Attachments/Appendices Contents

NOTE: Attachments are the protocols provided by BOEM that would be programmatically applied.

NOTE: The Appendices are "other" information used in the opinion.

Attachments to the 2025 Biological and Conference Opinion on the Federally Regulated Oil and Gas Program in the Gulf of America

Attachment 1: The Bureaus' Geophysical Survey Mitigation Protocol (in Bureaus' Focused BA Appendix A.1)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to, among other activities, all geophysical surveys associated with the federally regulated oil and gas program in the Gulf of America. This protocol, jointly developed with NMFS and the Bureaus, is intended to be a standard for geophysical survey use. Hence, it includes a broader scope of measures that may apply to activities beyond the Gulf of America oil and gas program.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow these programmatically applied protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the Gulf of America. Reporting requirements are included where appropriate.

A.1 Operational National Mitigation Protocols for Geophysical Surveys[1]

Table 1. Summary of Tiers and Associated Protocols

Elements	Tier 1	Tier 2	Tier 3[2]	Tier 4
Sources	Airgun arrays > 1,500 in^3 or any array with > 12 airguns	Airgun arrays ≤ 1,500 in^3 or ≤ 12 airguns	Sparkers	*De minimis* sources (see below)
Visual Protected Species Observers (PSO)[3]	Minimum of 2 NMFS-approved PSOs on duty during daylight hours (30 minutes before sunrise through 30 minutes after sunset); Limit of 4 consecutive hours on watch followed by a break of at least 1 hour; Maximum of 12 hours on watch per 24-hour period	Minimum of 2 NMFS-approved PSOs on duty during daylight hours (30 minutes before sunrise through 30 minutes after sunset); Limit of 4 consecutive hours on watch followed by a break of at least 1 hour; Maximum of 12 hours on watch per 24-hour period	Minimum of 1 PSO on duty during daylight hours (30 minutes before sunrise through 30 minutes after sunset); PSOs must be either designated by the Federal agency funding/conducting the survey or approved by NMFS	Not required
Passive acoustic monitoring (PAM)	Required[4]; minimum of 1 NMFS-approved PAM operator on duty from 30 minutes before start of source to 1 hour past the end of source use; Limit of 4 consecutive hours on watch followed by a break of at least 1 hour; Maximum of 12 hours on watch per 24-hour period	Not required		
Shutdown zones	• 500 m (all marine mammals) • 1,500 m (special circumstances; see Table 2 below) • 150 m (sea turtles)	• 100 m (all marine mammals and sea turtles) • 500 m (special circumstances; see Table 2 below)		Not required

[1] Agencies responsible for the preparation of these protocols include NOAA's NMFS, BOEM, and BSEE. The DOI's U.S. Geological Survey and the National Science Foundation provided input. Requirements for notifications, reporting, etc. to BOEM and/or BSEE are limited to activities occurring pursuant to those agencies' relevant statutory and regulatory authorities.

[2] A MMPA incidental take authorization is not required for Tier 3 surveys implementing these protocols.

[3] 24-hr visual monitoring may be required as warranted by improvements in low-light detection capabilities.

[4] PAM is not required for Tier 1 surveys occurring in Cook Inlet or in water depths < 100 m in the Gulf of America. Borehole seismic surveys (also referred to as vertical seismic profiles [VSP]) involving use of a stationary source position that is close to the well (e.g., deployed from a platform), such as zero-offset VSPs, are not required to use PAM.

Elements	Tier 1	Tier 2	Tier 3[2]	Tier 4
Pre-start clearance (additional buffer zone as applicable)	Required; 30-minute clearance period of the following zones: • 1,000 m (all marine mammals) • 1,500 m (special circumstances; see Table 2 below) • 150 m (sea turtles) Following detection within zone, animal must be observed exiting or additional period of 15 or 30 minutes	Required; 30-minute clearance period of the following zones: • 200 m (all marine mammals) • 100 m (sea turtles) • 500 m (special circumstances; see Table 2 below) Following detection within zone, animal must be observed exiting or additional period of 15 or 30 minutes	Required; 30-minute clearance period of the following zones: • 100 m (all marine mammals and sea turtles) • 500 m (special circumstances; see Table 2 below) Following detection within zone, animal must be observed exiting or additional period of 15 or 30 minutes	Not required
Ramp-up	Required; duration ≥ 20 minutes	Required for arrays only; duration dependent on number of elements; no minimum duration required	Required when technically feasible; ramp up sources to half power for 5 minutes and then to full power	Not required
Shutdown	Shutdown required for marine mammal detected within defined shutdown zones; Shutdown (i.e., pause) not requiring ramp -up for sea turtles detected within defined shutdown zones (during Tier 3 surveys, shutdown [i.e., pause] for sea turtles is optional); Exception for certain delphinids and pinnipeds; Re-start allowed following clearance period of 15 or 30 minutes.			Not required

A.1.1 Background

The use of marine acoustic sources for acquiring geophysical data (geophysical surveys) may have an impact on marine life, including marine mammals (all of which are protected under the Marine Mammal Protection Act [MMPA]) and species listed under the ESA. In addition, the Outer Continental Shelf Lands Act (OCSLA) requires that geophysical survey data be obtained in an environmentally sound manner. Due to these legal and environmental concerns, protocols have been developed to mitigate the impacts of these sources on sensitive species and habitats.

These protocols[5] reflect past and current requirements and are based on measures identified through the following: review of mitigation protocols required or recommended elsewhere; review articles and other available scientific literature; project design criteria, terms and conditions, and reasonable and prudent measures identified in ESA section 7 consultations; mitigation, monitoring, and reporting requirements identified in previous MMPA Incidental Take Authorizations (ITAs) issued to survey operators; and NMFS' technical memorandum on standards for a protected species observer and data management program (Baker et al., 2013).

To protect marine mammals and ESA-listed species (hereafter referred to as protected species) during operations, operators are required to follow specific survey protocols. Here, we address standardized baseline operational mitigation and monitoring protocols. However, it is important to be clear that different and/or additional protocols may sometimes be required depending on

[5] These protocols are designed for use in conjunction with activities for which take is authorized and/or exempted under the MMPA and/or ESA (Tiers 1/2) or may be used to avoid the potential for take (Tier 3). "Take" is defined under the respective statutes.

the specific action, location, and/or circumstances.[6] For example, time/area restrictions (which are not discussed here) may be required where sensitive species or stocks and/or critical biological functions are known to occur, or where subsistence uses are occurring.

Compliance with these standard operational requirements must be demonstrated by submitting reports as detailed below in the Reporting section (A.1.10).

Geophysical surveys are conducted to acquire information on marine seabed and subsurface geology, seafloor bathymetry, and water column features. The purposes of geophysical surveys include, but are not limited to: (1) obtaining data for hydrocarbon and mineral exploration and production; (2) siting of oil and gas structures, facilities, and pipelines and renewable energy structures and cables; (3) identifying possible seafloor or shallow-depth geologic hazards; (4) locating archaeological resources and benthic habitats; (5) mapping seafloor bathymetry and structure; and (5) conducting academic or government research. A general hierarchy of protocols is presented for three different categories of activities: Tier 1, Tier 2, and Tier 3. De minimis sources are included in a Tier 4, with no required mitigation protocols.

A.1.2 Tier Summary

Tier 1: Airgun arrays with total volume greater than 1,500 in^3 or any array with more than 12 airguns

Tier 2: Airgun arrays with total volume less than or equal to 1,500 in^3 and 12 airguns or fewer; single airgun

Tier 3: Sparkers

Tier 4: *De minimis* sources.

Examples of *de minimis* sources:

- Multibeam echosounders (hull-mounted or portable)

[6] We note that for any MMPA authorization issued, measures ensuring the "least practicable adverse impact" must be included, and that this standard applies to both marine mammal species or stocks and their habitat, as well as subsistence uses. This means that while a standardized list of measures will be helpful by increasing efficiency and effectiveness, NMFS still must independently evaluate every application, and there may occasionally be circumstances wherein the appropriate application of the "least practicable adverse impact" standard necessitates either the inclusion of additional measures or the shutdown of otherwise standard measures. Likewise, each ESA section 7 consultation requires analysis of the specific action proposed by the action agency. Protocols considered part of the proposed action are referred to as conservation measures in ESA consultations and the extent to which they avoid or minimize the effects of the action on ESA-listed species and/or designated critical habitat is analyzed as part of the consultation. Formal ESA section 7 consultations require NMFS issue a Biological Opinion with an associated Incidental Take Statement (ITS) that includes Reasonable and Prudent Measures (RPMs) considered necessary or appropriate to minimize the impact of any incidental take of ESA-listed species. Terms and Conditions (T&C) to implement the RPMs are included in the ITS. The RPMs and associated T&Cs may require additional measures to minimize take of ESA- listed species. There may also be cases where NMFS determines the measures described in this document and included in conservation measures that are part of the proposed action require modification or are not sufficiently protective as to avoid or minimize the effects of the action on ESA-listed species and/or designated critical habitat.

