



U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

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Shock Wave/Sound Propagation Modeling Results for Calculating Marine
Protected Species Impact Zones during Explosive Removal of Offshore
Structures

[OCS Study MMS 2003-059](#)

The Minerals Management Service (MMS), Gulf of Mexico OCS Region, announces the availability of a new study, Shock Wave/Sound Propagation Modeling Results for Calculating Marine Protected Species Impact Zones during Explosive Removal of Offshore Structures.

The objective of this study was to develop a method to determine shock wave propagation into water caused by the explosive removal of offshore structures. The objective was accomplished by performing numerical simulations of various explosive, pile, clay, and marine environments and determining the amount of energy coupled to the water. The numerical simulations demonstrated that less energy is coupled to the water for the detonation within a piling than would be coupled for free-water explosions. In addition, the simulations showed that a reduction of coupled energy into the water was dominated by pile confinement. Parametric numerical simulations were performed for a range of typical pile diameters, wall thicknesses, and explosive weights. From these results, a model was developed to predict the explosive efficiency factors for several scenarios. Finally, the UnderWater Calculator spreadsheet was developed to predict peak pressure, acoustic impulse, and energy flux density for both the free water and within piling detonations. The study describes the underwater shock wave/sound propagation model's development, design, and results.

This study is available only in compact disc format. The discs are available from the Minerals Management Service, Gulf of Mexico OCS Region, at a charge of \$15.00 by referencing OCS Study MMS 2003-059. You will be able to obtain this study also from the National Technical Information Service in the near future. Here are the addresses. You may also inspect copies at selected Federal Depository Libraries.

Minerals Management Service
Gulf of Mexico OCS Region
Public Information Office (MS 5034)
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394
Telephone requests may be placed at
(504) 736-2519, 1-800-200-GULF, or
FAX: (504) 736-2620

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
(703) 487-4650 or FAX: (703) 321-8547
Rush Orders: 1-800-336-4700

MMS is the Federal agency in the U.S. Department of the Interior that manages the nation's oil, natural gas, and other mineral resources on the outer continental shelf in Federal offshore waters. The agency also collects, accounts for, and disburses mineral revenues from Federal and American Indian leases. These revenues totaled over \$6 billion in 2002 and nearly \$127 billion since the agency was created in 1982. Annually, nearly \$1 billion from those revenues go into the Land and Water Conservation Fund for the acquisition and development of state and Federal park and recreation lands.

MMS Main Website: www.mms.gov
Gulf of Mexico Website: www.gomr.mms.gov

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