

DRAFT ENVIRONMENTAL ASSESSMENT AND DETERMINATION
PURSUANT TO THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA),
42 U.S.C. 4321, et seq. AND EXECUTIVE ORDER 12114

Low-Energy Marine Seismic Survey by the U.S. Geological Survey
in the deepwater Gulf of Mexico, April-May 2013

This constitutes a draft environmental analysis prepared by the U.S. Geological Survey for a low-energy marine seismic survey to be conducted April to May 2013 aboard the *R/V Pelican* in the deepwater Gulf of Mexico. This analysis is based, in part, on an Environmental Assessment report prepared by LGL Limited Environmental Research Associates (LGL) on behalf of NSF, entitled, “Request by U.S. Geological Survey for an Incidental Harassment Authorization to Allow the Incidental Take of Marine Mammals during a Low-Energy Marine Seismic Survey in the Gulf of Mexico, April–May 2013” (Attachment 1). The conclusions from the LGL report were used to inform USGS management of potential environmental impacts of the cruise. The USGS has reviewed and concurs with the report’s findings. Accordingly, the LGL report is incorporated into this analysis by reference as if fully set forth herein.

Project Objectives and Context

The purpose of the proposed study is to conduct a multicomponent and high-resolution marine seismic survey in two areas of the Gulf of Mexico that have previously been targeted for US government and private sector research on gas hydrates as a potential resource.

Multicomponent seismic surveys will constrain the areal distribution, saturation, and thickness of hydrate-bearing coarse-grained sediments beneath the seafloor. High resolution surveys will image the sedimentary section between the seafloor and the hydrate-bearing strata and provide information about faults, structural traps, sedimentation patterns, and related features that could affect the distribution of gas hydrate or the migration of gas.

Summary of Proposed Action and Alternatives

The procedures to be used for this survey are similar to those used for low energy seismic surveys carried about by academic and government researchers and would involve conventional seismic methodology. The proposed survey would take place during April to May 2013 within the deepwater Gulf of Mexico, entirely within the Exclusive Economic Zone (EEZ) of the U.S. (See Attachment 1, Figure 1). The seismic survey would consist of a maximum of 1400 km of transect lines (including turns) in water depths ranging from ~1500 to 2000 meters. During the

survey, a 2 airgun array would be deployed as an energy source; it would be operated as a single array consisting of two 105 in³ GI airguns, with a maximum discharge volume of 210 in³. Up to 25 ocean bottom seismometers would passively record the seismic energy. Energy would also be recorded by a towed 72-channel digital streamer. A 6 kJ sparker source would serve as backup for the two GI guns.

Seismic operations would be carried out for up to 8 days during the ~15 day cruise. Some minor deviation from proposed cruise dates may be required, depending on logistics, weather conditions, and the need to repeat some lines if data quality were substandard.

One alternative to the proposed action would be to issue an IHA at an alternative time and conduct the survey at that alternative time. Constraints on the availability of the vessel, of USGS operational personnel, and of USGS seismic equipment would need to be considered for alternative cruise times. Limitations on scheduling the vessel include additional research studies planned by other federal agencies for 2013 and the availability of the ocean bottom seismometers which are, at times, oversubscribed in the shared academic/research institution pool to which the USGS contributes instruments and annual fees.

Another alternative to conducting the proposed activities would be the “No Action” alternative (i.e., do not issue an IHA and do not conduct the operations). If the planned research were not conducted, the “No Action” alternative would result in no disturbance to marine mammals attributable to the proposed activities, but geophysical data of considerable scientific value that would increase understanding of the potential of high-saturation methane hydrate deposits to serve as a potential resource would be lost. The “No Action” alternative would therefore represent a lost opportunity to obtain data and knowledge important to science and to society in general.

Summary of environmental consequences

The potential effects of sounds from airguns on marine species, including mammals and turtles of particular concern, are described in detail in Attachment 1 (pages 20-30) and might include one or more of the following: tolerance, masking of natural sounds, behavioral disturbance, and at least in theory, temporary or permanent hearing impairment, or non-auditory physical or physiological effects. It is unlikely that the project would result in any cases of temporary or especially permanent hearing impairment, or any significant nonauditory physical impacts during seismic operations. Any such impacts would likely be localized, short-term, and involving a limited numbers of animals.

The proposed activity would include a mitigation program to further minimize potential impacts on marine mammals that may be present during the conduct of the research to a level of insignificance. As detailed in Attachment 1 (pages 6-10; and 25) monitoring and mitigation measures would include: ramp ups; two dedicated observers maintaining a visual watch during all daytime airgun operations; two observers 30 min before and during ramp ups during the day and at night; no start ups during poor visibility or at night unless at least one airgun has been operating; and shut downs when marine mammals or sea turtles are detected in or about to enter designated exclusion zones. The fact that the airguns, as a result of their design, direct the majority of the energy downward, and less energy laterally, would also be an inherent mitigation measure.

With the planned monitoring and mitigation measures, unavoidable impacts to each species of marine mammal that could be encountered would be expected to be limited to short-term, localized changes in behavior and distribution near the seismic vessel. At most, effects on marine mammals may be interpreted as falling within the U.S. Marine Mammal Protection Act (MMPA) definition of “Level B Harassment”. No long-term or significant effects would be expected on individual marine mammals, the populations to which they belong, or their habitats.

A survey at an alternative time would result in few net benefits. As described in Attachment 1, a number of marine mammal and sea turtle species are expected to occur in the area year-round, so altering the timing of the proposed project likely would result in no net benefits for those species. Postponing or changing the cruise period will delay this project and potentially disrupt others scheduled for the R/V *Pelican* in 2013. In addition, the proposed cruise dates are the period when the ship and all of the personnel and equipment essential to meet the overall project objectives are available.

The “no action” alternative would remove the potential for disturbance to marine mammals or sea turtles attributable to the proposed activities as described. It would, however, preclude important scientific research from going forward that has distinct potential to address geological processes of concern.

Conclusions

The USGS has reviewed and concurs with the conclusions of the LGL report (Attachment 1) that implementation of the proposed activity would not have a significant impact on the environment.