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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XC624

Takes of Marine Mammals Incidental to Specified Activities; Low-Energy Marine Geophysical Survey in the Tropical Western Pacific Ocean, September to October 2013

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

ACTION: Notice; issuance of an Incidental Take Authorization (ITA).

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 the Scripps Institution of Oceanography (SIO), a part of the University of California at San Diego, to take marine mammals, by Level B harassment, incidental to conducting a low-energy marine geophysical (seismic) survey in the tropical western Pacific Ocean, September to October 2013.

DATES: Effective September 6 through November 12, 2013.

ADDRESSES: A copy of the final IHA and application are available by writing to P. Michael Payne, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910 or by telephoning the contacts listed here.

A copy of the application containing a list of the references used in this document may be obtained by writing to the above address, telephoning the contact listed here (see FOR FURTHER INFORMATION CONTACT) or visiting the internet at:

http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications.

An "Environmental Analysis of a Low-Energy Marine Geophysical Survey by the R/V Roger Revelle in the Tropical Western Pacific Ocean, September-October 2013," was prepared by LGL Ltd., Environmental Research Associates, on behalf of the National Science Foundation (NSF) and SIO. NMFS also issued a Biological Opinion under section 7 of the Endangered Species Act (ESA) to evaluate the effects of the survey and IHA on marine species listed as threatened and endangered. The NMFS Biological Opinion is available online at: http://www.nmfs.noaa.gov/pr/consultations/opinions.htm. Documents cited in this notice may be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Howard Goldstein or Jolie Harrison, Office of Protected Resources, NMFS, 301-427-8401.

SUPPLEMENTARY INFORMATION:

Background

Section 101(a)(5)(D) of the MMPA, as amended (16 U.S.C. 1371 (a)(5)(D)), directs the Secretary of Commerce (Secretary) to authorize, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, 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, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

Authorization for the incidental taking of small numbers of marine mammals shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). The authorization must set forth the permissible methods of

taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the mitigation, monitoring and reporting of such takings. 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. Section 101(a)(5)(D) of the MMPA establishes a 45-day time limit for NMFS's review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of small numbers of marine mammals. Within 45 days of the close of the public comment period, NMFS must either issue or deny the authorization.

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].

Summary of Request

On April 5, 2013, NMFS received an application from the SIO requesting that NMFS issue an IHA for the take, by Level B harassment only, of small numbers of marine mammals incidental to conducting a low-energy marine seismic survey in International Waters (i.e., high seas) and in the Exclusive Economic Zone of the Federated States of Micronesia (Micronesia),

the Independent State of Papua New Guinea (Papua New Guinea), the Republic of Indonesia (Indonesia), and the Republic of the Philippines (Philippines) during September to October 2013. The SIO plans to use one source vessel, the R/V Roger Revelle (Revelle), and a seismic airgun array to collect seismic data in the tropical western Pacific Ocean. The SIO plans to use conventional low-energy, seismic methodology to fill gaps in equatorial Pacific data sets, namely the lack of high-resolution records from the eastern part of the Western Pacific Warm Pool to better assess controls on the hydrologic cycle in the Western Pacific Warm Pool, and a limited meridional coverage to test hypotheses related to the Plio-Pleistocene evolution of the Western Pacific Warm Pool. In addition to the planned operations of the seismic airgun array and hydrophone streamer, SIO intends to operate a multi-beam echosounder and sub-bottom profiler continuously throughout the survey. On June 5, 2013, NMFS published a notice in the Federal Register (78 FR 33811) making preliminary determinations and proposing to issue an IHA. The notice initiated a 30-day public comment period.

Acoustic stimuli (i.e., increased underwater sound) generated during the operation of the seismic airgun array may have the potential to cause a behavioral disturbance for marine mammals in the survey area. This is the principal means of marine mammal taking associated with these activities, and SIO has requested an authorization to take 26 species of marine mammals by Level B harassment. Take is not expected to result from the use of the multi-beam and sub-bottom profiler, for reasons discussed in this notice; nor is take expected to result from collision with the source vessel because it is a single vessel moving at a relatively slow speed 5 knots [kts]; 11.1 kilometers per hour [km/hr]; 6.9 miles per hour [mph]) during seismic acquisition within the survey, for a relatively short period of time (approximately 26 operational days). It is likely that any marine mammal would be able to avoid the vessel.

Description of the Specified Activity

SIO plans to conduct low-energy seismic and sediment coring surveys at 10 sites in the tropical western Pacific Ocean in September to October 2013. The study sites are located between approximately 4º South to 8º North and approximately 126.5 to 144.5º East in international waters (i.e., high seas) and in the Exclusive Economic Zones (EEZ) of the Federated States of Micronesia (Micronesia), the Independent State of Papua New Guinea (Papua New Guinea), the Republic of Indonesia (Indonesia), and the Republic of the Philippines (Philippines) (see Figure 1 of the IHA application). Water depths in the survey area range from 450 to 3,000 meters (m) (1,476.4 to 9,842.5 feet [ft]). The seismic surveys are scheduled to occur for 14 to 20 hours at each of the 10 sites for approximately 26 operational days in September to October 2013. Some minor deviation from these dates would be possible, depending on logistics and weather.

The surveys would fill gaps in equatorial Pacific data sets, namely the lack of high-resolution records from the eastern part of the Western Pacific Warm Pool to better assess the controls on the hydrologic cycle in the Western Pacific Warm Pool, and a limited meridional coverage to test hypotheses related to the Plio-Pleistocene evolution of the Western Pacific Warm Pool. To achieve the project's goals, the Principal Investigators, Drs. Y. Rosenthal and G. Mountain of Rutgers University propose to collect low-energy, high-resolution multi-channel seismic profiles and sediment cores in the heart of the Western Pacific Warm Pool. Survey data would also be included in a research proposal submitted to the Integrated Ocean Drilling Program (IODP) for funding consideration to extend the record of millennial climate variability in the western equatorial Pacific Ocean back to the mid-Miocene. Survey and site characterization data would assist the IODP in determining the viability of the sites for potential

future drilling.

The procedures to be used for the surveys would be similar to those used during previous seismic surveys by SIO and would use conventional seismic methodology. The survey will involve one source vessel, the R/V Roger Revelle. SIO will deploy two (each with a discharge volume of 45 cubic inch [in^3] with a total volume of 90 in^3) Generator Injector (GI) airgun array as an energy source at a tow depth of 2 m (6.6 ft). The receiving system will consist of one 600 m (1,968.5 ft) long hydrophone streamer. As the GI airguns are towed along the survey lines, the hydrophone streamer will receive the returning acoustic signals and transfer the data to the onboard processing system.

Straight survey lines will be collected in a grid of intersecting lines. Seven sites would be centered in small 9 x 9 km (4.9 x 4.9 nmi) grids of six intersecting lines (see Figure 1 of the IHA application). One site warrants slightly longer lines and would be surveyed in a large 18 x 18 km (9.7 x 9.7 nmi) grid of six intersection lines (see Figure 1 of the IHA application). Finally, sites S-1a and S-1b are close enough that efficiency in ship use would be achieved by covering both with a single grid of intersecting lines in a 30 x 26 km (16.2 x 14 nmi). Individual survey lines in this grid would be approximately 5 to 10 km (2.7 to 5.4 nmi) apart. The total track distance of survey data, including turns, would be approximately 1,033 km (557.8 nmi). Barring re-organization because of weather considerations or results that develop from data analyzed as sites are completed, sites would be surveyed in the order summarized in Table 1 (Table 1 of the IHA application). All planned seismic data acquisition activities will be conducted by technicians provided by SIO with onboard assistance by the scientists who have planned the study. The vessel will be self-contained, and the crew will live aboard the vessel for the entire cruise.

The planned seismic survey (e.g., equipment testing, startup, line changes, repeat coverage of any areas, and equipment recovery) will consist of approximately 1,032.9 kilometer (km) (557.7 nautical miles [nmi]) of transect lines (including turns) in the survey area in the tropical western Pacific Ocean (see Figure 1 of the IHA application). In addition to the operation of the airgun array, a multi-beam echosounder and a sub-bottom profiler will also likely be operated from the Revelle continuously throughout the cruise between the first and last survey sites. There will be additional seismic operations associated with equipment testing, ramp-up, and possible line changes or repeat coverage of any areas where initial data quality is sub-standard. In SIO's estimated take calculations, 25% has been added for those additional operations.

Table 1. Survey patterns and lengths at each survey site in the tropical western Pacific Ocean during September to October 2013.