- Side-scan and sector-scanning sonars
- Hull-mounted non-parametric sub-bottom profilers (SBPs) (e.g., Knudsens)
- Parametric shallow penetration SBPs (e.g., Innomars)
- Fathometers for navigation
- Towed non-parametric SBPs/ Compressed High-intensity Radiated Pulse (Chirp) systems (e.g., Edgetech 424, Edgetech 512i)
- EK60/EK80 split-beam echosounders
- 3-plate boomers
- Pingers (acoustic locators) for locating over the side wireline instrumentation in the water column
- Acoustic releases (brief duration pinging), e.g., for moorings, landers, OBS
- Ultra-short baseline (USBL) and long baseline (LBL) positioning equipment, e.g., for navigation of submersibles, remotely operated vehicles (ROVs), etc.
- All Acoustic Doppler Current Profiling (ADCP) equipment
- All instrumentation on human occupied vehicle (HOV)/ autonomous underwater vehicle (AUV)/ROVs
- Pressure-equipped inverted echo sounders (PIES) and Pressure Monitoring Transducers (PMTs)
- Electromagnetic sources
- Wolfspar[7]
- All instruments operated at 180 kHz or greater

Any additional sources that have the similar source level/directivity/frequency characteristics as those already included here may be included in Tier 4.

A.1.3 Definitions

Terms used in these protocols have the following meanings:

1. Protected species means any NMFS trust species listed under the ESA and/or protected by the MMPA. The requirements discussed herein primarily focus on air-breathing protected species that are more readily observed at the surface, such as marine mammals and sea turtles. However, other ESA-listed species are also protected, and observations of these species should be reported as detailed below.
2. Protected Species Observer (PSO) means a trained, independent biologist employed for purposes of conducting visual and/or acoustic observation for protected species. A conditionally-approved PSO is one with limited geophysical survey experience (i.e., less than 90 days tier-specific at-sea duty time under a lead PSO). An unconditionally-approved PSO is one with more than 90 days tier-specific at-sea experience (but no more than 18 months elapsed since the conclusion of the at-sea experience).

[7] Wolfspar is a proprietary low-frequency source used to supplement the quantity and quality of data collected during surveys using conventional airgun sources. Wolfspar is a variable-frequency marine resonator designed to produce ultra-low frequency (from 1.4-16 Hz, but typically used to produce signals at 2-4 Hz) swept (non-impulsive) signals. Other alternative low-frequency sources may be evaluated on a case-by-case basis.

3. An Incidental Take Authorization (ITA), issued pursuant to the MMPA, authorizes the take of marine mammals incidental to a specified activity. An ITA may be either an incidental harassment authorization (IHA), which is effective for a maximum period of one year, or a letter of authorization (LOA), which is issued under incidental take regulations (ITR) and may be effective for a period of up to five years.
4. An Incidental Take Statement (ITS) is provided with a biological opinion, in cases where NMFS concludes that a proposed agency action is found to be consistent with section 7(a)(2) and the proposed action may incidentally take ESA-listed species. The ITS specifies the impact of any incidental taking of listed species. To minimize such impacts, Reasonable and Prudent Measures (RPMs) and Terms and Conditions to implement the RPMs must be provided. Section 7(b)(4)(C) of the ESA provides that take of ESA-listed marine mammals may be included in the ITS of a biological opinion only if the taking is authorized through an MMPA ITA.
5. Tier 1 surveys are those using an airgun array with a total volume of greater than 1,500 in^3, or those containing more than 12 airguns, as the acoustic source. These surveys are also referred to as deep penetration or high energy surveys.
6. Tier 2 surveys are those using an airgun array with total volume of 1,500 in^3 or less, with 12 or fewer airguns, or a single airgun as the acoustic source. These surveys are also referred to as shallow penetration or low energy surveys.
7. Tier 3 surveys are those using a sparker.
8. "De minimis" here refers to sources considered unlikely to result in the incidental take of protected species. No mitigation protocols are required during surveys using only *de minimis*, or Tier 4, sources. Generally, use of these sources may be considered as not likely to adversely affect ESA-listed species and would not result in incidental take of marine mammals (as defined under the MMPA).
9. The term "small odontocetes" is used herein to define a group of cetacean species for purposes of defining the appropriate pre-start clearance period. Small odontocetes, as defined here, include certain genera of the Family Delphinidae (*Delphinus*, *Lagenodelphis*, *Lagenorhynchus*, *Lissodelphis*, *Stenella*, *Steno*, and *Tursiops*) and members of the Family Phocoenidae (i.e., porpoises). Note that the use of the term "small" in this context is not an absolute reference to size, but is rather used as reference to a group of species that are not typically deep diving.
10. The term "small delphinid" is used herein to define a group of cetacean species for which shutdown requirements are waived. Small delphinids, as defined here, include the same genera of the Family Delphinidae as are included in the definition of the term "small odontocete" above.
11. Pre-start clearance refers to a period of monitoring that may be required in order to ensure that protected species are not present within defined zones prior to activation of the sound source.
12. Ramp-up means the gradual and systematic increase of emitted sound levels from an active acoustic source.
13. Shutdown of the acoustic source means the immediate de-activation of the source, including all individual airgun elements of an array.
14. Shutdown zone (formerly exclusion zone) means the area to be monitored for possible shutdown upon detection of protected species within or entering that zone.

15. Buffer zone means a focal area beyond the standard shutdown zone to be monitored for the presence of protected species.
16. Visual monitoring means the use of trained PSOs (visual PSOs) to systematically scan the ocean surface visually for the presence of protected species and implement the required mitigation procedures. These PSOs must have successfully completed a PSO training program as described below. The focal area for visual observation includes the shutdown zone and buffer zone (when required), but PSOs should periodically scan adjacent waters. Visual monitoring of the shutdown zones and adjacent waters is intended to establish and, when visual conditions allow, maintain zones around the sound source that are clear of protected species. Visual monitoring of the buffer zone (when required) is intended to (1) provide additional protection to protected species that may be in the area during pre-start clearance, (2) aid in establishing and maintaining the shutdown zone by alerting the PSOs and crew of protected species that are outside of, but may approach and enter, the shutdown zone, and (3) enable collection of additional monitoring data to support an understanding of the effects of the activity on protected species.
17. Acoustic monitoring means the use of trained PSOs (acoustic PSOs[8]) to operate PAM equipment to acoustically detect the presence of vocalizing marine mammals. These observers must have successfully completed an acoustic PSO (or PAM operator) training program as described below. Acoustic monitoring involves acoustically detecting vocalizing marine mammals regardless of distance from the source, as localization of animals may not always be possible. Acoustic monitoring is intended to further support visual monitoring in maintaining a shutdown zone around the sound source. In cases where visual monitoring is not effective (e.g., due to weather, nighttime), acoustic monitoring may be used to allow certain activities to occur (or continue), as further detailed below.

A.1.4 General Requirements (Tiers 1–3)

1. A copy of any issued BOEM permit (if applicable) and/or ITA (if required) must be in the possession of the holder, vessel operator, other relevant personnel, the lead PSO (see description below), and any other relevant designees operating under the authority of the permit and/or ITA.
2. The operator must instruct relevant vessel personnel with regard to the authority of the protected species monitoring team, and must ensure that relevant vessel personnel and the protected species monitoring team participate in a joint onboard briefing (hereafter PSO briefing), led by the vessel operator and lead PSO, prior to beginning work to ensure that responsibilities, communication procedures, protected species monitoring protocols, safety and operational procedures, and permit/ITA requirements are clearly understood. This PSO briefing must be repeated when relevant new personnel (e.g., PSOs, acoustic source operator) join the survey operations before work commences.
3. The acoustic source must be deactivated when not acquiring data or preparing to acquire data, except as necessary for testing. Unnecessary use of the acoustic source must be avoided. For use of airgun arrays, notified operational capacity (not including redundant backup airguns) must not be exceeded during the survey, except where unavoidable for source testing and calibration purposes. All occasions where activated volume exceeds

[8] Acoustic PSOs may be referred to as PAM operators.

notified operational capacity must be communicated to the PSO(s) on duty and fully documented. The lead PSO must be granted access to relevant instrumentation documenting acoustic source power and/or operational volume.

A.1.5 Protected Species Observers

NMFS-approved PSOs must be used during Tier 1-3 surveys; Tier 3 surveys funded/conducted by Federal agencies are exempted from the requirements specified here but must designate qualified shipboard personnel to fulfill this role. Minimum PSO qualifications and required equipment for Tier 1-3 survey types (aside from the aforementioned Tier 3 surveys funded/conducted by Federal agencies) are identified here. The approval process includes NMFS' review of PSO qualifications using standardized guidance for PSO requirements. The number and types of PSOs required are included in the survey-specific sections below.

