

# Quick Look

## Gulf of Mexico OCS Proposed Geological and Geophysical Activities

Western, Central, and Eastern Planning Areas

Draft Programmatic Environmental Impact Statement





## QUICK LOOK

### BACKGROUND

The Bureau of Ocean Energy Management (BOEM) issued the *Gulf of Mexico OCS Proposed Geological and Geophysical Activities: Western, Central, and Eastern Planning Areas; Draft Programmatic Environmental Impact Statement* (Programmatic EIS) to describe and evaluate the potential environmental impacts related to geological and geophysical (G&G) survey activities in Federal and affected State waters of the Gulf of Mexico (GOM). The G&G surveys are conducted to provide data to inform business decisions about the development of oil and gas reserves, locate and evaluate marine mineral deposits, provide engineering data for developing renewable energy projects, identify geologic hazards and benthic habitats to avoid, and aid in the location and avoidance of archaeological sites. The area in which G&G survey activities may occur are within the three GOM planning areas (i.e., the Western, Central, and Eastern Planning Areas [WPA, CPA, and EPA]).

The Programmatic EIS establishes a framework for BOEM to guide subsequent National Environmental Policy Act (NEPA) analyses of site-specific actions while identifying and analyzing appropriate mitigation measures to be used during future G&G activities on the Outer Continental Shelf (OCS) in support of oil and gas, renewable energy, and marine mineral resource programs. BOEM will address the impacts of future site-specific actions in subsequent NEPA evaluations (40 CFR § 1502.20) using a tiering process based on this programmatic evaluation.

BOEM is the lead agency for the Programmatic EIS, with the Bureau of Safety and Environmental Enforcement (BSEE) and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) as cooperating agencies.

This summary provides an overview of the analysis of the proposed action and other alternatives that would allow BOEM to authorize G&G activities within the GOM where it has oversight. The details of the analysis conducted for each alternative and program area (i.e., oil and gas exploration and development, renewable energy, and marine minerals) can be found in the main body of the Programmatic EIS. Additional supporting information can be found in the appendices. The main body of the Programmatic EIS contains the following chapters:

- **Chapter 1 (Introduction)** describes the purpose, objectives, and scope of the Programmatic EIS; describes the role of BOEM, BSEE, and cooperating agencies; and explains the regulatory context of the Programmatic EIS.
- **Chapter 2 (Alternatives Including the Proposed Action)** describes the seven alternatives evaluated (including the proposed action), the survey protocols and mitigation measures included in all of the alternatives, and issues to be analyzed; and presents a comparison of impacts by alternative.
- **Chapter 3 (G&G Activities and Proposed Action Scenario)** describes the G&G activities included in each program area and the expected level of effort

- during the period covered by the Programmatic EIS (10-year period), identifies and describes the impact-producing factors (IPFs), and provides a cumulative activity scenario for impact analysis.
- **Chapter 4 (Description of the Affected Resources and Impact Analysis)** describes the affected environment and analyzes the potential impacts of each alternative.
  - **Chapter 5 (Other NEPA Considerations)** describes the unavoidable adverse impacts, irreversible and irretrievable commitment of resources, and the relationship between short-term uses and long-term productivity.
  - **Chapter 6 (Public Involvement and Agency Consultation and Coordination)** describes the consultation and coordination activities with Federal, State, and local agencies, federally recognized Indian Tribes, and other interested parties.
  - **Chapter 7 (Literature Cited)** describes the technical information on which the analyses within the Programmatic EIS is based.
  - **Chapter 8 (Preparers and Reviewers)** describes the technical staff within BOEM, BSEE, NMFS, and the contractors responsible for the content of the Programmatic EIS.

## AREA OF INTEREST

The area evaluated (Area of Interest, or AOI) includes the OCS waters of the GOM and the waters above the OCS that are within the Bureau of Ocean Energy Management's GOM planning areas (i.e., the WPA, CPA, and EPA). The AOI also includes the coastal waters of Texas, Louisiana, Mississippi, Alabama, and Florida (**Figure 1**).