Survey Site	Survey Pattern (km)	Survey Length (km)
WP-5	9 x 9 (4.9 x 4.9 nmi)	82.2 (44.4 nmi)
WP-6	9 x 9 (4.9 x 4.9 nmi)	82.2 (44.4 nmi)
S-1a, S-1b	30 x 26 (16.2 x 14)	349.5 (188.7)
WP-3	9 x 9 (4.9 x 4.9 nmi)	82.2 (44.4 nmi)
WP-4	9 x 9 (4.9 x 4.9 nmi)	82.2 (44.4 nmi)
WP-2	9 x 9 (4.9 x 4.9 nmi)	82.2 (44.4 nmi)
WP-1	9 x 9 (4.9 x 4.9 nmi)	82.2 (44.4 nmi)
WP-7	9 x 9 (4.9 x 4.9 nmi)	82.2 (44.4 nmi)
WP-8	18 x 18 (9.7 x 9.7 nmi)	108 (58.3 nmi)
Total		1,032.9 (557.7 nmi)

[1] Sites are listed in the intended order in which surveys would be conducted.

Dates, Duration, and Specified Geographic Region

The planned project and survey sites are located between approximately 4º South to 8º North and approximately 126.5 to 144.5º East in International Waters and in the EEZs of Micronesia, Papua New Guinea, Indonesia, and the Philippines (see Figure 1 of the IHA application). Water depths in the survey area range from approximately 450 to 3,000 m (1,476.4 to 9,842.5 ft). The Revelle is expected to depart from Lae, Papua New Guinea on September 6, 2013 and arrive at Manila, Philippines on October 1, 2013 (see Table 1 of the IHA application for the order of survey sites). Seismic operations would take approximately 14 to 20 hours at each of the 10 sites, and total transit time to the first site, between all sites, and from the last site would be approximately 13 days. The remainder of the time, approximately 6 days, would be spent collecting sediment cores at the 10 sites, for a total of 26 operational days. Some minor deviation from this schedule is possible, depending on logistics and weather (i.e., the cruise may depart earlier or be extended due to poor weather; there could be additional days of seismic operations if collected data are deemed to be of substandard quality).

NMFS outlined the purpose of the program in a previous notice for the proposed IHA (78 FR 33811, June 5, 2013). The activities to be conducted have not changed between the proposed IHA notice and this final notice announcing the issuance of the IHA. For a more detailed description of the authorized action, including vessel and acoustic source specifications, the reader should refer to the notice of the proposed IHA (78 FR 33811, June 5, 2013), the IHA application, EA, and associated documents referenced above this section.

Comments and Responses

A notice of the proposed IHA for the SIO low-energy seismic survey was published in the Federal Register on June 5, 2013 (78 FR 33811). During the 30-day public comment period,

NMFS received comments from the Marine Mammal Commission (Commission). The Commission's comments are online at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm. Following are their substantive comments and NMFS's responses:

Comment 1: The Commission recommends that NMFS require SIO, through the cooperation of the Lamont-Doherty Earth Observatory of Columbia University (L-DEO) and the National Science Foundation (NSF), to determine whether the range of sound speeds (minimums to maximums) at each of the 10 survey sites would increase the associated radii by 20 percent or more and if so, require SIO to re-estimate the proposed exclusion and buffer zones and associated takes of marine mammals accordingly.

Response: For clarification, it is not claimed that the model provides exact predictions of received sound levels, instead, the L-DEO model results are used to inform distances for the radii of exclusion zones established for mitigation purposes in a way that comparison with actual data has shown to be generally conservative.

The L-DEO model used for deep water is based on spherical spreading in a constant-velocity medium (where sound level decreases as a function of distance from the source) and incorporates the free surface reflection at the water-air interface. L-DEO has estimated that if for a given source configuration the constant sound speed input to the model changes between 1,475 m/second (4,839.2 ft/second) and 1,545 m/second (5,068.9 ft/second) (a 70 m/second [229.7 ft/second] difference), the corresponding change in exclusion zone radii for mitigation would be on the order of 2%. Based on the results of this sensitivity test, and given that the impact of such 2% variation on the take estimates would be very small, using a single sound speed value, such as 1,521.6 m/second (4,992.1 ft/second), for all model runs is appropriate.

The following statement "Diebold et al. (2010) demonstrated that L-DEO's model

underestimates the near-field sound level in waters of intermediate depth (600 to 1,100 m [1,968.5 to 3,608.9 ft])" is incorrect. In intermediate water depth, a correction factor of 1.5 is applied to the deep-water model results. After application of this correction factor, calibration measurements fall below the model curve adapted to intermediate water depth environments. This process and revised model curve is not described in Diebold et al. (2010) but was defined in numerous IHA applications and presented and further explained at a recent meeting with staff from the Commission, NMFS, NSF, and L-DEO. Furthermore, the 'underestimate' associated with "…the far-field sound level in waters of deep depth (1,600 to 1,700 m [5,249.3 to 5,577.4 ft])" refers to, at most, 10 data points (out of a thousand for more) with SEL less than 150 dB (Figure 11 in Diebold et al., 2010), and may be perhaps associated with the effect of local topographic features, which would be challenging for any model to accurately predict. In other words, what can be conservatively described as an underestimate of the sound level in the far-field (in this particular case) is referring to only a very small fraction of the measurements. Based on the explanations already provided, NMFS is satisfied that the applicants have provided sufficient scientific justification for their take estimates.

Comment 2: The Commission recommends that NMFS require L-DEO and NSF to test the accuracy of L-DEO's model by comparing it to the hydrophone data collected during previous surveys from environments other than the Gulf of Mexico (GOM) prior to the submittal of applications for the NMFS for seismic surveys to be conducted in 2014 – if the L-DEO and NSF either do not have enough data to compare the L-DEO's model to other environments or do not assess the accuracy of the model, re-estimate the proposed exclusion and buffer zones and associated takes of marine mammals using site-specific parameters (including sound speed profiles, bathymetry, and bottom characteristics) for all future applications that use the L-DEO's

model.

Response: NMFS evaluates the reasonableness of take estimates based on the best and latest scientific information available to NMFS at the time of the request. Nonetheless, NSF and L-DEO are proactively investigating novel ways to further verify the accuracy of model results in different geographic regions, including potentially cross-checking model results to hydrophone data collected during previous surveys, within the constraints of the currently limited federal budgetary environment.

Comment 3: The Commission recommends that NMFS (1) require SIO to revise its take estimates to include Level B harassment takes associated with the use of sub-bottom profiler and multi-beam echosounder when the airgun array is not firing; and (2) follow a consistent approach of requiring the assessment of Level B harassment takes for those types of sound sources (e.g., sub-bottom profilers, echosounders, side-scan sonar, and fish-finding sonar) by all applicants, who propose to use such sources.

Response: As described in NSF's application and the NSF/USGS PEIS (2011), they expect the sound levels produced by the sub-bottom and multi-beam echosounder sound sources to be exceeded by the sound levels produced by the airguns for the majority of the time. Additionally, because of the beam pattern and directionality of these sources, combined with their lower source levels, it is far less likely that these sources (which are used in some capacity by the vast majority of vessels on the water) will take marine mammals independently from the takes that have already been estimated for the airguns. Therefore, NMFS does not believe it is necessary to authorize additional takes for these sources for this action. Nonetheless, NMFS is currently evaluating the broader use of these types of sources to determine under what specific circumstances coverage for incidental take would be advisable (or not) and is working on

guidance that would outline a consistent recommended approach (to be used by applicants and NMFS) for addressing the potential impacts of these types of sources.

Comment 4: The Commission recommends that NMFS require SIO to estimate the number of marine mammals taken when the sub-bottom profiler and multi-beam echosounder are used in the absence of the airgun array based on the 120 dB (rms) threshold rather than the 160 dB (rms) threshold.

Response: NMFS disagrees with the Commission's recommendation that NMFS require SIO to estimate the number of marine mammals taken when the sub-bottom profiler and multi-beam echosounder are used in absence of the airgun array based on the 120 dB (rms) threshold rather than the 160 dB (rms) threshold. 160 dB (rms) is the appropriate threshold for these sound sources. Continuous sounds are those whose sound pressure level remains above that of the ambient sound, with negligibly small fluctuations in level (NIOSH, 1998; ANSI, 2005), while intermittent sounds are defined as sounds with interrupted levels of low or no sound (NIOSH, 1998). Thus, echosounder signals are not continuous sounds but rather intermittent sounds. Intermittent sounds can further be defined as either impulsive or non-impulsive. Impulsive sounds have been defined as sounds which are typically transient, brief (less than 1 second), broadband, and consist of a high peak pressure with rapid rise time and rapid decay (ANSI, 1986; NIOSH, 1998). Echosounder signals also have durations that are typically very brief (less than 1 second), with temporal characteristics that more closely resemble those of impulsive sounds than non-impulsive sounds, which typically have more gradual rise times and longer decays (ANSI, 1995; NIOSH, 1998). With regard to behavioral thresholds, we therefore consider the temporal and spectral characteristics of echosounder signals to more closely resemble those of an impulse sound than a continuous sound.

