

Appendix B: Survey Requirements and Mitigation Measures

Survey Requirements

Marine minerals site characterization and sand survey activities usually deploy the same suite of geophysical instruments that are used for archaeological surveys; therefore, a single survey effort often satisfies the needs for sand prospecting, identification of cultural resources and sensitive seafloor habitat, and identification of shallow hazards.

Survey vessels would follow planned track lines so that the desired coverage of the seafloor is achieved. The length and orientation of the lines are determined by the feature to be mapped. In general, lines are oriented longitudinally and transverse to the feature, and would extend beyond the feature itself to define the footprint and further understand the surrounding geology.

Although a grid pattern would be used, line spacing could be expanded in some areas and reduced in other areas that require greater detail. The grid pattern for each survey should cover the maximum area of potential effect for all anticipated physical disturbances. Appendix A includes descriptions of equipment. General survey requirements are as follows:

- Line spacing for any geophysical data for seafloor hazards assessments (sub-bottom profilers and side-scan sonar) will not exceed 492 feet (ft) (150 meters [m]) throughout the area.
- Line spacing for all chirp seismic and magnetometer data for archaeological resources assessments will not exceed 98 ft (30 m) throughout the area.
- Line spacing for multibeam or interferometric swath bathymetry, or side-scan sonar would be suitable for the water depths encountered and provide full coverage of the seabed plus suitable overlap and resolution of small discrete targets of 1.5-3 ft (0.5-1.0 m) in diameter at the relevant slant range.
- For site-specific surveys, the geophysical data requiring the narrowest line spacing will determine the survey coverage and line spacing for the given data collection.
- All track lines should run generally parallel to each other.

All data would be collected to the highest standard of 98 ft (30 m) for site-specific surveys. This standard may be adjusted by BOEM in consultation with state stakeholders if different line spacing is determined to be necessary. Additionally, conditions provided by some states (i.e., ME, NH, RI, NY, DE, VA, GA, FL, MS, LA) according to their Coastal Management Programs must be reviewed before surveys commence (compiled in Appendix E). Prior to geological surveys, reconnaissance and coordination would be undertaken in areas known to contain oil and gas infrastructure, including pipelines, to reduce the likelihood of encounter during surveys.

Mitigation Measures

Alternative A Mitigations

Time-Area Restrictions for Geophysical Surveys to Avoid North Atlantic Right Whales in the Atlantic

Geophysical surveys will be scheduled and conducted to the maximum extent practicable (as determined by the MMP) so that no active acoustic sources operating below 30 kilohertz (kHz) (a conservative estimate of the upper hearing threshold for North Atlantic right whales) will be used in the northeast critical habitat and northeast Seasonal Management Areas (SMAs) (Great South Channel, April 1 through July 31; Off Race Point, March 1 through April 30), mid-Atlantic SMAs (November 1 through April 30), and southeast critical habitat and SMAs (November 15 through April 15). All operations in these areas during the specified times will occur during daylight hours.

BOEM will require that vessel operators make use of the Early Warning System, Sighting Advisory System, and Mandatory Ship Reporting System while operating in the North Atlantic right whale critical habitat, SMAs, and Dynamic Management Areas (DMAs) at the times of year those designations are active or year-round in the case of the North Atlantic right whale critical habitat.

If, during the course of a geophysical survey, a DMA is established, use of all sound sources operating below 30 kHz in that DMA must be discontinued within 24 hours of the DMA establishment. Any geophysical surveys in proximity of DMA boundaries are required to remain at a distance such that received levels for all sound sources at these boundaries are no more than 160 dB re 1 μ Pa rms SPL.

These time-area restrictions do not apply in the Gulf of Mexico (GOM) because the critically endangered North Atlantic right whale rarely occurs in the GOM region.

Geophysical Survey Protocol

Only electromechanical sources would be used during geological and geophysical surveys (Table 2-1 of the EA; Appendix A). Electromechanical sources would be limited to boomer and chirp sub-bottom profilers, side-scan sonars, and single beam, interferometric, or multibeam depth sounders. The minimum number of geophysical sources possible would be used to obtain the necessary geophysical data.

