

**UNITED STATES DEPARTMENT OF THE INTERIOR  
MINERALS MANAGEMENT SERVICE  
PACIFIC OCS REGION**

NTL No. 06-P01

Effective Date: October 16, 2006

**NOTICE TO LESSEES AND OPERATORS (NTL) OF FEDERAL OIL AND GAS  
LEASES IN THE PACIFIC OUTER CONTINENTAL SHELF REGION**

**Shallow Hazards Survey and Report Requirements  
for OCS Development Operations**

This NTL supersedes NTL 98-13.

**Introduction**

The Chief, Office of Facilities, Safety and Enforcement (OFSE) requires all Pacific OCS Region (POCSR) lessees or right-of-way applicants (you) to perform an analysis of seafloor and subsurface geologic and manmade hazards of all areas considered for production platforms and pipelines (30 CFR 250.242(b), 250.906 and 250.1007 (a)(5)). Hazards analysis is the process of identifying and evaluating conditions that might affect the safety of proposed operations or conditions that might be affected by the proposed operations.

The initial evaluation process depends primarily on interpretation of data obtained from appropriately designed and executed high-resolution geophysical (HRG) surveys. In conjunction with, or in addition to, the shallow hazards survey, you must perform a geotechnical analysis of foundation soils underlying the proposed platform site and pipeline route (30 CFR 250.906 and .907 and CFR 250.1007(a)(5)). You may also be required to conduct additional biological and/or archaeological surveys when supplemental information is needed to perform an adequate site evaluation.

This NTL provides guidance for developing HRG survey strategies capable of detecting and evaluating hazardous conditions that might be in the vicinity of the proposed development site(s). Information from HRG surveys also provides the basis for preliminary evaluation of biological and archaeological resource potential. Careful planning can minimize redundancy in the survey effort necessary to comply with survey requirements in NTL 06-P02, **Biological Survey and Report Requirements** or NTL 06-P03, **Archaeological Survey and Report Requirements**.

This NTL also outlines formats required for your survey report and supporting data and information. These guidelines will assist you in preparing a comprehensive documentation package so that we can make a timely assessment of your proposed development activities.

**Pre-Survey Planning, Coordination, and Notification**

Shallow hazard survey activities described in the applicant's plan shall be conducted in accordance with all laws, regulations, rules and lease stipulations, including the Endangered Species Act of 1973 as amended (ESA) and the Marine Mammal Protection Act of 1972 (MMPA). You are encouraged to contact Minerals Management Service (MMS), Fish and Wildlife Service (FWS), and National Marine Fisheries Service (NMFS) to discuss conceptual plans, anticipated analyses, and time required for any agency reviews, when developing your project proposal.

If marine mammals may be incidentally taken by the proposed survey activities, an Incidental Harassment Authorization (IHA) or a small take authorization under MMPA may be required. The applicant should contact FWS and/or NMFS to discuss authorization for incidental take of marine mammals. MMS will coordinate with FWS and NMFS prior to approval of the applicant's plan to ensure proper authorizations are in place.

Prior to conducting shallow hazards surveys, the applicant shall provide MMS with the following information:

- Produced sound frequency, amplitude, and propagation estimates based on modeling or calculations acceptable to the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (FWS) for determination of effects on protected species,
- Description of endangered or threatened species and marine mammals that may be in the proposed survey area at the time of the proposed survey,
- Proposed measures to avoid impacts to protected species and mitigate any adverse impacts that may occur.

For endangered and threatened species, MMS will use this information to consult with the FWS and/or NMFS as appropriate. If, in their respective biological opinions, FWS or NMFS concludes that the proposed surveys may adversely affect an endangered or threatened species, additional terms and conditions intended to avoid or minimize incidental take will be required prior to approval of a plan by MMS.

