

Dated: February 4, 2009.

P. Michael Payne,

Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XM65

Incidental Takes of Marine Mammals Incidental to Specified Activities; Marine Geophysical Survey in the Southwest Pacific Ocean, January — February, 2009

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

ACTION: Notice; issuance of incidental take authorization.

SUMMARY: In accordance with the Marine Mammal Protection Act (MMPA) regulations, notification is hereby given that NMFS has issued an Incidental Harassment Authorization (IHA) to Lamont-Doherty Earth Observatory (L-DEO), a part of Columbia University, to take small numbers of marine mammals, by Level B harassment only, incidental to conducting a marine seismic survey in the southwest Pacific Ocean.

DATES: Effective January 14, 2009, through February 21, 2009.

ADDRESSES: A copy of the IHA and the application are available by writing to P. Michael Payne, Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910-3225 or by telephoning the contact listed here. A copy of the application containing a list of the references used in this document may be obtained by writing to the address specified above, telephoning the contact listed below (see **FOR FURTHER INFORMATION CONTACT**), or by visiting the internet at: <http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications>. Documents cited in this notice may be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Jeannine Cody, Office of Protected Resources, NMFS, (301) 713-2289.

SUPPLEMENTARY INFORMATION:

Background

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

Authorization for incidental taking shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined “negligible impact” in 50 CFR 216.103 as “...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.”

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Except with respect to certain activities not pertinent here, the MMPA defines “harassment” as:

any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Section 101(a)(5)(D) establishes a 45-day time limit for NMFS’ review of an application followed by a 30-day public notice and comment period on any proposed authorization for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either approve or deny the authorization.

Summary of Request

On August 18, 2008, NMFS received an application from L-DEO for the taking by Level B harassment only, of

small numbers of 29 species of marine mammals incidental to conducting, with research funding from the National Science Foundation (NSF), a marine seismic survey within the Exclusive Economic Zone (EEZ) of Tonga in the southwest Pacific Ocean during January through February 2009. NMFS outlined the purpose of the research program in a previous notice for the proposed IHA (73 FR 71606, November 25, 2008).

Description of the Activity

The planned survey will involve one source vessel, the R/V *Marcus G. Langseth* (*Langseth*), a seismic vessel owned by the NSF. NSF expects the *Langseth* to depart Nuku’alofa, Tonga on January 14, 2009 for a one-day transit to the study area in the Lau Basin in the southwest Pacific Ocean (between 19–21° S. and 175–176° W.).

To obtain high-resolution three-dimensional (3D) structures of the Lau Basin’s magmatic systems and thermal structures, the *Langseth* will deploy a towed array of 36 airguns with a total discharge volume of approximately 6,600 cubic inches (in³). The array configuration consists of four identical linear arrays or strings, with 10 airguns on each string. L-DEO will distribute the four airgun strings across an approximate area of 24 x 16 meters (m) (79 x 52 feet (ft)) behind the *Langseth* which will tow the array approximately 50–100 m (164–328 ft) behind the vessel at a tow-depth of 9–12 m (29.5–39.4 ft). The airgun array will fire for a brief (0.1 second (s)) pulse every 180 s. The array will remain silent at all other times.

The *Langseth* will also deploy 55 to 64 Ocean Bottom Seismometers (OBS) for the survey. As the airgun array is towed along the survey lines, the OBS will receive the returning acoustic signals and record them internally for later analysis. In addition to the operations of the airgun array, the *Langseth* will operate a multibeam echosounder (MBES) and a sub-bottom profiler (SBP) continuously throughout the Eastern Lau Spreading Center cruise.

The survey area is approximately 42 kilometers (km) (26 miles (mi)) offshore from Tonga in water depths ranging from 1000 – 2600 m (3280 — 9186 ft). The seismic survey effort (e.g., equipment testing, startup, line changes, repeat coverage of any areas, and equipment recovery) will require approximately 19 days to complete 42 transects of variable lengths, totaling 3650 km (2268 mi) and will include approximately 456 hours of airgun operation. Please see L-DEO’s application for more detailed information. The exact dates of the activities will depend on logistics,

weather conditions, and the need to repeat some lines if data quality is substandard.

L-DEO will conduct all geophysical data acquisition activities with on-board assistance by the scientists who have proposed the NSF-funded study. The scientific team consists of Dr. Doug Wiens (Washington University), Dr. Robert Dunn (University of Hawaii), Dr. Donna Blackman (Scripps Institution of Oceanography), and Dr. Spahr Webb (L-DEO). The vessel will be self-contained, and the crew will live aboard the vessel for the entire cruise.

NMFS has provided a more detailed description of the authorized action, including vessel and acoustic source specifications, in a previous notice for the proposed IHA (73 FR 71606, November 25, 2008).

Safety Radii

The distance from the sound source at which an animal would be exposed to these different received sound levels may be estimated and is typically referred to as safety radii. These safety radii are specifically used to help NMFS estimate the number of marine mammals likely to be harassed by the proposed activity and in deciding how close a marine mammal may approach an operating sound source before the applicant will be required to power-down or shut down the sound source.

L-DEO's acoustic models predict received sound levels in relation to distance and direction from the 36-airgun array in order to estimate the safety radii around their operations. L-DEO's model is based on empirical data gathered during the acoustic calibration study of the R/V *Maurice Ewing's*

(*Ewing*) array of 20 airguns (total volume 8600 in³) conducted in the northern Gulf of Mexico in 2003. L-DEO provides a more detailed description of the modeling effort and calculations of the safety radii in the previous notice for the proposed IHA (73 FR 71606, November 25, 2008), Section I of L-DEO's IHA application, and in Appendix A of the Environmental Assessment report prepared by LGL Limited environmental research associates (LGL) on behalf of NSF.

Using the modeled distances and various correction factors, Table 1 outlines the predicted distances at which three root mean square (rms) sound levels (190 decibels (dB), 180 dB, and 160 dB) are expected to be received from the 36-airgun array and a single airgun operating in water greater than 1000 m (3,820 ft) in depth.