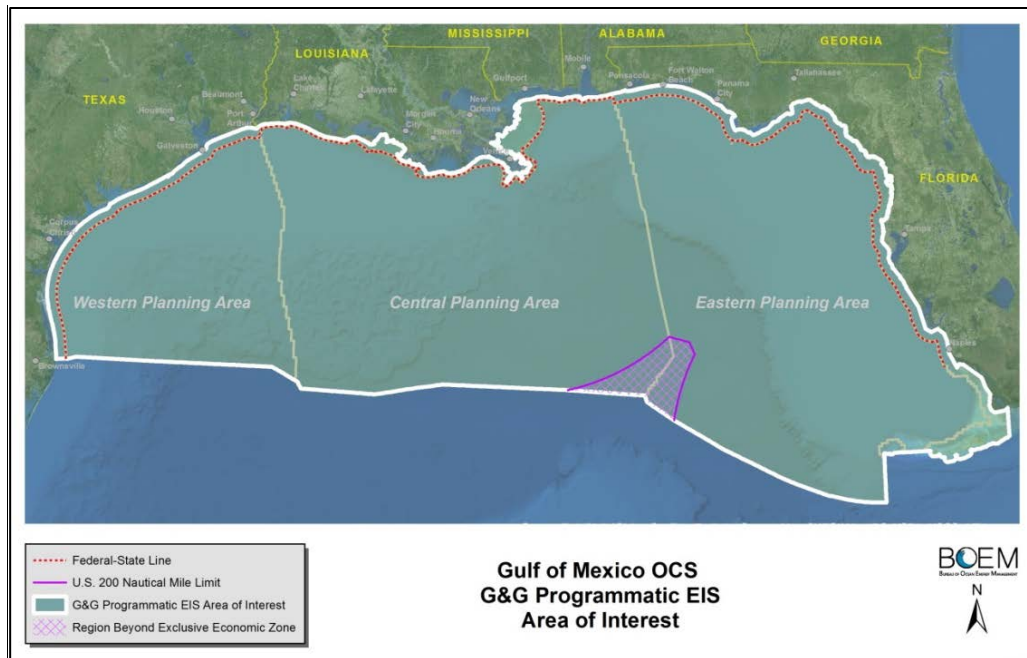


Figure 1. Area of Interest for the Proposed Action.

The Programmatic EIS includes resources that are found in or migrate through the AOI and adjacent areas and that may be affected by the proposed action. The AOI inner boundary follows the shoreline along most of the U.S. coast, extending across the mouths of estuaries and bays. State waters are not within BOEM's jurisdiction; the U.S. Army Corps of Engineers (USACE) permits G&G activities in State waters. The USACE also has jurisdiction over such activities, including OCS seafloor structures, in State and Federal waters. Despite limits to its regulatory authority, BOEM is addressing adjacent State waters in the Programmatic EIS because

- (1) NMFS has jurisdiction and MMPA permitting authority in Federal and State waters, and requires an assessment of the potential impacts to the human environment;
- (2) the acoustic energy introduced into the environment during G&G activities in Federal waters could affect resources in State waters; and
- (3) G&G activities could include interrelated and connected activities in Federal and State waters that would be considered connected actions.

## TYPES OF G&G ACTIVITIES ANALYZED

A variety of G&G techniques, most of which use sound in some way, are used to characterize the shallow and deep structure of the OCS, including the shelf, slope, and deepwater ocean environment. The G&G surveys are conducted to (1) obtain data for hydrocarbon and mineral exploration and production; (2) aid in siting of oil and gas structures and facilities, renewable energy structures and facilities, and pipelines; (3) locate and monitor the use of potential sand and gravel

resources for development; (4) identify possible seafloor or shallow-depth geologic hazards; and (5) locate potential archaeological resources and benthic habitats that should be avoided.

