

CHAPTER 2

ALTERNATIVES INCLUDING A PROPOSED ACTION

2. ALTERNATIVES INCLUDING A PROPOSED ACTION

2.1. MULTISALE NEPA ANALYSIS

This EIS addresses two proposed Federal actions. The proposed actions are two oil and gas lease sales (Lease Sales 189 and 197) in the proposed lease sale area of the EPA of the GOM OCS (**Figure 1-1**), as scheduled in the 5-Year Program. For analysis purposes, a proposed action is presented as a set of ranges for resource estimates, projected exploration and development activities, and impact-producing factors. Each of the proposed lease sales is expected to be within the scenario ranges; therefore, a proposed action is representative of either proposed Lease Sale 189 or Lease Sale 197. Each proposed action includes existing regulations and lease stipulations.

Since proposed Lease Sales 198 and 197 and their projected activities are very similar, this EIS encompasses both proposed leases sales as authorized under 40 CFR 1502.4, which allows related or similar proposals to be analyzed in one EIS. In addition, one Area ID was prepared for both proposed lease sales. The multisale EIS approach is intended to focus the NEPA/EIS process on the differences between the proposed lease sales and new issues and information. It also lessens duplication and saves resources. The scoping process for this document is described in **Chapters 1.4. and 5.3.** As mandated by NEPA, this EIS analyzes the potential impacts of the proposed actions on the marine, coastal, and human environments.

At the completion of the NEPA process for this EIS, a decision will be made only for proposed Lease Sale 189. An additional NEPA review (an EA) will be conducted in the year prior to proposed Lease Sale 197 to address any relevant new information. Formal consultation with other Federal agencies, the affected States, and the public will be carried out to assist in the determination of whether or not the information and analyses in this EIS are still valid. Specifically, an Information Request will be issued soliciting input on proposed Lease Sale 197.

The EA will tier from this EIS and will summarize and incorporate the material by reference. Because the EA will be prepared for a proposal that “is, or is closely similar to, one which normally requires the preparation of an EIS” (40 CFR 1501.4(e)(2)), the EA will be made available for public review for a minimum of 30 days prior to making a decision on the proposed lease sale. Consideration of the EA and any comments received in response to the Information Request will result in either a FONNSI or the determination that the preparation of a SEIS is warranted. If the EA results in a FONNSI, the EA and FONNSI will be sent to the Governors of the affected States. The availability of the EA and FONNSI will be announced in the *Federal Register*. The FONNSI will become part of the documentation prepared for the decision on the Notice of Sale.

In some cases, the EA may result in a finding that it is necessary to prepare a SEIS (40 CFR 1502.9). Some of the factors that could justify a SEIS are a significant change in resource estimates, legal challenge on the EA/FONNSI, significant new information, significant new environmental issue(s), new proposed alternative(s), a significant change in the proposed action, or the analysis in this EIS is deemed inadequate.

If a SEIS is necessary, it will also tier from this EIS and will summarize and incorporate the material by reference. The analysis will focus on addressing the new issue(s) or concern(s) that prompted the decision to prepare the SEIS. The SEIS will include a discussion explaining the purpose of the SEIS, a description of the proposed action and alternatives, a comparison of the alternatives, a description of the affected environment for any potentially affected resources that are the focus of the SEIS and were not described in this EIS, an analysis of new impacts or changes in impacts from this EIS because of new information or the new issue(s) analyzed in the SEIS, and a discussion of the consultation and coordination carried out for the new issues or information analyzed in the SEIS.

Lease sale-specific notices will be published as usual, except that the PNOS will be published after completion of the final NEPA document for proposed Lease Sale 197.

2.2. ALTERNATIVES, MITIGATING MEASURES, AND ISSUES

2.2.1. Alternatives

Two alternatives are analyzed in this EIS:

Alternative A (Preferred Alternative) — A Proposed Action: This alternative would offer for lease all unleased blocks within the proposed lease sale area for oil and gas operations (**Figure 1-2**). This area includes 256 blocks covering 1.5 million ac. At present, 118 blocks within this area are under lease. Acreage and block counts are subject to change as leases expire, are relinquished, or terminated.

In this EIS, a proposed action is presented as a set of ranges for resource estimates, projected exploration and development activities, and impact-producing factors. Each of the proposed lease sales is expected to be within the scenario ranges; therefore, a proposed action is representative of either proposed Lease Sale 189 or Lease Sale 197. The estimated amounts of resources projected to be developed as a result of a proposed lease sale are 0.065-0.085 BBO and 0.265-0.340 Tcf of gas.

Alternative A has been identified as the Agency's (MMS's) preferred alternative; however, this does not mean that another alternative may not be selected in the Record of Decision.

Alternative B — No Action: This alternative is the cancellation of a proposed lease sale. The opportunity for development of the estimated 0.065-0.085 BBO and 0.265-0.340 Tcf of gas that could have resulted from a proposed lease sale would be precluded or postponed. Any potential environmental impacts resulting from a proposed lease sale would not occur or would be postponed. This is thoroughly analyzed in the Final EIS for the 5-Year Program.

2.2.2. Mitigating Measures

2.2.2.1. Proposed Mitigating Measures Analyzed

The potential mitigating measures included for analysis in this EIS were developed as the result of scoping efforts over a number of years for the continuing OCS Program in the GOM. These measures will be considered for adoption by ASLM and are analyzed as part of Alternative A, and/or Alternative B.

Several stipulations that were applied to Lease Sale 181 in the Eastern GOM are analyzed as part of the proposed lease sales. The stipulations, and the alternatives under which they are analyzed, are listed below.

- Military Warning Areas Stipulation (Hold Harmless, Operational, and Electronic Transmissions Restrictions) (Alternatives A and B);
- Evacuation Stipulation for the Eglin Water Test Areas (Alternatives A and B); and
- Coordination and Consultation Stipulation for Exploration Activities in the Eglin Water Test Areas (Alternatives A and B).

The analysis of any stipulations as part of Alternative A and/or Alternative B does not ensure that the ASLM will make a decision to apply the stipulations to leases that may result from the proposed lease sale, nor does it preclude minor modifications in wording during subsequent steps in the prelease process if comments indicate changes are necessary or if conditions change.

Any stipulations or mitigation requirements to be included in the lease sale will be described in the Record of Decision for the lease sale. Mitigation measures in the form of lease stipulations are added to the lease terms and are therefore enforceable as part of the lease. In addition, each exploration and development plan, as well as any pipeline applications that may result from the proposed lease sale, will undergo a NEPA review, and additional project-specific mitigations may be applied as conditions of plan approval. The MMS has the authority to monitor and enforce these conditions, and under 30 CFR 250 Subpart N, may seek remedies and penalties from any operator that fails to comply with the conditions of permit approvals, including stipulations and other mitigation measures.

2.2.2.2. Existing Mitigating Measures

Mitigating measures have been proposed, identified, evaluated, or developed through previous MMS lease sale NEPA review and analysis processes. Many of these mitigating measures have been adopted and incorporated into regulations and/or guidelines governing OCS exploration, development, and production activities. All plans for OCS activities go through MMS review and approval to ensure compliance with established laws and regulations. Mitigating measures must be incorporated and documented in plans submitted to MMS. Operational compliance is enforced through the MMS on-site inspection program.

Mitigating measures that are a standard part of the MMS program require surveys to detect and avoid archaeological sites and biologically sensitive areas such as pinnacles, low-relief live bottoms, and chemosynthetic communities.

Some MMS-identified mitigating measures are incorporated into OCS operations through cooperative agreements or efforts with industry and various State and Federal agencies. These include the NOAA Fisheries Observer Program to protect marine mammals and sea turtles during explosive removals, regulations on minimum helicopter altitudes to prevent disturbance of wildlife, labeling operational supplies to track possible sources of accidental debris loss, development of methods of pipeline landfall to eliminate impacts to barrier beaches, and semiannual beach cleanup events.

2.2.3. Issues

Issues are defined by CEQ to represent those principal “effects” that an EIS should evaluate in-depth. Scoping identifies specific environmental resources and/or activities rather than “causes” as significant issues (CEQ Guidance on Scoping, April 30, 1981). The analysis in the EIS can then show the degree of change from present conditions for each issue due to the relevant actions related to proposed Lease Sales 189 and 197.