Source and Volume	Tow Depth (m)	Predicted RMS Distances (m)		
		190 dB	180 dB	160 dB
Single Bolt airgun 40 in ³	9–12	12	40	385
4 strings 36 airguns 6600 in ³	9	300	950	6000
	12	340	1120	6850

Table 1. Predicted distances to which sound levels ≥ 190 , 180, and 160 dB re 1 μ Pa might be received in deep (>1000 m; 3280 ft) water from the 36-airgun array during the seismic survey, January — February, 2009.

Comments and Responses

NMFS published a notice of receipt of the L-DEO application and proposed IHA in the **Federal Register** on November 25, 2008 (73 FR 71606). During the comment period, NMFS received comments from the Marine Mammal Commission (Commission), the Center for Regulatory Effectiveness (CRE); and the South Pacific Whale Research Consortium (SPWRC).

Following are the comments from the Commission, CRE, and SPWRC and NMFS' responses.

Comment 1: The Commission recommends that NMFS provide additional justification for its preliminary determination that the planned monitoring program will be sufficient to detect, with a high level of confidence, all marine mammals within or entering the identified safety zones; as such monitoring is essential for determining whether animals are being taken in unanticipated ways and unexpected numbers.

Response: NMFS believes that the planned monitoring program will be sufficient to detect (using visual detection and passive acoustic monitoring (PAM)), with reasonable certainty, most marine mammals within or entering identified safety radii. This

monitoring, along with the required mitigation measures (see below), will result in the least practicable adverse impact on the affected species or stocks and will result in a negligible impact on the affected species or stocks. The *Langseth* is utilizing a team of trained marine mammal observers (MMOs) to visually monitor marine mammals and conduct passive acoustic monitoring (PAM).

The *Langseth's* high observation tower is a suitable platform for conducting marine mammal and turtle observations. When stationed on the observation platform, the MMO's eye level will be approximately 18 m (59 ft) above sea level, providing a panoramic view around the entire vessel. During the daytime, the MMO(s) will scan the area around the vessel systematically using reticle binoculars (e.g., 7 x 50 Fujinon), big-eye binoculars (25 x 150), and the naked eye. The platform of the *Langseth* is high enough that, in good weather, MMOs can see out to 8.9 nm (16.5 km, 10.2 mi). All of the 180-dB safety radii that MMOs will monitor during ramp-ups and power-downs are less than 2 km (1.1 nm, 1.2 mi).

MMOs will use night vision devices (NVDs) (ITT F500 Series Generation 3 binocular-image intensifier or

equivalent), during dusk or nighttime, when required. Finally, L-DEO will provide laser rangefinding binoculars (Leica LRF 1200 laser rangefinder or equivalent) to MMOs to assist with distance estimation. MMOs estimate that visual detection from the ship is between 150 and 250 m (492 and 820 ft) using NVDs and about 30 m (98.4 ft) with the naked eye, which are affected by ambient lighting conditions, sea state, and thermal factors.

The *Langseth* will complement visual observations of marine mammals with an acoustical monitoring program. L-DEO will use a PAM system to improve detection, identification, localization, and tracking of marine mammals. The acoustic monitoring will alert visual observers (if on duty) when vocalizing cetaceans are detected. When an MMO detects a vocalization while visual observations are in progress, the acoustic MMO will contact the visual MMO immediately, to alert him/her to the presence of cetaceans (if they have not already been seen), and to initiate a power down or shut down, if required.

The theoretical detection distance of this PAM system is tens of kilometers and it has reliable detection rates out to 3 km (1.6 nm) and more limited ability out to tens of kilometers. During the

Ewing's cruise in the Gulf of Mexico in 2003, MMOs detected marine mammals at a distance of approximately 10 km (5.4 nm) from the vessel and identified them to species level at approximately 5 km (2.7 nm) from the vessel, though the bridge of that vessel was only 11 m (36 ft) above the water (vs. the Langseth, which is 18 m (59 ft) above sea level).

The likelihood of MMOs visual detecting a marine mammal at night is significantly lower than the ability to detect any species during the day. However, the PAM operates equally as effective at night as during the day, and does not depend on good visibility.

The *Langseth* will not start up the airguns unless the MMO can visibly detect the safety range for the 30 minutes prior (i.e., not an night) to start up. In all cases at night, the *Langseth* will already be operating the airguns. NMFS believes that operating the airguns at night will cause many cetaceans to avoid the vessel; thus reducing the number of cetaceans likely to come within the safety radii. Additionally, all of the safety radii in deep water depths are smaller than 2 km (1.1 nm, 1.2 mi) and fall easily within the reliable detection capabilities of the PAM.

Comment 2: The Commission recommends that observations be made during all ramp-up procedures to gather data needed to analyze and report on its effectiveness as a mitigation measure.

Response: The IHA requires that MMOs on the *Langseth* make observations for 30 minutes prior to ramp-up, during all ramp-ups, and during all daytime seismic operations and 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 operations and whether in state of ramp-up or power-down), sea state, visibility, cloud cover, and sun glare.

These requirements should provide information regarding the effectiveness of ramp-up as a mitigation measure, provided animals are detected during ramp-up.

Comment 3: The Commission recommends that the monitoring period prior to the initiation of seismic activities and to the resumption of

airgun activities after a power-down be extended to one hour.