A.1.5.1 Qualifications

1. The operator must use independent, dedicated, trained PSOs, meaning that the PSOs must be employed by a third-party observer provider, must have no tasks other than to conduct observational effort (visual or acoustic[9]), collect data, and communicate with and instruct relevant vessel crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards), and must have successfully completed an approved PSO training course for geophysical surveys appropriate for their designated task (visual or acoustic). Acoustic PSOs are required to complete specialized training for operating PAM systems and should have familiarity with the vessel and associated equipment with which they will be working, to the extent practicable. PSOs can act as acoustic or visual observers (but not simultaneously) as long as they demonstrate that their training and experience are sufficient to perform each task.
2. NMFS maintains a list of currently approved PSOs. PSO names must be provided to NMFS by the operator for review and confirmation of their approval for specific roles prior to commencement of the survey.[10] For prospective PSOs not previously approved, or for PSOs whose approval is not current, NMFS must review and approve PSO qualifications. Resumes should include information related to relevant education, experience, and training, including dates, duration, location, and description of prior PSO experience. Resumes must be accompanied by relevant documentation of successful completion of necessary training.
3. NMFS may approve PSOs as conditional or unconditional. A conditionally-approved PSO may be one who is trained but has not yet attained the requisite tier- and region-specific experience. An unconditionally-approved PSO is one who has attained the necessary experience within the relevant region. For unconditional approval, the PSO must have a minimum of 90 days at sea performing the role (either visual or acoustic) at the particular Tier level (1–3), with the conclusion of the most recent relevant experience not more than 18 months previous.
4. At least one of the visual and two of the acoustic PSOs (if required) aboard the vessel must be unconditionally-approved. One unconditionally-approved visual PSO must be designated as the lead for the entire PSO team. This lead should typically be the PSO

[9] Acoustic PSOs are only required for Tier 1 surveys.
[10] PSO-related inquiries should be directed to *nmfs.psoreview@noaa.gov*.

with the most experience, would coordinate duty schedules and roles for the PSO team[11], and serve as primary point of contact for the vessel operator. To the maximum extent practicable, the duty schedule must be planned such that unconditionally-approved PSOs are on duty with conditionally-approved PSOs.

5. PSOs must successfully complete relevant training, including completion of all required coursework and passing (80 percent or greater) a written and/or oral examination developed for the training program. Training requirements are described in Baker et al. (2013).
    a) PSOs must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or equivalent in the biological sciences, and at least one undergraduate course in math or statistics. The educational requirements may be waived if the PSO has acquired the relevant skills through alternate experience. Requests for such a waiver must be submitted to NMFS and must include written justification. Requests must be granted or denied (with justification) by NMFS within one week of receipt of submitted information. Alternate experience that may be considered includes, but is not limited to (1) secondary education and/or experience comparable to PSO duties; (2) previous work experience conducting academic, commercial, or government-sponsored protected species surveys; (3) previous work experience as a PSO (PSO must be in good standing and demonstrate good performance of PSO duties); and (4) traditional knowledge (in Alaska only).

A.1.5.2 Equipment

The operator is required to:

1. For Tier 1 surveys only (see below), provide PSOs with reticle bigeye binoculars (e.g., 25 x 150; 2.7 view angle; individual ocular focus; height control[12]) of appropriate capability solely for PSO use. These must be pedestal-mounted on the deck at the most appropriate vantage point that provides for optimal sea surface observation, PSO safety, and safe operation of the vessel.
2. Each survey required to have PAM will include a passive acoustic monitoring system that has been verified and tested by the acoustic PSO prior to or during the initiation of survey activities.
3. Work with the selected third-party observer provider to ensure PSOs have all equipment (including backup equipment) needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed marine mammals, and to ensure that PSOs are capable of calibrating equipment as necessary for accurate distance estimates and species identification. Such equipment, at a minimum, must include:
    a) At least one thermal (infrared) imaging device suited for the marine environment (BOEM program specific).
    b) Reticle binoculars (e.g., 7 x 50) of appropriate quality (at least one per PSO, plus backups).
    c) Global Positioning Units (GPS) (at least one plus backups).

[11] Responsibility for coordination of duty schedules and roles may be delegated, such as to a shore-based monitoring coordinator employed by the third-party observer provider.

[12] Equipment specifications are provided as examples with regard to appropriate capability only.

d) Digital cameras with a telephoto lens that is at least 300 mm or equivalent on a full-frame single lens reflex (SLR) (at least one plus backups). The camera or lens should also have an image stabilization system.
e) Equipment necessary for accurate measurement of distances to protected species.
f) Compasses (at least one plus backups).
g) Means of communication among vessel crew and PSOs.
h) Any other tools deemed necessary to adequately and effectively perform PSO tasks.

Equipment specified in (a) through (g) above may be provided by an individual PSO, the third-party observer provider, or the operator, but the latter is responsible for ensuring PSOs have the proper equipment required to perform the duties specified within these protocols.

A.1.6 Tier-Specific Survey Protocols

For purposes of defining mitigation requirements, we differentiate here between requirements for the three survey "tiers" that may reasonably be associated with potential for impacts to protected species (refer to definitions given earlier). Protocols associated with each tier are detailed below.

A.1.6.1 Tier 1 Survey Protocols

Tier 1 survey protocols are generally considered applicable to surveys using airgun arrays with a total volume greater than 1,500 in^3, or with 12 or more airguns. See Table above.

A.1.6.1.1 Visual Monitoring

1. During survey operations (e.g., any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of two PSOs must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).
2. Visual monitoring must begin no less than 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset.
3. Visual PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts, and must conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.
4. PSOs must establish and monitor applicable shutdown and buffer zones (see below). These zones must be based upon the radial distance from the edges of the airgun array (rather than being based on the center of the array or around the vessel itself). During use of the acoustic source (i.e., anytime the acoustic source is active, including ramp-up), occurrence of protected species within the relevant buffer zone (but outside the shutdown zone) should be communicated to the operator to prepare for the potential shutdown of the acoustic source.
5. Three shutdown zones are defined, depending on the species and context. A standard shutdown zone encompassing the area at and below the sea surface out to a radius of 500 meters (m) from the edges of the airgun array (0–500 m) is defined for marine mammals. For special circumstances, the shutdown zone encompasses an extended distance of 1,500 meters (0–1,500 meters, see Table 2). For sea turtles a standard shutdown zone of 150 meters (0–150 meters) from the edges of the airgun array applies.

6. During pre-start clearance monitoring (i.e., before ramp-up begins), the buffer zone acts as an extension of the shutdown zone in that observations of protected species within the buffer zone would also preclude airgun operations from beginning (i.e., ramp-up). Pre-start clearance zones are defined as follows. For all marine mammals (other than special circumstances), the pre-start clearance zone encompasses the area at and below the sea surface from the edge of the 500-meter shutdown zone out to a radius of 1,000 meters from the edges of the airgun array. For sea turtles, the pre-start clearance zone is the same as the shutdown zone (150 m). No buffer is added to the extended distance shutdown zone (1,500 m).
7. Visual PSOs must immediately communicate all observations of marine mammals to the on-duty acoustic PSO(s), including any determination by the PSO regarding species identification, distance, and bearing and the degree of confidence in the determination.
8. Any observations of protected species by crew members aboard any vessel associated with the survey must be relayed to the PSO team.
9. During good conditions (e.g., daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs must conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable.
10. Visual PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (visual and acoustic but not at the same time) may not exceed 12 hours per 24-hour period for any individual PSO.

A.1.6.1.2 Acoustic Monitoring[13]

1. Source vessels must use a towed PAM system at all times[14], which must be monitored by a minimum of one acoustic PSO beginning at least 30 minutes prior to ramp-up, at all times during use of the acoustic source, and until one hour after use of the acoustic source ceases. Remote acoustic PSOs may be utilized in conjunction with at least one vessel-based, unconditionally approved acoustic PSO.
2. Acoustic PSOs must immediately communicate all detections of marine mammals to visual PSOs (when visual PSOs are on duty), including any determination by the PSO regarding species identification, distance and bearing, and the degree of confidence in the determination.
3. Acoustic PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (acoustic and visual but not at the same time) may not exceed 12 hours per 24-hour period for any individual PSO.
4. Survey activity may continue for 30 minutes when the PAM system malfunctions or is damaged, while the PAM operator diagnoses the issue. If the diagnosis indicates that the PAM system must be repaired to solve the problem, operations may continue for an

[13] See PAM Requirements below for further detail.

[14] PAM may not be required when certain circumstances are present. For example, in the GULF OF AMERICA, use of towed PAM is not required for surveys operating in water depths shallower than 100 meters, and PAM is not required in Cook Inlet, Alaska.

additional five hours without acoustic monitoring during daylight hours only under the following conditions:

a) Sea state is less than or equal to BSS 4;
b) No marine mammals (excluding delphinids) detected solely by PAM in the applicable shutdown zone in the previous two hours;
c) NMFS and BSEE[15] are notified via email as soon as practicable with the time and location in which operations began occurring without an active PAM system; and
d) Operations with an active acoustic source, but without an operating PAM system, do not exceed a cumulative total of ten hours in any 24-hour period.