Only the chirp sub-bottom profiler and boomer would be operated at frequencies below 180 kHz, which is the upper hearing threshold for cetaceans. Source levels for sub-bottom profilers and boomers would not exceed 205 dB re 1 μ Pa rms and would be operated at the lowest power setting, narrowest beamwidth, and highest frequency possible to fulfill data needs and to effectively reduce exposure and received sound levels. Consistent with recent sound source verification studies on these active sources (Appendix A), threshold radii to 160 dB re 1 μ Pa rms (which equates to potential Level B Harassment) are expected to be less than 328 ft (100 m) because of the beam pattern characteristics and downward directivity; in the rare case when a

boomer or chirp is operating between 200 and 205 dB re 1 μ Pa rms SPL, the distance to Level B Harassment extends to 630 ft (192 m) and therefore, the acoustic exclusion zone increases. The distance to potential Level A Harassment is expected to be within 3 ft (1 m). Moreover, a chirp towfish (if not hull-mounted) would be towed as close to the seafloor as possible to further reduce the zone of ensonification (the area filled with sound). The use of boomers would be limited to rare circumstances where penetration from chirp sources is insufficient to map or delineate near surface geologic units.

Protocol requirements include the following:

1. An acoustic exclusion zone will be monitored during sand survey activities using any boomer or chirp (i.e., sub-bottom profiler sound source[s] operating below 180 kHz). The acoustic exclusion zone will be a 328-ft (100-m) radius zone around the sound source. If a boomer or chirp is operated from 200-205 dB re 1 μ Pa rms SPL, the acoustic exclusion zone will be extended to 656 ft (200 m). BOEM does not anticipate equipment would operate above 205 dB re 1 μ Pa rms SPL based on data needs. Accounting for differences in the source levels, operational frequency, and deployment mode, this exclusion zone will encompass the potential Level B (160 dB) harassment zone.
2. For chirp and boomer (i.e., geophysical surveys using sound sources operating at frequencies below 180 kHz), operations will be monitored by a National Marine Fisheries Service (NMFS)-approved, trained protected species observer (PSO). At least one PSO will be required aboard sand survey vessels at all times during daylight hours (dawn to dusk – i.e., from about 30 minutes before sunrise to 30 minutes after sunset) when survey operations are being conducted, including during conditions that adversely affect the effectiveness of sea surface observations (e.g., fog, rain, darkness). If conditions deteriorate during daylight hours such that the observations are not possible, visual observations will resume as soon as conditions permit. Ongoing activities may continue, but they may not be initiated under such conditions (i.e., without appropriate pre-activity monitoring).
3. Visual monitoring of acoustic exclusion zones will be conducted by searching the area around the vessel using hand-held reticle binoculars and the unaided eye to observe and document the presence and behavior of marine mammals and sea turtles. The PSOs may be trained third-party observers, crew members trained as observers, or a combination of both trained third-party and crew observers. The PSOs will be solely dedicated to perform visual observer duties. The PSOs shall operate under the following guidelines:
 - a. Other than brief alerts to make personnel aware of maritime hazards, no additional duties shall be assigned to observers during their watch.
 - b. A watch shall be no longer than 6 continuous hours. Consequently, at least two PSOs will be required on board vessels to monitor the acoustic exclusion zone when daily survey activities exceed 6 hours.
 - c. A break of at least 2 hours shall occur between 6-hour watches; no other duties shall be assigned during this period.