Response: As the MMC points out, several species of deep-diving cetaceans are capable of remaining underwater for more than 30 minutes, however, for the following reasons NMFS believes that 30 minutes is an adequate length for the monitoring period prior to the start-up of airguns: (1) because the *Langseth* is required to ramp-up, the time of monitoring prior to start-up of any but the smallest array is effectively longer than 30 minutes (Ramp up will begin with the smallest gun in the array and airguns will be added in a sequence such that the source level of the array will increase in steps not exceeding approximately 6 dB per 5-min period over a total duration of 20–30 min), (2) in many cases MMOs are making observations during times when sonar is not being operated and will actually be observing prior to the 30-minute observation period anyway, (3), the majority of the species that may be exposed do not stay underwater more than 30 minutes, and (4) all else being equal and if a deep diving individual happened to be in the area in the short time immediately prior to the pre-start-up monitoring, if an animal's maximum underwater time is 45 minutes, there is only a 1 in 3 chance that his last random surfacing would be prior to the beginning of the required 30-minute monitoring period.

Also, seismic vessels are moving continuously (because of long-towed array) and NMFS believes that unless the animal submerges and follows at the speed of the vessel (highly unlikely), the vessel will be far beyond the length of the safety radii within 30 minutes, and therefore it will be safe to start the airguns again.

Comment 4: In the proposed IHA on page 71612, column 2, paragraph 2: The statement "However, controlled exposure experiments in the Gulf of Mexico indicate that foraging behavior was altered upon exposure to airgun sound (Jochens *et al.*, 2006)," is not based on the most recent assessment of the data. NMFS' statement cites a 2006 Sperm Whale Seismic Study (SWSS) in the Gulf of Mexico Report which discusses data on foraging behavior and avoidance movements of seven tagged sperm whales in the Gulf of Mexico during exposure to airguns. The CRE requests that NMFS cite the final 2008 Synthesis Report on the sperm whale seismic study which cautions that the "...sample size of 7 animals that conducted foraging dives during exposure was too small to provide definitive results...the power of the test to detect *small* changes in foraging

success was low, and no conclusions on the biological significance of these effects for an individual animal or for the population can be made from the data sets available."

Response: As CRE points out in their letter, L-DEO acknowledges in their application (see Section 7, page 34) that seismic energy alters sperm whale foraging behavior. NMFS acknowledges the commentator's interpretation of the 2006 SSWS. However, after reviewing the 2008 Synthesis Report, NMFS believes that the following statement: "...sample size of 7 animals that conducted foraging dives during exposure was too small to provide definitive results...the power of the test to detect small changes in foraging success was low, and no conclusions on the biological significance of these effects for an individual animal or for the population can be made from the data sets available," refers to having the statistical power to detect small changes in foraging success. Conversely, page 264 of the 2008 Synthesis Report states the following: "...Our data seem to indicate that airgun exposure — even at the low exposure levels observed in this experiment — can result in large reductions in foraging rate for some individual sperm whales." Therefore, the proposed IHA notice statement that data indicated alterations in foraging behavior, is supported by one of the conclusions discussed in the 2008 Synthesis Report. NSF/L-DEO presented this study as one of several pieces of information that relate to this topic. Though the commenter has presented an alternate interpretation of the data related to foraging behavior, NMFS finds that the Environmental Assessment (EA) provides sufficient analysis of the available data and the information is not such that it will affect NMFS' findings.

Comment 5: The safety zone (power down/shut down zones) proposed are currently based on 180 dB (re $1\mu\text{Pa}^2$ rms) received level for cetaceans. While this is based on exposure levels that may cause a temporary threshold shift (TTS) in exposed cetaceans, biologically significant behavioral changes may occur at lower levels. Current best-practice is to power down at received levels of 160 dB (re $1\mu\text{Pa}^2$ rms). The SPWRC recommends that NMFS base the exclusion zones on the received levels of 160 dB.

Response: NMFS' marine mammal incidental take authorizations typically require a shutdown zone that corresponds to the isopleths associated with the Level A harassment threshold (i.e., 180 dB). NMFS does not require shutdown at the threshold associated

with the onset of Level B behavioral harassment (i.e., 160 dB), as that would effectively be an avoidance of take, which would render a take authorization under the MMPA unnecessary. The MMOs will still be looking beyond the safety zone and will use the information to help implement the current safety zone measures. Further, though NMFS does not ask for protective measures meant to entirely avoid disturbance of marine mammals, which would preclude the need for an authorization, we have included measures intended to affect the least practicable adverse impact on the species.

Comment 6: If the designated exclusion zone for power down/shut down zones is based on the received levels of 160 dB, SPWRC does not consider that L-DEO can effectively monitor such a large safety zone (> 6 km radius) in normal operating sea conditions and detect cetaceans at that distance. We recommend that a suitable support vessel with a high observation platform, with at least two experienced MMOs operates at least 3 to 4 km ahead of the seismic vessel as a forward lookout.

Response: See Comment 5. The designated exclusion zone for power down/shut down zones is based on the received levels of 180 dB, not 160 dB. The visual and acoustic monitoring program (see below) will be sufficient to detect, most marine mammals within or entering identified safety radii. This monitoring, along with the required mitigation measures, will result in the least practicable adverse impact on the affected species or stocks and will result in a negligible impact on the affected species or stocks.

Comment 7: As no systematic cetacean surveys have been undertaken to determine the diversity, abundance and distribution cetaceans within the Lau Basin during summer months and PAM systems cannot be relied upon to detect all cetaceans present during periods of night, SWPC recommends that should high densities of cetaceans be observed resulting in interruptions to seismic operations during daylight hours, a trigger for ceasing night time operations be included for the survey.

Response: It is NMFS' opinion that once a safety zone is determined visually to be free of marine mammals, seismic may continue into periods of poor visibility. It should be understood that the safety zone is not stationary but is moving along with the ship at whatever speed the ship is progressing.

The IHA authorizes L-DEO to continue marine geophysical surveys into night and low-light hours if such

segment of the survey is initiated when the entire relevant safety zones are visible and can be monitored for the entire 30 minutes prior (i.e., not at night) to starting the airguns. The IHA prohibits the initiation of the airgun array operation from a shut-down position at night or during low-light hours (such as in dense fog) when the full safety zone cannot be monitored by the MMOs. Finally, if L-DEO wishes to conduct seismic surveys at night or during low-light hours, a small airgun with the source level of at least 180 dB re μPa (rms) shall be initiated during the day-time with good visibility when no marine mammal is in the safety zone, and be kept on and monitored before ramping up for the survey.