Selection of environmental and socioeconomic issues to be analyzed was based on the following criteria:

- Issue is identified in CEQ regulations as subject to evaluation;
- The relevant resource/activity was identified through the scoping process or from comments on past EIS’s;
- The resource/activity may be vulnerable to one or more of the impact-producing factors (IPF) associated with the OCS Program. A reasonable probability of an interaction between the resource/activity and IPF should exist; or
- Information that indicates a need to evaluate the potential impacts to a resource/activity has become available.

2.2.3.1. Issues to be Analyzed

The following issues relate to potential IPF’s and the resources and activities that could be affected by OCS exploration, development, production, and transportation activities.

Petroleum Spills: The issues related to the potential impact of oil spills on the marine and coastal environments. Specific concerns were raised regarding the potential effects of oil spills on marine mammals, other endangered and threatened species, commercial fishing, recreation and tourism, water quality, and wetlands. Other concerns raised over the years of scoping were fate and behavior of oil spills, availability and adequacy of oil-spill containment and cleanup technologies, oil-spill cleanup strategies, impacts of various oil-spill cleanup methods, effect of winds and currents on the transport of oil spills, effects of weathering on oil spills, toxicological effects of fresh and weathered oil, air pollution associated with spilled oil, and short-term and long-term impacts of oil on wetlands.

Visual and Aesthetic Interference: The potential effects of the presence of drilling rigs and platforms, service vessels, helicopters, trash and debris, and flaring on visual aesthetics as seen by residents and visitors of the Pensacola area is an issue of great concern.

Air Emissions: The potential effects of emissions of combustion gases from platforms, drill rigs, service vessels, and helicopters have been raised as an issue. Also under consideration are the flaring of produced gases during extended well testing and the potential impacts of transport of production with associated H₂S.

Water Quality Degradation: Issues raised related to water quality degradation were most often associated with operational discharges of drilling muds and cuttings, produced waters, and domestic wastes. Water quality issues also included concerns related to impacts from sediment disturbance, petroleum spills and blowouts, and discharges from service vessels.

Other Wastes: Other concerns include storage and disposal of trash and debris, and trash and debris on recreational beaches.

Structure and Pipeline Emplacement: Some of the issues related to structure and pipeline emplacement are bottom area disturbances from bottom-founded structures or anchoring, sediment displacement related to pipeline burial, space-use conflicts, and the vulnerability of offshore pipelines to damage that could result in hydrocarbon spills or H₂S leaks.

Platform Removals: Concerns about the abandonment of operations include how a platform is removed, potential impacts of explosive removals on marine organisms, remaining operational debris snagging fishing nets, and site clearance procedures.

OCS-Related Support Services, Activities, and Infrastructure: Concerns over activities related to the shore-base support of the Development and Production Plan include vessel and helicopter traffic and emission, construction or expansion of navigation channels or onshore infrastructure, maintenance and use of navigation channels and ports, and deepening of ports.

Sociocultural and Socioeconomic: Many concerns have focused on the potential impacts to coastal communities. Issues include impacts on employment, population fluctuations, demands on public services, effects on land use, tourism, impacts to low-income or minority populations, and cultural impacts.

Coastal Zone Management: Concern has been expressed over potential conflicts with the coastal states' coastal zone management programs and with local county, parish, or community land-use plans.

OCS Oil and Gas Infrastructure Security: The MMS recognizes the increased importance of OCS oil and gas production and the need to protect offshore personnel and facilities. The MMS has taken and continues to take steps to ensure that OCS production facilities and the associated transportation network are secure. The MMS works closely with OCS operators, USCG, other Federal agencies, and local authorities to identify potential security risks and appropriate security measures that should be imposed. The MMS is also working with the Homeland Security Office in Washington, DC to develop OCS-wide security guidelines to enhance existing mitigation measures for the protection of OCS personnel, facilities, and equipment. The guidelines will establish protective measures for standard threat condition levels to help MMS personnel and operators respond during a crisis.

Other Issues: Many other issues have been identified. Several of these issues are subsets or variations of the issues listed above. All are taken under advisement and are considered in the analyses, if appropriate. Additional issues raised during scoping are noise from platforms, vessels, helicopters, and seismic surveys; turbidity as a result of seafloor disturbance or discharges; mechanical damage to biota and habitats; and multiple-use conflicts.

Resource Topics Analyzed in the EIS: The analyses in **Chapters 4.2., 4.4., and 4.5.** address the issues and concerns identified above under the following resource topics:

- Air Quality
- Alabama, Choctawhatchee, St. Andrew, and Perdido Key Beach Mice, and Florida Salt Marsh Vole
- Archaeological Resources (Historic and Prehistoric)
- Chemosynthetic Communities
- Coastal Barrier Beaches and Associated Dunes
- Coastal and Marine Birds
- Commercial Fisheries
- Fish Resources and Essential Fish Habitat
- Gulf Sturgeon
- Live Bottoms

- Marine Mammals
- Recreational Fishing, Beach Use, Visual Aesthetics, and Tourism
- Sea Turtles
- Socioeconomic Conditions
- Submerged Vegetation
- Water Quality (Coastal and Marine)
- Wetlands

2.2.3.2. Issues Considered but Not Analyzed

As previously noted, CEQ regulations for implementing NEPA instruct agencies to adopt an early process (termed “scoping”) for determining the scope of issues to be addressed and for identifying significant issues related to a proposed action. In this case, the proposed actions are proposed Lease Sales 189 and 197. As part of this scoping process, agencies shall identify and eliminate from detailed study the issues that are not significant to the proposed action or have been covered by prior environmental review.

Through our scoping efforts, numerous issues and topics were identified for consideration in this EIS. After careful evaluation and study, the following categories were considered not to be significant issues related to the proposed action or that have been covered by prior environmental review.

Global Warming and Alternative Energy

The categories of global warming and alternative energy are broad topics that reflect worldwide operations. Global warming and alternative energy have been addressed in other MMS programmatic NEPA documents. The most recent are NEPA documents originating from MMS Headquarters; e.g., the *Outer Continental Shelf Oil and Gas Leasing Program: 2002-2007 — Final EIS* (USDOJ, MMS, 2002b) and *Energy Alternatives and the Environment* (USDOJ, MMS, 2001d).

Improvement of Air Quality Standards

Comments and concerns that relate to improvements in air quality standards are issues under the jurisdiction of USEPA. The comments and concerns defined as such are unrelated to the proposed actions.

OCS and Nonindigenous/Invasive Species Occurrence

There are various oil and gas activities that potentially contribute to the introduction of organisms not geographically occurring in the GOM, as well as providing conditions to sustain their development once they have arrived.

Effects of invasive species can be debilitating on both habitat and native species and may (1) include a decrease in biological diversity of native ecosystems and associated habitats, (2) decrease the quality of important habitats for native fish and invertebrate species, (3) reduce habitats needed by threatened and endangered species, (4) increase direct and indirect competition with aquatic plants and animals, and (5) pose potential human health risks (USDOJ, MMS, 2002b).

To date, there is no conclusive data that shows OCS development and related activities are the responsible vector for the occurrence and establishment of non-indigenous or invasive species categories observed in the GOM Federal offshore waters.

The MMS is currently sponsoring two studies investigating (1) the interactions between migrating birds and oil and gas structures off coastal Louisiana and (2) the relationship, if any, of the Australian spotted and the pink jellyfish to OCS platforms. The data from both studies are too preliminary to use at this time.

Program and Policy Issues

Comments and concerns that relate to program and policy are issues under the direction of DOI and/or MMS and their guiding regulations, statutes, and laws. The comments and concerns defined as such are unrelated to the proposed actions.

Use of Revenues Generated by the Proposed Lease Sales

Comments and concerns that relate to the use of revenues are issues under the direction of the U.S. Congress and DOI and/or MMS and their guiding regulations, statutes, and laws. The comments and concerns defined as such are unrelated to the proposed actions.