4. When operating during reduced visibility, observers will monitor the waters around the acoustic exclusion zone using shipboard lighting, enhanced vision equipment, night-vision equipment, and/or passive acoustic monitoring (PAM). Nighttime surveys are permitted, though PAM is required in addition to night-vision goggles or other appropriate equipment subject to the *Nighttime Geophysical Surveys and Passive Acoustic Monitoring Protocol*. PAM involves towing an additional hydrophone streamer that detects frequencies produced by vocalizing marine mammals and can be used to allow some localization of the bearing (direction) of the animal from the vessel. The PAM system will have real-time processing and detection capability for marine mammal vocalizations over the frequency range of 100 Hz to 175 kHz. Sand survey activities' sound sources operating at frequencies below 180 kHz may be approved during periods of reduced visibility or at night, provided the nighttime survey and PAM protocol is followed.
5. Start-up and shut-down requirements: The acoustic exclusion zone for chirp and boomer (i.e., sound sources operating below 180 kHz) shall be monitored for all marine mammals and sea turtles for no less than 30 minutes prior to start-up and continue until operations cease. Immediate shutdown of the sound source would occur if any non-delphinid marine mammal is detected within the acoustic exclusion zone or appears to be entering it. Immediate shutdown of the sound source would occur if any sea turtle is detected entering or within the acoustic exclusion zone provided the source is operating below 2 kHz. Subsequent restart of the equipment may only occur following a confirmation that the exclusion zone is clear of all marine mammals and sea turtles for 30 minutes.
6. Shutdown of sound sources operating below 180 kHz will not be required for delphinids approaching the vessel (or vessel's towed equipment) that indicates a "voluntary approach" on behalf of the animal. A "voluntary approach" is defined as a clear approach toward the vessel by the animal(s) with a vector that indicates that it is approaching the vessel and remains near the vessel or towed equipment. The intent of the animal(s) would be subject to the determination of the PSO. If the PSO determines that the animal(s) is actively trying to avoid the vessel or the towed equipment, the acoustic sources must be immediately shutdown. The PSO must record the details of any non-shutdowns in the presence of a delphinid, including the distance of the animal(s) from the vessel at the first sighting, heading, position relative to the vessel, duration of sighting, and behavior.
7. BOEM will notify NMFS (Northeast [ME to VA]: nmfs.gar.esa.section7@noaa.gov; Southeast [NC to TX]: nmfs.ser.esa.consultations@noaa.gov) at least 30 days in advance of the start of the proposed activity to demonstrate how the proposed action is consistent with the activities and conditions considered herein.
8. Data on all marine mammal and sea turtle observations must be recorded by the observer based on standard observer data collection protocols. This information must include the following:
 - a. vessel name;
 - b. observers' names, affiliations, and resumes;

- c. date;
 - d. time and latitude/longitude when daily visual survey began;
 - e. time and latitude/longitude when daily visual survey ended;
 - f. average environmental conditions during visual surveys including
 - i. wind speed and direction,
 - ii. sea state (glassy, slight, choppy, rough, or Beaufort scale),
 - iii. swell (low, medium, high, or swell height in meters), and
 - iv. overall visibility (poor, moderate, good).
 - g. species (or identification to lowest possible taxonomic level);
 - h. certainty of identification (sure, most likely, best guess);
 - i. total number of animals;
 - j. number of calves and juveniles (if applicable/distinguishable);
 - k. description (as many distinguishing features as possible) of each individual seen, including length, shape, color and pattern, scars or marks, shape and size of dorsal fin, shape of head, and blow characteristics;
 - l. whether or not a shutdown was required;
 - m. direction of animal's travel relative to the vessel (drawing preferable);
 - n. behavior (as explicit and detailed as possible; note any observed changes in behavior); and
 - o. activity of vessel when sighting occurred.
9. BOEM will require the surveyor to prepare a monthly report that summarizes the survey activities and an estimate of the number of listed marine mammals, sea turtles, and any other protected species observed during these survey activities. BOEM (specifically the MMP) will provide a consolidated annual report to NMFS.

Vibracore Sampling Protocol

Only vibracores and grab samplers will be used to sample near-surface sediments during geological surveys. The vibratory mechanism on the vibracore will be the primary source of underwater sound during geological sampling operations in addition to broadband noise from the vessel. The vibrahead will not be operated until the vibracore platform makes contact with the seabed and core barrel makes contact with the seafloor to minimize sound level and duration. The vibrahead will not be operated when vibracore platform is being retrieved. No noise is associated with the use of grab samplers. Visual monitoring of an acoustic exclusion zone of 328 ft (100 m), consistent with the geophysical protocol, will be implemented. The same startup and shutdown requirements, consistent with the geophysical protocol, will be implemented when marine mammals and sea turtles are observed approaching or are within the acoustic exclusion zone.