The Commission suggests that, for certain sources considered here, the interval between pulses would not be discernible to the animal, thus rendering them effectively continuous. However, an echosounder's "rapid staccato" of pulse trains is emitted in a similar fashion as odontocete echolocation click trains. Research indicates that marine mammals, in general, have extremely fine auditory temporal resolution and can detect each signal separately (e.g., Au et al., 1988; Dolphin et al., 1995; Supin and Popov, 1995; Mooney et al., 2009), especially for species with echolocation capabilities. Therefore, it is highly unlikely that marine mammals would perceive echosounder signals as being continuous.

In conclusion, echosounder signals are intermittent rather than continuous signals, and the fine temporal resolution of the marine mammal auditory system allows them to perceive these sounds as such. Further, the physical characteristics of these signals indicate a greater similarity to the way that intermittent, impulsive sounds are received. Therefore, the 160 dB threshold (typically associated with impulsive sources) is more appropriate than the 120 dB threshold (typically associated with continuous sources) for estimating takes by behavioral harassment incidental to use of such sources.

Comment 5: The Commission recommends that NMFS consult with experts in the field of sound propagation and marine mammal hearing to revise the acoustic criteria and thresholds as necessary to specify threshold levels that would be more appropriate criteria and thresholds as necessary to specify threshold levels that would be more appropriate for a wider range of sound sources, including sub-bottom profilers and echosounders.

Response: NMFS agrees with the Commission's recommendation to revise existing acoustic criteria and thresholds as necessary to specify threshold levels that would be more appropriate for a wider range of sound sources, and are currently in process of producing such

revisions. In particular, NMFS recognizes the importance of context (e.g., behavioral state of the animals, distance) in behavioral responses. The current behavioral categorization (i.e., impulse vs. continuous) does not account for context and is not appropriate for all sound sources. Thus, updated NOAA Acoustic Guidance (http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm) will more appropriately categorize behavioral harassment criteria by activity type.

Comment 6: The Commission recommends that NMFS require SIO to use the (1) original density estimates from Dolar et al. (2006) rather than the estimates that have been adjusted by an arbitrary correction factor of 0.5; (2) density estimates for Fraser's dolphins from the Sulu Sea in 1994 and 1995 rather than just 1995; and (3) adjust density estimates for all species using some measure of uncertainty (e.g., two standard deviations) and re-estimate the numbers of takes accordingly.

Response: Based on the Commission's recommendation, NMFS has used the original density estimates from Dolar et al. (2006) without the adjusted correction factor of 0.5 for several marine mammals species (i.e., spinner, pantropical, Fraser's, bottlenose, and Risso's dolphins, and short-finned pilot, melon-headed, and dwarf sperm whales) and has recalculated the estimated possible number of individuals that may be exposed to sound levels greater than or equal to 160 dB (rms) during SIO's low-energy seismic survey, see Table 4 (below).

For estimating takes of Fraser's dolphins, NMFS has used the original density estimates from Dolar et al. (2006) without the adjusted correction factor of 0.5 (i.e., 430 animals/1,000 km^2) and the density estimates for Fraser's dolphins from the Sulu Sea in 1994 (i.e., 730 animals/1,000 km^2) and 1995 (i.e., 430 animals/1,000 km^2). The combined density for 1994 and 1995 is 580 animals/1,000 km^2. NMFS applied this combined density based on the Commission's recommendation. Using SIO's approach for calculating take of Fraser's dolphins,

the number of different individuals potentially exposed to received levels greater than or equal to 160 re 1 µPa (rms) was determined by multiplying the expected species density (i.e., 580 animals/1,000 km^2), times the anticipated area to be ensonified to that level during airgun operations excluding overlap (i.e., 1,063.8 km^2 including 25% contingency), which is approximately 617 animals.

Regarding the Commission's recommendation to adjust density estimates for all marine mammal species using some measure of uncertainty (e.g., two standard deviations) and re-estimate the number of takes, please see the response to Comment 7 (below).

Comment 7: The Commission recommends that NMFS formulate policy or guidance regarding a consistent approach for how applicants should incorporate uncertainty in density estimates.

Response: The availability of representative density information for marine mammal species varies widely across space and time. Depending on where surveys and modeling have been conducted, it may be necessary to consult estimates that are from a different area or season, that are at a non-ideal spatial scale, or that have not been updated in several years. NMFS is currently evaluating available density information and is working on guidance that would outline a consistent approach for addressing uncertainty in specific situations where certain types of data are or are not available.

Comment 8: The Commission recommends that NMFS consult with the funding agency (i.e., NSF) and individual applicants (e.g., SIO and L-DEO) to develop, validate, and implement a monitoring program that provides a scientifically sound, reasonably accurate assessment of the types of marine mammal takes and the actual numbers of marine mammals taken – the assessment should account for applicable g(0) and f(0) values.

Response: There will be periods of transit time during the cruise, and PSOs will be on watch prior to and after the seismic portions of the surveys, in addition to during the surveys. The collection of this visual observational data by PSOs may contribute to baseline data on marine mammals (presence/absence) and provide some generalized support for estimated take numbers, but is unlikely that the information gathered from these cruises along would result in any statistically robust conclusions for any particular species because of the small number of animals typically observed.

NMFS is currently working to develop recommendations for how applicants can appropriately correct marine mammal detections to better estimate the number of animals likely taken during specified activities, in consideration of those that are not detected.

Comment 9: The Commission recommends that NMFS work with NSF to analyze monitoring data to assess the effectiveness of ramp-up procedures as a mitigation measure for seismic surveys.

Response: NMFS acknowledges the Commission's request for an analysis of ramp-ups and will work with NSF and SIO to help identify the effectiveness of the mitigation measure for seismic surveys. The IHA requires that PSOs on the Revelle 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 the seismic vessel, sighting cue, apparent reaction of 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 shut-down), Beaufort wind force and sea state, visibility, and sun glare.

One of the primary purposes of monitoring is to result in "increased knowledge of the species" and the effectiveness of required monitoring and mitigation measures; the effectiveness of ramp-up as a mitigation measure and marine mammal reaction to ramp-up would be useful information in this regard. NMFS requires NSF and SIO to gather all data that could potentially provide information regarding the effectiveness of ramp-up as a mitigation measure in its monitoring report. However, considering the low numbers of marine mammal sightings and low number of ramp-ups it is unlikely that the information will result in any statistically robust conclusions for this particular seismic survey. Over the long term, these requirements may provide information regarding the effectiveness of ramp-up as a mitigation measure, provided PSOs detect animals during ramp-up.

Comment 10: An individual opposes the issuance of the IHA to SIO, SIO's project is killing marine mammals.

Response: As described in detail in the Federal Register notice for the proposed IHA (78 FR 33811, June 5, 2013), as well as in this document, NMFS does not believe that SIO's low energy seismic survey would cause injury, serious injury, or mortality to marine mammals, nor are those authorized under the IHA. The required monitoring and mitigation measures that SIO would implement during the low-energy seismic survey would further reduce the adverse effect on marine mammals to the lowest levels practicable. NMFS anticipates only behavioral disturbance to occur during the conduct of the low-energy seismic survey.

Description of the Marine Mammals in the Specified Geographic Area of the Specified Activity

The marine mammal species that potentially occur within the tropical western Pacific

Ocean include 26 species of cetaceans and one sirenian. In addition to the 26 species known to occur in the tropical western Pacific Ocean, there are three species known to occur in coastal waters of the study area, these include the Australian snubfin dolphin (Orcaella heinsohni), Indo-Pacific humpback dolphin (Sousa chinensis), and the Indo-Pacific bottlenose dolphin (Tursiops aduncus). However, these species do not occur in in slope or deep, offshore waters where the planned activities would take place. Those three species are not considered further in this document. No pinnipeds are known to occur in the study area.

The marine mammals that generally occur in the action area belong to three taxonomic groups: mysticetes (baleen whales), odontocetes (toothed whales), and sirenians (the dugong). Marine mammal species listed as endangered under the U.S. Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 et seq.), includes the humpback (Megaptera novaeangliae), sei (Balaenoptera borealis), fin (Balaenoptera physalus), blue (Balaenoptera musculus), and sperm (Physeter macrocephalus) whale, as well as the dugong. Of those endangered species, the humpback, sei, fin, blue, and sperm whale is likely to be encountered in the survey area. The dugong (Dugong dugon) is the one marine mammal species mentioned in this document that is managed by the U.S. Fish and Wildlife Service (USFWS) and is not considered further in this analysis; all others are managed by NMFS.