2.3. PROPOSED LEASE SALES 189 AND 197

2.3.1. Alternative A (Preferred Alternative) — A Proposed Action

2.3.1.1. Description

This alternative would offer for lease all unleased blocks within the proposed lease sale area for oil and gas operations (**Figure 1-2**). The proposed lease sale area is the same area offered under Lease Sale 181 in 2001 (**Figure 1-1**). The area is comprised of 256 blocks covering 1.5 million ac in 1,600 to 3,000 m of water, making each proposed lease sale relatively small in comparison to a Central or Western GOM lease sale. Acreage and block counts are subject to change as leases expire, are relinquished, or terminated. Geographically, the proposed lease sale area is 70 mi from Louisiana, 98 mi from Mississippi, 93 mi from Alabama, and 100 mi from Florida. It is estimated that each proposed lease sale could result in the production of 0.065-0.085 BBO, 0.265-0.340 Tcf of gas, 11-13 exploration and delineation wells, 19-27 development wells, and 2 production structures. There are currently 118 leased blocks and 138 unleased blocks within the proposed lease sale area (**Figure 1-2**), which is subject to change as leases expire, are relinquished, or terminated. As of April 1, 2003, four leases have been drilled in the proposed lease sale area; one lease began gas production in August 2002 (**Figure 1-3**). The remaining 10 EP's, submitted in the proposed lease sale area, cover 19 blocks (**Figure 1-3**). It is not expected that all of the blocks offered would be leased; only some of the leases would actually produce oil and gas.

In this EIS, a proposed action is presented as a set of ranges for resource estimates, projected exploration and development activities, and impact-producing factors. Each of the proposed lease sales is expected to be within the scenario ranges; therefore, a proposed action is representative of either proposed Lease Sale 189 or Lease Sale 197. The estimated amounts of resources projected to be developed as a result of a proposed lease sale are 0.065-0.085 BBO and 0.265-0.340 Tcf of gas.

The analyses of impacts summarized below and described in detail in **Chapters 4.2. and 4.4.** are based on a development scenario, which is a set of assumptions and estimates on the amounts, locations, and timing for OCS exploration, development, and production operations and facilities, both offshore and onshore. A detailed discussion of the development scenario and major related impact-producing factors is presented in **Chapters 4.1. and 4.3.**

2.3.1.2. Summary of Impacts

Activities relating to a proposed lease sale are expected to minimally affect the land use, infrastructure, and demography of the Gulf Coast States. Existing coastal oil and gas infrastructure is expected to be sufficient to handle activities associated with a proposed action; therefore, no new coastal infrastructure is projected. Only minor economic changes (less than a 1% increase in employment) in the Texas, Louisiana, Mississippi, and Alabama coastal subareas would occur from a proposed lease sale. Employment changes are expected to be met primarily with the existing population and available labor force. The OCS-related fabrication to support a proposed lease sale could occur in Texas, Louisiana, Mississippi, and or Alabama, but not in Florida.

Navigation canals associated with the primary (Port Fourchon and Venice, Louisiana; and Mobile, Alabama) and secondary (including Cameron, Houma, Intracoastal City, and Morgan City, Louisiana; and Pascagoula, Mississippi) service bases would be utilized by a proposed action. The OCS-related vessel

traffic and maintenance dredging on these channels would minimally impact wetlands, barrier beaches and associated dunes, and seagrasses. Impacts to coastal water quality from support facilities, vessel discharges, and nonpoint-source runoff are expected to be minimal. Air emissions are not expected to change PSD Class I and II classifications. Routine activities would generate trash and debris that might minimally impact beach mice, birds, and recreational resources located the Gulf States.

Most onshore OCS activities associated with a proposed lease sale are projected to occur in Louisiana; two of the three primary service bases as well as four of the five secondary service bases expected to be used by a proposed action are located in Louisiana. Therefore, Louisiana is expected to receive most of the environmental and socioeconomic impacts from a proposed lease sale. Lafourche Parish (<0.5% within 10 days and <0.5-1% within 30 days) and Plaquemines Parish (1% within 10 days and 2% within 30 days) in Louisiana have a >0.5 percent probability of a spill occurring as a result of a proposed action and contacting the shoreline. Alabama and Mississippi would also experience some environmental and socioeconomic impacts (mentioned above), although not as much as Louisiana, because each State has only one projected service base within its boundaries. The majority of impacts to Texas are expected to be economic (employment) in nature. This is due to the fact that most of the OCS-related decisionmaking for a proposed lease sale would take place from the offshore oil and gas industry's corporate headquarters, which are located in Houston, Texas. Texas would experience some minimal environmental impacts. The majority of nonhazardous oil-field waste from a proposed lease sale is projected to be disposed of in Texas. This would add to channel traffic and its related impacts. Florida is expected to experience very little to no economic stimulus and minimal environmental impacts.

Considering all of these impacts, a proposed action is not expected to have a disproportionate adverse environmental or health effect on minority or low-income people due to the population distribution along the GOM.

Impacts on Air Quality (Chapters 4.2.1.1. and 4.4.1.)

Emissions of pollutants into the atmosphere from the activities associated with a proposed action are not expected to have significant impacts on onshore air quality because of the prevailing atmospheric conditions, emission heights, emission rates, and the distance of these emissions from the coastline. Emissions from proposed action activities are not expected to have concentrations that would change onshore air quality classifications. Increases in onshore annual average concentrations of NO_x, sulphur oxide (SO_x), and particulate matter smaller than 10 microns (PM₁₀) are estimated to be less than the maximum increases allowed under the PSD program.

Accidents involving high concentrations of H₂S could result in deaths and environmental damage. Because of the distance of the proposed lease sale area to the coastline and because accidental releases of H₂S are a local phenomenon, any significant impacts of air quality on the coastlines would not be expected. Other emissions of pollutants into the atmosphere from accidental events as a result of a proposed action are not projected to have significant impacts on onshore air quality because of the prevailing atmospheric conditions, emission height, emission rates, and the distance of these emissions from the coastline. Increases in onshore annual average concentrations of NO_x, SO_x, and PM₁₀ are estimated to be less than maximum increases allowed under the PSD Class I and II program; therefore, they would not change onshore air quality classifications.

Impacts on Water Quality

Coastal Waters (Chapters 4.2.1.2.1. and 4.4.2.1.)

The primary impacting sources to water quality in coastal waters are point-source and storm water discharges from support facilities, vessel discharges and nonpoint-source runoff. The impacts to coastal water quality from a proposed action should be minimal as long as all existing regulatory requirements are met.

Chemical spills, the accidental release of SBF, and blowouts are expected to have temporary, localized impacts on water quality. Small oil spills (<1,000 bbl) are not expected to significantly impact water quality in marine and coastal waters. Larger oil spills (≥1,000 bbl), however, could impact water quality, especially in coastal waters.

Marine Waters (Chapters 4.2.1.2.2. and 4.4.2.2.)

During exploratory activities, the primary impacting sources to marine water quality are discharges of drilling fluids and cuttings. Any change in NPDES permit limitations would impact the volumes of fluids and cuttings discharges. Impacting discharges during production activities are produced water and supply-vessel discharges. Impacts to marine waters from a proposed action should be minimal as long as regulatory requirements are followed.

Chemical spills, the accidental release of SBF, and blowouts are expected to have temporary, localized impacts on water quality. Small oil spills (<1,000 bbl) are not expected to significantly impact water quality in marine and coastal waters. Larger oil spills (≥1,000 bbl), however, could impact water quality especially in coastal waters.

Impacts on Sensitive Coastal Environments

Coastal Barrier Beaches and Associated Dunes (Chapters 4.2.1.3.1. and 4.4.3.1.)

Existing facilities originally built inland may, through natural erosion and shoreline recession, be located in the barrier beach and dune zone and contribute to erosion there. A proposed action may contribute to the continued use of such facilities. Maintenance dredging of barrier inlets and bar channels is expected to occur, which combined with channel jetties, generally causes minor and very localized impacts on adjacent barrier beaches downdrift of the channel due to sediment deprivation. The worst of these situations is found on the sediment-starved coasts of Louisiana, where sediments are largely organic. A proposed action would utilize navigation canals associated with the primary service bases (Port Fourchon and Venice, Louisiana; and Mobile, Alabama) and secondary service bases (including Cameron, Houma, Intracoastal City, and Morgan City, Louisiana; and Pascagoula, Mississippi). Based on use, a proposed action would account for a very small percentage of these impacts, which would occur whether a proposed action is implemented or not.

A proposed action is not expected to adversely alter barrier beach configurations significantly beyond existing, ongoing impacts in very localized areas downdrift of artificially jettied and maintained channels. A proposed action may extend the life and presence of facilities in eroding areas, which can accelerate erosion. Strategic placement of dredged material from channel maintenance, channel deepening, and related actions can mitigate adverse impacts upon these localized areas.

Should a spill contact a barrier beach, oiling is expected to be light and sand removal during cleanup activities is expected to be minimized. No significant impacts to the physical shape and structure of barrier beaches and associated dunes are expected to occur as a result of a proposed action.

