Commerce, or any of his or her duly authorized representatives, shall have access to any pertinent books, documents, papers and records of the recipient, whether written, printed, recorded, produced or reproduced by any mechanical, magnetic or other process or medium, in order to make audits, inspections, excerpts, transcripts or other examinations as authorized by law. When the Office of the Inspector General (OIG) requires an audit on a Commerce award, the OIG will usually make the arrangements to audit the award, whether the audit is performed by OIG personnel, an independent accountant under contract with Commerce, or any other Federal, state or local audit entity.

Government-Wide Debarment and Suspension

You must submit a completed Form CD–511, ''Certification Regarding Debarment, Suspension and Other Responsibility Matters; Drug-Free Workplace Requirements and Lobbying.'' Prospective participants (as defined at 15 CFR 26.105) are subject to 15 CFR part 26, ''Non-procurement Debarment and Suspension'' and the related section of the certification form prescribed here applies.

Dated: June 4, 1999.

Andrew J. Kemmerer,

Acting Assistant Administrator, National Marine Fisheries Service.

[FR Doc. 99–14788 Filed 6–10–99; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 021699A]

Small Takes of Marine Mammals Incidental to Specified Activities; Seismic Hazards Investigation in Southern California

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

ACTION: Notice of issuance of an incidental harassment authorization.

SUMMARY: In accordance with provisions of the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that an Incidental Harassment Authorization (IHA) to take small numbers of marine mammals by harassment incidental to collecting marine seismic-reflection data offshore from southern California has been issued to the U.S. Geological Survey (USGS).

DATES: This authorization is effective from June 3, 1999, through July 31, 1999.

ADDRESSES: A copy of the application may be obtained by writing to Donna Wieting, Acting Chief, Marine Mammal Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225, or by telephoning one of the contacts listed here.

FOR FURTHER INFORMATION CONTACT: Kenneth R. Hollingshead, NMFS, (301) 713–2055, or Christina Fahy, NMFS, 562–980–4023.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) directs the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of marine mammals by U.S. 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.

Permission may 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 and that the permissible methods of taking and requirements pertaining to the 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.''

Subsection 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. The MMPA now defines ''harassment'' as:

> ...any act of pursuit, torment, or annoyance which
> (a) has the potential to injure a marine mammal or
> marine mammal stock in the wild; or (b) 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.

Subsection 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 authorizations for the incidental harassment of small numbers of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny issuance of the authorization.

Summary of Request

On January 15, 1999, NMFS received a request from the USGSfor authorization to take small numbers of several species of marine mammals by harassment incidental to collecting marine seismic-reflection data offshore from southern California. Seismic data was planned to be collected during a 2-week period between May and July 1999 to support studies of the regional landslide and earthquake hazards and to understand how saltwater invades coastal aquifers. A revised request was received on February 11, 1999.

Background

The USGS proposes to conduct a high-resolution seismic survey offshore from Southern California to investigate (1) the hazards posed by landslides and potential earthquake faults in the nearshore region from Santa Barbara to San Diego and (2) the invasion of seawater into freshwater aquifers that are critical to the water supply for people within the Los Angeles-San Pedro area. Both of these tasks are multi-year efforts that require using a small airgun.

Coastal Southern California is the most highly populated urban area along the U.S. Pacific coast. The primary objective of the USGS research is to provide information to help mitigate the earthquake threat to this area. The USGS emphasizes that the goal is not earthquake prediction but rather an assistance in determining what steps might be taken to minimize the devastation should a large quake occur. The regional earthquake threat is known to be high, and a major earthquake could adversely affect the well being of a large number of people.

Important geologic information that the USGS will derive from this project's seismic-reflection data concerns how earthquake deformation is distributed offshore; that is, where the active faults are and what the history of movement along them has been. This should improve understanding of the shifting pattern of deformation that occurred

over both the long term (approximately the last 100,000 years) and short term (the last few thousand years). The USGS seeks to identify actively deforming structures that may constitute significant earthquake threats. The USGS also proposes to locate offshore landslides that might affect coastal areas. Not only major subsea landslides might affect the footings of coastal buildings, but also very large slides can generate local tsunamis. These large sea waves can be generated by seafloor movement that is produced either by landslides or by earthquakes. Knowing where large slides have occurred offshore will help locate areas susceptible to wave inundation.