A.1.6.1.3 Pre-start clearance and Ramp-up

A ramp-up procedure, involving a step-wise increase in the number of airguns firing and total active array volume until all operational airguns are activated and the full volume is achieved, is required at all times as part of the activation of the acoustic source. A 30-minute pre-start clearance observation period must occur prior to the start of ramp-up. The intent of pre-start clearance observation (30 minutes) is to ensure no protected species are within the shutdown zones, and buffer zone if applicable, prior to the beginning of ramp-up. The only time detections of protected species in the buffer zone would prevent operations is during pre-start clearance (i.e., the beginning of ramp-up). The intent of ramp-up is to warn protected species of pending operations and to allow sufficient time for those animals to leave the immediate vicinity. All operators must adhere to the following pre-start clearance and ramp-up requirements:

1. The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the shutdown and buffer zones for 30 minutes prior to the initiation of ramp-up (pre-start clearance). During this 30 minute pre-start clearance period the entire applicable shutdown and buffer zones must be visible, except as indicated in #7 below.
2. Ramp-ups must be scheduled so as to minimize the time spent with the source activated prior to the start of acquisition.
3. A visual PSO conducting pre-start clearance observations must be notified again immediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed.
4. Any PSO on duty has the authority to delay the start of survey operations if a protected species is detected within the applicable pre-start clearance zone.
5. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that mitigation commands are conveyed swiftly while allowing PSOs to maintain watch.
6. When both visual and acoustic PSOs are on duty, all detections of marine mammals must be immediately communicated to the entire on-duty PSO team for potential verification of visual observations by the acoustic PSO or of acoustic detections by visual PSOs.
7. Ramp-up may not be initiated if any protected species is within the applicable shutdown or buffer zone. If a protected species is observed within the applicable shutdown zone or the buffer zone during the 30 minute pre-start clearance period, ramp-up may not begin

[15] Notifications to BSEE required for survey activities related to oil and gas, renewable energy, or marine minerals programs in Federal waters.

until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species).

8. Ramp-up must begin by activating a single airgun of the smallest volume in the array and must continue in stages by doubling the number of active elements at the commencement of each stage, with each stage of approximately the same duration. Total ramp-up duration must not be less than 20 minutes. The operator must provide information to the PSO documenting appropriate procedures were followed.
9. PSOs must monitor the shutdown and buffer zones 30 minutes before and during ramp-up, and ramp-up must cease and the source must be shut down upon detection of a protected species within the applicable shutdown zone. Once ramp-up has begun, detections of protected species within the buffer zone do not require shutdown, but such detection must be recorded and communicated to the operator to prepare for potential shutdown.
10. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate acoustic monitoring has occurred with no detections of protected species within the pre-start clearance zone in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.
11. If the acoustic source is shut down for brief periods (i.e., less than 30 minutes) for reasons other than implementation of prescribed mitigation (e.g., mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual and/or acoustic observation and no visual or acoustic detections of protected species have occurred within the pre-start clearance zone. For any longer shutdown, pre-start clearance observation and ramp-up are required.
12. Testing of the acoustic source involving all elements requires ramp-up. Testing limited to individual source elements or strings does not require ramp-up but does require a 30-minute pre-start clearance period.

A.1.6.1.4 Shutdown

All operators must adhere to the following shutdown requirements:

1. Any PSO on duty has the authority to call for shutdown of the acoustic source if a protected species is detected within the applicable shutdown zone.
2. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch.
3. When both visual and acoustic PSOs are on duty, all detections of marine mammals must be immediately communicated to the entire on-duty PSO team for potential verification of visual observations by the acoustic PSO or of acoustic detections by visual PSOs.
4. When the airgun array is active (i.e., anytime one or more airguns is active, including during ramp-up) and (1) a protected species appears within or enters the applicable shutdown zone and/or (2) a marine mammal (excluding delphinids) is detected acoustically and localized within the applicable shutdown zone, the acoustic source must be shut down. When shutdown is instructed by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation.

5. The shutdown requirement is waived for small delphinids[16] and pinnipeds[17].
   a) If a delphinid (individual belonging to the indicated genera of the Family Delphinidae) or pinniped is visually detected within the shutdown zone, no shutdown is required unless the PSO confirms the individual to be of a genus other than those listed, in which case a shutdown is required. Acoustic detection of delphinids does not require shutdown.
6. If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger shutdown zone), PSOs may use best professional judgment in making the decision to call for a shutdown.
7. Upon implementation of shutdown, the source may be reactivated after the protected species has been observed exiting the applicable shutdown zone (i.e., animal is not required to fully exit the buffer zone where applicable) or following a clearance period (15 minutes for small odontocetes and 30 minutes for all other species) with no further detection of the protected species. For sea turtles observed in the shutdown zone, a shutdown not requiring ramp-up (i.e., a "pause") is to be implemented until the sea turtle is no longer observed in the shutdown zone.

A.1.6.2 Tier 2 Survey Protocols

Tier 2 survey protocols are generally considered applicable to surveys using airgun arrays of 1,500 in^3 volume or smaller and 12 airguns or fewer, or surveys using single airguns. See Table above.

A.1.6.2.1 Visual Monitoring

1. During survey operations (e.g., any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of two PSOs must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).
2. Visual monitoring must begin no less than 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset.
3. Visual PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts, and must conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.
4. PSOs must establish and monitor applicable shutdown and buffer zones (see below). These zones must be based upon the radial distance from the edges of the airgun array (or single airgun) (rather than being based on the center of the array or around the vessel itself). During use of the acoustic source (i.e., anytime the acoustic source is active, including ramp-up), occurrence of protected species within the relevant buffer zone (but

[16] Applicable genera will be specific to the region, and include the following: *Delphinus*, *Lagenodelphis*, *Lagenorhynchus*, *Lissodelphis*, *Stenella*, *Steno*, and *Tursiops*. This list may be revised as taxonomy changes.
[17] Waiver for pinnipeds may not be applicable for surveys that may affect ESA-listed pinnipeds.

outside the shutdown zone) should be communicated to the operator to prepare for the potential shutdown of the acoustic source.

5. Two shutdown zones are defined, depending on the species and context. Here, a standard shutdown zone encompassing the area at and below the sea surface out to a radius of 100 meters from the edges of the airgun array (0–100 meters) is defined for marine mammals and sea turtles. For special circumstances, the shutdown zone encompasses an extended distance of 500 meters (0-500 meters, see Table 2).
6. During pre-start clearance monitoring (i.e., before ramp-up begins), the buffer zone also acts as an extension of the shutdown zone in that observations of protected species within the buffer zone would also preclude airgun operations from beginning (i.e., ramp-up). Pre-start clearance zones are defined as follows. For all marine mammals (other than special circumstances), the pre-start clearance zone encompasses the area at and below the sea surface from the edge of the 100-meter shutdown zone out to a radius of 200 meters from the edges of the airgun array (or single airgun). For sea turtles, the pre-start clearance zone encompasses the area at and below the sea surface from the edge of the 100-meter shutdown zone. No buffer is added to the extended distance shutdown zone (500 m).
7. Any observations of protected species by crew members aboard any vessel associated with the survey must be relayed to the PSO team.
8. During good conditions (e.g., daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs must conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable.
9. Visual PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period.

A.1.6.2.2 Pre-start Clearance and Ramp-up

A ramp-up procedure, involving a step-wise increase in the number of airguns firing and total active array volume until all operational airguns are activated and the full volume is achieved, is required at all times as part of the activation of the acoustic source. (Ramp-up is not relevant for surveys using a single airgun as the acoustic source.) A 30-minute pre-start clearance observation period must occur prior to the start of ramp-up. The intent of pre-start clearance observation (30 minutes) is to ensure no protected species are within the shutdown zones, and buffer zone if applicable, prior to the beginning of ramp-up. The only time detections of protected species in the buffer zone would prevent operations is during pre-start clearance (i.e., the beginning of ramp-up or single airgun testing). The intent of ramp-up is to warn protected species of pending operations and to allow sufficient time for those animals to leave the immediate vicinity. All operators must adhere to the following pre-start clearance and ramp-up requirements:

1. The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the shutdown and buffer zones for 30 minutes prior to the initiation of ramp-up (pre-start clearance). During this 30-minute pre-start clearance period the entire applicable shutdown and buffer zones must be visible, except as indicated below (see item **7.**).

2. Ramp-ups must be scheduled so as to minimize the time spent with the source activated prior to the start of acquisition.
3. A visual PSO conducting pre-start clearance observations must be notified again immediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed.
4. Any PSO on duty has the authority to delay the start of survey operations if a protected species is detected within the applicable pre-start clearance zone.
5. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that mitigation commands are conveyed swiftly while allowing PSOs to maintain watch.
6. Ramp-up may not be initiated if any protected species is within the applicable shutdown or buffer zone. If a protected species is observed within the applicable shutdown zone or the buffer zone during the 30-minute pre-start clearance period, ramp-up may not begin until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species).
7. Ramp-up must begin by activating a single airgun of the smallest volume in the array and must continue in stages by doubling the number of active elements at the commencement of each stage, with each stage of approximately the same duration. Total ramp-up duration will be dependent on the number of array elements. The operator must provide information to the PSO documenting appropriate procedures were followed.
8. PSOs must monitor the shutdown and buffer zones 30 minutes before and during ramp-up, and ramp-up must cease and the source must be shut down upon observation of a protected species within the applicable shutdown zone. Once ramp-up has begun, observations of protected species within the buffer zone do not require shutdown, but such observation must be recorded and communicated to the operator to prepare for potential shutdown.
9. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate visual monitoring has occurred with no detections of protected species in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.
10. If the acoustic source is shut down for brief periods (i.e., less than 30 minutes) for reasons other than implementation of prescribed mitigation (e.g., mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual observation and no detections of protected species have occurred within the applicable shutdown zone. For any longer shutdown, pre-start clearance observation and ramp-up are required.
11. Testing of the acoustic source involving all elements requires ramp-up. Testing limited to individual source elements or strings does not require ramp-up but does require a 30-minute pre-start clearance period.