Wetlands (Chapters 4.2.1.3.2. and 4.4.3.2.)

A proposed action is not projected to result in the construction of any new pipeline landfalls and would use the existing pipeline system. Secondary impacts, such as continued widening of existing pipeline and navigation channels and canals, as well as the failure of mitigation structures, are also expected to convert wetlands to open water.

Maintenance dredging of navigation channels and canals is expected to occur with minimal impacts; a proposed action is expected to contribute minimally to the need for this dredging. Alternative dredged-material disposal methods can be used to enhance and create coastal wetlands. By artificially keeping navigation channels open and with larger dimensions than the region's natural hydrodynamic processes, maintenance dredging maintains tidal and storm flushing potential of inland regions at maximum capacities as they relate to the described needs of the canal project. Without maintenance dredging, these channels would naturally fill in, reducing the channels' cross-sectional areas and their capacities to flush or drain a region when under the influences of storms and tides.

Adverse initial impacts and more importantly secondary impacts of maintenance, continued existence, and the failure of mitigation structures for pipeline and navigation canals are considered the most significant OCS-related and proposed-action-related impacts to wetlands. Although initial impacts are considered locally significant and largely limited to where OCS-related canals and channels pass through wetlands, secondary impacts may have substantial, progressive, and cumulative adverse impacts to the hydrologic basin or subbasin in which they are found. The broad and diffuse distribution of OCS-related

activities offshore and along the Central Gulf Coast makes it difficult to distinguish proposed action impacts from other ongoing OCS and non-OCS impacts to wetlands. The MMS has initiated studies to better evaluate these impacts and related mitigative efforts.

Offshore oil spills resulting from a proposed action are not expected to significantly damage inland wetlands; however, if an inland oil spill related to a proposed action occurs, some impact to wetland habitat would be expected. Although the impact may occur generally over coastal regions, the impact has the highest probability of occurring in the coastal regions where oil is handled (Louisiana, near Timbalier Bay, Grand Isle, or east of the Mississippi River) and major service bases (Venice and Fourchon, Louisiana; and Mobile, Alabama).

Although the probability of occurrence is low, the greatest threat to wetland habitat is from an inland spill resulting from a vessel accident or pipeline rupture. While a resulting slick may cause minor impacts to wetland habitat and surrounding seagrass communities, the equipment and personnel used to clean up a slick over the impacted area may generate the greatest direct impacts to the area. Associated foot traffic may work oil farther into the sediment than would otherwise occur. Close monitoring and restrictions on the use of bottom-disturbing equipment would be needed to avoid or minimize those impacts.

Seagrass Communities (Chapters 4.2.1.3.3. and 4.4.3.3.)

Beds of submerged vegetation within a channel's area of influence would have already adjusted to bed configurations in response to turbidity generated there. Very little, if any, damage would then occur as a result of typical channel traffic. Generally, propwash would not resuspend sediments in navigation channels beyond pre-project conditions.

Depending upon the submerged plant species involved, narrow scars in dense portions of the beds would take 1-7 years to recover. Scars through sparser areas would take 10 years or more to recover. The broader the scar, the longer the recovery period. Extensive damage to a broad area may never be corrected.

Much of the dredged material resulting from maintenance dredging would be placed on existing dredged-material disposal sites or used for other mitigative projects. Therefore, no significant adverse impacts are expected to occur to seagrass communities from maintenance dredging related to a proposed action.

Should a spill $\geq 1,000$ bbl occur offshore from activities resulting from a proposed action, the seagrass communities have a <0.5 percent probability of contact within 10 or 30 days. Because of the location of most submerged aquatic vegetation, inshore spills pose the greatest threat to them. Such spills may result from either vessel collisions that release fuel and lubricants or from pipelines that rupture. If an oil slick settles into a protective embayment where seagrass beds are found, shading may cause reduced chlorophyll production; shading for more than about 2 weeks could cause thinning of leaf density. Under certain conditions, a slick could reduce dissolved oxygen in an embayment and cause stress to the bed and associated organisms due to reduced oxygen conditions. These light and oxygen problems can correct themselves once the slick largely vacates the embayment, and light and oxygen levels are returned to pre-slick conditions.

Increased water turbulence due to storms or vessel traffic will break apart the surface sheen and disperse some oil into the water column, as well as increase suspended particle concentration, which will adsorb to the dispersed oil. Typically, these situations will not cause long-term or permanent damage to the seagrass beds, although some dieback of leaves is projected for one growing season. The diversity or population of epifauna and benthic fauna found in seagrass beds may be reduced for up to 2 years, depending on several factors including type of oil (refined products are more toxic), time of year, amount of mixing, and weathering. No permanent loss of seagrass is projected to result from oil contact, unless an unusually low tidal event allows direct contact between the slick and vegetation.

Although the probability of their occurrence is low, the greatest threat to inland, seagrass communities would be from an inland spill resulting from a vessel accident or pipeline rupture. Although a resulting slick may cause minor impacts to the bed, equipment and personnel used to clean up a slick over shallow seagrass beds may generate the greatest direct impacts to the area. Associated foot traffic may work oil farther into the sediment than would otherwise occur. Scarring may occur if an oil slick is cleaned up over a shallow submerged aquatic vegetation bed where vessels, booms, anchors, and personnel on foot would be used and scar the bed. Close monitoring and restrictions on the use of bottom-disturbing equipment would be needed to avoid or minimize those impacts.

Impacts on Sensitive Offshore Benthic Resources

Continental Shelf Resources

Live Bottoms (Pinnacle Trend) (Chapters 4.2.1.4.1.1. and 4.4.4.1.1.)

Activities resulting from a proposed action are not expected to adversely impact the pinnacle trend environment because of the Live Bottom Stipulation. No community-wide impacts are expected. Potential impacts would be from pipeline emplacement only and the Live Bottom Stipulation would minimize the potential for mechanical damage. The frequency of impacts on the pinnacles would be rare, and the severity should be slight because of the widespread nature of the features.

No pinnacles are located in the proposed lease sale area; however, pipelines in the pinnacle trend may transport proposed action production. A subsurface oil spill would rise in the water column, surfacing almost directly over the source location, and thus not impact pinnacles. Because of this and the small size and dispersed nature of many of the features, impacts from accidental events as a result of a proposed action are estimated to be infrequent. No community-wide impacts are expected. Oil spills would not be followed by adverse impacts (e.g., high elevated decrease in live cover) because of the depth of the features and dilution of spills (by currents and the quickly rising oil). The frequency of impacts on the pinnacles would be rare, and the severity should be slight because of the widespread nature of the features.

Continental Slope and Deepwater Resources

Chemosynthetic Communities (Chapters 4.2.1.4.2.1. and 4.4.4.2.1.)

Chemosynthetic communities are susceptible to physical impacts from structure placement (including templates or subsea completions), anchoring, and pipeline installation. The provisions of NTL 2000-G20 greatly reduce the risk of these physical impacts by requiring avoidance of potential chemosynthetic communities identified on required geophysical survey records or by requiring photodocumentation to establish the absence of chemosynthetic communities prior to approval of the structure emplacement.

If the presence of a high-density community were missed using existing procedures, potentially severe or catastrophic impacts could occur due to partial or complete burial by muds and cuttings associated with pre-riser discharges or some types of riserless drilling. To date, there are no known impacts from oil and gas activities on a high-density chemosynthetic community. Variations in the dispersal and toxicity of synthetic-based drilling fluids may contribute to the potential areal extent of these impacts. The severity of such an impact is such that there would be incremental losses of productivity, reproduction, community relationships, and overall ecological functions of the community, and incremental damage to ecological relationships with the surrounding benthos.

Studies indicate that periods as long as hundreds of years are required to reestablish a seep community once it has disappeared (depending on the community type), although it may reappear relatively quickly once the process begins, as in the case of a mussel community. Tube-worm communities may be the most sensitive of all communities because of the combined requirements of hard substrate and active hydrocarbon seepage. Mature tube-worm bushes have been found to be several hundred years old. There is evidence that substantial impacts on these communities would permanently prevent reestablishment.

A proposed action is expected to cause little damage to the ecological function or biological productivity of the widespread, low-density chemosynthetic communities. The rarer, widely scattered, high-density, Bush Hill-type chemosynthetic communities could experience minor impacts from drilling discharges or resuspended sediments located at more than 1,500 ft away as required by NTL 2000-G20.