Some faults that have produced earthquakes lie entirely offshore or extend into offshore areas where they can be studied using high-resolution seismic-reflection techniques. An example is the Rose Canyon fault, which, extending through the San Diego area, is considered to be the primary earthquake threat. This fault extends northward from La Jolla, beneath the inner continental shelf, and appears again onshore in the Los Angeles area. This fault and others like it near shore could generate moderate (M5-6) to large (M6-7) earthquakes.

Knowing the location and geometry of fault systems is critical to estimating the location and severity of ground shaking. Therefore, the results of this project will contribute to decisions involving land use, hazard zonation, insurance premiums, and building codes.

The proposed work is in collaboration with scientists at the Southern California Earthquake Center, which analyzes faults and earthquakes in onshore regions, and with scientists at the Scripps Institute of Oceanography, who measure strain (incremental movement) on offshore faults.

The USGS also wants to collect high-resolution seismic- reflection data to locate the sources and pathways of seawater that intrudes into freshwater aquifers below San Pedro. Ground water usage in the Los Angeles basin began in the mid-1800s. Today, more than 44,000 acre-feet of freshwater each year are extracted from the aquifers that underlie just the city of San Pedro. Extracting freshwater from coastal aquifers causes offshore salt water to flow toward areas of active pumping. To limit this salt-water intrusion, the Water Replenishment District and water purveyors in San Pedro are investing $2.7 million per year to inject freshwater underground to establish a zone of high water pressure in the aquifer. The resulting zone of high pressure will form a barrier between the invasive saltwater and the productive coastal aquifers.

USGS scientists in San Diego are working with the Los Angeles County Department of Public Works and the Water Replenishment District to develop a ground-water simulation model to predict fluid flow below San Pedro and nearby parts of the Los Angeles Basin. This model will eventually be used in managing water resources. The accuracy of the present model, however, is compromised by a paucity of information about aquifer geometry and about other geologic factors that might affect fluid flow. Data the USGS collects will be used to improve three-dimensional, fluid-flow models to aid in the management of water resources.

Because noise from seismic airguns and other acoustic instruments may result in the harassment or injury of marine mammals incidental to conducting the activity, an IHA under section 101(a)(5)(D) of the MMPA is warranted.

Fieldwork described here will be the third airgun survey that the USGS has conducted under close supervision by marine-mammal biologists. In March 1998, the USGS used a large (6500 in^3; 106 liters) airgun array in and around Puget Sound to study the regional earthquake hazard. The USGS employed 12 biologists, who worked on two ships continuously to oversee airgun operations. On several occasions, the USGS shut off the airguns when marine mammals entered safety zones that had been stipulated by NMFS under an IHA, and, when mammals left these zones, the USGS gradually ramped up the array as required to avoid harming wildlife. Marine mammal biologists reported that, during the survey, no overt distress was evident among the dense marine mammal populations, and, afterward, no unexplained marine mammal strandings occurred. In August 1998, the USGS surveyed offshore from Southern California, using a small airgun (40 in^3; 655 cm^3). Marine mammal biologists oversaw this activity, and the survey the USGS proposes here will be conducted with similar oversight.

Experimental Design

Marine studies conducted by the USGS focus on areas where natural hazards have their greatest potential impact on society. In Southern California, USGS studies will concern four areas. The first area in priority is the coastal zone and continental shelf between Los Angeles and San Diego, where much of the hazard appears to be associated with strike-slip faults, such as the Newport-Inglewood and Palos Verdes faults. The second study area lies offshore, in the Santa Monica, San Pedro, and San Diego Trough deeps, where rapid sedimentation has left a more complete record, relative to shallow-water areas, that the USGS can use to decipher earthquake history. The third area is the extension into the Santa Barbara Channel of major elements of onshore geology, including some large faults. The fourth area is the geologic boundary, marked generally by the Channel Islands, between the inner California Borderland (dominated by strike-slip faults) and the Santa Barbara Channel (dominated by compressional faults). The study proposed here focuses on the highest priority area, which lies near shore between Los Angeles and San Diego.

The seismic-reflection survey will last 14 days. From its experience collecting seismic-reflection data in this general area during 1998, the USGS proposed to conduct the 1999 survey sometime within the May through July window. The basis for this decision is its desire to avoid the gray whale migrations and the peak arrival of other mysticete whales during late summer.