A.1.6.2.3 Shutdown

All operators must adhere to the following shutdown requirements:

1. Any PSO on duty has the authority to call for shutdown of the acoustic source if a protected species is detected within the applicable shutdown zone.

2. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch.
3. When the acoustic source is active (i.e., anytime one or more airguns is active, including during ramp-up) and a protected species appears within or enters the applicable shutdown zone, the acoustic source must be shut down. When shutdown is instructed by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation.
4. The shutdown requirement is waived for small delphinids and pinnipeds.
    a) If a delphinid (individual belonging to the indicated genera of the Family Delphinidae) or pinniped is visually detected within the shutdown zone, no shutdown is required unless the PSO confirms the individual to be of a genus other than those listed, in which case a shutdown is required.
5. If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger shutdown zone), PSOs may use best professional judgment in making the decision to call for a shutdown.
6. Upon implementation of shutdown, the source may be reactivated after the protected species has been observed exiting the applicable shutdown zone (i.e., animal is not required to fully exit the buffer zone where applicable) or following a clearance period (15 minutes for small odontocetes and 30 minutes for all other species) with no further detection of the marine mammal(s). For sea turtles observed in the shutdown zone, a shutdown not requiring ramp-up (i.e., a "pause") is to be implemented until the sea turtle is no longer observed in the shutdown zone.

A.1.6.3 Tier 3 Survey Protocols

Tier 3 survey protocols are generally considered applicable to surveys using sparkers and some other sources that have not yet been fully evaluated to the point that a final determination has been made about their tiering (e.g., 1- and 2-plate boomers and bubble guns). Operators may elect to implement Tier 3 mitigation protocols to avoid potential take of marine mammals, or may instead elect to request an incidental take authorization under the MMPA in lieu of implementing these protocols. See Table above.

A.1.6.3.1 Visual Monitoring

1. During survey operations (e.g., any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of one PSO must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).
2. Qualified shipboard personnel may be designated by the operator to fulfill these roles during Federally funded/conducted research. PSOs must be NMFS-approved for other Tier 3 survey effort.
3. Visual monitoring must begin no less than 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset.
4. Visual PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts and must conduct visual observations using

binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.

5. PSOs must establish and monitor applicable shutdown zones (see below). These zones must be based upon the radial distance from the acoustic source (rather than being based around the vessel itself).
6. Two shutdown zones are defined, depending on the species and context. Here, a standard shutdown zone encompassing the area at and below the sea surface out to a radius of 100 meters from the sound source (0–100 meters) is defined for marine mammals and sea turtles. For special circumstances, the shutdown zone encompasses an extended distance of 500 meters (0-500 meters, see Table 2).
7. Any observations of protected species by crew members aboard any vessel associated with the survey must be relayed to the PSO team.
8. Visual PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period.

A.1.6.3.2 Pre-start Clearance and Ramp-up

A ramp-up procedure, involving a gradual increase in source level output, is required at all times as part of the activation of the acoustic source when technically feasible. Operators should ramp up sources to half power for 5 minutes and then proceed to full power. A 30-minute pre-start clearance observation period must occur prior to the start of ramp-up. The intent of pre-start clearance observation (30 minutes) is to ensure no protected species are within the shutdown zones prior to the beginning of ramp-up. The intent of ramp-up is to warn protected species of pending operations and to allow sufficient time for those animals to leave the immediate vicinity. All operators must adhere to the following pre-start clearance and ramp-up requirements:

1. The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the shutdown zones for 30 minutes prior to the initiation of ramp-up (pre-start clearance). During this 30-minute pre-start clearance period the entire applicable shutdown zone must be visible, except as indicated below (see #7 below).
2. Ramp-ups must be scheduled so as to minimize the time spent with the source activated.
3. A visual PSO conducting pre-start clearance observations must be notified again immediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed.
4. Any PSO on duty has the authority to delay the start of survey operations if a protected species is detected within the applicable pre-start clearance zone.
5. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that mitigation commands are conveyed swiftly while allowing PSOs to maintain watch.
6. Ramp-up may not be initiated if any protected species is within the applicable shutdown zone. If a protected species is observed within the applicable shutdown zone during the 30-minute pre-start clearance period, ramp-up may not begin until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species).

7. PSOs must monitor the shutdown zones 30 minutes before and during ramp-up, and ramp-up must cease and the source must be shut down upon observation of a protected species within the applicable shutdown zone.
8. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate visual monitoring has occurred with no detections of protected species in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.
9. If the acoustic source is shut down for brief periods (i.e., less than 30 minutes) for reasons other than implementation of prescribed mitigation (e.g., mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual observation and no detections of protected species have occurred within the applicable shutdown zone. For any longer shutdown, pre-start clearance observation and ramp-up are required.

A.1.6.3.3 Shutdown

All operators must adhere to the following shutdown requirements:

1. Any PSO on duty has the authority to call for shutdown of the acoustic source if a protected species is detected within the applicable shutdown zone.
2. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch.
3. When the acoustic source is active and a protected species appears within or enters the applicable shutdown zone, the acoustic source must be shut down. When shutdown is instructed by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation.
4. The shutdown requirement is waived for small delphinids and pinnipeds.
   a) If a delphinid (individual belonging to the indicated genera of the Family Delphinidae) or pinniped is visually detected within the shutdown zone, no shutdown is required unless the PSO confirms the individual to be of a genus other than those listed, in which case a shutdown is required.
5. If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger shutdown zone), PSOs may use best professional judgment in making the decision to call for a shutdown.
6. Upon implementation of shutdown, the source may be reactivated after the protected species has been observed exiting the applicable shutdown zone or following a clearance period (15 minutes for small odontocetes and 30 minutes for all other species) with no further detection of the protected species. For sea turtles observed in the shutdown zone, a voluntary shutdown not requiring ramp-up (i.e., a “pause”) may be implemented until the sea turtle is no longer observed in the shutdown zone.

A.1.7 Additional Standard Protocols

The following protocols are required when relevant, regardless of tier.

A.1.7.1 Entanglement and Entrainment Risk Reduction

All lines (rope, chain, cable, etc.) associated with geophysical surveys should be stiff, taut, and non-looping to the extent practicable to avoid possible entanglement and entrainment risk. When feasible, flexible lines such as nylon or polypropylene that could loop or tangle protected species should be enclosed in a sleeve to add rigidity and prevent looping or tangling. No excess underwater line is allowed. Equipment, especially towed apparatuses (e.g., tail buoys), must be operated in a way as to prevent entrainment of sea turtles or other protected species to the extent feasible.

A.1.7.2 Nodal Survey Requirements

To avoid the risk of entanglement, BOEM permit-holders conducting surveys using ocean-bottom nodes or similar gear must:

1. Use negatively buoyant coated wire-core tether cable;
2. Ensure all cables/lines are designed to be rigid;
3. Retrieve all lines immediately following completion of the survey; and
4. Attach acoustic pingers directly to the coated tether cable; acoustic releases should not be used.

A.1.8 Vessel Strike Avoidance Requirements

Crew and supply vessel personnel should use an appropriate reference guide that includes identifying information on all marine mammals, sea turtles, and other marine aquatic protected species that may be encountered. Vessel operators must comply with the below measures except under extraordinary circumstances when the **safety of the vessel or crew is in doubt or the safety of life at sea is in question**. These requirements do not apply in any case where compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of the restriction, cannot comply (e.g., having an array).

1. Vessel operators and crews must maintain a vigilant watch for all protected species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any protected species. A single protected species at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised. A visual observer aboard the vessel must monitor a vessel strike avoidance zone around the vessel (species-specific distances detailed below). Visual observers monitoring the vessel strike avoidance zone may be third-party observers (i.e., PSOs) or crew members, but crew members responsible for these duties must be provided sufficient training[18] to 1) distinguish protected species from other phenomena and 2) broadly to identify a marine mammal as a right whale, other whale (defined in this context as sperm whales or baleen whales other than right whales), or other marine mammals.
2. All vessels (e.g., source vessels, chase vessels, supply vessels), regardless of size, must observe a 10-knot speed restriction in specific areas designated by NMFS for the protection of North Atlantic right whales from vessel strikes. These include all Seasonal

[18] For example, see the U.S. Navy's Marine Species Awareness Training: https://www.youtube.com/watch?v=KKo3r1yVBBA

Management Areas (SMA) (when in effect) and any dynamic management areas (DMA) (when in effect). See www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales for specific detail regarding these areas.

3. In the Gulf of America, all vessels (e.g., source vessels, chase vessels, supply vessels), regardless of size, must observe a 10-knot speed restriction in the 2020 Rice's Whale Area (2020 RWA), as identified in the Biological and Conference Opinion on Bureau of Ocean Energy Management's Oil and Gas Program Activities in the Gulf of America, which is the area from 100- to 400- meter isobaths from 87.5º W to 27.5º N plus an additional 10 km around that area.
4. In the Gulf of Alaska and Bering Sea, all vessels (e.g., source vessels, chase vessels, supply vessels), regardless of size, must observe a 10-knot speed restriction while within designated North Pacific right whale critical habitat.
5. Vessel speeds must also be reduced to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near a vessel.
6. All vessels must maintain a minimum separation distance of 500 m from right whales. If a right whale is sighted within the relevant separation distance, the vessel must steer a course away at 10 knots or less until the 500-m separation distance has been established. If a whale is observed but cannot be confirmed as a species other than a right whale, the vessel operator must assume that it is a right whale and take appropriate action. In the Gulf of America, this requirement is expanded to include any species of baleen whale.
7. All vessels must maintain a minimum separation distance of 100 m from sperm whales and all other baleen whales.
8. All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other protected species, with an understanding that at times this may not be possible (e.g., for animals that approach the vessel).
9. When protected species are sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area, reduce speed and shift the engine to neutral). This does not apply to any vessel towing gear or any vessel that is navigationally constrained.