A variety of G&G techniques are used to characterize the shallow and deep structure of the shelf, slope, and deepwater ocean environments. In general, the activities include the following: (1) deep-penetration seismic airgun surveys used almost exclusively for oil and gas exploration and development; (2) electromagnetic surveys, geological test wells, and various remote-sensing methods used only in support of oil and gas exploration and development; (3) non-airgun high-resolution geophysical (HRG) surveys used in all three planning areas of the Gulf of Mexico to detect and monitor geohazards, and archaeological resources; and (4) geological and geotechnical bottom sampling used in all three program areas to assess the suitability of seafloor sediments for supporting structures (e.g., renewable energy facilities such as wind turbines) or to evaluate the quantity and quality of sand for beach nourishment and coastal restoration projects.

The G&G activities in support of renewable energy development would consist mainly of HRG and geotechnical surveys in Federal and State waters less than 40 meters (m) (131 feet [ft]) deep. The G&G activities in support of marine mineral uses (e.g., sand and gravel mining) would consist mainly of HRG and geotechnical surveys in Federal and State waters less than 30 m (98 ft) deep. The G&G deep-penetration seismic surveys are conducted almost exclusively in support of oil and gas exploration and development, and would be conducted in all three planning areas. For these surveys, vessels tow an airgun or an array of airguns that emit acoustic energy pulses through the overlying water then into the seafloor over long durations and over large areas. Thus, these surveys are one of the most extensive G&G activities that would be conducted and are one of the potentially impactful activities analyzed in the Programmatic EIS.

## ALTERNATIVES

Seven alternatives (A through G) are analyzed in the Programmatic EIS. The alternatives examined in detail in the Programmatic EIS present a range of options that include continuation as presently done, various closure areas where activities would be extensively curtailed, avoidance and cessation of operation when marine mammals are in close proximity to the survey vessels, greatly increased monitoring, dramatic reductions in the levels of activities permitted, and a no action alternative where new surveys would cease. The alternatives considered are given in **Chapter 2 of the Programmatic EIS**, and additional details about the alternatives considered are included here as **Attachment A**.

## MITIGATION MEASURES

Mitigation measures are designed to avoid or minimize potential effects. All G&G activities permitted under the alternatives would need to comply with existing laws, regulations, and in-place mitigations. Additionally, during the Marine Mammal Protection Act authorization process that takes place after the Programmatic EIS, NMFS may require additions or alterations to mitigation measures to further minimize impacts to marine mammals. The mitigation measures that would be required under each alternative are given in **Table ES-1 of the Programmatic EIS**.

## RESOURCES EVALUATED

Marine resources with the potential for significant effects from the proposed action are rigorously evaluated in the Programmatic EIS. These issues, identified during scoping for analysis in the Programmatic EIS, are listed below.

- Resources evaluated include marine mammals, sea turtles, fishes, marine and coastal birds, benthic communities, Marine Protected Areas, commercial and recreational fishing (fish catch), essential fish habitat, *Sargassum* communities, archaeological resources, economic impacts, and labor.
- Impacting factors with the potential to affect marine resources are underwater noise, geophysical vessel traffic, aircraft traffic, accidental spills, entanglement from marine equipment, geophysical vessel discharges, trash and debris, and seafloor-disturbing activities.

## CUMULATIVE IMPACTS

Cumulative impacts refer to the impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. An analysis was conducted to identify non-G&G activities with IPFs similar to those in G&G activities that should be considered for inclusion in a cumulative activities scenario. The three major topical areas (components) are the OCS Program, Oil and Gas Activities in State Waters, and Other Major Factors Influencing the AOI.

**OCS Program:** The OCS Program includes activities associated with oil and gas exploration and development, decommissioning, renewable energy development, and marine minerals use. The IPFs associated with OCS Program activities that coincide with the proposed action include vessel and equipment noise (including explosives use [decommissioning]), vessel traffic (support vessel traffic), aircraft traffic and noise, stand-off distance, vessel discharges, seafloor disturbance, geological test well discharges, and accidental fuel spills.