Chemosynthetic communities could be susceptible to physical impacts from a blowout depending on bottom-current conditions. The provisions of NTL 2000-G20 greatly reduce the risk of these physical impacts by requiring avoidance of potential chemosynthetic communities identified on required geophysical survey records or by requiring photodocumentation to establish the absence of chemosynthetic communities prior to approval of the structure emplacement.

Studies indicate that periods as long as hundreds of years are required to reestablish a seep community once it has disappeared (depending on the community type). There is evidence that

substantial impacts on these communities would permanently prevent reestablishment, particularly if hard substrate required for recolonization was buried.

Potential accidental impacts from a proposed action are expected to cause little damage to the ecological function or biological productivity of the widespread, low-density chemosynthetic communities. The rarer, widely scattered, high-density, Bush Hill-type chemosynthetic communities located at more than 1,500 ft away from a blowout could experience minor impacts from resuspended sediments.

Nonchemosynthetic Communities (Chapters 4.2.1.4.2.2. and 4.4.4.2.2.)

Some impact to soft-bottom benthic communities from drilling and production activities would occur as a result of physical impact from structure placement (including templates or subsea completions), anchoring, and installation of pipelines regardless of their locations. Megafauna and infauna communities at or below the sediment/water interface would be impacted from the muds and cuttings normally discharged at the seafloor at the start of every new well prior to riser installation. The impact from muds and cuttings discharged at the surface are expected to be low in deep water. Drilling muds would not be expected to reach the bottom beyond a few hundred meters from the surface-discharge location, and cuttings would be dispersed. Even in situations where substantial burial of typical benthic communities occurred, recolonization from populations from neighboring substrate would be expected over a relatively short period of time for all size ranges of organisms, in a matter of days for bacteria, and probably less than one year for most all macrofauna species.

Deepwater coral habitats and other potential hard-bottom communities not associated with chemosynthetic communities appear to be very rare. These unique communities are distinctive and similar in nature to protected pinnacles and topographic features on the continental shelf. Any hard substrate communities located in deep water would be particularly sensitive to impacts from OCS activities. Impacts to these sensitive habitats could permanently prevent recolonization with similar organisms requiring hard substrate; however, it is thought that deepwater hard-bottom communities are protected as an indirect result of the avoidance of potential chemosynthetic communities required by NTL 2000-G20. A new MMS-funded study of these habitats is planned in the near future.

A proposed action is expected to cause little damage to the ecological function or biological productivity of the widespread, typical deep-sea benthic communities.

Accidental events resulting from a proposed action are expected to cause little damage to the ecological function or biological productivity of the widespread, typical, deep-sea benthic communities. Some impact to benthic communities would occur as a result of impact from an accidental blowout. Megafauna and infauna communities at or below the sediment/water interface would be impacted by the physical disturbance of a blowout or by burial from resuspended sediments. Even in situations where substantial burial of typical benthic communities occurred, recolonization from populations from neighboring substrate would be expected over a relatively short period of time for all size ranges of organisms, in a matter of hours to days for bacteria and probably less than one year for most all macrofauna species.

Deepwater coral habitats and other potential hard-bottom communities not associated with chemosynthetic communities appear to be very rare. These unique communities are distinctive and similar in nature to protected pinnacles and topographic features on the continental shelf. Any hard substrate communities located in deep water would be particularly sensitive to impacts. Impacts to these sensitive habitats could permanently prevent recolonization with similar organisms requiring hard substrate, but adherence to the provisions of NTL 2000-G20 should prevent all but minor impacts to hard-bottom communities beyond a distance from a well site of 454 m (1,500 ft).

A proposed action is expected to cause little damage to the ecological function or biological productivity of the widespread, typical, deep-sea benthic communities.

Impacts on Marine Mammals (Chapters 4.2.1.5. and 4.4.5.)

Small numbers of marine mammals could be killed or injured by chance collision with service vessels, or by entanglement with or consumption of trash and debris lost from service vessels, drilling rigs, and fixed and floating platforms. Deaths due to structure removals are not expected. There is no conclusive evidence whether anthropogenic noise has or has not caused long-term displacements of, or

reductions in, marine mammal populations. Contaminants in waste discharges and drilling muds might indirectly affect marine mammals through food-chain biomagnification, although the scope of effects and their magnitude are not known.

The routine activities of a proposed action is not expected to have long-term adverse effects on the size and productivity of any marine mammal species or population stock endemic to the northern GOM.

Accidental blowouts, oil spills, and spill-response activities resulting from a proposed action have the potential to impact marine mammals in the GOM. Characteristics of impacts (i.e., acute vs. chronic impacts) depend on the magnitude, frequency, location, and date of accidents, characteristics of spilled oil, spill-response capabilities and timing, and various meteorological and hydrological factors. Populations of marine mammals in the northern GOM would be exposed to residuals of oils spilled as a result of a proposed action during their lifetimes. Chronic or acute exposure may result in the harassment, harm, or mortality to marine mammals occurring in the northern GOM. In most foreseeable cases, exposure to hydrocarbons persisting in the sea following the dispersal of an oil slick would result in sublethal impacts (e.g., decreased health, reproductive fitness, and longevity; and increased vulnerability to disease) to marine mammals.

Impacts on Sea Turtles (Chapters 4.2.1.6. and 4.4.6.)

Routine activities resulting from a proposed action have the potential to harm individual sea turtles. These animals could be impacted by the degradation of water quality resulting from operational discharges; noise generated by helicopter and vessel traffic, platforms, and drillships; brightly-lit platforms; vessel collisions; and jetsam and flotsam generated by service vessels and OCS facilities. Lethal effects are most likely to be from chance collisions with OCS service vessels, ingestion of debris, or entanglement in flotsam. Most OCS activities are expected to have sublethal effects. Contaminants in waste discharges and drilling muds might indirectly affect sea turtles through food-chain biomagnification; there is uncertainty concerning the possible effects. Chronic sublethal effects (e.g., stress) resulting in persistent physiological or behavioral changes and/or avoidance of impacted areas could cause declines in survival or fecundity, and result in population declines; however, such declines are not expected. The routine activities of a proposed action are unlikely to have significant adverse effects on the size and recovery of any sea turtle species or population in the GOM.

Accidental blowouts, oil spills, and spill-response activities resulting from a proposed action have the potential to impact small to large numbers of sea turtles in the GOM, depending on the magnitude and frequency of accidents, the ability to respond to accidents, the location and timing of accidents, and various meteorological and hydrological factors. Populations of sea turtles in the northern GOM would be exposed to residuals of oils spilled as a result of a proposed action during their lifetimes. Chronic or acute exposure may result in the harassment, harm, or mortality to sea turtles occurring in the northern GOM. In most foreseeable cases, exposure to hydrocarbons persisting in the sea following the dispersal of an oil slick would result in sublethal impacts (e.g., decreased health, reproductive fitness, and longevity; and increased vulnerability to disease) to sea turtles. Sea turtles hatchlings exposed to and becoming fouled by or consuming tarballs persisting in the sea following the dispersal of an oil slick would likely result in their death.

Impacts on the Alabama, Choctawhatchee, St. Andrew, and Perdido Key Beach Mice, and Florida Salt Marsh Vole (Chapters 4.2.1.7. and 4.4.7.)

An impact from a proposed action on the Alabama, Choctawhatchee, St. Andrew and Perdido Key beach mice, and Florida salt marsh vole is possible but unlikely. Impact may result from consumption of beach trash and debris. Efforts undertaken for the removal of marine debris or for beach restoration, such as sand replenishment, may temporarily scare away beach mice, destroy their food resources, or collapse the tops of their burrows.

Given the necessity of coincident storm surge for oil to reach beach mouse habitat and contact the beach mice or vole, no direct impacts of oil spills on beach mice or vole from a proposed action are anticipated. Protective measures required under the ESA should prevent any oil-spill response and cleanup activities from having significant impact to the beach mice and their habitat.

Impacts on Coastal and Marine Birds (Chapters 4.2.1.8. and 4.4.8.)

The majority of effects resulting from a proposed action in the EPA on endangered/threatened and nonendangered/nonthreatened coastal and marine birds are expected to be sublethal: behavioral effects, nonfatal exposure to or intake of OCS-related contaminants or discarded debris, temporary disturbances, and displacement of localized groups from impacted habitats. Chronic sublethal stress, however, is often undetectable in birds. As a result of stress, individuals may weaken, facilitating infection and disease; then, migratory species may not have the strength to reach their destination. No significant habitat impacts are expected to occur directly from routine activities resulting from a proposed action. Secondary impacts to coastal habitats would occur over the long term and may ultimately displace species from traditional sites to alternative sites.