The USGS has not yet determined the exact tracklines for the survey, but the USGS does know the areas where airgun use will be concentrated. Two of these areas are southwest and southeast of Los Angeles, and the third and largest one is west and northwest of San Diego. In these areas seismic-reflection data will be collected along a grid of lines that are about 2 km (1.2 mi) apart.

The USGS proposes to use a small airgun and 200-m (656–ft) long streamer to collect seismic-reflection data. The potential effect on marine mammals is from the airgun; mammals cannot become entangled in the streamer. The USGS will also use a low-powered, high-resolution seismic system to obtain detailed information about the very shallow geology. The seismic- reflection system will be onboard a vessel owned by a private contractor. Ocean-bottom seismometers will be deployed to measure the velocity of sound in shallow rocks to help unravel the recent history of fault motion. These seismometers are passive recorders and pose no threat to the environment.

Ship navigation will be accomplished using satellites of the Global Positioning System. The survey ship will be able to report accurate positions, which is important to mitigating the airgun's effect on marine mammals and to analyzing what impact, if any, airgun operations had on the environment.

The Seismic Sound Sources

During this survey, the USGS will operate two sound sources--an airgun and a high-resolution Huntec(TM) system. The main sound source will be a single small airgun of special type called a generator-injector, or GI-gun (trademark of Seismic Systems, Inc., Houston, TX). This type of airgun consists of two small airguns within a single steel body. The two small airguns are fired sequentially, with the precise timing required to stifle the bubble oscillations that typify sound pulses from a single airgun of common type. These oscillations impede detailed analysis of fault and aquifer structure. For arrays consisting of many airguns, bubble oscillations are canceled by careful selection of airgun sizes. The GI-gun is a mini-array that is carefully adjusted to achieve the desired bubble cancellation. Airguns and GI-guns with similar chamber sizes have similar peak output pressures.

The GI-gun for this survey has two equal-sized chambers of 35 in^3 (57 mm^3), and the gun will be fired every 12 seconds. Compressed air delivered to the GI-gun will have a pressure of about 3000 psi. The gun will be towed 12 meters (39.4 ft) behind the vessel and suspended from a float to maintain a depth of about 1 m (3.3 ft).

The manufacturer's literature indicates that a GI-gun of the size the USGS will use has a sound-pressure level (SPL) of about 220 dB re 1 µPa-m. In comparison, a 40–in^3 (65 mm^3) airgun has an SPL of 216 dB re 1 µPa-m (Richardson *et al.*, 1995). The GI-gun's output sound pulse has a duration of about 10 ms. The amplitude spectrum of this pulse, as shown by the manufacturer's data, indicates that most of the sound energy is at frequencies below 500 Hz. Field measurements by USGS personnel indicate that the GI-gun's emits low sound amplitudes at frequencies above 500 Hz. Thus, high-amplitude sound from this source is at frequencies that are outside the main hearing band of odontocetes and pinnipeds (Richardson *et al.*, 1995).

The high-resolution Huntec(TM) system uses an electrically powered sound source. In operation, the sound producing and recording hardware are towed behind the ship near the seabottom. The unit emits sound about every 0.5 seconds. This system provides highly detailed information about stratified sediment, so that dates obtained from fossils in sediment samples can be correlated with episodes of fault offset. The SPL for this unit is 210 dB re 1 µPa-m. The output-sound bandwidth is 0.5 kHz to 8 kHz, with the main peak at 4.5 kHz.

Description of Habitat and Marine Mammals Affected by the Activity

The Southern California Bight supports a diverse assemblage of 29 species of cetaceans (whales, dolphins, and porpoises) and 6 species of pinnipeds (seals and sea lions). The species of marine mammals that are likely to be present in the seismic research area during the year include the bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), killer whale (*Orcinus orca*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), northern right whale dolphin (*Lissodelphis borealis*), Risso's dolphin (*Grampus griseus*), pilot whale (*Globicephala macrorhynchus*), Dall's porpoise (*Phocoenoides dalli*), sperm whale (*Physeter macrocephalus*), humpback whale (*Megaptera novaengliae*), gray whale (*Eschrichtius robustus*), blue whale (*Balaenoptera musculus*), minke whale (*Balaenoptera acutorostrata*), fin whale (*Balaenoptera physalus*), harbor seal (*Phoca vitulina*), elephant seal (*Mirounga angustirostris*), northern sea lion (*Eumetopias jubatus*), and California sea lion (*Zalophus californianus*), northern fur seal (*Callorhinus ursinus*) and sea otters (*Enhydra lutris*). General information on these species can be found in the USGS application and in Barlow *et al.* (1997). Please refer to those documents for information on the biology, distribution, and abundance of these species.