We have found that a pre-survey planning meeting allows you and (MMS) to discuss common goals and expectations before you mobilize for a shallow hazards survey. Another purpose for this meeting is to ensure that you have or will receive all necessary permits, authorizations, and reviews by other agencies necessary to conduct the survey. Working closely with us helps you to meet overall requirements and tailor the survey to the site-specific needs of your area.

<b>Pre-Survey Meeting With MMS</b>
At least 30 days prior to starting field operations
At least 60 days if a California State geophysical permit is required

At a minimum you should be prepared to discuss your survey plan, including specifications of data acquisition systems, field technique, data to be acquired, processing

and analysis to be performed, data/information to be submitted, anticipated dates of field operations, and a navigation pre-plot (1:12,000) at this meeting. In addition, you should provide:

- Proposed survey data acquisition systems and specifications,
- Survey logistics (dates, times, weather limitations, etc.),
- Vessel characteristics (size, equipment, etc.),
- Sea floor characteristics expected based on available information (depth, slope, substrate, etc.).

When conducting offshore survey operations employing towed geophysical gear, you must notify commercial fishers and other OCS users (30 CFR 251.6(c)). We recommend that you consult with the MMS (805/389-7550) early in the planning process for current MMS POCSR notification procedures. Your formal, written notice must be provided to all users at least two weeks before the start of field operations and verification of the process you followed must be provided to us prior to conducting the survey. In addition, you or your contractor must re-notify the MMS in writing at least 72 hours prior to mobilization. We will advise you if an MMS observer(s) will be monitoring the survey onboard the vessel.

You are further encouraged to consult with the following parties about your survey plans:

- **The Joint Oil/Fisheries Liaison Office**, (805) 963-8819, for assistance in identifying potential commercial fishing issues. Early coordination is important in reducing conflicts, which are associated primarily with fixed commercial fishing gear, and will assure sufficient lead time for resolving issues.
- **The California State Lands Commission, Geophysical Coordinator** in Long Beach, CA, (562) 590-5201, to obtain a permit if your survey plans include using towed geophysical gear within California State waters.
- **The U.S. Coast Guard, Office of Aids to Navigation** in Alameda, CA, (510) 437-2976, for requirements for timely publication in the Notice to Mariners.

### **HRG Survey Strategies**

We recognize that HRG data acquisition and processing technology continually evolve and that no single survey strategy can be optimum for the variety of conditions that may be present. We encourage you to develop plans that utilize **best survey technology** in ways that address the specific needs of a proposed project, as long as they are consistent with the objectives of reliable detection and accurate evaluation of site conditions. We also encourage you to use innovative survey and data processing technologies.

In planning your survey, you may incorporate by reference data on file with the MMS, POCSR, into the data set submitted in support of the hazard assessment, if coverage, quality and technique are consistent with present survey objectives. We will not accept

poor quality data, or data acquired using obsolete techniques, if assessment objectives are compromised. In such cases, we will require a resurvey.

## Types of Surveys

Shallow hazard surveys can be categorized into two types, production platform sites and pipeline route surveys. Each survey type requires a particular suite of tools to be run (see Table).

**Survey Types\***

	Platform Site	Pipeline Route**
Shallow Seismic	X	X
Intermediate Seismic	X	X
Deep Seismic	X	X
Bathymetry	X	X
Side Scan Sonar	X	X
Magnetometer	X	X
Core Holes	X	X
Final Report	X	X

\* For any other survey type, please contact MMS for survey systems needed.

\*\* New deep seismic surveying may not be required if the MMS determines that adequate pre-existing deep seismic data are available.

## Survey Grids

A site-specific survey for a **production platform** must cover at least the area within a 1,000 m (3,300 ft) radius of the proposed platform location or 100 m (300 ft) beyond the furthest anticipated anchor locations for a derrick barge and pipe lay barge, whichever is greater. A site-specific survey for a **pipeline route** must cover at least the area within a 600 m (2,000 ft) radius of the axis of the proposed pipeline route or 100 m (300 ft) beyond the furthest anticipated anchor locations for a derrick barge and pipe lay barge, whichever is greater. We may require you to survey a larger area if sensitive habitat or other conditions need to be evaluated.