**Oil and Gas Activities in State Waters:** The oil and gas activities in State waters include activities associated with oil and gas exploration and development and decommissioning. It is recognized that the types of activities described for OCS Program activities would be the same as the oil and gas activities in State waters and would have the same IPFs. However, oil and gas activities in State waters would include the G&G surveys permitted by other agencies.

**Other Major Factors Influencing the AOI:** The other major factors influencing the AOI include activities associated with deepwater ports; commercial and recreational fishing; shipping and marine transportation; ocean dredged material disposal site; existing, planned, and new cable infrastructure; military activities; scientific research; maintenance dredging of Federal channels; coastal restoration programs; Mississippi River hydromodification; extreme climatic events; climate change and sea-level rise; and natural oil seeps.

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## IMPACT CONCLUSIONS BY RESOURCE FOR ALTERNATIVES A THROUGH G

The analysis conducted in the Programmatic EIS identifies the change from present conditions for issues (principal effects identified for analysis) resulting from the relevant actions related to the proposed action. Baseline environmental characterization and impact analysis for seven alternatives (A through G) were conducted for the resource areas listed under “Resources Evaluated” above considering the IPFs (i.e., the G&G activities with the potential to affect the environment of the AOI). The levels of impacts determined by resource and applicable IPFs across the seven alternatives are summarized in **Table 1**. The analysis of impacts for resource areas under Alternatives A through G are discussed in detail in **Chapter 4 of the Programmatic EIS**. The differences in impacts between those identified under Alternative A and those identified for Alternatives B through G are discussed by resource and the relevant IPF. The IPFs and impact significance criteria applied during the impact assessment remained the same for all alternatives for each resource. The conclusions of impact assessment for alternatives are presented in **Table 1** below.



Table 1. Impact Levels by Resource and Applicable Impact-Producing Factor Across Alternatives A Through G.

Resource and Impact-Producing Factor		Alternative <sup>1</sup>						
		A	B	C	D	E	F	G
Marine Mammals								
Active Acoustic Sound Sources	Deep-Penetration Airguns	Mod	Mod <sup>2,3,4,5</sup>	Mod <sup>2,4,5</sup>	Mod <sup>2,5,7</sup>	Mod <sup>2,4,5</sup>	Min <sup>2,3,4,5</sup>	Min
	Shallow-Penetration Airguns	Min	Min <sup>2,3,4,5</sup>	Min <sup>2,4,5</sup>	Min <sup>2,5,7</sup>	Min <sup>2,4,5</sup>	Min <sup>2,3,4,5</sup>	Min
	HRG Equipment	Min	Min	Min <sup>6</sup>	Min <sup>6</sup>	Min <sup>6</sup>	Min <sup>6</sup>	Min
Vessel and Equipment Noise		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min
Vessel Traffic		Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod
Aircraft Traffic and Noise		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Trash and Debris		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Entanglement		Nom	Nom	Nom	Nom	Nom	Nom	No Impact
Accidental Fuel Spills		Nom-Min	Nom-Min	Nom-Min	Nom--Min	Nom-Min	Nom-Min	Nom-Min
Cumulative (incremental increase)		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min
Sea Turtles								
Active Acoustic Sound Sources	Airguns	Min	Min	Min	Min	Min	Min	Nom
	HRG Equipment	Nom-Min	Nom-Min	Nom-Min <sup>6</sup>	Nom-Min <sup>6</sup>	Nom-Min <sup>6</sup>	Nom-Min <sup>6</sup>	Nom
Vessel and Equipment Noise		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Vessel Traffic		Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod
Aircraft Traffic and Noise		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Trash and Debris		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Entanglement		Nom	Nom	Nom	Nom	Nom	Nom	No Impact
Accidental Fuel Spills		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min
Cumulative (incremental increase)		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min
Fisheries Resources and Essential Fish Habitat								
Active Acoustic Sound Sources	Airguns	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min
	HRG Equipment	Nom	Nom	Nom	Nom	Nom	Nom	Nom
Vessel and Equipment Noise		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom
Trash and Debris		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Seafloor Disturbance		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Drilling Discharges		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Entanglement		Nom	Nom	Nom	Nom	Nom	Nom	No Impact
Accidental Fuel Spills		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min
Cumulative (incremental increase)		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom

Table 1. Impact Levels by Resource and Applicable Impact-Producing Factor Across Alternatives A Through G (continued).