A.1.9 Data Collection[19]

PSOs must use standardized electronic data forms to record data. PSOs must record detailed information about any implementation of mitigation requirements, including the distance of protected species to the acoustic source and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, and if shutdown was implemented, the length of time before any subsequent ramp-up of the acoustic source. If required mitigation was not implemented, PSOs should record a description of the circumstances. At a minimum, the following information must be recorded:

[19] Data collection and reporting (see below) requirements reference requirements that may be transmitted to an operator via permit, ITA, ITS, and/or lease stipulations. Outside of these contexts, data collection and reporting may not be required.

1. Vessel names (source vessel and other vessels associated with survey), vessel size and type, maximum speed capability of vessel[20];
2. Dates of departures and returns to port with port name;
3. PSO names and affiliations;
4. Date and participants of PSO briefings (as discussed in **A.1.4. General Requirements**, item 2.);
5. Visual monitoring equipment used;
6. PSO location on vessel and height of observation location above water surface;
7. Dates and times (Greenwich Mean Time) of survey on/off effort and times corresponding with PSO on/off effort;
8. Vessel location (decimal degrees) when survey effort begins and ends and vessel location at beginning and end of visual PSO duty shifts;
9. Vessel location at 30-second intervals if obtainable from data collection software, otherwise at practical regular interval;
10. Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any change;
11. Water depth (if obtainable from data collection software);
12. Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including BSS and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon;
13. Factors that may contribute to impaired observations during each PSO shift change or as needed as environmental conditions change (e.g., vessel traffic, equipment malfunctions);
14. Survey activity information (and changes thereof), such as acoustic source power output while in operation, number and volume of airguns operating in an array, tow depth of an acoustic source, and any other notes of significance (i.e., pre-start clearance, ramp-up, shutdown, testing, shooting, ramp-up completion, end of operations, streamers, etc.); and
15. Upon visual observation of any protected species, the following information:
    a) Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);
    b) Vessel/platform/survey activity at time of sighting (e.g., deploying, recovering, testing, shooting, data acquisition, other);
    c) PSO who sighted the animal;
    d) Time of sighting;
    e) Initial detection method;
    f) Sightings cue;
    g) Vessel location at time of sighting (decimal degrees);
    h) Water depth;
    i) Direction of vessel's travel (compass direction);
    j) Speed of the vessel(s) from which the observation was made;
    k) Direction of animal's travel relative to the vessel;
    l) Identification of the animal (e.g., genus/species, lowest possible taxonomic level, or unidentified), and the composition of the group if there is a mix of species;
    m) Species reliability (an indicator of confidence in identification);
    n) Estimated distance to the animal and method of estimating distance;

[20] Data collection requirements referencing vessels and related data are not applicable to surveys conducted with a stationary acoustic source, e.g., 0-offset vertical seismic profiling.

o) Estimated number of animals (high/low/best);
p) Estimated number of animals by cohort (e.g., adults, yearlings, juveniles, calves, group composition);
q) Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics);
r) Detailed behavior observations (e.g., number of blows/breaths, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior before and after point of closest approach);
s) Animal's closest point of approach and/or closest distance from any element of the acoustic source; and
t) Description of any actions implemented in response to the sighting (e.g., delays, shutdown, ramp-up) and time and location of the action.

16. If a marine mammal is detected using a PAM system, the following additional information should be recorded:
    u) An acoustic encounter identification number, and whether the detection was linked with a visual sighting;
    v) Date and time when first and last heard;
    w) Types and nature of sounds heard (e.g., clicks, whistles, creaks, burst pulses, continuous, sporadic, strength of signal);
    x) Any additional information recorded such as water depth of the hydrophone array, bearing of the animal to the vessel (if determinable), species or taxonomic group (if determinable), spectrogram screenshot, and any other notable information.

A.1.10 Reporting[21]

1. The operator must submit a draft comprehensive report (see ITA and/or permit for contact information) on all activities and monitoring results within 90 days of the completion of the survey or expiration of the ITA and/or permit, whichever comes sooner. The report must describe all activities conducted and sightings of protected species, must provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates and locations of survey operations and all protected species sightings (dates, times, locations, activities, associated survey activities). The draft report must also include geo-referenced time-stamped vessel tracklines for all time periods during which acoustic sources were operating. Tracklines should include points recording any change in acoustic source status (e.g., when the sources began operating, when they were turned off, or when they changed operational status such as from full array to single airgun or vice versa). GIS files must be provided in ESRI shapefile format and include the UTC date and time, latitude in decimal degrees, and longitude in decimal degrees. All coordinates must be referenced to the WGS84 geographic coordinate system. In addition to the report, all raw observational data must be made available. The report must summarize the information submitted in interim monthly reports (if required) as well as additional data collected as described above in *Data Collection*. A final report must be submitted within 30 days following resolution of any comments on the draft report.

[21] Reporting as required through relevant regulatory documents issued by NMFS and/or BOEM.

2. For operations requiring the use of PAM, the report must include a validation document concerning the use of PAM, which should include necessary noise validation diagrams and demonstrate whether background noise levels on the PAM deployment limited achievement of the planned detection goals. Copies of any vessel self-noise assessment reports must be included with the report. See **PAM Requirements** below.
3. Reporting injured or dead protected species: Sightings of any injured or dead protected species must be reported to NMFS, regardless of the cause of injury or death.

For reporting dead or injured marine mammals, refer to the reporting requirements described below. For reporting other dead or injured protected species, refer to NMFS' website at https://www.fisheries.noaa.gov/report.

In the event that personnel involved in the survey activities discover an injured or dead marine mammal, the incident must be reported to NMFS and to the applicable regional stranding network(s) as soon as feasible. The report must include the following information:

a) Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
b) Species identification (if known) or description of the animal(s) involved;
c) Condition of the animal(s) (including carcass condition if the animal is dead);
d) Observed behaviors of the animal(s), if alive;
e) If available, photographs or video footage of the animal(s); and
f) General circumstances under which the animal was discovered.

In the event of a ship strike of a marine mammal by any vessel involved in the survey activities, the incident must be reported to NMFS and to the regional stranding network(s) as soon as feasible. The report must include the following information:

g) Time, date, and location (latitude/longitude) of the incident;
h) Species identification (if known) or description of the animal(s) involved;
i) Vessel's speed during and leading up to the incident;
j) Vessel's course/heading and what operations were being conducted (if applicable);
k) Status of all sound sources in use;
l) Description of any avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike;
m) Environmental conditions (e.g., wind speed and direction, BSS, cloud cover, visibility) immediately preceding the strike;
n) Estimated size and length of animal that was struck;
o) Description of the behavior of the marine mammal immediately preceding and/or following the strike;
p) If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;
q) Estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and
r) To the extent practicable, photographs or video footage of the animal(s).

A.1.10.1 Marine Mammal Stranding

Marine mammals involved in live stranding events (or near-shore atypical milling) are considered especially susceptible to the effects of additional stressors. The shutdown procedures below are not related to the investigation of the cause of any such stranding and their

implementation is not intended to imply that the activity of the authorized entity is the cause of the stranding. Rather, shutdown procedures are intended to protect marine mammals exhibiting indicators of distress by minimizing their exposure to possible additional stressors, regardless of the factors that contributed to the stranding.

In the event of a live stranding (or near-shore atypical milling) event within 50 km of the survey operations, where the NMFS stranding network is engaged in herding or other interventions to return animals to the water, NMFS will advise of the need to implement shutdown procedures for all active acoustic sources operating within 50 km of the stranding. Shutdown procedures for live stranding or milling marine mammals include the following:

1. If at any time, the marine mammal(s) die or are euthanized, or if herding/intervention efforts are stopped, NMFS will advise that the shutdown around the animals' location is no longer needed.
2. Otherwise, shutdown procedures will remain in effect until NMFS determines and advises that all live animals involved have left the area (either of their own volition or following an intervention).
3. If further observations of the marine mammals indicate the potential for re-stranding, additional coordination will be required to determine what measures are necessary to minimize that likelihood (e.g., extending the shutdown or moving operations farther away) and to implement those measures as appropriate.

If NMFS determines that the circumstances of any marine mammal stranding found in the vicinity of the activity suggest investigation of the association with survey activities is warranted, and an investigation into the stranding is being pursued, NMFS will submit a written request indicating that the following initial available information must be provided as soon as possible, but no later than 7 business days after the request for information:

1. Status of all sound source use in the 48 hours preceding the estimated time of stranding and within 50 km of the discovery/notification of the stranding by NMFS; and
2. If available, description of the behavior of any marine mammal(s) observed preceding (i.e., within 48 hours and 50 km) and immediately after the discovery of the stranding.
3. In the event that the investigation is still inconclusive, the investigation of the association of the survey activities is still warranted, and the investigation is still being pursued, NMFS may provide additional information requests, in writing, regarding the nature and location of survey operations prior to the time period above.