Bald eagles, piping plovers, and brown pelicans use habitat that is open to the sky and may be impacted by helicopter noise. They would also be susceptible to disturbance by discarded debris. Turbidity may reduce predation efficiency by brown pelicans on pelagic fishes.

Oil spills from a proposed action pose the greatest potential direct and indirect impacts to coastal and marine birds. Birds that are heavily oiled are usually killed. If physical oiling of individuals or local groups of birds occurs, some degree of both acute and chronic physiological stress associated with direct and secondary uptake of oil would be expected. Small coastal spills could contact and affect the different groups of coastal and marine birds, most commonly marsh birds, waders, waterfowl, and certain shorebirds. Lightly oiled birds can sustain tissue and organ damage from oil ingested during feeding and grooming or from oil that is inhaled. Stress and shock enhance the effects of exposure and poisoning. Low levels of oil could stress birds by interfering with food detection, feeding impulses, predator avoidance, territory definition, homing of migratory species, susceptibility to physiological disorders, disease resistance, growth rates, reproduction, and respiration. The toxins in oil can affect reproductive success. Indirect effects occur by the fouling of nesting habitat and by the displacement of individuals, breeding pairs, or populations to less favorable habitats.

Dispersants used in spill cleanup activity can have toxic effects similar to oil on the reproductive success of coastal and marine birds. The air, vehicle, and foot traffic that takes place during shoreline cleanup activity can disturb nesting populations and degrade or destroy habitat.

Figures 4-27, 4-29, and 4-30 show the probability of offshore spills ($\geq 1,000$ bbl) occurring and contacting wintering piping plovers, brown pelicans, and bald eagles within 10 or 30 days as a result of a proposed action. While foraging on oiled shores, piping plovers can physically oil themselves or secondarily contaminate themselves through ingestion of oiled intertidal sediments and prey. If an offshore spill were to occur and reach the coast, oil would reach the intertidal beach feeding areas before it would contact piping plover nests on the fore dunes. Brown pelicans are susceptible to both physical oiling and secondary effects via ingestion of oiled prey (i.e., fish). The bald eagle may become physically oiled or affected by the ingestion of the oiled prey.

Impacts on Endangered and Threatened Fish

Gulf Sturgeon (Chapters 4.2.1.9.1. and 4.4.9.1.)

Potential impacts on Gulf sturgeon may occur from resuspended sediments and OCS-related discharges, as well from nonpoint runoff from estuarine OCS-related facilities. The low toxicity of this pollution and the unlikely, simultaneous occurrence of individual Gulf sturgeon and of contamination is expected to result in little impact of a proposed action on Gulf sturgeon. Routine activities resulting from a proposed action in the EPA are expected to have little potential effects on Gulf sturgeon.

The Gulf sturgeon could be impacted by oil spills resulting from a proposed action. Contact with spilled oil could cause irritation of gill epithelium and disturbance of liver function in Gulf sturgeon. The likelihood of spill occurrence and contact to the Gulf sturgeon as a result of a proposed action is very low — 1 percent within 10 days and 2 percent within 30 days.

Smalltooth Sawfish (Chapters 4.2.1.9.2. and 4.4.9.2.)

Potential impacts to smalltooth sawfish may occur from jetsam and flotsam, suspended sediments, OCS-related discharges, and nonpoint runoff from estuarine OCS-related facilities. However, because the

current population of smalltooth sawfish is primarily found in southern Florida in the Everglades and Florida Keys, impacts to these rare animals from routine activities associated with a proposed action are expected to be miniscule.

Potential impacts to the smalltooth sawfish from a proposed action could occur from accidental oil spills. Contact with or ingestion/absorption of spilled oil by smalltooth sawfish could result in mortality or nonfatal physiological impact, especially irritation of gill epithelium and disturbance of liver function. However, because the current population of smalltooth sawfish is primarily found in southern Florida in the Everglades and Florida Keys and because of the low probability of these areas being contacted by an oil spill, impacts to these rare animals from accidental events associated with a proposed action are unlikely.

Impacts on Fisheries and Commercial Fishing (Chapters 4.2.1.10., 4.2.1.11., and 4.4.10.)

It is expected that coastal and marine environmental degradation from a proposed action would have little effect on fish resources or EFH. The impact of coastal and marine environmental degradation is expected to cause an undetectable decrease in fish resources or in EFH. Recovery of fish resources and EFH can occur from more than 99 percent, but not all, of the expected coastal and marine environmental degradation. Fish populations, if left undisturbed, would regenerate in one generation, but any loss of wetlands as EFH would be permanent.

Offshore discharges and subsequent changes to marine water quality would be regulated by NPDES permits. At the expected level of impact, the resultant influence on fish resources and EFH would be negligible and indistinguishable from natural population variations.

Activities such as OCS discharge of drilling muds and produced water would cause negligible impacts and would not deleteriously affect fish resources or EFH. At the expected level of impact, the resultant influence on fish resources would cause less than a 1 percent change in fish populations or EFH. As a result, there would be little disturbance to fish resources or EFH.

A proposed action is expected to result in less than a 1 percent decrease in fish resources and/or standing stocks or in EFH. It would require one generation for fish resources to recover from 99 percent of the impacts. Recovery from the loss of wetlands habitat would probably not occur.

Activities such as seismic surveys would cause negligible impacts and would not deleteriously affect commercial fishing activities. Operations such as production platform emplacement and underwater OCS impediments would cause slightly greater impacts on commercial fishing. Some positive impacts to commercial fishing resulting from fish aggregating around deepwater structures may be possible. At the expected level of impact, the resultant influence on commercial fishing would be indistinguishable from variations due to natural causes. As a result, there would be very little impact to commercial fishing. A proposed action is expected to result in less than a 1 percent change in activities, in pounds landed, or in the value of landings. It would require less than 6 months for fishing activity to recover from any impacts.

Accidental events resulting from oil and gas development in a proposed action area of the GOM have the potential to cause some detrimental effects on fisheries and fishing practices. A subsurface blowout would have a negligible effect on GOM fish resources or commercial fishing. If spills due to a proposed action were to occur in open waters of the OCS proximate to mobile adult finfish or shellfish, the effects would likely be nonfatal and the extent of damage would be reduced due to the capability of adult fish and shellfish to avoid a spill, to metabolize hydrocarbons, and to excrete both metabolites and parent compounds. The effect of proposed-action-related oil spills on fish resources and commercial fishing is expected to cause less than a 1 percent decrease in standing stocks of any population, commercial fishing efforts, landings, or value of those landings. Any affected commercial fishing activity would recover within 6 months. At the expected level of impact, the resultant influence on fish populations and commercial fishing activities within the proposed lease sale area would be negligible and indistinguishable from variations due to natural causes.

It is expected that coastal environmental degradation from a proposed action would have little effect on fish resources or EFH; however, wetland loss could occur due to a petroleum spill contacting inland areas.

Impacts on Recreational Fishing (Chapters 4.2.1.12. and 4.4.11.)

The leasing, exploration, development, production, and transportation of oil and gas in the proposed lease sale area could attract limited additional recreational fishing activity to petroleum structures installed on productive leases. Each structure placed in the GOM to produce oil or gas would function as a de facto artificial reef, attract sport fish, and improve fishing prospects in the immediate vicinity of platforms. This impact would last for the life of the structure, until the structures are removed from the location and the marine environment. A proposed action would have a beneficial effect on offshore and deep-sea recreational fishing within developed leases accessible to fishermen. The 100-mi travel distance would be substantial, but not insurmountable. These effects would last until the production structures are removed from the marine environment. Short-term, space-use conflict could occur during the time that any pipeline is being installed.

The estimated number and size of potential spills associated with a proposed action activities (**Chapter 4.4.1.2.**) are unlikely to decrease recreational fishing activity but may divert the location or timing of a few planned fishing trips.

Impacts on Recreational Resources (Chapters 4.2.1.13. and 4.4.12.)

Operations resulting from a proposed action would generate additional marine debris. The impact on Gulf Coast recreational beaches is expected to be minimal. The incremental increase in helicopter and vessel traffic is expected to add little additional noise that may annoy beach users. A proposed action is expected to result in nearshore operations that may adversely affect the enjoyment of some Gulf Coast beach uses; however, these would have little effect on the number of beach users.