Potential Effects of Seismic Surveys on Marine Mammals

General Discussion

Seismic surveys are used to obtain data about rock formations up to several thousands of feet deep. These surveys are accomplished by transmitting sound waves into the earth, which are reflected off subsurface formations and recorded with detectors in the water column. A typical marine seismic source is an airgun array, which releases compressed air into the water creating an acoustical energy pulse that is directed downward toward the seabed. Hydrophones spaced along a streamer cable just below the surface of the water receive the reflected energy from the subsurface formations and transmit data to the seismic vessel. Onboard the vessel, the signals are amplified, digitized, and recorded on magnetic tape.

Disturbance by seismic noise is the principal means of taking by this activity. Vessel noise may provide a secondary source. Also, the physical presence of vessel(s) could lead to some non-acoustic effects involving visual or other cues.

Depending upon ambient conditions and the sensitivity of the receptor, underwater sounds produced by open-water seismic operations may be detectable some distance away from the activity. Any sound that is detectable is (at least in theory) capable of eliciting a disturbance reaction by a marine mammal or by masking a signal of comparable frequency. An incidental harassment take is presumed to occur when marine mammals in the vicinity of the seismic source (or vessel) react to the generated sounds or to visual cues.

Seismic pulses are known to cause some species of whales, including gray whales, to behaviorally respond within a distance of several kilometers (Richardson *et al.*, 1995). Although some limited masking of low-frequency sounds is a possibility for those species of whales using low frequencies for communication, the intermittent nature of seismic source pulses will limit the extent of masking. Bowhead whales, for example, are known to continue calling in the presence of seismic survey sounds, and their calls can be heard between seismic pulses (Richardson *et al.*, 1986).

When the received levels of noise exceed some behavioral reaction threshold, cetaceans will show disturbance reactions. The levels, frequencies, and types of noise that will elicit a response vary between and within species, individuals, locations and seasons. Behavioral changes may be subtle alterations in surface-dive-respiration cycles. More conspicuous responses include changes in activity or aerial displays, movement away from the sound source, or complete avoidance of the area. The reaction threshold and degree of response are related to the activity of the animal at the time of the disturbance. Whales engaged in active behaviors, such as feeding, socializing, or mating, are less likely than resting animals to show overt behavioral reactions, unless the disturbance is directly threatening.

Hearing damage is not expected to occur during the project. While it is not known whether a marine mammal very close to the airgun would be at risk of permanent hearing impairment, temporary threshold shift (TTS) is a theoretical possibility for animals very close to an airgun. However, planned monitoring and mitigation measures (described later in this document) are designed to detect marine mammals occurring near the seismic source(s) and to avoid, to the greatest extent practicable, exposing them to sound

pulses that have any possibility of causing hearing damage, including TTS.

Maximum Sound-Exposure Levels for Marine Mammals

Loud continuous sounds can damage the hearing of marine mammals. However, the adverse effects of sound on mammals have been documented for exposure times that last for tens of seconds or minutes, but effects have not been documented for the brief pulses typical of the GI-gun (10 ms) and the Huntec(TM) system (0.3 ms). NMFS has long considered that the maximum SPLs to which marine mammals should be exposed from impulse sounds are 180 dB re 1 μPa_{RMS} for mysticetes and sperm whales, and 190 dB re 1 μPa_{RMS} for odontocetes and pinnipeds. More recently, scientists at two workshops on acoustic noise and marine mammals supported NMFS' determination.

At the time of its application, the USGS lacked detailed measurement of sound-transmission loss for the southern California offshore, so, based upon the best science available, the USGS estimated how SPL varies with distance from the airgun by assuming that sound decays according to 25Log(R). The coefficient 25 accounts approximately for the attenuation that is caused by the sound interacting with the seabottom. The USGS used this procedure to derive safety zone estimates based on the 220 dB SPL produced by the GI-gun, the larger of the two sound sources the USGS plans to use.