Few systematic surveys have been conducted in the tropical western Pacific Ocean, and none have taken place during September to October. Borsa and Nugroho (2010) conducted 1,561 km (842.9 nmi) of surveys of Raja Ampat waters, including the Halmahera Sea, in West Papua during November to December 2007. Visser (2002 in Visser and Bonoccorso, 2003) conducted preliminary surveys in Kimbe Bay, New Britain, Papua New Guinea. Miyazaki and Wada (1978) surveyed 11,249 km (6,074nmi) in the wider tropical Pacific, including Micronesia,

and the waters off Papua New Guinea and the Solomon Islands during January to March 1976. Shimada and Miyashita (2001) conducted 8,721 km (4,709 nmi) of surveys in Micronesia, the Solomon Islands, and north of Papua New Guinea during February to March from 1999 to 2001. Oremus (2011) described 4,523 km (2,442.2 nmi) of surveys in the Solomon Islands during November of 2009 and 2010. Dolar et al. (2006) surveyed the waters of the central Philippines, including the Sulu Sea, during May to June 1994 and 1995; 2,747 km (1,483.3 nmi) were covered. In May 1996, Dolar et al. (1997) surveyed 825 km (445.5 nmi) in the southern Sulu Sea. Another survey of relevance to the survey area is one that took place during January to April 2007 in the waters of Guam and the Commonwealth of the Northern Mariana Islands; a total of 11,033 km (5,957.3 nmi) were surveyed in the area 10 to 18º North and 142 to 148º East (SRS-Parsons, 2007; Fulling et al., 2011). The aforementioned surveys took place in shallow coastal waters as well as deeper offshore waters. Records from the Ocean Biogeographic Information System (OBIS) database hosted by Rutgers and Duke University (Read et al., 2009) were also considered. Table 3 (below) presents information on the abundance, distribution, population status, conservation status, and population trend of the species of marine mammals that may occur in the study area during September to October 2013.

Table 2. The habitat, regional abundance, and conservation status of marine mammals that may occur in or near the low-energy seismic survey area in the tropical western Pacific Ocean (See text and Table 3 in SIO's application for further details).

Species	Habitat	Population Estimate	ESA[1]	MMPA[2]
Mysticetes				
Humpback whale (Megaptera novaeangliae)	Pelagic, nearshore waters, and banks	3,520[3]	EN	D
Minke whale (Balaenoptera acutorostrata)	Pelagic and coastal	25,000[4]	NL	NC
Bryde's whale (Balaenoptera edeni)	Pelagic and coastal	21,000[5]	NL	NC
Omura's whale (Balaenoptera omurai)	Pelagic and coastal	NA	NL	NC
Sei whale (Balaenoptera borealis)	Primarily offshore, pelagic	7,260 to 12,620[6]	EN	D
Fin whale (Balaenoptera physalus)	Continental slope, pelagic	13,620 to 18,680[7]	EN	D
Blue whale (Balaenoptera musculus)	Pelagic, shelf, coastal	NA	EN	D
Odontocetes				
Sperm whale (Physeter macrocephalus)	Pelagic, deep sea	29,674[8]	EN	D
Pygmy sperm whale (Kogia breviceps)	Deep waters off the shelf	NA	NL	NC
Dwarf sperm whale (Kogia sima)	Deep waters off the shelf	11,200[9]	NL	NC
Cuvier's beaked whale (Ziphius cavirostris)	Pelagic	20,000[9]	NL	NC
Longman's beaked whale (Indopacetus pacificus)	Pelagic	NA	NL	NC
Ginkgo-toothed beaked whale (Mesoplodon ginkgodens)	Pelagic	25,300[10]	NL	NC
Blainville's beaked whale (Mesoplodon densirostris)	Pelagic	25,300[10]	NL	NC
Killer whale (Orcinus orca)	Pelagic, shelf, coastal	8,500[9]	NL	NC

Short-finned pilot whale (Globicephala macrorhynchus)	Pelagic, shelf coastal	53,608[12]	NL	NC
False killer whale (Pseudorca crassidens)	Pelagic	16,668[12]	NL	NC
Melon-headed whale (Peponocephala electra)	Pelagic	45,400[9]	NL	NC
Pygmy killer whale (Feresa attenuata)	Pelagic	38,900[9]	NL	NC
Risso's dolphin (Grampus griseus)	Deep water, seamounts	83,289[12]	NL	NC
Bottlenose dolphin (Tursiops truncatus)	Offshore, inshore, coastal, estuaries	168,792[12]	NL	NC
Rough-toothed dolphin (Steno bredanensis)	Pelagic	107,633[11]	NL	NC
Fraser's dolphin (Lagenodelphis hosei)	Pelagic	289,300[9]	NL	NC
Striped dolphin (Stenella coeruleoalba)	Pelagic	570,038[13]	NL	NC
Pantropical spotted dolphin (Stenella attenuata)	Coastal, pelagic	438,064[11]	NL	NC
Spinner dolphin (Stenella longirostris)	Coastal, pelagic	734,837[13]	NL	NC
Sirenians				
Dugong (Dugong dugon)	Coastal	NA	EN	D

NA = Not available or not assessed.
[1] U.S. Endangered Species Act: EN = Endangered, T = Threatened, DL = Delisted, NL = Not listed.
[2] U.S. Marine Mammal Protection Act: D = Depleted, S = Strategic, NC = Not Classified.
[3] Oceania (Constantine et al., 2010).
[4] Northwest Pacific and Okhotsk Sea (IWC, 2013).
[5] Western North Pacific (IWC, 2013).
[6] North Pacific (Tillman, 1977).
[7] North Pacific (Ohsumi and Wada, 1974).
[8] Western North Pacific (Whitehead, 2002).
[9] Eastern Tropical Pacific (Wade and Gerrodette, 1993).
[10] Eastern Tropical Pacific, all Mesoplodon spp. (Wade and Gerrodette, 1993)
[11] Eastern Tropical Pacific (Gerrodette et al., 2008).
[12] Western North Pacific (Miyashita, 1993).
[13] Whitebelly stock in Eastern Tropical Pacific (Gerrodette et al., 2008).

Refer to sections 3 and 4 of SIO's application for detailed information regarding the abundance and distribution, population status, and life history and behavior of these other marine mammal species and their occurrence in the project area. The application also presents how SIO calculated the estimated densities for the marine mammals in the survey area. NMFS has reviewed these data and determined them to be the best available scientific information for the purposes of the IHA.

Potential Effects on Marine Mammals

Acoustic stimuli generated by the operation of the airguns, which introduce sound into the marine environment, may have the potential to cause Level B harassment of marine mammals in the survey area. The effects of sounds from airgun operations might include one or more of the following: tolerance, masking of natural sounds, behavioral disturbance, 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). Although the possibility cannot be entirely excluded, it is unlikely that the project would result in any cases of temporary or permanent hearing impairment, or any significant non-auditory physical or physiological effects. Based on the available data and studies described here, some behavioral disturbance is expected. A more comprehensive review of these issues can be found in the "Programmatic Environmental Impact Statement/Overseas Environmental Impact Statement prepared for Marine Seismic Research that is funded by the National Science Foundation and conducted by the U.S. Geological Survey" (NSF/USGS, 2011).

The notice of the proposed IHA (78 FR 33811, June 5, 2013) included a discussion of the

effects of sounds from airguns on mysticetes and odontocetes including tolerance, masking, behavioral disturbance, hearing impairment, and other non-auditory physical effects. NMFS refers the reader to SIO's application and EA for additional information on the behavioral reactions (or lack thereof) by all types of marine mammals to seismic vessels.

Anticipated Effects on Marine Mammal Habitat, Fish, and Invertebrates

NMFS included a detailed discussion of the potential effects of this action on marine mammal habitat, including physiological and behavioral effects on marine fish, fisheries, and invertebrates in the notice of the proposed IHA (78 FR 33811, June 5, 2013). The seismic survey will not result in any permanent impact on habitats used by the marine mammals in the survey area, including the food sources they use (i.e., fish and invertebrates), and there will be no physical damage to any habitat. While NMFS anticipates that the specified activity may result in marine mammals avoiding certain areas due to temporary ensonification, this impact to habitat is temporary and reversible, which was considered in further detail in this notice of the proposed IHA (78 FR 33811, June 5, 2013), as behavioral modification. The main impact associated with the activity will be temporarily elevated noise levels and the associated direct effects on marine mammals.

Mitigation

In order to issue an Incidental Take Authorization (ITA) under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and the availability of such species or stock for taking for certain subsistence uses.

SIO reviewed the following source documents and have incorporated a suite of appropriate mitigation measures into their project description.

(1) Protocols used during previous NSF and USGS-funded seismic research cruises as approved by NMFS and detailed in the recently completed NSF/USGS PEIS (2011);

(2) Previous IHA applications and IHAs approved and authorized by NMFS; and

(3) Recommended best practices in Richardson et al. (1995), Pierson et al. (1998), and Weir and Dolman, (2007).

To reduce the potential for disturbance from acoustic stimuli associated with the activities, SIO and/or its designees have planned to implement the following mitigation measures for marine mammals:

(1) Exclusion zones around the sound source;

(2) Speed and course alterations;

(3) Shut-down procedures; and

(4) Ramp-up procedures.