It is unlikely that a spill would be a major threat to recreational beaches because any impacts would be short term and localized. Should a spill contact a recreational beach, short-term displacement of recreational activity from the areas directly affected would occur. Beaches directly impacted would be expected to close for periods of 2-6 weeks or until the cleanup operations were complete. Should a spill result in a large volume of oil contacting a beach or a large recreational area being contacted by an oil slick, visitation to the area could be reduced by as much as 5-15 percent for as long as one season, but such an event should have no long-term effect on tourism.

Tarballs can lessen the enjoyment of the recreational beaches but should have no long-term effect on the overall use of beaches.

Impacts on Archaeological Resources

Historic (Chapters 4.2.1.14.1. and 4.4.13.1.)

The greatest potential impact to an archaeological resource as a result of a proposed action would result from a contact between an OCS offshore activity (drilling rig emplacement, platform installation, pipeline installation, or dredging) and a historic shipwreck. The archaeological survey and archaeological clearance of sites required prior to an operator beginning oil and gas activities on a lease are estimated to be highly effective at identifying possible historic shipwreck sites. Since the site survey and clearance provide a substantial reduction in the potential for a damaging interaction between an impact-producing factor and a historic shipwreck, there is a very small possibility of an OCS activity impacting a historic site.

Ten of the blocks offered in the proposed lease sale area fall within the MMS GOM Region's high-probability area for the occurrence of historic shipwrecks, and would require a survey at a minimum 300-m linespacing.

Most other activities associated with a proposed action are not expected to impact historic archaeological resources. Ferromagnetic debris has the potential to mask the magnetic signatures of historic shipwrecks. It is expected that onshore archaeological resources would be protected through the review and approval processes of the various Federal, State, and local agencies involved in permitting onshore activities. Deepening and/or widening activities associated with maintenance dredging of navigation channels may result in impacts to historic shipwrecks.

Oil and gas activities associated with a proposed action could impact a shipwreck because of incomplete knowledge on the location of shipwrecks in the GOM. Although this occurrence is not

probable, such an event would result in the disturbance or destruction of important historic archaeological information. Other factors associated with a proposed action are not expected to affect historic archaeological resources.

Accidents associated with oil and gas exploration and development activities as a result of a proposed action are not assumed to impact historic archaeological resources. It is not likely for an offshore oil spill to occur and contact coastal historic archaeological sites from accidental events associated with a proposed action. The major type of impact from an oil-spill accidental event would only be visual contamination by physical contact to a historic coastal site, such as a historic fort or lighthouse. It is expected that there would be only minor impacts to historic archaeological resources as a result oil-spill cleanup operations. These impacts would be temporary and reversible.

Prehistoric (Chapters 4.2.1.14.1 .and 4.4.13.1.)

Since no new onshore infrastructure is projected as a result of a proposed action and no prehistoric sites are located within the proposed lease sale area, a proposed action is not expected to result in impacts to prehistoric archaeological sites.

Oil spills may threaten the prehistoric archaeological resources of the Central and Eastern GOM. Should such an impact occur, unique or significant archaeological information would be lost and the impacts would be irreversible, and could result in the loss of radiocarbon dating potential for the site. Oil spill clean-up operations could result in the direct disturbance or destruction of artifacts, site features and site context by cleanup equipment or the looting of sites by cleanup personnel.

Impacts on Human Resources and Land Use

Land Use, Coastal Infrastructure, Demographics, and Economic Factors (Chapters 4.2.1.15.1-3. and 4.4.14.1-3.)

Activities relating to a proposed lease sale are expected to minimally affect the analysis area's land use, infrastructure, and demography. A proposed action, of its own accord, would not alter the current land use of the analysis area or require additional OCS-related coastal infrastructure. Current baseline estimates of population growth for the analysis area show a continuation of growth, but at a slower rate; a proposed lease sale would not alter this trend. Only minor economic changes (less than a 1% increase in employment) in the Texas, Louisiana, Mississippi, and Alabama coastal subareas would occur from a proposed lease sale. This demand would be met primarily with the existing population and available labor force. There would be very little to no economic stimulus in the Florida subareas. While a proposed lease sale would not significantly impact the analysis area, OCS activities from past and future OCS lease sales would continue to occur and impact the analysis area. In other words, even if a proposed action were not held, there would still be OCS-related impacts in the analysis area from past and future OCS lease sales.

The short-term social and economic consequences for the GOM coastal region should a spill >1,000 bbl occur includes opportunity cost of 155-363 person-years of employment and expenditures of \$8.8-20.7 million that could have been gone to production or consumption rather than spill-cleanup efforts. Non-market effects such as traffic congestion, strains on public services, shortages of commodities or services, and disruptions to the normal patterns of activities or expectations are also expected to occur in the short term. These negative, short-term social and economic consequences of an oil spill are expected to be modest in terms of projected cleanup expenditures and the number of people employed in cleanup and remediation activities. Negative, long-term economic and social impacts may be more substantial if fishing, shrimping, oystering, and/or tourism were to suffer or were to be perceived as having suffered because of the spill.

Environmental Justice (Chapters 4.2.1.15.4. and 4.4.14.4.)

Because of the existing extensive and widespread support system for OCS-related industry and associated labor force, the effects of a proposed action are expected to be widely distributed and little felt. In general, who would be hired and where new infrastructure might be located is impossible to predict. Impacts related to a proposed action are expected to be economic and have a limited but positive effect on

low-income and minority populations. Given the existing distribution of the industry and the limited concentrations of minority and low-income peoples, a proposed action is not expected to have a disproportionate effect on these populations.

Lafourche Parish would experience the most concentrated effects of a proposed action; however, because the parish is not heavily low-income or minority, because the Houma are not residentially segregated, and because the effects of road traffic and port expansion would not occur in areas of low-income or minority concentration, these groups would not be differentially affected. In general, the effects in Lafourche Parish are expected to be mostly economic and positive. A proposed action would help to maintain ongoing levels of activity rather than expand them.

Considering the population distribution along the GOM, a proposed action is not expected to have a disproportionate adverse environmental or health effect on minority or low-income people.

2.3.1.3. Mitigating Measures

2.3.1.3.1. Military Warning Areas Stipulation — Hold and Save Harmless, Electromagnetic Emissions, and Operational Restrictions (“standard” Eastern GOM military stipulation)

A standard military warning areas stipulation has been applied to all blocks leased in military areas in the GOM since 1977. **Figure 2-1** shows the military warning areas in the GOM. This stipulation for the Eastern GOM is applied to all blocks leased within a warning or water test area. The stipulation was applied to blocks in warning areas in past lease sales in the Eastern GOM and is considered by DOI and DOD to be an effective method of mitigating potential multiple-use conflicts. Note that the “standard” military stipulation has been modified to remove the evacuation requirement. This stipulation shall be a part of any lease resulting from the proposed lease sales. The stipulation reads as follows:

(a) Hold and Save Harmless

Whether compensation for such damage or injury might be due under a theory of strict or absolute liability or otherwise, the lessee assumes all risks of damage or injury to persons or property, which occur in, on, or above the OCS, to any persons or to any property of any person or persons in connection with any activities being performed by the lessee in, on, or above the OCS, if such injury or damage to such person or property occurs by reason of the activities of any agency of the United States Government, its contractors, or subcontractors, or any of its officers, agents or employees, being conducted as a part of, or in connection with, the programs or activities of the command headquarters listed at the end of this stipulation.

Notwithstanding any limitation of the lessee’s liability in Section 14 of the lease, the lessee assumes this risk whether such injury or damage is caused in whole or in part by any act or omission, regardless of negligence or fault, of the United States, its contractors or subcontractors, or any of its officers, agents, or employees. The lessee further agrees to indemnify and save harmless the United States against all claims for loss, damage, or injury in connection with the programs or activities of the aforementioned military installation, whether the same be caused in whole or in part by the negligence or fault of the United States, its contractors, or subcontractors, or any of its officers, agents, or employees and whether such claims might be sustained under a theory of strict or absolute liability or otherwise.