Therefore, in cases where the airguns are already operating at night, NMFS believes that the continuing airgun operation will cause many cetaceans to avoid the vessel, which therefore will reduce the number likely to come within the safety radii. Additionally, because of normal operating procedures, which entail beginning seismic operations as soon after dawn as possible, at the most, less than one third of actual airgun operation (and much less, most likely) will occur at nighttime.

Comment 8: It is recommended that if three or more cetacean related interruptions (shutdowns or power downs) occur during the daylight hours then no nighttime seismic operations are conducted the following night. This is best practice and a requirement for all seismic surveys in Australian waters.

Response: See Comment 7. It is NMFS opinion that once a safety zone is determined visually to be free of marine mammals, seismic should continue into periods of poor visibility. As a general rule, termination of seismic during nighttime and poor visibility is simply not practicable due to cost considerations and ship time schedules. A review of previous monitoring programs indicates that these species were not within a distance to incur Level A harassment.

L-DEO's monitoring plan, along with the required mitigation measures in the IHA, will result in the least practicable adverse impact on the affected species or stocks and will result in a negligible impact on the affected species or stocks.

Comment 9: As the proposed seismic survey is an activity governed by the Tongan Fisheries Act of 1989, we recommend a Tonga Fisheries Observer be invited to participate in the survey (with all costs covered).

Response: NMFS acknowledges the commentator's interpretation of the Tongan Fisheries Act 1989 and will

forward SPWRC's request to NSF and L-DEO. NSF/L-DEO has received approval from the Tonganese government to conduct the survey and the terms and conditions of the IHA encourage NSF to coordinate with the Tongan government regarding the proposed seismic activity.

Comment 10: It is recommended that at least one SPWRC representative who is familiar with the cetacean species within the region be included, in the MMO team for the survey (with all costs associated with participating in the survey covered) and that the Consortium have full access to all cetacean sighting data collected.

Response: L-DEO appoints NMFS-qualified marine mammal observers with NMFS' concurrence. If an SPWRC representative requests to participate in the seismic survey, they should discuss this directly with a representative from L-DEO.

The IHA requires L-DEO to submit a report on all activities and monitoring results to the Office of Protected Resources, NMFS, within 90 days after the expiration of the IHA. L-DEO is then required to submit a final report within 30 days after receiving comments from NMFS on the draft report. NMFS will make a copy of the final report available on the internet at: <http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications>.

Description of Marine Mammals in the Activity Area

Twenty-nine marine mammal species may occur off the coast of Tonga, including 21 odontocetes (toothed cetaceans, such as dolphins), and 8 mysticetes (baleen whales). Pinnipeds are unlikely to be encountered in or near the Lau Basin survey area where seismic operations will occur, and are, therefore, not addressed further in this document. Five of these species are listed as endangered under the U.S. Endangered Species Act (ESA), including the humpback (*Megaptera novaeangliae*), sei (*Balaenoptera borealis*), fin (*Balenoptera physalus*), blue (*Balenoptera musculus*), and sperm (*Physeter macrocephalus*) whales. This IHA will only address requested take authorizations for cetaceans as L-DEO does not expect to encounter pinnipeds that far offshore in the study area. Thus L-DEO is not requesting any takes for pinnipeds in this IHA.

Table 2 below outlines the species, their habitat and abundance in the proposed survey area, and the estimated exposure levels. Additional information regarding the status and distribution of the marine mammals in the area as well as how L-DEO calculated the densities were included in a previous notice for

the proposed IHA (73 FR 71606, November 25, 2008) and in Sections III and IV of L-DEO's application.

Species	Habitat	Abundance in the SW Pacific	Occurrence in the Survey Area	Maximum Estimate of Individuals Exposed to \geq 160 dB	Percent of Estimated Population Exposed to \geq 160 dB
Humpback whale*	Nearshore waters	6,200	Rare	3	0.01
Sei whale*	Offshore, pelagic	12,000	Common	3	0.01
Fin whale*	Pelagic, continental slope	3,031	Uncommon	3	0.03
Blue whale*	Pelagic, coastal	756	Uncommon	3	0.12
Pygmy right whale	Coastal, oceanic	N.A.	Common	3	N.A.
Minke whale	Pelagic, coastal	155,000	Rare in Jan.	3	0.001
Dwarf minke whale	Coastal	N.A.	N.A.	3	N.A.
Bryde's whale	Pelagic, coastal	16,500	Common	14	0.02
Sperm whale*	Pelagic, deep seas	22,700	Common	22	0.03
Pygmy sperm whale	Deep waters off the shelf	N.A.	Common	353	N.A.
Dwarf Sperm whale	Deep waters off the shelf	11,200	Uncommon	353	0.85
Cuvier's beaked whale	Pelagic	20,000	Common	40	0.09
Southern bottlenose whale	Pelagic	N.A.	Rare	0	N.A.
Longman's beaked whale	Pelagic	N.A.	Uncommon	16	N.A.
Blainville's beaked whale	Pelagic	25,300	Common	40	0.07
Ginkgo-toothed beaked whale	Pelagic	25,300	Rare	16	0.03
Rough-toothed dolphin	Deep water	145,900	Uncommon	1,649	0.59
Bottlenose dolphin	Coastal, oceanic	243,500	Common	330	0.07
Pantropical spotted dolphin	Coastal, pelagic	1,298,400	Uncommon	1,649	0.07
Spinner dolphin	Coastal, pelagic	1,019,300	Rare	3,298	0.17
Striped dolphin	Continental shelf	1,918,000	Rare	330	0.01
Fraser's dolphin	Waters > 1000 m	289,300	Rare	989	0.18
Short-beaked common dolphin	Shelf, pelagic	2,210,900	Common	330	0.01
Risso's dolphin	Waters > 1000 m	175,800	Common	330	0.10
Melon-headed whale	Oceanic	45,400	Uncommon	152	0.10
Pygmy killer whale	Deep, pantropical	38,900	Uncommon	30	0.02
False killer whale	Pelagic	39,800	Uncommon	91	0.07
Killer whale	Widely distributed	8,500	Common	61	0.20
Short-finned pilot whale	Pelagic	160,200	Common	61	0.01
Total				10,173	