Exclusion Zones – SIO use radii to designate exclusion and buffer zones and to estimate take for marine mammals. Table 3 (see below) shows the distances at which one would expect to receive three sound levels (160 and 180 dB) from the two GI airgun array. The 180 dB level shut-down criteria are applicable to cetaceans, as specified by NMFS (2000). SIO used these levels to establish the exclusion and buffer zones.

Received sound levels have been modeled by L-DEO for a number of airgun configurations, including two 45 in^3 Nucleus G airguns, in relation to distance and direction from the airguns (see Figure 2 of the IHA application). In addition, propagation measurements of pulses from two GI airguns have been reported for shallow water (approximately 30 m [98.4 ft]

depth in the GOM (Tolstoy et al., 2004). However, measurements were not made for the two GI airguns in deep water. The model does not allow for bottom interactions, and is most directly applicable to deep water. Based on the modeling, estimates of the maximum distances from the GI airguns where sound levels are predicted to be 180 and 160 dB re 1 µPa (rms) in deep water were determined (see Table 3 below).

Empirical data concerning the 180 and 160 dB (rms) distances were acquired for various airgun arrays based on measurements during the acoustic verification studies conducted by L-DEO in the northern GOM in 2003 (Tolstoy et al., 2004) and 2007 to 2008 (Tolstoy et al., 2009). Results of the 36 airgun array are not relevant for the two GI airguns to be used in the planned survey. The empirical data for the 6, 10, 12, and 20 airgun arrays indicate that, for deep water, the L-DEO model tends to overestimate the received sound levels at a given distance (Tolstoy et al., 2004). Measurements were not made for the two GI airgun array in deep water; however, SIO plans to use the safety radii predicted by L-DEO's model for the planned GI airgun operations in deep water, although they are likely conservative given the empirical results for the other arrays. The 180 dB (rms) radii are shut-down criteria applicable to cetaceans and pinnipeds, respectively, as specified by NMFS (2000); these levels were used to establish exclusion zones. Therefore, the assumed 180 dB radii are 100 m for intermediate and deep water, respectively. If the PSO detects a marine mammal(s) within or about to enter the appropriate exclusion zone, the airguns will be shut-down immediately.

Table 3 summarizes the predicted distances at which sound levels (160 and 180 dB [rms]) are expected to be received from the two airgun array operating in intermediate (100 to 1,000 m [328 to 3,280 ft]) and deep water (greater than 1,000 m [3,280 ft]) depths.

Table 3**.** Predicted and modeled (two 45 in^3 GI airgun array) distances to which sound levels ≥

180 and 160 dB re: 1 μPa (rms) could be received in intermediate and deep water during the low-energy survey in the tropical western Pacific Ocean, September to October 2013.

Source and Total Volume	Tow Depth (m)	Water Depth (m)	Predicted RMS Radii Distances (m) for 2 GI Airgun Array	
			160 dB	180 dB
Two GI Airguns (90 in^3)	2	Intermediate (100 to 1,000)	600 (1,968.5 ft)	100 (328 ft)
Two GI Airguns (90 in^3)	2	Deep (> 1,000)	400 (1,312.3 ft)	100 (328 ft)

Speed and Course Alterations – If a marine mammal is detected outside the exclusion zone and, based on its position and direction of travel (relative motion), is likely to enter the exclusion zone, changes of the vessel's speed and/or direct course will be considered if this does not compromise operational safety. This would be done if operationally practicable while minimizing the effect on the planned science objectives. For marine seismic surveys towing large streamer arrays, however, course alterations are not typically implemented due to the vessel's limited maneuverability. After any such speed and/or course alteration is begun, the marine mammal activities and movements relative to the seismic vessel will be closely monitored to ensure that the marine mammal does not approach within the exclusion zone. If the marine mammal appears likely to enter the exclusion zone, further mitigation actions will be taken, including further course alterations and/or shut-down of the airgun(s). Typically, during seismic operations, the source vessel is unable to change speed or course, and one or more alternative mitigation measures will need to be implemented.

Shut-down Procedures - SIO will shut-down the operating airgun(s) if a marine mammal is detected outside the exclusion zone for the airgun(s), and if the vessel's speed and/or course cannot be changed to avoid having the animal enter the exclusion zone, the seismic source will be shut-down before the animal is within the exclusion zone. Likewise, if a marine mammal is

already within the exclusion zone when first detected, the seismic source will be shut down immediately.

Following a shut-down, SIO will not resume airgun activity until the marine mammal has cleared the exclusion zone. SIO will consider the animal to have cleared the exclusion zone if:

- A PSO has visually observed the animal leave the exclusion zone, or
- A PSO has not sighted the animal within the exclusion zone for 15 minutes for species with shorter dive durations (i.e., small odontocetes), or 30 minutes for species with longer dive durations (i.e., mysticetes and large odontocetes, including sperm, pygmy and dwarf sperm, killer, and beaked whales).

Although power-down procedures are often standard operating practice for seismic surveys, they are not going to be used during this planned seismic survey because powering-down from two airguns to one airgun would make only a small difference in the exclusion zone(s) – but probably not enough to allow continued one-airgun operations if a marine mammal came within the exclusion zone for two airguns.

Ramp-up Procedures – Ramp-up of an airgun array provides a gradual increase in sound levels, and involves a step-wise increase in the number and total volume of airguns firing until the full volume of the airgun array is achieved. The purpose of a ramp-up is to "warn" marine mammals in the vicinity of the airguns and to provide the time for them to leave the area avoiding any potential injury or impairment of their hearing abilities. SIO will follow a ramp-up procedure when the airgun array begins operating after a specified period without airgun operations or when a shut-down shut down has exceeded that period. SIO proposes that, for the present cruise, this period would be approximately 15 minutes. L-DEO and USGS has used similar periods (approximately 15 minutes) during previous low-energy seismic surveys.

Ramp-up will begin with a single GI airgun (45 in^3). The second GI airgun (45 in^3) will be added after 5 minutes. During ramp-up, the PSOs will monitor the exclusion zone, and if marine mammals are sighted, a shut-down will be implemented as though both GI airguns were operational.

If the complete exclusion zone has not been visible for at least 30 minutes prior to the start of operations in either daylight or nighttime, SIO will not commence the ramp-up. 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 outer part of the exclusion zone for that array will not be visible during those conditions. If one airgun has operated, 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 could move away if they choose. A ramp-up from a shut-down may occur at night, but only where the exclusion zone is small enough to be visible. SIO will not initiate a ramp-up of the airguns if a marine mammal is sighted within or near the applicable exclusion zones during the day or close to the vessel at night.

NMFS has carefully evaluated the applicant's mitigation measures and has considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. NMFS's evaluation of potential measures included consideration of the following factors in relation to one another:

(1) The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;

(2) The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and

(3) The practicability of the measure for applicant implementation.

Based on NMFS's evaluation of the applicant's measures, as well as other measures considered by NMFS or recommended by the public, NMFS has determined that the mitigation measures provide the means of effecting the least practicable adverse impacts on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an ITA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for IHAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area.

Monitoring

SIO will conduct marine mammal monitoring during the project, in order to implement the mitigation measures that require real-time monitoring, and to satisfy the anticipated monitoring requirements of the IHA. SIO's "Monitoring Plan" is described below this section. SIO understand that this monitoring plan will be subject to review by NMFS and that refinements may be required. The monitoring work described here has been planned as a self-contained project independent of any other related monitoring projects that may be occurring simultaneously in the same regions. SIO is prepared to discuss coordination of their monitoring

program with any related work that might be done by other groups insofar as this is practical and desirable.

Vessel-based Visual Monitoring

SIO's PSOs will be based aboard the seismic source vessel and will watch for marine mammals near the vessel during daytime airgun operations and during any ramp-ups of the airguns at night. PSOs will also watch for marine mammals near the seismic vessel for at least 30 minutes prior to the start of airgun operations after an extended shut-down (i.e., greater than approximately 15 minutes for this cruise). When feasible, PSOs will conduct observations during daytime periods when the seismic system is not operating for comparison of sighting rates and behavior with and without airgun operations and between acquisition periods. Based on PSO observations, the airguns will be shut-down when marine mammals are observed within or about to enter a designated exclusion zone. The exclusion zone is a region in which a possibility exists of adverse effects on animal hearing or other physical effects.

During seismic operations in the tropical western Pacific Ocean, at least three PSOs will be based aboard the Revelle. SIO will appoint the PSOs with NMFS's concurrence. Observations will take place during ongoing daytime operations and nighttime ramp-ups of the airguns. During the majority of seismic operations, at least one PSO will be on duty from observation platforms (i.e., the best available vantage point on the source vessel) to monitor marine mammals near the seismic vessel. PSO(s) will be on duty in shifts no longer than 4 hours in duration. Other 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 on how to do so.