Nighttime Geophysical Surveys and Passive Acoustic Monitoring Protocol

Geophysical surveys will occur during daylight hours to the maximum extent practicable or cost effective. If nighttime operations occur, a PAM system will be used unless (1) the system cannot be deployed from the same survey platform, (2) the system is not demonstrated to be effective and economical, and (3) its use unreasonably interferes with geophysical equipment deployment

and data acquisition. If BOEM, working with its surveyor, determines that PAM cannot effectively be used to monitor the exclusion zone (usually 328 ft [100 m] unless it is extended to 656 ft [200 m] for chirps and boomers operating between 200 and 205 dB re 1 μ Pa rms SPL), they will document why and modulate operational frequencies of geophysical equipment, provided adequate data quality is achievable. Nighttime observers will visually monitor the exclusion zone with night-vision goggles or other appropriate equipment, regardless of whether PAM is used or not. Because PAM does not aid in the detection of non-vocalizing animals, including sea turtles and sturgeon, the frequency of chirp and boomer sources during nighttime surveys will be modulated to operate outside the upper limit of hearing range of the species most likely to be present in the survey area (e.g., loggerhead hear less than 1 kHz; leatherback hear less than 2 kHz; and sturgeon hear less than 1 kHz). These details would be established in survey plans for specific projects. The PAM would not be required to be used as a supplement during daylight operations because acoustic exclusion and vessel strike zones can be effectively monitored by observers.

If nighttime geophysical surveys are conducted, the lighting scheme on the survey vessel will be adjusted through reduction, shielding, lowering, and appropriate placement of light sources, to avoid attracting or otherwise disturbing sea turtles, sea birds, and other marine species. Adjustments to the lighting on the vessel would not fall below the minimum standard required by the U.S. Coast Guard (USCG) and Occupational Safety and Health Administration.

Vessel Strike Avoidance Protocol

All sand survey activities (including vessel transit), regardless of vessel size, will be required to comply with the following requirements:

1. Vessel operators, crews, and visual observers or PSOs must maintain a vigilant watch for marine mammals, sea turtles, and protected fish (e.g., sturgeon and smalltooth sawfish), and slow down or stop their vessel regardless of vessel size to avoid striking protected species. A visual observer aboard all sand survey vessels will monitor an area around a transiting survey vessel, the vessel strike exclusion zone (distances specified below), to ensure that it is free of marine mammals, sea turtles, and protected fish. At least one observer will be required aboard all vessels. Visual observers, for the purpose of vessel strike, may be third-party or not third-party, but require training. In addition, vessel operators would be required to comply with NMFS marine mammal and sea turtle viewing guidelines for a region.
2. In accordance with NMFS’ “Compliance Guide for the Right Whale Ship Strike Reduction Rule” (50 CFR § 224.105 and 78 FR 73726-73736), when safety allows, vessels, regardless of size, shall transit within the 10-knot (kn) (18.5-kilometer/hour [km/hr]) speed restriction in North Atlantic right whale DMAs, northeast critical habitat and SMAs, mid-Atlantic SMAs, and southeast critical habitat and SMAs at the appropriate times:

Seasonal Management Area	Effective Dates
<u>Northeast Feeding Areas</u>	
Cape Cod Bay SMA	January 1 – May 15
Off Race Point SMA	March 1 – April 30

Seasonal Management Area	Effective Dates
Great South Channel SMA	April 1 – July 31
<u>Mid-Atlantic Migratory Route</u>	
Port and vessel route areas from Block Island, RI to Savannah, GA	November 1 – April 30
<u>Southeast Calving and Nursery Grounds</u>	
South GA to North FL	November 15 – April 15
SMA maps and coordinates: https://www.greateratlantic.fisheries.noaa.gov/shipstrike/doc/compliance_guide.pdf	

When safety permits, vessel speeds should also be reduced to 10 kn (18.5 km/hr) or less when mother/calf pairs, pods, or large assemblages of right whales are observed near a transiting vessel. A single animal at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should be exercised when an animal is observed. Mandatory reductions in speed will also limit continuous noise levels related to propeller cavitation and hull-wave interaction.