Assuming that the 25Log(R) decay that the USGS used to estimate safe distances from the airgun is correct, this indicates that an SPL of 190 dB re 1 µPa is attained about 16 m (52.5 ft) away from the airgun, and an SPL of 180 dB re 1 µPa is attained at about 40 m (131 ft) away. However, for precautionary reasons during field operations, the USGS proposes that, at all times, the safe distance for odontocetes and pinnipeds be 50 m (164 ft) and for mysticetes, 100 m (328 ft).

Comments and Responses

A notice of receipt of the application and proposed authorization was published on March 5, 1999 (64 FR 10644), and a 30-day public comment period was provided on the application and proposed authorization. Comments were received from the Marine Mammal Commission (MMC), the California Coastal Commission (CCC), and one individual. The CCC asked a number of questions; those relevant to the application for an IHA are included here. Information on the authorization request and expected impact on marine mammal species, not subject to reviewer comments, can be found in the proposed authorization notice and is not repeated here, but is considered part of the record of decision, except as modified by this notice.

On May 11, 1999, the CCC objected to the USGS project and its consistency determination, even though the CCC staff had recommended approval (see CD–32–99). During the May 11, 1999, public hearing, the USGS modified its project to avoid operating within the 3–mile limit of State waters and to expand the marine mammal safety radius for odontocetes to be the same as mysticetes (i.e., 100 m (328 ft) safety zone) in order to ensure that marine mammals would be exposed to no greater than 180 dB sound levels. Nevertheless, even with these modifications, the CCC found the project was not consistent to the maximum extent practicable with the California Coastal Management Plan (CCMP).

The CCC further determined that alternative measures exist that would enable the project to be conducted in a manner consistent to the maximum extent practicable with the CCMP. One alternative measure identified by the CCC would require no night-time seismic activities. The CCC requirements are discussed later in this document. On May 28, 1999, the USGS submitted a letter to NMFS, requesting the CCC suggested modifications be made to their application for an IHA.

Comment 1: The MMC questions the statement in the USGS application that NMFS considers that the maximum sound pressure levels (SPLs) to which marine mammals can be exposed are 180 dB re 1 μPa_{RMS} * * * for mysticetes and sperm whales, and 190 dB re 1 μPa_{RMS} for odontocetes and pinnipeds. No citation was provided for this statement and, while the MMC is aware that the referenced sound levels were judged to be appropriate by the panel of experts convened by NMFS last September, the MMC was not aware that NMFS had accepted or made known the panel's findings in this regard. The MMC requests NMFS' rationale for these determinations.

Response: NMFS notes that the mentioned SPLs have been adopted by NMFS as the lower bound for Level A harassment authorizations for impulse sounds, such as from seismic airguns (please refer to 50 CFR 216.3 for a definition of Level A and Level B harassment), and have relatively long usage in establishing safety zones for marine mammals in such areas as the U.S. Beaufort Sea (see 61 FR 26501, May 28, 1996; 61 FR 38715, July 25, 1996; 62 FR 38263, July 17, 1997; and 63 FR 40505, July 29, 1998) and Puget Sound (see 62 FR 488817, September 17, 1997, and 63 FR 2213, January 14, 1998). The rationale for using these levels was provided first in an authorization to the Exxon Corporation for seismic work in southern California in 1995 (see 60 FR 53753, October 17, 1995). Because of the length of that discussion, it is not repeated here. However, since the time of that authorization, NMFS has questioned the reliability of using data on humans as surrogates for marine mammal impacts. As a result, until better scientific data on marine mammals are collected, NMFS has adopted a more precautionary level of 190 dB as the lower bound for Level A harassment for odontocetes and pinnipeds, and not the higher levels noted in the Exxon authorization.

NMFS wishes to clarify that, under section 101(a)(5)(D) of the MMPA, applicants may apply for a take by acoustic injury (Level A harassment); however, NMFS limits the use of authorizations for harassment involving the ''potential to injure'' to takings that may involve non-serious injury, such as TTS. Serious injury for marine mammals, such as permanent hearing loss within the species' primary hearing range, may lead fairly quickly to the animal's death. For example, if an application indicates that the short-term use of an acoustic source at its maximum output level has the potential to cause TTS in a marine mammal's hearing ability, that taking would constitute a Level A ''harassment'' take, since the animal's hearing ability would be expected to recover and, therefore, the section 101(a)(5)(D) application would be appropriate. However, if the acoustic source at its maximum level has the potential to cause a permanent threshold shift in a marine mammal's hearing ability or potentially could cause TTS over a significant period of time on the same animals, that activity will be considered by NMFS to be capable of causing serious injury to a marine mammal and, therefore, might not be appropriate for an IHA, unless effective mitigation was implemented to prevent more than non-serious injury.