A.1.11 References

Baker K, Epperson D, Gitschlag G, Goldstein H, Lewandowski J, Skrupky K, et al. 2013. National standards for a protected species observer and data management program: a model using geological and geophysical surveys. NOAA Technical Memorandum NMFS-OPR-49, National Marine Fisheries Service.

Table 2. Extended Distance, Shutdown Zone, Species and Context.[1]

Species and/or Group	Shutdown Zone (meters) Tier 1	Shutdown Zone (meters) Tier 2/3
North Atlantic right whale (*Eubalaena glacialis*)	0-1,500	0-500
North Pacific right whale (*Eubalaena japonica*)	0-1,500	0-500
Rice's whale (*Balaenoptera ricei*)	0–1,500	0–500
Beaked whales (*Ziphiidae spp.*)	0–1,500	0–500
Dwarf and pygmy sperm whales (*Kogia spp.*)	0–1,500	0–500
Southern resident killer whale (*Orcinus orca*)	0-1,500	0-500
Cook Inlet beluga whales (*Delphinapterus leucas*)	0-1,500	0-500
Large whale with calf[2]	0–1,500	0–500
Groups (6+) of large whales	0–1,500	0–500

[1] This list is not exhaustive. Other species or circumstances may warrant use of the extended shutdown zone in certain situations.

[2] "Large whale" is defined as a sperm whale or any baleen whale; calf defined as an animal less than two -thirds the body size of an adult observed to be in close association with an adult.

PAM Requirements

Towed PAM systems should consist of hardware (e.g., hydrophone array, recorder, cables) and software (e.g., data processing program and algorithm). Some type of automated detection software must be used. Acoustic signals are processed for output to the PAM operator with software designed to detect marine mammal vocalizations. Current PAM technology has some limitations (e.g., limited directional capabilities and detection range, detection of signals due to vessel and flow noise, low accuracy in localization) and there are no formal guidelines currently in place regarding specifications for hardware, software, or operator training requirements.

NMFS' requirement to use PAM refers to the use of calibrated hydrophone arrays with full system redundancy to detect, identify, and estimate distance and bearing to vocalizing cetaceans, to the extent possible. With regard to calibration, the PAM system should have at least one calibrated hydrophone, sufficient for determining whether background noise levels on the towed PAM system are sufficiently low to meet performance expectations. Additionally, if multiple hydrophone types occur in a system (i.e., monitor different bandwidths), then one hydrophone from each such type must be calibrated, and whenever sets of hydrophones (of the same type) are sufficiently spatially separated such that they would be expected to experience ambient noise environments that differ by 6 dB or more across any integrated species cluster bandwidth, then at least one hydrophone from each set should be calibrated. In terms of calibrating the rest of the system, the signal route to the data recorder and monitoring software must be calibrated so that the binary amplitude data written to hard disk can be converted into units of acoustic pressure. The configuration of hardware should be coupled with appropriate software to aid monitoring and listening by a PAM operator skilled in bioacoustics analysis and computer system specifications capable of running appropriate software. GPS data acquisition is recommended for all PAM operations. If the PAM plan (see below) claims an ability to localize, every localization estimate obtained from a PAM system must be accompanied by some estimate of uncertainty and ambiguity.

In the absence of formal standards addressing any of these three facets of PAM technology, all Tier 1 survey operators must provide a PAM plan including description of the hardware and software proposed for use. Following the survey, a validation document must be submitted as part of required reporting (see below). The purpose of the PAM plan is to demonstrate that the PAM system being proposed for use is adequate for addressing the mitigation goals. The plan must include methodology and documentation requirements for all stages of the project. As recommended by Thode et al. (2017), PAM plans should, at minimum, adequately address and describe (1) the hardware and software planned for use, including a hardware performance diagram demonstrating that the sensitivity and dynamic range of the hardware is appropriate for the operation; (2) deployment methodology, including target depth/tow distance; (3) definitions of expected operational conditions, used to summarize background noise statistics; (4) proposed detection-classification-localization methodology, including anticipated species clusters (using a cluster definition table), target minimum detection range for each cluster, and the proposed localization method for each cluster; (5) operation plans, including the background noise sampling schedule; (6) array design considerations for noise abatement; and (7) cluster-specific details regarding which real-time displays and automated detectors the operator would monitor. Where relevant, the plan should address the potential for PAM deployment on a receiver vessel or other associated vessel separate from the acoustic source.

Species clusters – The plan must list the species of concern during the upcoming operation. While some species may be listed individually for special attention, in many circumstances it is

expected that for the purposes of a PAM operation multiple species can be grouped together in a "cluster" that shares similar acoustic and behavioral characteristics (e.g., sperm whale, beaked whales). The plan must specify a target minimum detection (and possibly localization) range for each species cluster used in the document. Different ranges can be defined for different operational conditions. The PAM system may exceed this detection range, but must always be capable of achieving this minimum detection range.

Hardware and software specifications – The plan must have a section dedicated to demonstrating that the PAM hardware is sensitive enough to detect signals from the species clusters of concern at the target minimum detection ranges specified. The plan should include a hardware specification table and hardware performance diagram. The diagram will show the sensitivity and bandwidth of the combined array hardware and recording system, as well as the received levels required for a given species cluster to be detectable at the target minimum detection range. The overall goal of the diagram is to visually demonstrate that the planned PAM array/recording system would have the capability of detecting various species clusters at required target ranges, provided that background noise levels are not an issue.

Operational conditions – The validation document should demonstrate whether the PAM system has been compromised by excessive background noise, whether that noise is electronic interference, flow, platform, or environmental noise. Therefore, the plan must define a set of "operational conditions" under which detection statistics (background noise profiles) will be categorized during the project. Operational conditions consist of three categories: platform activity and status, mitigation (activity) status, and environmental status.

Operating procedures – The plan must describe the level of effort that is reasonably expected to occur for the monitoring requirements. For every species cluster, the plan should detail which part of the PAM display would be used for detecting that cluster. For example, if a scrolling spectrogram display is being used for a species cluster, then the spectrogram's fast Fourier transform sample size, frequency bandwidth, and their refresh rate must be specified. Similar details would be provided for other software tools, such as click detectors and other automated detectors and classifiers. The plan must also provide a screenshot of the expected monitor display.

In coordination with vessel crew, the lead PAM operator will be responsible for deployment, retrieval, and testing and optimization of the hydrophone array. While on duty, the PAM operator must diligently listen to received signals and/or monitoring display screens in order to detect vocalizing cetaceans, except as required to attend to PAM equipment. The PAM operator must use appropriate sample analysis and filtering techniques and must report all cetacean detections. While not required prior to development of formal standards for PAM use, NMFS recommends that vessel self-noise assessments be undertaken during mobilization in order to optimize PAM array configuration according to the specific noise characteristics of the vessel and equipment involved, and to refine expectations for distance/bearing estimations for cetacean species during the survey. Copies of any vessel self-noise assessment reports must be included with the summary trip report.

This report must also include a validation document concerning the use of PAM, which should include necessary noise validation diagrams (NVD) and demonstrate whether background noise levels on the PAM deployment limited achievement of the planned detection goals. A separate diagram must be produced for every background noise percentile chosen for analysis. Background noise percentiles, rather than a simple average of the data, are required because the highly non-stationary characteristics of many background noise profiles cannot be described by

a simple mean. For example, data collected during a seismic survey will have short periods of time containing high-intensity pulses and longer periods of time dominated by lower levels of reverberation. Taking a simple mean of these noise data would imply background noise levels substantially higher than what may actually have been present between seismic pulses. A validation report would typically contain between three to five diagrams, depending on the number of percentiles analyzed. At a minimum, the validation report should contain three diagrams that include the 50th percentile (median), 5th percentile, and 95th percentile. The 25th percentile and 75th percentile may also be included. In each percentile diagram, a separate background noise curve must be drawn for each defined operational condition. In general, the NVD should be generated from the data stream that is used for detecting the presence of marine mammal signals. For example, if beamforming or some other form of array gain has been applied before invoking signal detection, then the NVD should be generated using the beamformed data, and not omnidirectional data. The complete set of NVDs, one for each percentile of interest, combined with a table that lists the fraction of time the activity was in each operational state, provides a means of reviewing the background noise-limitations encountered by the PAM system during various operational conditions. Actual marine mammal detections should be plotted on this diagram for a reasonableness check on the expected received levels. Overall, the validation document should reiterate all the goals and parameters stated in the planning document and verify that goals were/were not met, why, changes, etc. Also, the validation document should state whether the planning was suited to the needs of the survey and met the required mitigation standards.

Attachment 2: The Bureaus' Marine Debris Protocol (in Bureaus' Focused BA Appendix A.2)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the Gulf of America. Reporting requirements are included where appropriate.

A.2 Marine Debris

Marine debris poses a threat to fish, marine mammals, sea turtles, and potentially other marine animals; causes costly delays and repairs for commercial and recreational boating interests; detracts from the aesthetic quality of recreational shore fronts; and increases the cost of beach and park maintenance. The discharge of garbage and debris has been the subject of strict laws, such as MARPOL-Annex V and the Marine Debris Act, 33 U.S.C. 1951 et seq., and regulations imposed by various agencies including the United States Coast Guard (USCG) and the U.S. Environmental Protection Agency (USEPA).