3. When North Atlantic right whales are sighted at any time during the year, vessels, regardless of size, must maintain a minimum separation distance of 1,640 ft (500 m). The following avoidance measures must be taken if a vessel comes within 1,640 ft (500 m) of a right whale:
 - a. While underway, the vessel operator shall steer a course away from the right whale at 10 kn (18.5 km/hr) or less until the minimum separation distance has been established.
 - b. If a right whale is spotted in the path of a vessel or within 328 ft (100 m) of a vessel underway, the operator shall reduce speed and shift engines to neutral. The operator shall only re-engage engines after the right whale has moved out of the path of the vessel and is more than 328 ft (100 m) away. If the right whale is still within 1,640 ft (500 m) of the vessel, the vessel shall select a course away from the whale's course at a speed of 10 kn (18.5 km/hr) or less. This procedure shall also be followed if a right whale is spotted while a vessel is stationary. Whenever possible, a vessel should remain parallel to the whale's course while transiting, avoiding abrupt changes in direction until it has left the area.
4. Vessels, regardless of size, must maintain a minimum separation distance of 328 ft (100 m) year-round if whales other than right whales, seals, or manatees are sighted. The survey will comply with other relevant manatee construction conditions when operating within the species' range. All vessels will follow routes of deep water whenever possible. Year-round, vessels, regardless of size, shall maintain a distance of 164 ft (50 m) or greater from delphinid cetaceans. If encountered during transit, a vessel shall attempt to remain parallel to the animal's course, avoiding excessive speed or abrupt changes in course.
5. All vessels, regardless of size, must maintain a distance of 164 ft (50 m) or greater if sea turtles or other protected species are sighted, whenever possible. Engines will not be re-engaged until the animals are clear of the 50-m (164-ft) exclusion area. The survey will comply with other relevant smalltooth sawfish construction conditions summarized below when operating within the species range. During nighttime

geophysical surveys and transit, nighttime observer requirements will be implemented and vessel speed will not exceed 5 kn (9.3 km/hr) in areas where sea turtles are most likely to be present.

6. Sightings of any injured or dead protected species, as well as any interactions, must be reported to BOEM and NMFS or the U.S. Fish and Wildlife Service within 24 hours, regardless of whether the injury or death was caused by their vessel. Appropriate contacts, based on geographic region, will be established prior to each project.

Sea Turtle and Smalltooth Sawfish “Construction” Conditions

The full suite of mitigation measures typically applied to minimize impacts to sea turtles and sawfish during "construction activities" are available online https://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/sea_turtle_and_smalltooth_sawfish_construction_conditions_3-23-06.pdf.

In addition to the aforementioned reporting requirements for all protected species interactions, injury or mortality, or other observations, the following mitigation measures are also required during geophysical surveying and geological sampling:

1. All personnel shall be alerted to the potential presence and need to avoid sea turtles and smalltooth sawfish, as well as the fact that there are penalties for harming, harassing, or killing these species.
2. All vessels shall operate at “no wake/idle” speeds at all times while in water depths where the draft of the vessel provides less than a 4-ft(1.2-m) clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
3. If a sea turtle or smalltooth sawfish is seen within 100 yards (300 ft, or 91 m) of the active daily operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include the cessation of operation of any moving equipment closer than 50 ft (15-m) of a sea turtle or smalltooth sawfish. Operation of any mechanical equipment (e.g., vibracores) shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50 ft (15-m) radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.

Historic and Pre-contact Sites Avoidance and Reporting Requirements

The proposed action includes geophysical survey activities, which have no potential to affect archaeological resources, followed by vibracoring and grab sampling, which may have the potential to affect archaeological resources on or shallowly buried beneath the seafloor. Vibracores measure 3-4 inches (7.6-10.1 centimeters) in diameter and may extend up to 20 ft (6 m) in depth below surface. Both vibracores and grab samples will generally be limited in depth to near-surface sand deposits with a maximum seafloor disturbance footprint of less than 21.5 square feet (2 square meters) for each sample.