The table below contains line spacing for all acoustic surveys. When an archaeological or biological survey is required, supplemental primary line spacing for magnetometer (mag) and side scan sonar (SSS) data acquisition may be necessary for the area of interest that is significantly tighter than the primary grid spacing previously described and a higher frequency (see NTL 06-P03, **Archaeological Survey and Report Requirements** or NTL 06-P02, **Biological Survey and Report Requirements**). After discussing your survey plan at the pre-survey meeting, MMS will provide you with specific line spacing and other requirements for these surveys.

### Line Spacing for Survey Grids

	Platform*	Pipeline*
Shallow Seismic	≤150 and ≤150	≤150 and ≤1,200
Intermediate Seismic	≤150 and ≤150	≤150 and ≤1,200
Deep Seismic	≤150 and ≤150	
Bathymetry	≤150 and ≤150	≤150 and ≤1,200
Side Scan Sonar	≤150 and ≤150	≤150 and ≤1,200
Magnetometer	≤150 and ≤150	≤150 and <1,200
Core Holes	≤150 and ≤150	≤150 and <1,200

\*Primary and tie lines in meters. Line spacing for platform surveys may not exceed 150 m (500 ft) intervals. Pipeline surveys may not exceed 150 m (500 ft) intervals for primary lines and 1,200 m (4,000 ft) intervals for tie lines. For pipeline surveys, MMS will decide the appropriate line spacing based upon the amount of pre-existing deep seismic data available and the purpose of the pipeline.

### Geophysical Data Acquisition Systems

Survey Systems	Survey Tools	Specifications
Primary Navigation System of Survey Vessel	Survey-grade differential global positioning system (GPS) capability.	Surface position accuracy for the survey vessel of 2m (6 ft).
USBL Navigation System of Towed Sensors	An ultra-short baseline (USBL) system, incorporating a survey grade gyroscope, for deep water/long tow sensors that is <u>integrated</u> with the primary navigation system.	Towed sensor accuracy of 10 m (30 ft) or better. Position accuracy for sensors associated with very long (>1,000 m (3,300 ft)) tow configurations should be accurate to within 1% of the distance between vessel and sensor.
Shallow Subbottom Profiler	A Chirp system is preferred.	Broad band swept FM piezoelectric sources with dominant energy source in the 2 to 16 kHz spectrum ("Chirp" pulse) to provide maximum resolution at shallow depths below the seafloor. A deep-tow configuration equipped with USBL navigation and motion compensation will usually be needed when water depth exceeds 150 m (500 ft).
Intermediate	Mini-Sparker, boomer,	IP systems can use a variety of

Penetration (IP) Seismic Profiler	mini-sleeve exploder and small air gun are common sources.	sources to produce source energy in the 0.5 to 1.5 kHz spectrum to resolve features within the zone obscured by pulse reverberation typical of most DP (see below) systems.
Deep Penetration (DP) Seismic Profiler	Sparker, water gun, sleeve exploder, air gun, or air gun array are common sources.	DP systems typically employ a small air gun or air gun array to provide sufficient source energy for multi-channel recording in the 50 to 200 Hz spectrum to resolve features at maximum depth.
Bathymetry	High Resolution Multi Beam.	Bathymetry data are required with a minimum accuracy of 1% of water depth. A multi-beam, survey grade precision depth recording system is adequate for areas characterized by relatively flat, featureless seafloor topography. You must use the swath method (a type of three-dimensional surveying) to survey areas characterized by irregular topography or deep water (depths > 150 m, 500 ft). You should consider processing swath data (or other digital sonar data/information, such as SSS or SBP) to generate <b>acoustic seabed classification</b> displays (see <b>Survey Report, <i>Maps</i></b> ) and to aid in planning more effective geotechnical and biological surveys.
Sea Floor Imaging	Side Scan Sonar.	Use dual-channel, <u>digital</u> high resolution side scan sonar (SSS) to provide spatially and amplitude corrected seafloor images suitable for preparation of high-quality, digitally-processed, seafloor mosaics. Acquisition strategy should facilitate reliable detection of targets measuring 0.5 m, or smaller, and provide a minimum of 100% coverage of the seafloor along the 150 meter-spaced grid. No data holidays are permitted between adjacent 150 meter spacing lines (however, small areas of reduced target resolution directly beneath the