Table 2. Abundance, preferred habitat, and commonness of the marine mammal species that may be encountered during the proposed survey within the Lau Basin survey area. The far right columns indicate the estimated number of each species that will be exposed to \geq 160 dB based on maximum density estimates. NMFS believes that, when mitigation measures are taken into consideration, the activity is likely to result in take of numbers of animals less than those indicated by the column titled "Maximum Estimate of Individuals Exposed to \geq 160 dB."

* Federally listed endangered species.

Potential Effects on Marine Mammals

The effects of sounds from airguns might include one or more of the following: tolerance, masking of natural sounds, behavioral disturbances, and at least in theory, temporary or permanent hearing impairment, or non-auditory physical or physiological effects (Richardson *et al.*, 1995; Gordon *et al.*, 2004; Nowacek *et al.*, 2007; Southall *et al.*, 2007). Permanent hearing impairment, in the unlikely event that it occurred, would constitute injury, but temporary threshold shift (TTS) is not an injury (Southall *et al.*, 2007). It is unlikely that the project would result in any cases of temporary impairment, or any significant non-auditory physical or physiological effects. Some behavioral disturbance is expected, but this would be localized and short-term. Also, behavioral disturbance is expected to be limited to relatively short distances.

The notice of the proposed IHA (73 FR 71606, November 25, 2008) included a discussion of the effects of sounds from airguns on mysticetes (baleen whales) and odontocetes (toothed whales), including tolerance, masking, behavioral disturbance, hearing impairment, and other non-auditory physical effects. Additional information on the behavioral reactions (or lack thereof) by all types of marine mammals to seismic vessels can be found in Appendix B of L-DEO's application.

The notice of the proposed IHA also included a discussion of the potential effects of the multibeam echosounder (MBES) and the sub-bottom profiler (SBP). Because of the shape of the beams of these sources and their power, NMFS believes it unlikely that marine mammals will be exposed to either the MBES or the SBP at levels at or above those likely to cause harassment. Further, NMFS believes that the brief exposure of cetaceans or pinnipeds to few signals from the multi-beam bathymetric sonar system is not likely to result in the harassment of marine mammals.

Estimated Take by Incidental Harassment

The notice of the proposed IHA (73 FR 71606, November 25, 2008) included an in-depth discussion of the methods used to calculate the densities of the marine mammals in the area of the seismic survey and the take estimates. Based on numbers of animals encountered during previous L-DEO seismic surveys, the likelihood of the successful implementation of the required mitigation measures, and the likelihood that some animals will avoid the area around the operating airguns,

NMFS believes that L-DEO's airgun seismic testing program may result in the Level B harassment of some lower number of individual marine mammals (a few times each) than is indicated by the column titled, Maximum Estimate of Individuals Exposed to ≥ 160 dB, in Table 2. L-DEO has asked for authorization for take of their "maximum estimate" of numbers for each species. Though NMFS believes that take of the requested numbers is unlikely, we still find these numbers small relative to the population sizes.

Few have conducted systematic aircraft- or ship-based surveys for marine mammals in the offshore waters of the southern Pacific Ocean. Hence, the species of marine mammals that occur in the area are not well known. L-DEO's estimates are based on species accounts in part derived from Reeves *et al.* (1999), who summarized distribution information from the area served by the South Pacific Regional Environment Programme (SPREP). The SPREP region covers a vast area of the Pacific Ocean between the Tropic of Capricorn and the Equator from Papua New Guinea (140°E.) to Pitcairn Island (130°W.).

Estimates of the numbers of marine mammals that might be affected are based on consideration of the number of marine mammals that could be disturbed appreciably by approximately 3,650 km of seismic surveys during the proposed seismic program in the Lau Basin, Tonga. The estimates of exposures to various sound levels assume that the surveys will be completed; in fact, the planned number of line-kilometers has been increased by 25 percent to accommodate lines that may need to be repeated, equipment testing, etc.

All anticipated "takes by harassment" authorized by this IHA are Level B harassment only, involving temporary changes in behavior. Because of the required implementation of mitigation measures and the likelihood that some cetaceans will avoid the area around the operating airguns of their own accord, NMFS does not expect any marine mammal to approach the sound source close enough to be injured (Level A harassment). Given these considerations, the predicted number of marine mammals that might be exposed to sounds at or greater than 160 dB may be somewhat overestimated. Thus, the following estimates of the numbers of marine mammals potentially exposed to sounds equal to or greater than 160 dB are precautionary, and probably overestimate the actual numbers of marine mammals that might be exposed.

Potential Effects on Habitat

A detailed discussion of the potential effects of this action on marine mammal habitat, including was included in the notice of the proposed IHA (73 FR 71606, November 25, 2008). Based on the discussion in the proposed IHA notice, the authorized operations are not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations or stocks and will not result in any permanent impact on habitats used by marine mammals, or to the food sources they use. The main impact issue associated with the proposed activity will be temporarily elevated noise levels and the associated direct effects on marine mammals.

The *Langseth* will deploy and retrieve approximately 55–64 OBS. The OBS anchors will remain upon equipment recovery. Although OBS placement will disrupt a very small area of seafloor habitat and may disturb benthic invertebrates, the impacts are expected to be localized and transitory. The vessel will deploy the OBS in such a way that creates the least disturbance to the area. Thus, it is not expected that the placement of OBS would have adverse effects beyond naturally occurring changes in this environment, and any effects of the planned activity on marine mammal habitats and food resources are expected to be negligible.

