)	10
Gray seal (*Halochoerus grypus*)	5
Harp seal (*Pagophilius groenlandicus*)	0
Hooded seal (*Cystophora cristata*)	0