		sensor are acceptable at the intersection of perpendicular grid lines). Long tow configurations need to employ USBL navigation and will usually require multiplexed data transmission capability to eliminate cross talk. Additionally, the SSS system you select must be capable of digitizing sonar signals in the towfish to inhibit data loss over long cable lengths, and incorporate a magnetic heading sensor in the towfish to aid in accurate towfish positioning.
Magnetometer	Marine Magnetometer.	We only require magnetometer systems for archaeological resource assessments (see NTL 06-P03, <b>Archaeological Survey and Report Requirements</b> ).*

\*The grid spacing will be determined after your pre-survey meeting with MMS.

### Geotechnical Surveys

A Development and Production Plan (DPP) for a platform must include a detailed geotechnical evaluation of the platform's foundation based on analysis of one or more soil borings from the site. Section 30 CFR 250.909 provides specific requirements for subsurface investigation and testing for pile-supported and gravity-type structures.

In addition, you must perform sufficient geological/geotechnical sampling and testing of foundation soils to thoroughly categorize foundation engineering conditions within the proposed pipeline corridor (30 CFR 250.208). The principal purposes of the geotechnical survey are to: (1) assess the suitability of shallow foundation soils to support the pipeline under extreme operational and environmental conditions that might be encountered, and (2) document soil characteristics necessary for pipeline design and installation.

You should utilize the results of the shallow hazards survey in planning your geotechnical site survey and in selecting locations/depths of soil samples and in-situ tests. Additionally you must:

- Analyze in-situ and laboratory soil test data to estimate foundation soil response to maximum anticipated static and dynamic loads.
- Determine embedment depth and predict susceptibility of the foundation to liquefaction and scour phenomena.
- Characterize liquefaction potential specifically in the context of regional seismicity.
- Evaluate the potential for seafloor erosion and scour in the context of empirically-derived current velocity data for the project area.

- Integrate the results of the geotechnical and shallow hazards investigations to provide a comprehensive analysis of foundation stability for the site.

We will interpret the HRG and other data for the project site prior to approving a proposed platform or pipeline location. Based on our interpretation, you may be required to verify hazards, archaeological resources or sensitive habitats to ensure safety of personnel and equipment and protection (or avoidance) of archaeological resources, etc. This may require the use of equipment and techniques such as underwater video/photography, hydrocarbon sniffer surveys, diver inspection, current velocity measurements, additional seafloor sampling and/or geologic age-dating.

### **Hazard Survey Report Requirements**

Submit two paper copies of the comprehensive shallow hazards survey report to the Chief, OFSE with the DPP. In addition, submit one digital form of the report in an appropriate word processing format (contact MMS for guidance). The report(s) must include:

- Technical specifications of survey equipment.
- A summary of field operations, including unusual incidents.
- Personnel list noting functional responsibilities.
- Methods of data analysis and processing procedures.
- Results and conclusions of the hazards evaluation, including any potential archaeological resources or sensitive habitat.
- Page size geographic area map showing proposed platform site and pipeline route relative to nearby geographic features.
- Geotechnical data/analysis of soil samples from the pipeline corridor and soil borings from platform site (if not submitted separately).
- Interpreted geologic structure and stratigraphic cross-sections for the platform site.
- Anomaly table of geologic and manmade hazards/conditions, potential archaeological resources and sensitive habitats keyed to the maps, with locations presented in latitude and longitude (decimal degrees) and Lambert/UTM coordinates. Locations of seafloor and shallow subsurface anomalies (e.g., debris) which may impact commercial fishing operations should also be reported in Loran C coordinates.