(b) Electromagnetic Emissions

The lessee agrees to control its own electromagnetic emissions and those of its agents, employees, invitees, independent contractors or subcontractors emanating from individual designated defense warning and water test areas in accordance with requirements specified by the commander of the command headquarters listed in **Table**

2-1 (hereinafter “the appropriate command headquarters”) to the degree necessary to prevent damage to, or unacceptable interference with, Department of Defense flight, testing, or operational activities, conducted within individual designated warning and water test areas. Prior to entry into the particular warning or water test area, the lessee, its agents, employees, invitees, independent contractors or subcontractors, must coordinate electromagnetic emissions with the appropriate onshore military installation command headquarters.

(c) Operational

The lessee, when conducting or causing any activities in the individual designated warning and water test areas, shall enter into an agreement with the appropriate command headquarters listed in **Table 2-1** prior to commencing such activities. Such an agreement will provide for positive control of personnel and property associated with lessee’s activity and operations existing in the warning and water test areas at any time.

Effectiveness of the Lease Stipulation

The hold harmless section of the military stipulation serves to protect the U.S. Government from liability in the event of an accident involving the lessee and military activities. The actual operations of the military and the lessee and its agents will not be affected.

The electromagnetic emissions section of the stipulation requires the lessee and its agents to reduce and curtail the use of radio, citizens band, or other equipment emitting electromagnetic energy within some areas. This serves to reduce the impact of oil and gas activity on the communications of military missions and reduces the possible effects of electromagnetic energy transmissions on missile testing, tracking, and detonation.

The operational section requires notification to the military of oil and gas activity to take place within a military use area. This allows the base commander to plan military missions and maneuvers that will avoid the areas where oil and gas activities are taking place or to schedule around these activities. Prior notification helps reduce the potential impacts associated with vessels and helicopters traveling unannounced through areas where military activities are underway.

This stipulation reduces potential impacts, particularly in regards to safety, but does not reduce or eliminate the actual physical presence of oil and gas operations in areas where military operations are conducted. The reduction in potential impacts resulting from this stipulation makes multiple-use conflicts most unlikely. Without the stipulation, some potential conflict is likely. The best indicator of the overall effectiveness of the stipulation may be that there has never been an accident involving a conflict between military operations and oil and gas activities.

2.3.1.3.2. Evacuation Stipulation for the Eglin Water Test Areas

- (a) The lessee, recognizing that oil and gas resource exploration, exploitation, development, production, abandonment, and site cleanup operations on the leased area of submerged lands may occasionally interfere with tactical military operations, hereby recognizes and agrees that the United States reserves and has the right to temporarily suspend operations and/or require evacuation on this lease in the interest of national security. Such suspensions are considered unlikely in this area. Every effort will be made by the appropriate military agency to provide as much advance notice as possible of the need to suspend operations and/or evacuate. Advance notice of fourteen (14) days shall normally be given before requiring a suspension or evacuation, but in no event will the notice be less than four (4) days. Temporary suspension of operations may include the evacuation of personnel, and appropriate sheltering of personnel not evacuated. Appropriate shelter shall mean the protection of all lessee personnel for the entire duration of any Department of Defense activity from flying or falling objects or substances and will be implemented by a written order from the MMS Regional Supervisor for Field Operations (RS-FO), after

- consultation with the appropriate command headquarters or other appropriate military agency, or higher authority. The appropriate command headquarters, military agency or higher authority shall provide information to allow the lessee to assess the degree of risk to, and provide sufficient protection for, lessee's personnel and property. Such suspensions or evacuations for national security reasons will not normally exceed seventy-two (72) hours; however, any such suspension may be extended by order of the RS-FO. During such periods, equipment may remain in place, but all production, if any, shall cease for the duration of the temporary suspension if so directed by the RS-FO. Upon cessation of any temporary suspension, the RS-FO will immediately notify the lessee such suspension has terminated and operations on the leased area can resume.
- (b) The lessee shall inform the MMS of the persons/offices to be notified to implement the terms of this stipulation.
 - (c) The lessee is encouraged to establish and maintain early contact and coordination with the appropriate command headquarters, in order to avoid or minimize the effects of conflicts with potentially hazardous military operations.
 - (d) The lessee shall not be entitled to reimbursement for any costs or expenses associated with the suspension of operations or activities or the evacuation of property or personnel in fulfillment of the military mission in accordance with subsections (a) through (c) above.
 - (e) Notwithstanding subsection (d), the lessee reserves the right to seek reimbursement from appropriate parties for the suspension of operations or activities or the evacuation of property or personnel associated with conflicting commercial operations.

Effectiveness of the Lease Stipulation

This stipulation would provide for evacuation of personnel and shut-in of operations during any events conducted by the military that could pose a danger to ongoing oil and gas operations. It is expected that the invocation of these evacuation requirements will be extremely rare.

It is expected that these measures will serve to eliminate dangerous conflicts between oil and gas operations and military operations. Continued close coordination between MMS and the military may result in improvements in the wording and implementation of these stipulations.

2.3.1.3.3. Coordination and Consultation Stipulation for Exploration Activities in the Eglin Water Test Areas

- (a) The placement, location, and planned periods of operation of surface structures on this lease during the exploration stage are subject to approval by the MMS Regional Director (RD) after the review of an operator's EP. Prior to approval of the EP, the lessee shall consult with the appropriate command headquarters regarding the location, density, and the planned periods of operation of such structures, and to maximize exploration while minimizing conflicts with Department of Defense activities. When determined necessary by the appropriate command headquarters, the lessee will enter a formal Operating Agreement with such command headquarters, that delineates the specific requirements and operating parameters for the lessee's proposed activities in accordance with the military stipulation clauses contained herein. If it is determined that the proposed operations will result in interference with scheduled military missions in such a manner as to possibly jeopardize the national defense or to pose unacceptable risks to life and property, then the RD may approve the EP with conditions, disapprove it, or require

modification in accordance with 30 CFR 250. The RD will notify the lessee in writing of the conditions associated with plan approval, or the reason(s) for disapproval or required modifications. Moreover, if there is a serious threat of harm or damage to life or property, or if it is in the interest of national security or defense, pending or approved operations may be suspended in accordance with 30 CFR 250. Such a suspension will extend the term of a lease by an amount equal to the length of the suspension, except as provided in 30 CFR 250.169(b). The RD will attempt to minimize such suspensions within the confine of related military requirements. It is recognized that the issuance of a lease conveys the right to the lessee as provided in section 8(b)(4) of the Outer Continental Shelf Lands Act to engage in exploration, development, and production activities conditioned upon other statutory and regulatory requirements.

- (b) The lessee is encouraged to establish and maintain early contact and coordination with the appropriate command headquarters, in order to avoid or minimize the effects of conflicts with potentially hazardous military operations.
- (c) If national security interests are likely to be in continuing conflict with an existing operating agreement, the RD will direct the lessee to modify any existing operating agreement or to enter into a new operating agreement to implement measures to avoid or minimize the identified potential conflicts, subject to the terms and conditions and obligations of the legal requirements of the lease.

Effectiveness of the Lease Stipulation

This stipulation would provide for review of pending oil and gas operations by military authorities and could result in delaying oil and gas operations if military activities have been scheduled in the area that may put the oil and gas operations and personnel at risk.

2.3.2. Alternative B — No Action

2.3.2.1. Description

This alternative is equivalent to cancellation of one or both proposed lease sales. The opportunity for development of the estimated 0.065-0.085 BBO and 0.265-0.340 Tcf of gas that could have resulted from the proposed lease sale would be precluded or postponed. Any potential environmental impacts resulting from the proposed lease sale(s) would not occur or would be postponed.

2.3.2.2. Summary of Impacts

If Alternative B is selected, all impacts, positive and negative, associated with the proposed lease sale(s) would be eliminated. This alternative would therefore result in no effect on the sensitive resources and activities discussed in **Chapters 4.2. and 4.4.** The incremental contribution of the proposed lease sale(s) to cumulative effects would also be foregone, but effects from other activities, including other OCS lease sales, would remain.

Strategies that could provide replacement resources for lost domestic OCS oil and gas production include a combination of energy conservation; onshore domestic oil and gas supplies; alternative energy sources; and imports of oil, natural gas, and liquefied natural gas. Market forces are assumed to be the predominant factor in determining substitutes for OCS oil and gas. Based on this, increased imports of foreign oil are assumed to be the largest replacement source. Much of this imported oil would enter the U.S. through the GOM, thus increasing the probability of tanker spills, which are usually closer to shore and can be larger in volume. This is thoroughly analyzed in the Final EIS for the 5-Year Program.