It should also be understood that, while NMFS considers that the maximum SPLs to which marine mammals should be exposed from impulse sounds are 180 dB re 1 μPa_{RMS} for mysticetes and sperm whales and 190 dB re 1 μPa_{RMS} for odontocetes and pinnipeds, the definition of ''harassment'' in section 3 of the MMPA authorizes takes by harassment to include injury (Level A harassment). As mentioned previously, 180 dB/190 dB SPLs are considered by NMFS to be the

lowest level of Level A harassment. This means that safety zones are established as a mitigation measure to reduce takings to the lowest level practicable as required by section 101(a)(5)(D)(ii)(I). Therefore, in accordance with section 101(a)(5)(D)(v), provided the applicant requested takes that included Level A harassment, the fact that a marine mammal entered the designated safety zone undetected is not considered a violation of the MMPA or of the IHA.

In any case, in order to obtain a certificate of compliance (required of the USGS by the Coastal Zone Management Act) from the CCC, the USGS must observe the more restrictive 180–dB criterion for both mysticetes and odontocetes. Accordingly, the USGS, in a letter to NMFS, amended its application to indicate that a safety zone of 100 m (328 ft) should be established, which is equivalent to 180 dB using 20Log(R) SPL.

Comment 2: The CCC asked, if the operation includes shallow water, why 25Log(R) is an appropriate dispersion model? Also, one of the two sources, the Huntec system, emits sound at or near the bottom (if at all). Again, is the 25Log(R) the appropriate dispersion model for this source. If the assumption that 25Log(R) is the correct attenuation factor, the MMC recommends, in order to protect marine mammals from serious injury, that a more conservative estimate of the attenuation rate be used to calculate the safety zones, or that measurements be made at the beginning of the surveys to confirm the assumed 25Log(R) within the horizontal distances less than the depth of the water column.

Response: The USGS notes that it used a 25Log(R) decay in SPL because acoustic modeling and measurements in the field show that sound decays quickly in water that overlies a sloping seabottom. In a medium with no acoustic interfaces, sound spreads spherically and SPL reduces at 20Log(R). A sloping bottom, however, causes sound to exit the water layer and beam into the underlying sediment, enhancing the transmission loss toward a beach (e.g., Jensen and Tindle, 1987; Deane and Buckingham, 1993; Glegg *et al*., 1993; Richardson *et al*., 1994; Jensen *et al*., 1994). In fact, a zone of high transmission loss, an ''acoustic shadow zone,'' lies just offshore from a beach. This argues against the common misunderstanding that underwater sound intensifies up-slope toward a beach.

The enhanced transmission loss, relative to 20Log(R), that occurs over a sloping bottom has been verified by field measurements from scattered locations. The USGS, in conjunction with its 1997 seismic survey in Puget Sound (Fisher *et al*., 1999) measured sound decay with distance from a 108–liter (L) airgun array (Bain, 1999). A least-squares, straight-line fit to data from ranges less than 10 km (5.4 nm) indicates that airgun sound decays at 29Log(R). In water 90 m (295 ft) deep off Los Angeles Harbor, USGS scientists measured a 26Log(R) transmission loss, using the same airgun the USGS will deploy this coming season. Off the Big Sur coast of central California, the SPL of a single 1.6 L airgun decreased at 25Log(R) decay toward the beach.

Greenridge Sciences, Inc.(1998) measured the transmission loss of airgun sound at Platform Harmony in the Santa Barbara Channel. Estimated loss was high, the coefficient of the logarithm is 48 to 60. Finally, measurements of acoustic thermometry (ATOC) sounds versus distance, in nearshore water that is 10 m (33 ft) to 80 m (262 ft) deep, indicate a high transmission loss (TL) of about 43Log(R).