Monitoring and Mitigation

Mitigation and monitoring measures required to be implemented for the proposed seismic survey have been developed and refined during previous L-DEO seismic survey studies and associated environmental assessments, IHA applications, and IHAs. The mitigation and monitoring measures described herein represent a combination of the procedures required by past IHAs for other similar projects and on recommended best practices in Richardson *et al.* (1995), Pierson *et al.* (1998), and Weir and Dolman (2007). The measures are described in detail below.

Required mitigation measures include: (1) safety radii; (2) speed or course alteration, provided that doing so will not compromise operational safety requirements; (2) power-down procedures; (3) shutdown procedures; (4) ramp-up procedures; and (5) special procedures for nighttime and low-light hour operations.

Vessel-based Visual Monitoring

Vessel-based marine mammal visual observers (MMVOs) will be based

aboard the seismic source vessel and will watch for marine mammals near the vessel during daytime airgun operations and during start-ups of airguns at night. MMVOs will also watch for marine mammals near the seismic vessel for at least 30 minutes prior to the start of airgun operations and after an extended shutdown of the airguns (i.e., 7 minutes). When feasible, MMVOs will also make observations during daytime periods when the seismic system is not operating for comparison of animal abundance and behavior. Based on MMVO observations, airguns will be powered down, or if necessary, shut down completely (see below), when marine mammals are detected within or about to enter a designated safety radius corresponding to 180-dB isopleths. The MMVOs will continue to maintain watch to determine when the animal(s) are outside the safety radius, and airgun operations will not resume until the animal has left that zone. The predicted distances for the safety radii are listed according to the sound source, water depth, and received isopleth in Table 1.

During seismic operations in the southwest Pacific Ocean, at least three visual observers and one bioacoustician will be based aboard the *Langseth*. MMVOs will be appointed by L-DEO with NMFS' concurrence. At least one MMVO, and when practical two, will monitor the safety radii for marine mammals during daytime operations and nighttime startups of the airguns. Use of two simultaneous MMVOs will increase the proportion of the animals present near the source vessel that are detected. MMVO(s) will be on duty in shifts of duration no longer than 4 hours. The vessel crew will also be instructed to assist in detecting marine mammals and implementing mitigation requirements (if practical). Before the start of the seismic survey the crew will be given additional instruction regarding how to do so.

The *Langseth's* high observation tower is a suitable platform for conducting marine mammal and turtle observations. When stationed on the observation platform, the MMO's eye level will be approximately 18 m (59 ft) above sea level, providing a panoramic view around the entire vessel. During the daytime, the MMO(s) will scan the area around the vessel systematically using reticle binoculars (e.g., 7 x 50 Fujinon), big-eye binoculars (25 x 150), and the naked eye. The platform of the *Langseth* is high enough that, in good weather, MMOs can see out to 8.9 nm (16.5 km, 10.2 mi). All of the 180-dB safety radii that MMOs will monitor during ramp-ups and power-downs are less than 2 km (1.1 nm, 1.2 mi).

MMOs will use night vision devices (NVDs) (ITT F500 Series Generation 3 binocular-image intensifier or equivalent), during dusk or nighttime, when required. Finally, L-DEO will provide laser rangefinding binoculars (Leica LRF 1200 laser rangefinder or equivalent) to MMOs to assist with distance estimation. MMOs estimate that visual detection from the ship is between 150 and 250 m (492 and 820 ft) using NVDs and about 30 m (98.4 ft) with the naked eye, which are affected by ambient lighting conditions, sea state, and thermal factors.

Passive Acoustic Monitoring

PAM will take place to complement the visual monitoring program. Acoustic monitoring can be used in addition to visual observations to improve detection, identification, localization, and tracking of cetaceans. It is only useful when marine mammals call, but it can be effective either by day or by night and does not depend on good visibility. The acoustic monitoring will serve to alert visual observers when vocalizing cetaceans are detected. It will be monitored in real time so visual observers can be advised when cetaceans are detected. When bearings (primary and mirror-image) to calling cetacean(s) are determined, the bearings will be relayed to the visual observer to help him/her sight the calling animal(s).

The PAM system consists of hardware (i.e., hydrophones) and software. The "wet end" of the system consists of a low-noise, towed hydrophone array that is connected to the vessel by a "hairy" faired cable. The array will be deployed from a winch located on the back deck. A deck cable will connect from the winch to the main computer lab where the acoustic station and signal condition and processing system will be located. The lead-in from the hydrophone array is approximately 400 m (1,312 ft) long, and the active part of the hydrophone is approximately 56 m (184 ft) long. The hydrophone array is typically towed at depths of 20 m (65.6 ft).

The towed hydrophone array will be monitored 24 hours per day while at the survey area during airgun operations and also during most periods when the *Langseth* is underway with the airguns not operating. One MMO and/or bioacoustician will monitor the acoustic detection system at any one time, by listening to the signals from two channels via headphones and/or speakers and watching the real time spectrographic display for frequency ranges produced by cetaceans. MMOs monitoring the acoustical data will be on shift for 1–6 hours. Of the three observers required on board, one will

have primary responsibility for PAM during the seismic survey. However, all MMOs are expected to rotate through the PAM position, although the most experienced with acoustics will be on PAM duty more frequently.

When a vocalization is detected, the acoustic MMO will, if visual observations are in progress, contact the MMVO immediately to alert him/her to the presence of the vocalizing marine mammal(s) (if they have not already been seen), and to allow a power down or shutdown to be initiated, if required. The information regarding the call will be entered into a database. The data to be entered includes an acoustic encounter identification number, whether it was linked with a visual sighting, date, time when first and last heard and whenever any additional information was recorded, position and water depth when first detected, bearing if determinable, species or species group (e.g., unidentified dolphin, sperm whale), types and nature of sounds heard (e.g., clicks, continuous, sporadic, whistles, creaks, burst pulses, strength of signal, etc.), and any other notable information. The acoustic detection can also be recorded for further analysis.