The Revelle is a suitable platform for marine mammal observations and will serve as the platform from which PSOs will watch for marine mammals before and during seismic operations. The Revelle has been used for that purpose during the routine California Cooperative Oceanic Fisheries Investigations (CalCOFI). Two locations are likely as observation stations onboard the Revelle. Observing stations are located on the 02 level, with the PSO eye level at approximately 10.4 m (34.1 ft) above the waterline. At a forwarded-centered position on the 02 deck, the view is approximately 240º; an aft-centered view includes the 100 m (328.1 ft) radius area around the GI airguns. The PSO eye level on the bridge is approximately 15 m (49.2 ft) above sea level. Standard equipment for PSOs will be reticule binoculars and optical range finders. At night, night-vision equipment will be available. The PSOs will be in communication with ship's officers on the bridge and scientists in the vessel's operations laboratory, so they can advise promptly of the need for avoidance maneuvers or seismic source shut-down. Observing stations will be at the 02 level with PSO's eye level approximately 10.4 m (34 ft) above sea level – one forward on the 02 deck commanding a forward-centered, approximately 240º view around the vessel, and one atop the aft hangar, with an aft-centered view that includes the radii around the airguns. The eyes on the bridge watch will be at a height of approximately 15 m (49 ft); PSOs will work on the enclosed bridge and adjoining aft steering station during any inclement weather. During daytime, the PSO(s) will scan the area around the vessel systematically with reticle binoculars (e.g., 7 x 50 Fujinon), Big-eye binoculars (e.g., 25 x 150), optical range-finders (to assist with distance estimation), and the naked eye. At night, night-vision equipment will be available. The optical range-finders are useful in training observers to estimate distances visually, but are generally not useful in measuring distances to animals directly. Estimating distances is done primarily with the reticles

in the binoculars. The PSO(s) will be in wireless communication with ship's officers on the bridge and scientists in the vessel's operations laboratory, so they can advise promptly of the need for avoidance maneuvers or a shut-down of the seismic source.

When marine mammals are detected within or about to enter the designated exclusion zone, the airguns will immediately be shut-down if necessary. The PSO(s) will continue to maintain watch to determine when the animal(s) are outside the exclusion zone by visual confirmation. Airgun operations will not resume until the animal is confirmed to have left the exclusion zone, or if not observed after 15 minutes for species with shorter dive durations (small odontocetes) or 30 minutes for species with longer dive durations (mysticetes and large odontocetes, including sperm, pygmy sperm, dwarf sperm, killer, and beaked whales).

PSO Data and Documentation

PSOs will record data to estimate the numbers of marine mammals exposed to various received sound levels and to document apparent disturbance reactions or lack thereof. Data will be used to estimate numbers of animals potentially "taken" by harassment (as defined in the MMPA). They will also provide information needed to order a shut-down of the airguns when a marine mammal is within or near the exclusion zone. Observations will also be made during daytime periods when the Revelle is underway without seismic operations (i.e., transits, to, from, and through the study area) to collect baseline biological data.

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 seismic source or vessel (e.g., none, avoidance, approach, paralleling, etc.), and behavioral pace.

2. Time, location, heading, speed, activity of the vessel, sea state, wind force, visibility, 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 ramp-ups or shut-downs will be recorded in a standardized format. Data will be entered into an electronic database. The data accuracy will be verified by computerized data validity checks as the data are entered and by subsequent manual checking of the database by the PSOs at sea. These procedures will allow initial summaries of data to be prepared during and shortly after the field program, and will facilitate transfer of the data to statistical, graphical, and other programs for further processing and archiving.

Results from the vessel-based observations will provide the following information:

1. The basis for real-time mitigation (airgun shut-down).

2. Information needed to estimate the number of marine mammals potentially taken by harassment, which must be reported to NMFS.

3. Data on the occurrence, distribution, and activities of marine mammals in the area where the seismic study is conducted.

4. Information to compare the distance and distribution of marine mammals relative to the source vessel at times with and without seismic activity.

5. Data on the behavior and movement patterns of marine mammals seen at times with and without seismic activity.

SIO will submit a comprehensive report to NMFS within 90 days after the end of the cruise. The report will describe the operations that were conducted and sightings of marine

mammals near the operations. The report submitted to NMFS will provide full documentation of methods, results, and interpretation pertaining to all monitoring. The 90-day report will summarize the dates and locations of seismic operations and all marine mammal sightings (i.e., dates, times, locations, activities, and associated seismic survey activities). The report will minimally include:

- 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;
- Analyses of the effects of various factors influencing detectability of marine mammals including sea state, number of PSOs, and fog/glare;
- Species composition, occurrence, and distribution of marine mammals sightings including date, water depth, numbers, age/size/gender, and group sizes; and analyses of the effects of seismic 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; and
- Distribution around the source vessel versus airgun activity state.

The report will also include estimates of the number and nature of exposures that could result in "takes" of marine mammals by harassment or in other ways. After the report is considered final, it will be publicly available on the NMFS website at:

http://www.nmfs.noaa.gov/pr/permits/incidental.htm#iha . In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as an injury (Level A harassment), serious injury or mortality (e.g., ship-strike, gear interaction, and/or entanglement), SIO will immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS at 301-427-8401 and/or by email to Jolie.Harrison@noaa.gov and Howard.Goldstein@noaa.gov, and the NMFS Pacific Islands Region Marine Mammal Stranding and Entanglement Hotline at 1-888-256-9840 (David.Schofield@noaa.gov). The report must include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

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

In the event that SIO 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), SIO will immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Jolie.Harrison@noaa.gov and Howard.Goldstein@noaa.gov, and the NMFS Pacific Islands Region Marine Mammal Stranding and Entanglement Hotline (1-888-256-9840) and/or by email to the Pacific Islands Regional Stranding Coordinator (David.Schofield@noaa.gov). The report must include the same information identified in the paragraph above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with SIO to determine whether modifications in the activities are appropriate.

In the event that SIO 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 the IHA (e.g., previously wounded animal, carcass with moderate or advanced decomposition, or scavenger damage), SIO will report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Jolie.Harrison@noaa.gov and Howard.Goldstein@noaa.gov, and the NMFS Pacific Islands Regional Marine Mammal Stranding and Entanglement Hotline (1-888-256-9840), and/or by email to the Pacific Islands Regional Stranding Coordinator (David.Schofield@noaa.gov), within

24 hours of discovery. SIO will provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Activities may continue while NMFS reviews the circumstances of the incident.

Estimated Take by Incidental 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].

Level B harassment is anticipated and authorized as a result of the low-energy marine seismic survey in the tropical western Pacific Ocean. Acoustic stimuli (i.e., increased underwater sound) generated during the operation of the seismic airgun array are expected to result in the behavioral disturbance of some marine mammals. There is no evidence that the planned activities could result in injury, serious injury, or mortality for which SIO seeks the IHA. The required mitigation and monitoring measures will minimize any potential risk for injury, serious injury, or mortality.

The following sections describe SIO's methods to estimate take by incidental harassment and present the applicant's estimates of the numbers of marine mammals that could be affected during the planned seismic program in the tropical western Pacific Ocean. The estimates are based on a consideration of the number of marine mammals that could be harassed by approximately 1,033 km (557.8 nmi) of seismic operations with the two GI airgun array to be used as depicted in Figure 1 of the IHA application.

During simultaneous operations of the airgun array and the other sources, any marine mammals close enough to be affected by the multi-beam echosounder and sub-bottom profiler would already be affected by the airguns. During times when the airguns are not operating, it is unlikely that marine mammals will exhibit more than minor, short-term responses to the multi-beam echosounder and sub-bottom profiler given their characteristics (e.g., narrow, downward-directed beam) and other considerations described previously in our notice of the proposed IHA (78 FR 33811, June 5, 2013). Therefore, take was not authorized specifically for these sound sources beyond that which is already authorized for airguns.

The only densities reported for the overall survey area are for eight species sighted during vessel-based surveys in coastal and oceanic waters of the Sulu Sea, Philippines, covering an area of approximately 23,000 km^2 (6,705.7 nmi^2), during May to June 1994 and 1995 (Dolar et al., 2006). To supplement those density data, SIO used densities for seven other species expected to occur in the survey area that were sighted during a systematic vessel-based marine mammal survey in Guam and the southern Commonwealth of the Northern Mariana Islands (CNMI) during January to April 2007 (Fulling et al., 2011). The cruise area was defined by the boundaries 10 to 18º North and 142 to 148º East, encompassing an area of approximately 585,000 km^2 (170,558.7 nmi^2). For five species not sighted in either survey, but expected to occur in the planned survey area, SIO also used densities for the "outer EEZ stratum" of Hawaiian waters, covering approximately 2,240,000 km^2 (653,079.5 nmi^2), based on a survey conducted in August to November 2002 (Barlow, 2006). All three surveys used standard line-transect protocols developed by NMFS Southwest Fisheries Science Center. Survey effort was 2,313 km (1,248.9 nmi) in the Sulu Sea, 11,033 km (5,957.3 nmi) in the CNMI, and 13,500 km (7,289.4 nmi) in Hawaii.