Resource and Impact-Producing Factor		Alternative <sup>1</sup>						
		A	B	C	D	E	F	G
<b>Benthic Communities</b>								
Active Acoustic Sound Sources	Airguns	Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
	HRG Equipment	Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Trash and Debris		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Seafloor Disturbance		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Drilling Discharges		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Accidental Fuel Spills		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Cumulative (incremental increase)		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
<b>Marine and Coastal Birds</b>								
Active Acoustic Sound Sources	Airguns	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom	Nom-Min	Nom
	HRG Equipment	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom
Vessel and Equipment Noise		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom
Vessel Traffic		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom
Aircraft Traffic and Noise		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom
Trash and Debris		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Accidental Fuel Spills		Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod
Cumulative (incremental increase)		Nom	Nom	Nom	Nom	Nom	Nom	Nom
<b>Marine Protected Areas</b>								
Active Acoustic Sound Sources	Airguns	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	No-Nom
	HRG Equipment	Min	Min	Min	Min	Min	Min	No-Nom
Trash and Debris		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Seafloor Disturbance		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Drilling Discharges		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Accidental Fuel Spills		Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	Nom-Mod	No-Nom
Cumulative (incremental increase)		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	No-Nom
<b>Sargassum Communities</b>								
Vessel Traffic		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Vessel Discharges		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Trash and Debris		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Accidental Fuel Spills		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Cumulative (incremental increase)		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
<b>Commercial Fisheries</b>								
Active Acoustic Sound Sources	Airguns	Min	Min	Min	Min	Min	Min	Nom
	HRG Equipment	Nom	Nom	Nom	Nom	Nom	Nom	Nom

Table 1. Impact Levels by Resource and Applicable Impact-Producing Factor Across Alternatives A Through G (continued).

Resource and Impact-Producing Factor		Alternative <sup>1</sup>						
		A	B	C	D	E	F	G
Vessel Traffic		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Stand-Off Distance		Min	Min	Min	Min	Nom-Min	Min	Nom
Seafloor Disturbance		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Entanglement		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom
Accidental Fuel Spills		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Cumulative (incremental increase)		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom
Recreational Fisheries								
Active Acoustic Sound Sources	Airguns	Nom	Nom	Nom	Nom	Nom	Nom	Nom
	HRG Equipment	Nom	Nom	Nom	Nom	Nom	Nom	Nom
Vessel Traffic		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Stand-Off Distance		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Accidental Fuel Spills		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Cumulative (incremental increase)		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Archeological Resources								
Seafloor Disturbance		Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	Nom-Min	No Impact
Drilling Discharges		Nom	Nom	Nom	Nom	Nom	Nom	No Impact
Accidental Fuel Spills		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Cumulative (incremental increase)		Nom	Nom	Nom	Nom	Nom	Nom	No-Nom
Other Marine Uses								
Vessel Traffic		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Aircraft Traffic and Noise		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Stand-Off Distance		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Seafloor Disturbance		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Accidental Fuel Spills		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Cumulative (incremental increase)		Nom	Nom	Nom	Nom	Nom	Nom	Nom
Human Resources and Land Use								
Land Use and Infrastructure		No Impact	No Impact	No Impact	No Impact	Nom	No Impact	Min
Environmental Justice		No Impact	No Impact	No Impact	No Impact	Nom	No Impact	Min
Demographics		No Impact	No Impact	No Impact	No Impact	Nom	No Impact	Min
Socioeconomics		No Impact	No Impact	No Impact	No Impact	Min	No Impact	Min
Economic Factors		No Impact	Min-Mod	Min	Min-Mod	Min-Mod	Mod	Maj
Cumulative (incremental increase)		No Impact	No Impact	No Impact	No Impact	Min	No Impact	Mod

Table 1. Impact Levels by Resource and Applicable Impact-Producing Factor Across Alternatives A Through G (continued).