Speed or Course Alteration – If a marine mammal is detected outside the safety radius and, based on its position and the relative motion, is likely to enter the safety radius or exclusion zone (EZ), the vessel's speed and/or direct course may be changed. This would be done if practicable while minimizing the effect on the planned science objectives. The activities and movements of the marine mammal(s) (relative to the seismic vessel) will then be closely monitored to determine whether the animal is approaching the applicable EZ. If the animal appears likely to enter the EZ, further mitigation actions will be taken, i.e., either further course alterations or a power down or shut down of the airguns. Typically, during seismic operations, major course and speed adjustments are often impractical when towing long seismic streamers and large source arrays, thus alternative mitigation measures (see below) will need to be implemented.

Power-down Procedures – A power-down involves reducing the number of operating airguns in use to minimize the exclusion zone, so that marine mammals are no longer in or about to enter this zone. A power-down of the airgun array to a reduced number of operating airguns may also occur when the vessel is moving from one seismic line to another. During a power down for mitigation, one airgun will be operated. The continued operation of at least one airgun is intended to alert

marine mammals to the presence of the seismic vessel in the area. In contrast, a shut down occurs when all airgun activity is suspended.

If a marine mammal is detected outside the safety radii but is likely to enter it, and if the vessel's speed and/or course cannot be changed to avoid the animal(s) entering the EZ, the airguns will be powered down to a single airgun before the animal is within the EZ. Likewise, if a mammal is already within the EZ when first detected, the airguns will be powered down immediately. During a power down of the airgun array, the 40-in³ airgun will be operated. If a marine mammal is detected within or near the smaller safety radii around that single airgun (see Table 1 above), all airguns will be shutdown (see next subsection).

Following a power down, airgun activity will not resume until the marine mammal is outside the safety radius for the full array. The animal will be considered to have cleared the safety radius if it:

- (1) Is visually observed to have left the safety radius; or
- (2) Has not been seen within the safety radius for 15 minutes in the case of small odontocetes; or
- (3) Has not been seen within the safety radius for 30 minutes in the case of mysticetes and large odontocetes, including sperm, pygmy sperm, dwarf sperm, and beaked whales; or
- (4) During airgun operations following a power-down (or shut-down) and subsequent animal departure as above, the airgun array will resume operations following ramp-up procedures described below.

Shutdown Procedures – The operating airgun(s) will be shut down if a marine mammal is detected within or approaching the safety radius for the then-operating single 40 in³ airgun while the airgun array is at full volume or during a power down. Airgun activity will not resume until the marine mammal has cleared the safety radius or until the MMO is confident that the animal has left the vicinity of the vessel. Criteria for judging that the animal has cleared the safety radius will be as described in the preceding subsection.

Ramp-up Procedures – A ramp-up procedure will be followed when the airgun array begins operating after more than seven minutes without airgun operations or when a power-down has exceeded seven minutes. This period is based on the modeled 180-dB radius for the 36-airgun array (see Table 1) in relation to the planned speed of the *Langseth* while shooting. Similar periods (approximately eight to 10

minutes) were used during previous L-DEO surveys.

Ramp-up will begin with the smallest airgun in the array (40 in³). Airguns will be added in a sequence such that the source level of the array will increase in steps not exceeding 6 dB per 5-minute period over a total duration of approximately 20 to 25 minutes. During ramp-up, the MMVOs will monitor the safety radius, and if marine mammals are sighted, a course/speed change, power down, or shutdown will be implemented as though the full array were operational.

If the complete safety radius has not been visible for at least 30 minutes prior to the start of operations in either daylight or nighttime, ramp-up will not commence unless at least one airgun (40 in³ or similar) has been operating during the interruption of seismic survey operations. Given these provisions, it is likely that the airgun array will not be ramped up from a complete shut down at night or in thick fog, because the other part of the safety radius for that array will not be visible during those conditions. If one airgun has operated during a power down period, ramp up to full power will be permissible at night or in poor visibility, on the assumption that marine mammals will be alerted to the approaching seismic vessel by the sounds from the single airgun and have the opportunity to move away. Ramp up of the airguns will not be initiated if a marine mammal is sighted within or near the applicable safety radius during the day or close to the vessel at night.

MMVO Data and Documentation

MMVOs will record data to estimate the numbers of marine mammals exposed to various received sound levels and to document any apparent disturbance reactions or lack thereof. Data will be used to estimate the numbers of mammals potentially "taken" by harassment. They will also provide information needed to order a power-down or shutdown of airguns when marine mammals are within or near the relevant safety radius. When a sighting is made, the following information about the sighting will be recorded:

- (1) 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.

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

The data listed under (2) 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.

All observations, as well as information regarding airgun power down and shutdown, will be recorded in a standardized format. Data will be entered into a custom electronic database. The accuracy of data will be verified by computerized data validity checks as the data are entered and by subsequent manual checking of the database. Preliminary reports will be prepared during the field program and summaries forwarded to the operating institution's shore facility and to NSF weekly or more frequently. MMO observations will provide the following information:

- (1) The basis for decisions about powering down or shutting down airgun arrays.
- (2) Information needed to estimate the number of marine mammals potentially 'taken by harassment.' These data will be reported to NMFS per terms of MMPA authorizations or regulations.
- (3) Data on the occurrence, distribution, and activities of marine mammals in the area where the seismic study is conducted.
- (4) Data on the behavior and movement patterns of marine mammals seen at times with and without seismic activity.

Reporting

A draft report will be submitted to NMFS within 90 days after expiration of the IHA. The report will describe the operations that were conducted and sightings of marine mammals near the operations. The report will be submitted to NMFS, providing full documentation of methods, results, and interpretation pertaining to all monitoring and mitigation. The 90-day draft report will summarize the dates and locations of seismic operations (dates, times, locations, heading, speed, weather, sea state, activities), and all marine mammal sightings (dates, times, locations, species, behavior, number of animals, associated seismic survey activities).