The densities mentioned above have been corrected, by the original authors, for trackline detection probability bias, and in one of the three areas, for availability bias. Trackline detection probability bias is associated with diminishing sightability with increasing lateral distance from the trackline f(0). Availability bias refers to the fact that there is less than 100% probability of sighting an animal that is present along the survey trackline, and it is measured by g(0). Dolar et al. (2006) and Fulling et al. (2011) did not correct the CNMI densities for g(0), which for all but large (greater than 20) groups of dolphins (where g(0) = 1), resulted in underestimates of density. Although there is some uncertainty about the representatives of the data and the assumptions used in the calculations below, the approach used here is believed to be the best available approach.

Table 4. Estimated densities and possible number of marine mammal species that might be exposed to greater than or equal to 160 dB during SIO's low-energy seismic survey (ensonified area 1,063.8 km^2) in the tropical western Pacific Ocean, September to October 2013.

Species	Density (#/1,000 km^2)[1]	Calculated Take (i.e., Estimated Number of Individuals Exposed to Sound Levels ≥ 160 dB re 1 μPa)[2]	Approximate Percentage of Best Population Estimate of Stock (Calculated Take)[3]	Requested Take Authorization[4]
Mysticetes				
Humpback whale	NA	0	0.03	1
Minke whale	NA	0	0.01	3
Bryde's whale	0.41	0	0.01	2
Omura's whale	NA	0	NA	2
Sei whale	0.29	0	0.03 to 0.02	2
Fin whale	NA	0	0.05 to 0.04	7
Blue whale	NA	0	NA	2
Odontocetes				
Sperm whale	1.23	1	0.02 (<0.01)	5
Pygmy sperm whale	3.19	3	NA (NA)	3
Dwarf sperm whale	10	10	0.09 (0.09)	10
Cuvier's beaked whale	6.8	7	0.04 (0.04)	7
Longman's beaked whale	0.45	0	NA (NA)	18
Ginkgo-toothed beaked whale	0	0	<0.01 (0)	2
Blainville's beaked whale	1.28	1	<0.01 (<0.01)	2
Killer whale	0.16	0	0.08	7
Short-finned pilot whale	320.0	340	0.63 (0.63)	340
False killer whale	1.11	1	0.06 (<0.01)	10

Melon-headed whale	40.0	42	0.09 (0.09)	42
Pygmy killer whale	0.14	0	0.02 (0)	6
Risso's dolphin	30.0	32	0.04 (0.04)	32
Bottlenose dolphin	110.0	118	0.07 (0.07)	118
Rough-toothed dolphin	0.29	0	0.01 (0)	9
Fraser's dolphin	580.0	617	0.21 (0.21)	617
Striped dolphin	6.16	7	<0.01 (<0.01)	27
Pantropical spotted dolphin	650.0	692	0.16 (0.16)	692
Spinner dolphin	1,370.0	1,458	0.2 (0.2)	1,458

NA = Not available or not assessed.

[1] Densities calculated from Table 4 of Barlow (2006) using the abundance in the outer EEZ stratum and the surface area of the stratum give on p. 452 of Barlow (2006).

[2] Calculated take is estimated density (reported density times correction factor) multiplied by the area ensonified to 160 dB (rms) around the planned seismic lines, increased by 25% for contingency.

[3] Requested (and calculated) takes expressed as percentages of the regional populations.

[4] Requested Take Authorization increased to mean group size for species for which densities were not available but that have been sighted in the survey area and for species whose calculated takes were less than group size.

SIO estimated the number of different individuals that may be exposed to airgun sounds with received levels greater than or equal to 160 dB re 1 μPa (rms) on one or more occasions by considering the total marine area that would be within the 160 dB radius around the operating airgun array on at least one occasion and the expected density of marine mammals in the area (in the absence of the a seismic survey). The number of possible exposures (including repeat exposures of the same individuals) can be estimated by considering the total marine area that would be within the 160 dB radius around the operating airguns, excluding areas of overlap. During the survey, the transect lines are widely spaced relative to the 160 dB (rms) distance (600 m for intermediate water depths and 400 m for deep water depths). Thus, the area including overlap is 1.07 times the area excluding overlap, so a marine mammal that stayed in the survey areas during the entire survey could be exposed slightly more than once, on average. However, it is unlikely that a particular animal would stay in the area during the entire survey.

The number of different individuals potentially exposed to received levels greater than or equal to 160 re 1 μPa (rms) was calculated by multiplying:

(1) The expected species density (in number/km^2), times

(2) The anticipated area to be ensonified to that level during airgun operations excluding overlap.

The area expected to be ensonified was determined by entering the planned survey lines into a MapInfo GIS, using the GIS to identify the relevant areas by "drawing" the applicable 160 dB buffer (see Table 1 of the IHA application) around each seismic line, and then calculating the total area within the buffers.

Applying the approach described above, approximately 851 km^2 (approximately 1,063.8 km^2 including the 25% contingency) would be within the 160 dB isopleth on one or more

occasions during the survey. The take calculations within the study sites do not explicitly add animals to account for the fact that new animals (i.e., turnover) are not accounted for in the initial density snapshot and animals could also approach and enter the area ensonified above 160 dB; however, studies suggest that many marine mammals will avoid exposing themselves to sounds at this level, which suggests that there would not necessarily be a large number of new animals entering the area once the seismic survey started. Because this approach for calculating take estimates does not allow for turnover in the marine mammal populations in the area during the course of the survey, the actual number of individuals exposed may be underestimated, although the conservative (i.e., probably overestimated) line-kilometer distances used to calculate the area may offset this. Also, the approach assumes that no cetaceans will move away or toward the tracklines as the Revelle approaches in response to increasing sound levels before the levels reach 160 dB. Another way of interpreting the estimates that follow is that they represent the number of individuals that are expected (in absence of a seismic program) to occur in the waters that will be exposed to greater than or equal to 160 dB (rms).

SIO's estimates of exposures to various sound levels assume that the surveys will be carried out in full; however, the ensonified areas calculated using the planned number of line-kilometers has been increased by 25% to accommodate lines that may need to be repeated, equipment testing, etc. As is typical during offshore ship surveys, inclement weather and equipment malfunctions are likely to cause delays and may limit the number of useful line-kilometers of seismic operations that can be undertaken. The estimates of the numbers of marine mammals potentially exposed to 160 dB (rms) received levels are precautionary and probably overestimate the actual numbers of marine mammals that could be involved. These estimates assume that there will be no weather, equipment, or mitigation delays, which is highly unlikely.

Table 4 (Table 4 of the IHA application) shows the estimates of the number of different individual marine mammals anticipated to be exposed to greater than or equal to 160 dB re 1 μPa (rms) during the seismic survey if no animals moved away from the survey vessel. The requested take authorization is given in the far right column of Table 4 (Table 4 of the IHA application). The requested take authorization has been increased to the average mean group sizes from the surveys whose densities were used in the calculations, or from Jefferson et al. (2008) for species not sighted during the surveys.

The estimate of the number of individual cetaceans that could be exposed to seismic sounds with received levels greater than or equal to 160 dB re 1 μPa (rms) during the survey is (with 25% contingency) in Table 4 of this document (see Table 4 of the IHA application). That total (with 25% contingency) includes 0 baleen whales, 1 sperm whale, 3 pygmy sperm whales, 5 dwarf sperm whale, 7 Cuvier's beaked whales, and 1 Blainville's beaked whales could be taken by Level B harassment during the low-energy seismic survey, which would represent 0, <0.01, NA, 0.05, 0.04, 0.01 % of the regional populations, respectively. Most of the cetaceans potentially taken by Level B harassment are delphinids: bottlenose, Fraser's, pantropical spotted, and spinner dolphins as well as short-finned pilot whales are estimated to be the most common delphinid species in the area, with estimates of 118, 617, 692, 1,458, and 340, which would represent 0.07, 0.21, 0.16, 0.2, and 0.63% of the affected regional populations, respectively.

Encouraging and Coordinating Research

SIO and NSF will coordinate the planned marine mammal monitoring program associated with the low-energy seismic survey with other parties that express interest in this

activity and area. SIO and NSF will coordinate with applicable U.S. agencies (e.g., NMFS), and will comply with their requirements.