Both vibracores and grab samples are being collected to confidently characterize modern sand resources identified in preliminary geophysical survey data and are not intended to investigate areas of potential effect for archaeological resources or identification of paleo-land forms. Any geologic or other information of archaeological interest will be documented, and any potential cultural layers will be noted and photographed. This information will be used to inform additional investigation and/or avoidance and protection mitigations in the design of any future borrow area(s) to ensure that future activities that may be proposed do not adversely affect potential historic properties. The following mitigation measures are proposed:

1. BOEM will require, to the maximum extent possible, the use of a dynamically positioned vessel or live boating methodology during vibracore and grab sampling operations to avoid unnecessary anchoring and seafloor disturbance. Although BOEM plans to minimize anchoring to the extent possible, there could be instances where anchoring cannot be avoided due to emergency situations or field conditions. In these instances, a minimum-sized anchor/anchor array will be used and will be restricted to an area cleared, either previously or in real-time, of cultural resources and shallow hazards.
2. Before seafloor sampling is conducted, a geological sampling plan will be submitted to BOEM. After seafloor sampling is completed, and upon request, BOEM (through the MMP) will make pertinent geological data, including core logs, photographs, and related textural data, available to stakeholders and consulting parties in an electronic format. Prior to distribution, BOEM will review this information and determine if any of the data contains sensitive cultural information. If surveys are planned to occur in Alabama State waters in connection with the federal activity, additional consultation and coordination with the Alabama State Historic Preservation Office will occur, as requested (Appendix D).
3. BOEM will require advance (sequential) or real-time (concurrent) site-specific information, from sub-bottom, side-scan sonar, or multibeam/swath backscatter of equivalent resolution, magnetometer data, and/or direct observation, to determine the presence of potential archaeological resources prior to undertaking any seafloor-disturbing activities. BOEM or its surveyors would use this information to ensure that physical impacts on archaeological resources would not take place. All sampling must occur within the effective coverage of geophysical data, whether during a reconnaissance or site-specific survey stage. Sampling locations should not be placed within the nadir or other gaps of side-scan sonar survey data. In the instances of sequential geophysical and geological data, the surveyor must provide to BOEM a determination by a Qualified Marine Archaeologist as to whether any potential archaeological resources are present in the area. In instances where sequential data collection is not possible, concurrent geophysical surveys and geological sampling may occur, provided a Qualified Marine Archaeologist participates in the field effort or has concurrent access to review data quality, interpret data, and provide assurance that the immediate area is clear of resources that may be potentially affected before vibracoring, grab sampling, and/or associated anchoring can begin. A Qualified Marine Archaeologist must meet the Secretary of the Interior's Professional Qualifications Standards for Archaeology (48 FR 44738-44739); must have demonstrable, professional experience in interpretation of marine geophysical data; and must demonstrate familiarity/experience with the archaeology of the Study

Area. With sufficient coordination and notice, a BOEM archaeologist may be able to participate in data review and interpretation.

4. All geological sampling must avoid potential archaeological resources by a minimum of 164 ft (50 m). All associated anchoring, if any, must avoid potential archaeological resources by 328 ft (100 m). The avoidance distance must be calculated from the maximum discernible extent of the archaeological resource. During vibracoring, vibracore penetration rates will also be monitored to help ensure minimum sampling in geologic units not indicative of surface sands.
5. Surveyors will report suspected historic and pre-contact archaeological resources to BOEM and take necessary precautions to protect said resources. BOEM will also require reporting and avoidance for any previously undiscovered suspected archaeological resource and precautions to protect the resource from seafloor-disturbing activities. Undiscovered archaeological resources could include items such as a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of historic objects, piles of ballast rock) or pre-contact artifacts within the Study Area. If the surveyor discovers any archaeological resource while conducting operations, operations that could continue to affect the discovery must be immediately halted and the discovery reported to BOEM within 24 hours. In the event that the seafloor-disturbing activities impact potential historic properties, the operator and Qualified Marine Archaeologist who prepared the report must instead provide a statement documenting the extent of these impacts to BOEM within 24 hours.

Sensitive Benthic Habitat and Communities Avoidance Requirements

BOEM will generally avoid anchoring, geological sampling, and any other seafloor-disturbing activities in the vicinity of sensitive benthic habitat and associated communities, including live/hard bottom, rippled scour depressions, cobbled seafloor, reef tract, and Habitat Areas of Particular Concern (HAPCs) not only because of their conservation value but also because these areas are not likely to host sand rich deposits. Any seafloor-disturbing activities in these areas will avoid these habitats and general seafloor impacts by either (1) using a dynamically positioned vessel or live boating methodology to support geological sampling and/or (2) require site-specific geophysical data in advance of sampling to map and otherwise avoid benthic resources. All sensitive benthic habitat including topographic features, live bottom habitats, and potentially sensitive biological features must be avoided by at least 500 ft (152 m) during vibracoring or other seafloor-sampling activities including anchoring.