The report will also include the estimates of the amount and nature of potential "take" of marine mammals by harassment or in other ways, as well as a description of the implementation and effectiveness of the monitoring and mitigation measures of the IHA and

Biological Opinion's (BiOp) Incidental Take Statement. L-DEO is then required to submit a final report within 30 days after receiving comments from NMFS on the draft report.

Endangered Species Act (ESA)

Pursuant to section 7 of the ESA, NSF has consulted with the NMFS, Office of Protected Resources, Endangered Species Division on this seismic survey. NMFS Headquarters' Office of Protected Resources, Permits, Conservation, and Education Division has also consulted internally pursuant to section 7 of the ESA on the issuance of an IHA under section 101(a)(5)(D) of the MMPA for this activity. On January 13, 2009, NMFS issued a BiOp and concluded that the issuance of an IHA is not likely to jeopardize the continued existence of blue, fin, humpback, sei, and sperm whales; green sea turtles (*Chelonia mydas*); hawksbill sea turtles (*Eretmochelys imbricata*); leatherback sea turtles (*Dermochelys coriacea*); loggerhead sea turtles (*Caretta caretta*); and olive ridley sea turtles (*Lepidochelys olivacea*). The BiOp also concluded that the proposed activities would have no effect on critical habitat, as the Tongan government has no such designation within the action area. Finally, NMFS has incorporated the Relevant Terms and Conditions of the Incidental Take Statement in the BiOp into the IHA.

National Environmental Policy Act (NEPA)

On September 22, 2005 (70 FR 55630), NSF published a notice of intent to prepare a Programmatic Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OES) to evaluate the potential environmental impacts associated with the use of seismic sources in support of NSF-funded research by U.S. academic scientists. NMFS agreed to be a cooperating agency in the preparation of the EIS/OEIS. This EIS/OEIS has not been completed. Therefore, in order to meet NSF's and NMFS' NEPA requirements for the proposed activity and issuance of an IHA to L-DEO, the NSF has prepared an EA that is specific to the marine geophysical survey conducted by the R/V *Marcus G. Langseth* in the Southwest Pacific Ocean off the coast of Tonga. The NSF has made a Finding of No Significant Impact (FONSI) determination based on information contained within its EA that implementation of the proposed action is not a major Federal action having significant effects on the environment within the meaning of NEPA. NSF determined, therefore, that

an environmental impact statement would not be prepared. On November 25, 2008 (73 FR 71606), NMFS noted that the NSF had prepared an EA for the southwest Pacific Ocean surveys and made this EA available upon request. NMFS has reviewed the information contained in NSF's EA and determined that the NSF EA describes the proposed action alternative, and the potential impacts on marine mammals, endangered species, and other marine life that could be impacted by the preferred alternative and the other alternatives. Accordingly, NMFS adopted the NSF EA under 40 CFR 1506.3 and made its own FONSI. The NMFS FONSI also takes into consideration additional mitigation measures required by the IHA that are not in NSF's EA. Therefore, NMFS has determined that it is not necessary to issue a new EA, supplemental EA or an EIS for the issuance of an IHA to L-DEO for this activity. A copy of the EA and the NMFS FONSI for this activity is available upon request (see **ADDRESSES**).

Determinations

NMFS has determined that the impact of conducting the seismic survey in the southwest Pacific Ocean may result, at worst, in a temporary modification in behavior (Level B harassment) of small numbers of 29 species of cetaceans. Though NMFS believes that take of the requested numbers is unlikely, we still find these numbers small relative to the population sizes. Further, this activity is expected to result in a negligible impact on the affected species or stocks.

The provision requiring that the activity not have an unmitigable adverse impact on the availability of the affected species or stock for subsistence uses is not implicated for this proposed action. There is no subsistence harvest of marine mammals in the proposed research area; therefore, there will be no impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses.

This negligible impact determination is supported by: (1) the likelihood that, given sufficient warning through relatively slow ship speed, marine mammals are expected to move away from a noise source that is annoying prior to it becoming potentially injurious; (2) the fact that marine mammals would have to be closer than 40 m (131 ft) in deep water, when a single airgun is in use from the vessel to be exposed to levels of sound (180 dB) believed to have even a minimal chance of causing TTS; (3) the fact that marine mammals would have to be closer than 950 m (0.5 nm) in deep water, when the full array is in use at

a 9 m (29.5 ft) tow depth from the vessel to be exposed to levels of sound (180 dB) believed to have even a minimal chance of causing TTS; (4) the likelihood that marine mammal detection ability by trained observers is good at those distances from the vessel; (5) the use of PAM, which is effective out to tens of km, will assist in the detection of vocalizing marine mammals at greater distances from the vessel; (6) the incorporation of other required mitigation measures (i.e., ramp-up, power-down, and shutdown); and (7) the limited duration of the seismic survey in the study area (approximately 39 days). As a result, no take by injury or death is anticipated, and the potential for temporary or permanent hearing impairment is very low and will be avoided through the incorporation of the required monitoring and mitigation measures.

While the number of potential incidental harassment takes will depend on the distribution and abundance of marine mammals in the vicinity of the survey activity, the number of potential harassment takings is estimated to be small, relative to the affected species and stock sizes, and has been mitigated to the lowest level practicable through incorporation of the measures mentioned previously in this document.

Authorization

As a result of these determinations, NMFS has issued an IHA to L-DEO for conducting a marine geophysical survey in the southwest Pacific Ocean in January — February, 2009, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: January 13, 2009.

James H. Lecky,

*Director, Office of Protected Resources,
National Marine Fisheries Service.*

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XN15

Taking and Importing Marine Mammals; U.S. Navy Training in the Hawaii Range Complex

AGENCY: National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Commerce.

ACTION: Notice; issuance of a letter of authorization.