Note: Impacts are categorized as Major, Moderate, Minor, or Nominal (refer to **Chapter 4.1.2 of the Programmatic EIS** for definitions).

G&G = geological and geophysical; HRG = high resolution geophysical; No = No Impact; Nom = Nominal; Min = Minor; Mod = Moderate; Maj = Major

<sup>1</sup> Alternative A = Pre-Settlement (June 2013) Alternative. Alternative B = Settlement Agreement Alternative. Alternative C = Alternative C Plus Additional Mitigation Measures. Alternative D = Alternative C Plus Marine Mammal Shutdowns. Alternative E = Alternative C at Reduced Activity Levels. Alternative F = Alternative C Plus Area Closures. Alternative G = No New Activity Alternative.

<sup>2</sup> Provides protection to coastal marine mammal species (i.e., common bottlenose dolphins, manatees, Atlantic spotted dolphins) when they are reproducing (calving) and increases the fitness values of the reproducing species.

<sup>3</sup> Provides protection for whale species (Bryde's, beaked, sperm, dwarf and pygmy sperm whales) and manatees providing localized reduction in sound exposure and associated impacts for those species.

<sup>4</sup> Provides protection to bay, sound and estuary (BSE) stocks of bottlenose dolphins, individual coastal stocks bottlenose dolphins and Atlantic spotted dolphins, and manatees; individual beaked whales and sperm whales, as well as potentially calving sperm whales; the small population of geographically and genetically distinct Bryde's whales in the GOM.

<sup>5</sup> Provides protection to vocalizing marine mammals.

<sup>6</sup> Provides protection to all marine mammals and sea turtles, with additional protection (shutdown) for sperm, Bryde's, beaked, dwarf and pygmy sperm whales, and manatees.

<sup>7</sup> Provides protection for all marine mammals except bow riding dolphins (bottlenose, Fraser's, Clymene's, rough-toothed, striped, spinner, Atlantic spotted, pantropical, and Risso's).

## ATTACHMENT A

Seven alternatives are analyzed in the Programmatic EIS. Alternatives A through F would allow BOEM to permit and/or authorize G&G activities in support of BOEM's three program areas (i.e., oil and gas exploration and development, renewable energy, and marine minerals) within the AOI. Alternative G, the No New Activity Alternative, provides the Council on Environmental Quality's requirement for including a No Action Alternative. The general purpose of each alternative evaluated is to analyze the impacts to the marine environment with each suite of mitigation measures proposed in each alternative.

**Alternative A – Pre-Settlement (June 2013) Alternative:** All G&G survey activities supporting the oil and gas, renewable energy, and marine minerals programs permitted or authorized under Alternative A would be required to comply with all statutes, regulations, lease stipulations, and mitigation measures in place prior to the Settlement Agreement, i.e.,

- guidance for vessel strike avoidance;
- guidance for marine debris awareness;
- avoidance of sensitive benthic resources;
- guidance for avoidance of historic and prehistoric sites;
- guidance for shallow hazards survey and reporting;
- guidance for activities in or near national marine sanctuaries;
- guidance for military coordination;
- guidance for ancillary activities (oil and gas program only) ; and
- implementation of the Seismic Airgun Survey Protocol: Protected Species Observer (PSO) and Passive Acoustic Monitoring (PAM) Programs.

**Alternative B – Settlement Agreement Alternative:** The G&G activities would include implementation of mitigation, monitoring, and reporting as well as mitigation measure requirements outlined in the Settlement Agreement for Civil Action No. 2:10 cv-01882 dated June 25, 2013.