1. As previously described, BOEM will require, to the maximum extent possible, the use of a dynamically positioned vessel or live boating methodology during vibracore and grab sampling operations to avoid unnecessary seafloor disturbance. Although BOEM plans to minimize anchoring, there may be instances where anchoring cannot be avoided due to emergency situations or field situations/conditions. In these instances, a minimum-sized anchor/anchor array will be used and will be restricted to an area cleared, previously or in real-time, of cultural resources and shallow hazards.
2. BOEM would require advance (sequential) or real-time (concurrent) site-specific information from sub-bottom, side-scan sonar, or multibeam/swath backscatter of equivalent resolution and/or direct observation to determine the presence of potential

sensitive benthic resources prior to undertaking any seafloor-disturbing activities. BOEM or its surveyors would use this information to ensure that physical impacts on sensitive benthic resources are avoided or minimized.

3. Before seafloor sampling is conducted, a geological sampling plan will be submitted to BOEM, and BOEM will confirm that the plan is consistent with the required mitigation measures. Upon request, BOEM (through the MMP) will make pertinent geological and or geophysical data available in an electronic format to interested stakeholders.

Marine Pollution Control Plan

All sand survey activities will occur under a marine pollution control plan developed by the surveyor. The marine pollution control plan must address the marine debris awareness requirement. The surveyor must prepare for and take all necessary precautions to prevent discharges of waste or hazardous materials that may impair water quality. Sufficient fuel spill response equipment and supplies shall be available onboard (or readily mobilized with a secondary vessel) to contain and recover the maximum scenario fuel spill keyed to the proposed operations and disclosed in the marine pollution control plan. In the event of such an occurrence, notification and response will be in accordance with applicable requirements of 40 CFR part 300. All vessel operations must be compliant with USCG regulations and the U.S. Environmental Protection Agency's (USEPA) Vessel General Permit, as applicable. BOEM, USCG, and USEPA, as necessary, will be notified of a noncompliant discharges and remedial actions taken. Reports of the incident and resultant actions will be provided to BOEM.

As an additional measure to reduce the likelihood of accidental fuel spills, vessel fueling will only occur in-port at a docking facility; no at-sea cross-vessel fueling will be permitted.

Marine Debris Awareness Program

All participants in sand survey activities will be educated on marine trash and debris awareness elimination. The surveyor will be required to ensure that its employees and subcontractors are made aware of the environmental and socioeconomic impacts associated with marine trash and debris and their responsibilities for ensuring that trash and debris are not intentionally or accidentally discharged into the marine environment where it could affect protected species.

The deliberate discharge of containers and other similar materials (i.e., trash and debris) into the marine environment is prohibited, and durable identification markings on equipment, tools, containers (especially drums), and other materials are required, as well as the recording and reporting of items lost overboard to BOEM. Furthermore, the intentional jettisoning of trash has been the subject of strict laws such as the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex V and the Marine Plastic Pollution Research and Control Act, as well as regulations imposed by various agencies such as USCG and USEPA.

Navigation and Commercial Fisheries Operations Conflict Minimization Requirements

Notification of pending activities will be made in the USCG Local Notice to Mariners no less than 48 hours prior to the commencement of all sand survey activities. The call sign of the

survey vessel and preferred communication channel must be identified. Surveys off the coast of Maine coast must provide additional notification to State officials, as requested (Appendix E).

Consistent with applicable USCG regulations, all designated vessels will be equipped with Automatic Information System (AIS) and will broadcast vessel's identity, type, position, course, speed, and navigational status during surveying activities. BOEM will require any vessel greater than 65 ft (20 m), regardless of operational status, to employ an AIS system.

No hydrophone streamer or other source towline may exceed 328 ft (100 m) beyond the survey vessel to minimize the effective footprint of operations and minimize disturbance to fisheries vessels, fisheries gear, and/or other shipping or boating traffic.