- Page size reductions of maps described below.

*Maps:* Annotate all maps to be submitted with linear bar-scales (feet and meters), geographic and plane coordinates (latitude and longitude, Lambert, UTM), lease boundaries, lease numbers, exploratory well locations, geologic/geotechnical sampling locations, proposed platform site(s) and pipeline corridor. Large scale map data must be in a format compatible with the MMS Geographic Information System in current use (contact MMS for guidance). Submit the following set of maps at a scale of 1:12,000:

- Navigation Post-Plot Map of survey vessel positions.
- Bathymetry Map showing depth (in feet) and sediment types (from acoustic seabed classification ground truthed with sediment sampling information).
- Geologic Features Map showing surficial geology and conditions of interest for hazards assessments keyed to anomaly table in survey report.
- Shallow Isopach Map showing thickness of unconsolidated Holocene/late-Pleistocene sediments (in feet).
- Shallow Hazards Anomaly Map showing significant subsurface conditions of interest for hazards assessment keyed to anomaly table in the survey report.
- Shallow Structure Map showing contours (in feet) on top of a late-Pleistocene unconformity prominent within the study area.

*Seafloor Mosaic:* Fully corrected digital mosaic of the seafloor (including corrections for towfish crabbing) constructed at a scale and pixel resolution to be determined by the Chief, OFSE. The mosaic must include a geographic grid overlay identical to mapped coordinates.

*Velocity Data/Information:* Tabulated site-specific velocity data/information for conversion of seismic travel time to depth within the depth ranges specified for the DP.

Supporting Data must include the following:

- A complete set of paper copies of all geophysical records acquired during the survey.
- One complete set of original sonographs, or enhanced copies generated from playback of digitally recorded data, and a second complete set of data in a format suitable for MMS interactive work station analysis (contact MMS for guidance). All recordings must be fully annotated and labeled, including: date, time, vessel speed and heading, profile number, and navigation fixes corresponding to fix points on post-plot maps. Also note significant changes in recording or playback settings (e.g., gain/tvg sweep) and changes in tow cable length. Paper copies should be z-folded (except for original records) and include identification labels. We will return original recordings of sonographs when our reviews are completed.
- When additional investigations are required, one complete set of survey data (e.g., photographs, videotapes, etc.) from the supplemental site-survey. Videotapes must be fully annotated with date, time and position data (northings/eastings and fix locations) that correspond to tabulated and mapped information.
- An itemized invoice enumerating the data by type, line number and inclusive fix points for all data submitted.

You should maintain original data not submitted to us for at least 3 years; we may ask you to make it available to us before then.

### **Information to be Made Available to the Public**

All geological and high-resolution geophysical data and interpreted information used to support shallow hazards and other safety and environmental analyses may be made available to the public 60 days after you submit it to MMS (30 CFR 250.197(b)(2)).

### ***Paperwork Reduction Act of 1995 Statement***

The collections of information referred to in this NTL are intended to provide clarification, description, or interpretation of requirements contained in 30 CFR 250, subparts A (Form MMS-132), B, I, J, and 30 CFR 251. The Office of Management and

Budget (OMB) approved the information collection requirements and assigned OMB Control Numbers 1010-0114, 1010-0151, 1010-0149, 1010-0050, and 1010-0048, respectively. This NTL does not impose additional information collection requirements subject to the Paperwork Reduction Act of 1995.

If you have any questions or need clarification regarding this NTL, please contact the MMS, POCSR Office of Facilities, Safety and Enforcement at (805) 389-7550.

Original signed by

OCT 16 2006

Nabil F. Masri  
Chief  
Office of Facilities, Safety and Enforcement

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Date