Alternative B consists of all mitigation measures, with the exception of guidance for ancillary activities, that were in place prior to the Settlement Agreement (included in Alternative A, **Chapter 2.3 of the Programmatic EIS**), as well as the newly proposed mitigation measures below;

- implementation of the expanded PSO Program: expanded to include manatees as well as whales;
- implementation of the expanded PAM requirement: the required use of PAM for all deep-penetration seismic airgun surveys in water depths >100 m (328 ft);

- implementation of a minimum separation distance between simultaneous deep-penetration seismic airgun surveys when operating in the designated Areas of Concern identified by Plaintiffs in the Settlement;
- coastal waters' seasonal restrictions from January 1 to April 30;
- closures for all deep-penetration seismic airgun surveys (portions of Areas of Concern 2, 3, and 4) located in the EPA, and;
- additional reporting and application requirements.

**Alternative C – Alternative A Plus Additional Mitigation Measures:** The G&G surveys permitted or authorized under Alternative C would be required to comply with all of the mitigation measures included in Alternative A plus the additional measures described below:

- expanded PSO Program: expanded to include manatees;
- implementation of expanded PAM requirement: the required use of PAM for all deep-penetration seismic airgun surveys in water depths >100 m (328 ft);
- expanded PAM requirement: the required use of PAM for all deep-penetration seismic airgun surveys at all times in the Mississippi Canyon and De Soto Canyon lease blocks;
- implementation of the Non-Airgun HRG Survey Protocol; and
- coastal waters' seasonal restrictions from February 1 to May 31, expanded from Alternative B.

**Alternative D – Alternative C Plus Additional Marine Mammal Shutdowns:** The additional marine mammal shutdowns are listed below:

- expanded PSO Program and includes shutdown for all marine mammals with the exception of bow-riding dolphins (i.e., bottlenose, Fraser's, Clymene's, rough-toothed, striped, spinner, Atlantic spotted, pantropical, and Risso's dolphins) and would also apply to all authorizations for deep-penetration seismic airgun surveys in the AOI regardless of water depth.

**Alternative E – Alternative C at Reduced Activity Levels:** Under Alternative E, all mitigation measures described above (same as Alternative C) would apply but with a reduced level of activity. Alternative E contains two options:

- **Alternative E1** – A reduction (in line miles) of deep-penetration, multi-client seismic activities by 10 percent from the estimated levels in a calendar year; and
- **Alternative E2** – A reduction (in line miles) of deep-penetration, multi-client seismic activities by 25 percent from the estimated levels in a calendar year.

**Alternative F – Alternative C Plus Area Closures:** Under Alternative F, currently authorized G&G activities in the closure areas would be allowed to continue subject to the terms and conditions of existing permits or authorizations and without being required to implement additional mitigation measures. All new G&G surveys permitted or authorized under Alternative F would be required to comply with all the mitigation measures included in Alternative C plus the additional closure and boundary areas described below.

- no new seismic airgun and non-airgun HRG surveys in the CPA, EPA, Dry Tortugas, and Flower Garden Banks closure areas;
  - the CPA Closure Area targets sperm whales and beaked whales for protection;
  - the EPA Closure Area was designed to protect cetaceans, primarily targeting the Bryde's whale;
  - the Dry Tortugas Closure Area targets sperm and beaked whales; and
  - the Flower Gardens Closure Area targets marine resources found within the Flower Garden Banks National Marine Sanctuary, such as various species of stony corals, sponges, anemones, jellies, bony fishes, rays, sharks, sea turtles, birds, and marine mammals; and
- airgun surveys conducted outside of the closure areas would be required to remain at a distance such that received sound levels at the closed area boundaries would not exceed the threshold for Level B harassment.

**Alternative G – No Action:** This is the No New Activity Alternative.

- BOEM would cease issuing permits for new G&G surveys and would not approve G&G surveys proposed under exploration or development plans. The G&G activities previously authorized under an existing permit or lease would proceed but would not be renewed or reauthorized and, thus, would eventually be phased out.
- For NMFS, denial of the Marine Mammal Protection Act authorizations (either as Letters of Authorization issued under Incidental Take Regulations or as Individual Harassment Authorizations) constitutes NMFS' No Action Alternative, which is consistent with NMFS' statutory obligation under the Marine Mammal Protection Act to grant or deny applications to authorize incidental take and to prescribe mitigation, monitoring and reporting with any authorizations.