Impact on Availability of Affected Species or Stock for Taking for Subsistence Uses

Section 101(a)(5)(D) of the MMPA also requires NMFS to determine that the authorization will not have an unmitigable adverse effect on the availability of marine mammal species or stocks for subsistence use. There is subsistence hunting for sperm whales, as well as other cetaceans and dugongs in Indonesia (Reeves, 2002; Marsh et al., n.d.). The hunting of Bryde's whales in the Philippines appears to be prohibited now, but dugongs are still taken there, as well as in Papua New Guinea (Marsh et al., n.d.). SIO and NMFS do not expect the activities to have any impact on the availability of species or stocks of marine mammals in the study area for subsistence users that implicate MMPA section 101(a)(5)(D).

Negligible Impact and Small Numbers Analysis Determination

As a preliminary matter, NMFS typically includes our negligible impact and small numbers analyses and determinations under the same section heading of our Federal Register notices. Despite co-locating these terms, NMFS acknowledges that negligible impact and small numbers are distinct standards under the MMPA and treat them as such. The analyses presented below do not conflate the two standards; instead, each standard has been considered independently and NMFS has applied the relevant factors to inform our negligible impact and small numbers determinations.

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.'' In making a negligible impact determination, NMFS evaluated factors such as:

(1) The number of anticipated injuries, serious injuries, or mortalities;

(2) The number, nature, and intensity, and duration of Level B harassment (all relatively limited); and

(3) The context in which the takes occur (i.e., impacts to areas of significance, impacts to local populations, and cumulative impacts when taking into account successive/contemporaneous actions when added to baseline data);

(4) The status of stock or species of marine mammals (i.e., depleted, not depleted, decreasing, increasing, stable, impact relative to the size of the population);

(5) Impacts on habitat affecting rates of recruitment/survival; and

(6) The effectiveness of monitoring and mitigation measures.

For reasons stated previously in this document, in the notice of the proposed IHA (78 FR 33811, June 5, 2013) and based on the following factors, the specified activities associated with the marine seismic survey are not likely to cause PTS, or other non-auditory injury, serious injury, or death. The factors include:

(1) The likelihood that, given sufficient notice through relatively slow ship speed, marine mammals are expected to move away from a noise source that is annoying prior to its becoming potentially injurious;

(2) The potential for temporary or permanent hearing impairment is relatively low and would likely be avoided through the implementation of the shut-down measures; and

(3) The likelihood that marine mammal detection ability by trained PSOs is high at close proximity to the vessel.

No injuries, serious injuries, or mortalities are anticipated to occur as a result of the SIO's planned marine seismic surveys, and none are authorized by NMFS. Table 4 of this document

outlines the number of requested Level B harassment takes that are anticipated as a result of these activities. Due to the nature, degree, and context of Level B (behavioral) harassment anticipated and described (see "Potential Effects on Marine Mammals" section above) in this notice, the activity is not expected to impact rates of annual recruitment or survival for any affected species or stock, particularly given NMFS's and the applicant's plan to implement mitigation, monitoring, and reporting measures to minimize impacts to marine mammals. Additionally, the seismic survey will not adversely impact marine mammal habitat.

For the other marine mammal species that may occur within the action area, there are no known designated or important feeding and/or reproductive areas. Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (i.e., 24 hr cycle). Behavioral reactions to noise exposure (such as disruption of critical life functions, displacement, or avoidance of important habitat) are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall et al., 2007). Additionally, the seismic survey will be increasing sound levels in the marine environment in a relatively small area surrounding the vessel (compared to the range of the animals), which is constantly travelling over distances, and some animals may only be exposed to and harassed by sound for less than day.

Of the 26 marine mammal species under NMFS jurisdiction that may or are known to likely to occur in the study area, five are listed as threatened or endangered under the ESA: humpback, sei, fin, blue, and sperm whales. These species are also considered depleted under the MMPA. Of these ESA-listed species, incidental take has been requested to be authorized for humpback, sei, fin, blue, and sperm whales. There is generally insufficient data to determine population trends for the other depleted species in the study area. To protect these animals (and other marine mammals in the study area), SIO must cease or reduce airgun operations if any

marine mammal enters designated zones. No injury, serious injury, or mortality is expected to occur and due to the nature, degree, and context of the Level B harassment anticipated, and the activity is not expected to impact rates of recruitment or survival.

As mentioned previously, NMFS estimates that 26 species of marine mammals under its jurisdiction could be potentially affected by Level B harassment over the course of the IHA. The population estimates for the marine mammal species that may be taken by Level B harassment were provided in Table 4 of this document.

NMFS's practice has been to apply the 160 dB re 1 μPa (rms) received level threshold for underwater impulse sound levels to determine whether take by Level B harassment occurs. Southall et al. (2007) provide a severity scale for ranking observed behavioral responses of both free-ranging marine mammals and laboratory subjects to various types of anthropogenic sound (see Table 4 in Southall et al. [2007]).

NMFS has determined, provided that the aforementioned mitigation and monitoring measures are implemented, the impact of conducting a low-energy marine seismic survey in the tropical western Pacific Ocean, September to October 2013, may result, at worst, in a modification in behavior and/or low-level physiological effects (Level B harassment) of certain species of marine mammals.

While behavioral modifications, including temporarily vacating the area during the operation of the airgun(s), may be made by these species to avoid the resultant acoustic disturbance, the availability of alternate areas within these areas for species and the short and sporadic duration of the research activities, have led NMFS to determine that the taking by Level B harassment from the specified activity will have a negligible impact on the affected species in the specified geographic region. NMFS believes that the length of the seismic survey, the

requirement to implement mitigation measures (e.g., shut-down of seismic operations), and the inclusion of the monitoring and reporting measures, will reduce the amount and severity of the potential impacts from the activity to the degree that it will have a negligible impact on the species or stocks in the action area.

NMFS has determined, provided that the aforementioned mitigation and monitoring measures are implemented, that the impact of conducting a low-energy marine seismic survey in the tropical western Pacific Ocean, September to October 2013, may result, at worst, in a temporary modification in behavior and/or low-level physiological effects (Level B harassment) of small numbers of certain species of marine mammals. The requested take estimates represent small numbers relative to the affected species or stock sizes (i.e., all are less than 1%). See Table 4 for the requested authorized take numbers of marine mammals.

Endangered Species Act

Of the species of marine mammals that may occur in the survey area, several are listed as endangered under the ESA, including the humpback, sei, fin, blue, and sperm whales. SIO did not request take of endangered North Pacific right whales due to the low likelihood of encountering this species during the cruise. Under section 7 of the ESA, NSF, on behalf of SIO, has initiated formal consultation with the NMFS, Office of Protected Resources, Endangered Species Act Interagency Cooperation Division, on this low-energy seismic survey. NMFS's Office of Protected Resources, Permits and Conservation Division, has also initiated formal consultation under section 7 of the ESA with NMFS's Office of Protected Resources, Endangered Species Act Interagency Cooperation Division, to obtain a Biological Opinion evaluating the effects of issuing the IHA under section 101(a)(5)(D) of the MMPA on threatened and endangered marine mammals for this activity. These two consultations were consolidated

and addressed in a single Biological Opinion addressing the direct and indirect effects of these interdependent actions. In September 2013, NMFS issued a Biological Opinion and concluded that the action and issuance of the IHA are not likely to jeopardize the continued existence of cetaceans and sea turtles and included an Incidental Take Statement (ITS) incorporating the requirements of the IHA as Terms and Conditions. The Biological Opinion also concluded that designated critical habitat of these species does not occur in the action area and would not be affected by the survey.

National Environmental Policy Act

With SIO's complete application, SIO and NSF provided NMFS an "Environmental Analysis of a Low-Energy Marine Geophysical Survey by the R/V Roger Revelle in the Tropical Western Pacific Ocean, September-October 2013" (Environmental Analysis), prepared by LGL Ltd., Environmental Research Associates, on behalf of SIO and NSF. The Environmental Analysis analyzes the direct, indirect, and cumulative environmental impacts of the specified activities on marine mammals including those listed as threatened or endangered under the ESA. NMFS, after review and evaluation of the NSF and SIO Environmental Analysis for consistency with the regulations published by the Council of Environmental Quality (CEQ) and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act, prepared an independent Environmental Assessment (EA) titled "Environmental Assessment on the Issuance of an Incidental Harassment Authorization to the Scripps Institution of Oceanography to Take Marine Mammals by Harassment Incidental to a Low-Energy Marine Geophysical Survey in the Tropical Western Pacific Ocean, September to October 2013." After considering the EA, the information in the IHA application, Biological Opinion, and the Federal Register notice, as well as public comments, NMFS has determined

that the issuance of the IHA is not likely to result in significant impacts on the human environment and has prepared a Finding of No Significant Impact (FONSI). An Environmental Impact Statement is not required and will not be prepared for the action.

Authorization

NMFS has issued an IHA to SIO for the take, by Level B harassment, of small numbers of marine mammals incidental to conducting a low-energy marine seismic survey in the tropical western Pacific Ocean, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: September 13, 2013.

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Helen M. Golde,
Deputy Director,
Office of Protected Resources,
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