Therefore, on the basis of abundant, numerical acoustic modeling and some field measurements, the USGS and NMFS believe that 25Log(R) is a conservative estimate of sound TL for airgun sounds over a sloping seabottom, like that offshore from southern California. In particular, sound that propagates into shallow water near and within the 3–mile (4.8 km) limit should decay sharply toward shore. However, the CCC will require the USGS to observe a 100–m (328–ft) safety radius around the airgun, which distance is consistent with the source level of the airgun and a 20Log(R) TL model. At this distance, received SPL would be 180 dB using a 20Log(R) TL model. Because a more conservative estimate of the attenuation rate has been used to calculate the safety zones measurements, NMFS does not consider it necessary for measurements to be made at the beginning of the surveys to confirm the TL.

The Huntec instrument is deployed at varying depths beneath the sea surface to avoid noise from large ships and ocean waves, but no attempt is made to maintain this instrument at a close distance to the sea floor. For safety reasons, the Huntec vehicle remains at least 50 m (164 ft) above the seafloor, except in water that is shallower than 100 m (328 ft), where the Huntec will be at a depth of about 10 m (33 ft). The maximum deployment is 150 m (492 ft). The maximum SPL of the Huntec is about 25 percent of the G-I gun's maximum SPL, and mitigation zones were calculated to account for the GI-gun. These zones, therefore, are even more conservative for Huntec.

Comment 3: The CCC asked how will marine mammals be observed and avoided during low-visibility times (such as night-time and fog)? Will there only be visual monitoring or is acoustic monitoring included as well.

Response: The USGS proposes to rely on visual monitoring; there will not be any aerial surveys or acoustic monitoring. At night, biologists proposed to use light-amplification scopes to improve visibility and detection of the animals. However, in order for the USGS to be consistent to the greatest extent practicable with the CCMP, the USGS will not conduct GI-gun seismic surveys during nighttime.

Comment 4: The MMC notes that marine mammal observers aboard the seismic vessels will need to work 6 hour shifts if seismic operations continue around the clock. The MMC questions whether two observers will be able to effectively monitor and detect marine mammals approaching the designated safety zones, particularly at night and after the first few days working the alternating 6–hour shifts. The MMC recommends that NMFS consult with the applicant to better determine the rationale for using two observers as proposed.

Response: Three biological observers will be employed with two on watch at all times. According to restrictions placed on the USGS by the CCC, the USGS will be unable to use the airgun for 8 hours overnight, so all observers will benefit from a full, 8–hour sleep, and off-watch periods during the day offer additional rest.

Comment 5: The CCC asks who will be conducting the marine mammal monitoring?

Response: Employees of researchers at the Cascadia Research in Olympia, WA, will likely oversee monitoring.

Comment 6: The CCC asks why a 35–in^3 airgun is louder than a 45–in^3 airgun? Is that because it contains two chambers?

Response: The GI-gun uses 3000–psi pressure, while most airguns use 2000–psi pressure. This likely accounts for the greater source strength of the GI-gun.

Estimated Number of Potential Harassments of Marine Mammals

The zone of influence for the GI-gun is defined to be the circle whose radius is the distance from the gun where the SPL reduces to 160 dB re 1 μPa_{rms} for those marine mammals that can hear either the low frequency sound from seismic airguns or the mid-frequency Huntec system. For 25Log(R) TL, the zone of influence is estimated to be a

circle with a radius of 250 m (820 ft); for 20Log(R), the zone of influence would be 1,000 m. Based solely on estimated marine mammal populations within the survey area and on the number of individuals that were observed during the 1998 USGS survey and not on the expected number of animals that may be harassed by the GI-gun and Huntec system, the USGS estimates that up to 5 killer whales, 10 minke whales, 50 northern sea lions, 100 northern fur seals, 100 northern elephant seals, 100 Dall's porpoise, 100 Risso's dolphins, 100 northern right-whale dolphins, 100 Pacific white-sided dolphins, 100 bottlenosed dolphins, 200 California sea lions, 200 Pacific harbor seals, and 6,000 common dolphins may be harassed incidental to the USGS survey. No mysticetes (except possibly minke whales) or sperm whales are expected to be in the area at the time of the survey and, therefore, would not be subject to incidental harassment, and no marine mammals will be seriously injured or killed as a result of the seismic survey. In addition, because the Huntec system will be towed near the seabottom and because the attenuation of mid-frequency sources is greater than low frequency sources, it is likely that few to no marine mammals at or near the surface will be affected by this acoustic instrument.