During surveys, the survey operator must notify all fisheries vessels observed within 6,500 ft (approximately 2 km) of a geophysical survey to avoid potential entanglement in fishing gear. Vessels will "fly" the appropriate USCG-approved day shapes (mast head signals used to communicate with other vessels) and display the appropriate lighting during daylight and any nighttime operations to designate the vessel has limited maneuverability.

To minimize interaction with fishing gear that may be present, the survey operator will traverse or visually scan the general survey area, or use other effective methods, prior to commencing survey operations to determine the presence of deployed fishing gear. Observed fishing gear must be avoided by a minimum of 100 ft (30 m). Fishing gear must not be relocated or otherwise disturbed.

National Marine Sanctuaries

Sand survey activities will not occur in National Marine Sanctuaries.

Advance Notification of Survey Activities in Military Warning/Test Areas or NASA Areas

The Atlantic and Gulf of Mexico OCS regions are used extensively by the U.S. Department of Defense for conducting various mission operations, including air-to-air gunnery, rocket and missile research and testing, sonar buoy operations, pilot training, and aircraft carrier operations. The National Aeronautics and Space Administration (NASA) also conducts activities in and next to these OCS regions. To ensure personnel safety and to reduce the likelihood of conflicts between military or NASA operations and any geological and geophysical surveying in military warning or test areas, direct notification to and coordination with the relevant Naval/Air Force military commands or NASA is required at least 7 days in advance of commencing survey activities, as deemed appropriate by BOEM based on geographic scope and duration. In addition, advance notification of all survey activities planned in any military warning/test areas or NASA areas, regardless of scope or duration, must be made in the USCG Local Notice to Mariners no less than 72 hours prior to the commencement of all survey activities. The call sign of the survey vessel and preferred communication channel must be identified.

Alternative B Mitigations

In addition to mitigations outlined for Alternative A, the following mitigations would be applied under Alternative B.

Operational Restrictions

Under Alternative B, sand survey activities would be subject to an additional operational restriction; geological surveys would occur only after geophysical surveys have been conducted and analyzed. The difference between this alternative and Alternative A is that there is no option for simultaneous deployment and geophysical and geological data collection. This alternative could require two mobilizations to an area if it is determined that additional (site-specific) investigation is warranted. Additionally, no anchoring would be permitted during geological surveys, except in the case of an emergency. This alternative provides for a more deliberate assessment and consideration of seafloor-disturbing activities and provides for an incremental improvement in impact avoidance and sensitive resource protection but increases the number of trips, as well as logistical planning and vessel, crew, and other equipment costs.

Additional source frequency restrictions would be applied to minimize potential effects on loggerhead sea turtles (and incidentally other sea turtles) during the loggerhead nesting season (May 1 to October 31) offshore of southeastern Florida (79 FR 39856; refer to Figure 3-1 of the EA). These restrictions would limit sand survey activities to frequencies that are below the hearing threshold for loggerhead sea turtles, which is approximately 1 kHz. Nighttime surveys would be avoided altogether in that area to minimize noise-related harassment and vessel strike risk.

Additional Time-Area Closures

Alternative B would also incorporate additional time-area closures in the Study Area to specifically avoid particularly important biological areas of other protected and managed species. The exact closure areas and value of those closures would be determined in context of the areas ultimately nominated for study. However, BOEM anticipates that the actual survey areas may include important foraging grounds or may be located in migratory corridors, depending on the time of year. The NMFS, through regional Fishery Management Councils, is tasked with identifying HAPCs within essential fish habitat-designated areas to focus conservation priorities on specific areas that play a particularly important role in the life cycles of federally managed fish species. The HAPCs identified for spawning and nursery areas (Appendix C) help safeguard fish breeding and overall fish population and can protect fish during this vulnerable time of their lifecycle. Once the exact survey areas are determined, geophysical surveys would be scheduled to avoid HAPCs (e.g., cape-associated shoals) during critical spawning and nursing windows to the maximum extent practicable. These time-area closures may contribute to a small reduction in vessel strike risk and minimize the likelihood of noise-related effects depending on location, time of year, and organismal behavior.