Mitigation of Potential Environmental Impact

To avoid potential TTS injury to marine mammals, a safety zone will be established and monitored continuously by biologists, and the USGS must shut off the airguns whenever the ship and a marine mammal converge closer than 100 m (328 ft). However, because no authorization was requested to incidentally harass mysticetes (except minke whales) or sperm whales (since they're not expected to be in the area), a safety zone of 250 m (820 ft) will need to be monitored for these species.

The USGS plans to have marine biologists aboard the ship who will have the authority to stop airgun operations when a mammal enters the safety zone.

During seismic-reflection surveying, the ship's speed will be only 4 to 5 knots, so that, when the airgun is being discharged, nearby marine mammals will have gradual warning of the vessel's approach and can move away. Finally, NMFS will coordinate with the local stranding network during the time of the survey to determine whether strandings can be related to the seismic operation.

Additionally, in accordance with the May 28, 1999, request from the USGS, airgun activities will not be conducted during nighttime. This will decrease the potential that a marine mammal might enter the safety zone undetected.

Monitoring and Reporting

Biologists, affiliated with the Cascadia Research Collective in Olympia, Washington, will monitor marine mammals at all times while the airguns are active. Three trained marine mammal observers will be aboard the seismic vessel to mitigate the potential environmental impact from airgun use and to gather data on the species, number, and reaction of marine mammals to the airgun. To ensure that no marine mammals are within the safety zone, monitoring will begin no later than 30 minutes prior to the acoustic sources being turned on. Each observer will work shifts that limit on-watch times to no more than 4 consecutive hours. Observers will use 7x50 binoculars with internal compasses and reticules to record the horizontal and vertical angle to sighted mammals. Monitoring data to be recorded during airgun operations include the observer on duty and weather conditions (such as Beaufort sea state, wind speed, cloud cover, swell height, precipitation, and visibility). For each mammal sighting, the observer will record the time, bearing and reticule readings, species, group size, and the animal's surface behavior and orientation. Observers will instruct geologists to shut off the airgun array whenever a marine mammal enters its respective safety zone.

Consultation

Under section 7 of the Endangered Species Act, NMFS has completed consultation on the issuance of an IHA. NMFS finds this action to be unlikely to adversely affect listed marine mammals because the endangered whales are expected to be in offshore waters outside the Channel Islands at the time of the year that the activity will take place and northern sea lions, which are expected to be in more northerly waters during the summer, are not known to be affected by low frequency seismic sources unless close to the source.

Conclusions

NMFS has determined that the short-term impact of conducting marine seismic-reflection data in offshore southern California may result, at worst, in a temporary modification in behavior by certain species of pinnipeds and cetaceans. While behavioral modifications may be made by certain species of marine mammals to avoid the resultant noise from the seismic airgun, this behavioral change is expected to have no more than a negligible impact on the animals.

In addition, no take by serious injury or death is anticipated, and takes will be at the lowest level practicable due to the incorporation of the mitigation measures previously mentioned. No known rookeries, mating grounds, areas of concentrated feeding, or other areas of special significance for marine mammals occur within or near the planned area of operations during the season of operations.

Since NMFS is assured that the taking would not result in more than the incidental harassment (as defined by the MMPA) of small numbers of certain species of marine mammals, would have only a negligible impact on these stocks, and would result in the least practicable impact on the stocks, NMFS has determined that the requirements of section 101(a)(5)(D) of the MMPA have been met and the authorization can be issued.

Authorization

Accordingly, NMFS has issued an IHA to the USGS for the possible harassment of small numbers of several species of marine mammals incidental to collecting marine seismic-reflection data offshore from southern California during the period from June 3 through July 31, provided the mitigation, monitoring and reporting requirements described in the authorization are undertaken.

Dated: June 3, 1999.

Hilda Diaz-Soltero,

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

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DEPARTMENT OF DEFENSE

Department of the Air Force

Notice of Intent To Prepare an Environmental Impact Statement for Peacekeeper Missile System Deactivation/ Dismantlement at F.E. Warren Air Force Base, Wyoming

The United States Air Force Space Command is issuing this notice to advise the public that the Air Force intends to prepare an Environmental Impact Statement (EIS) to assess the potential environmental impacts of deactivation/dismantlement of the Peacekeeper Missile System of the 90th Space Wing based at F. E. Warren Air Force Base in Cheyenne, Wyoming. The EIS will also evaluate the potential impacts of sustainment of the current system which is the No Action