These protocols will be implemented by BOEM, BSEE, and lessees in complying with the ESA (16 U.S.C. §§ 1531-1544) and MMPA (16 U.S.C. §§1361- 1423h).

A.2.1 Definitions

Marine debris means as any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper or any other solid, human-made item or material that is lost or discarded in the marine environment by the Lessee while conducting oil and gas activities on the OCS in connection with a lease, grant, or approval issued by BOEM.

A.2.2 Protocol

A.2.2.1 Marine Debris Placards

The permit holders must post placards that include each of the information text boxes in Attachment 2 (Section A.2.4) of this Protocol in prominent places on all vessels, offshore training or orientation areas engaged in oil and gas operations in the Gulf of America OCS or where activity occurs. Each of the placards depicted, with the language specified, must be displayed on a 5x8 inch format or larger. One or more areas may be omitted if there is insufficient space. These notices must be referenced, and their contents explained, during any initial orientation given on the vessel. Placards must be sturdy enough to withstand the local environment and must be replaced when damage or wear compromises readability.

A.2.2.2 Marine Debris Training and Certification Process

All vessel operators, employees, and contractors performing OCS activities on behalf of the lessee must complete marine debris awareness training annually. The training consists of two parts:

1. viewing a marine debris training video or slide show (described below); and
2. receiving an explanation from management personnel that emphasizes their commitment to the requirements.

The marine debris training videos, training slide packs, and other marine debris related educational materials may be found at https://www.bsee.gov/debris and https://www.ooctraining.org/. The training videos, slides, and related material may be downloaded directly from the website.

Lessees engaged in oil and gas activities must continue to develop and use a marine debris awareness training and certification process that reasonably assures that they, and their respective employees, contractors, and subcontractors are, in fact, trained.

The training process must include the following elements:

1. A viewing of either the video or the slide show by the personnel specified above;
2. An explanation from the management that conveys the commitment of the company to achieve the objectives of the debris containment requirement;
3. Attendance measures (initial and annual); and
4. Recordkeeping and availability of records for inspection by BSEE.

Training Report: By January 31st of each year, the lessee must provide BSEE with an annual report (1–2 pages) signed by a company official that describes your marine debris awareness training process, number of people trained, estimated related costs, and certifies that the training process has been followed for the previous calendar year. You should send the report and any questions concerning compliance by email to marinedebris@bsee.gov. In lieu of emailing the report, you may send a printed copy to:

Bureau of Safety and Environmental Enforcement
Environmental Compliance Division - Gulf of America Section
1201 Elmwood Park Blvd.
New Orleans, Louisiana 70123

A.2.3 Marine Debris Marking and Securing

Marking: Materials, equipment, tools, containers, and other items used in OCS activities which could be lost or discarded overboard must be clearly marked with the vessel or facility identification. All markings must clearly identify the owner and must be durable enough to resist the effects of the environmental conditions to which they may be exposed.

Securing: Materials, equipment, tools, containers, and other items used in OCS activities which could be lost or discarded overboard must be properly secured to prevent loss overboard.

1. Marine Debris Incidents

Recovery: Lessees must recover marine debris that is lost or discarded in the marine environment while performing OCS activities. If the marine debris is located within the boundaries of a potential archaeological resource and/or avoidance area, or a sensitive ecological and/or benthic resource area, the Lessee must contact BSEE for approval prior to conducting any recovery efforts that could impact the seafloor. The Lessee must enact steps throughout its OCS program to prevent similar incidents and must submit a description of these actions to BSEE in the Recovery Report below.

48-Hour Report: Lessees must submit a report to BSEE within 48 hours of a marine debris incident via marinedebris@bsee.gov. The "48-Hour Report" must describe recovery efforts or explain in detail if the Lessee determined that debris recovery is not warranted because (a) conditions are unsafe; (b) debris is insignificant and unrecoverable because it has floated away or sunk to the seafloor; or (c) debris is insignificant and immediate recovery is cost prohibitive. If conditions are unsafe, recovery must be attempted when conditions become safe. The Lessee must recover the marine debris lost or discarded if BSEE does not agree with the reasons provided by the Lessee to be relieved from the obligation to recover the marine debris. The 48- Hour Report must also include the following:

a) project identification and contact information for the lessee, operator, and/or contractor;

b) the date and time of the incident;
c) the lease number, OCS area and block, and coordinates of the object's location (latitude and longitude in decimal degrees);
d) a detailed description of the dropped object to include dimensions (approximate length, width, height, and weight), composition (e.g., plastic, aluminum, steel, wood, paper, hazardous substances, or defined pollutants), and whether it floats or sinks in seawater;
e) pictures, data imagery, data streams, and/or a schematic/illustration of the object, if available;
f) indication of whether the lost or discarded item could be a magnetic anomaly of greater than 50 nanotesla (nT), a seafloor target of greater than 0.5 m, or a sub-bottom anomaly of greater than 0.5m when operating a magnetometer or gradiometer, side scan sonar, or sub-bottom profiler in accordance with BOEM's and BSEE's applicable guidance;
g) an explanation of how the object was lost; and a description of immediate recovery efforts and results, including photos.

Recovery Plan: The Lessee must submit a "Recovery Plan" to BSEE via marinedebris@bsee.gov if marine debris is not recovered in 48 hours and BSEE determines that recovery is warranted. If BSEE does not object to an assertion in the 48-Hour Report that recovery is not warranted, then a Recovery Plan is not needed. The Recovery Plan must be submitted no later than 10 calendar days from the date in which the incident occurred and must detail a plan to recover the debris within 30 days from the date in which the incident occurred. Unless otherwise objected to by BSEE within 48 hours of the filing of the Recovery Plan, the Lessee can proceed with the activities described in the Recovery Plan. The Lessee must request and obtain approval of a time extension if recovery activities cannot be completed within 30 days from the date in which the incident occurred.

Recovery Report: The Lessee must submit a "Recovery Report" to BSEE via marinedebris@bsee.gov within 10 calendar days from the date in which the recovery activities are completed. The Recovery Report must inform BSEE whether the debris has been recovered, a description of the recovery activities, and any substantial deviation from recovery activities as proposed in the Recovery Plan. The Lessee must describe steps enacted throughout all the Lessee's OCS leases to prevent similar incidents. If recovery was performed within 48 hours and described in the 48-Hour Report, or recovery is unwarranted, a Recovery Report is not required.

Decommissioning Application: Information on unrecovered marine debris must be included and addressed in the description of the site clearance activities provided in the decommissioning application required under 30 CFR § 285.906.

A.2.4 Marine Debris Placards

WHAT IS MARINE DEBRIS?

Marine debris is any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper or any other man-made item or material that is lost or discarded in the marine environment. Marine debris may be intentionally dumped, accidentally dropped, or indirectly deposited.

Whatever the source, marine debris is a direct result of human activities on land and at sea. Depending upon its composition, marine debris may sink to the seafloor, drift in the water column, or float on the surface of the sea. Certain debris, such as plastics, can persist for hundreds of years in the marine environment without decomposing.

WARNING!

YOUR ACTIONS MAY SUBJECT YOU TO SEVERE LEGAL CONSEQUENCES!

The disposal and/or discharge of any solid waste anywhere in the marine environment (other than ground-up food particles) is strictly prohibited by U.S. Coast Guard and Environmental Protection Agency regulations. THIS INCLUDES MATERIALS OR DEBRIS ACCIDENTALLY LOST OVERBOARD.

The disposal of equipment, cables, chains, containers, or other materials into offshore waters is prohibited by the Bureau of Safety and Environmental Enforcement (30 CFR 250.300(b)(6)). THIS INCLUDES MATERIALS OR DEBRIS ACCIDENTALLY LOST OVERBOARD.

ATTENTION!

MARINE DEBRIS MAY CAUSE SEVERE ECOLOGICAL DAMAGE!

Marine debris discarded or lost from offshore and coastal sources may injure or kill fish, marine mammals, sea turtles, seabirds, and other wildlife.

Thousands of marine animals, including marine mammals, sea turtles and seabirds, die every year from being entangled in fishing line, strapping bands, discarded ropes and nets and plastic six-pack rings. Additionally, unknown numbers of marine animals die each year from internal injury, intestinal blockage, and starvation as a result of ingesting marine debris.

Marine debris fouls boat propellers and clogs water intake ports on engines thereby endangering the safety of fishermen and boaters and resulting in heavy loss of time and money.

Marine debris detracts from the aesthetic quality of recreational beaches and shorelines and increases the cost of park and beach maintenance.

ATTENTION!

SECURE ALL LOOSE ARTICLES!

NMFS now expects petroleum industry personnel to pick up and recover any articles lost overboard from boats and offshore structures as safety conditions permit. Additionally, 30 CFR 250.300(d) requires recording and reporting items lost overboard to the District Manager through facility daily operations reports.

Protect marine animals, as well as your valuable time and money, by doing the following to prevent accidental loss of these items:

Properly securing all materials, equipment, and personal belongings. Articles such as hardhats, life vests, sunglasses, cigarette lighters, parts bags, buckets, shrink wrap, strip lumber, and pipe thread protectors become marine debris when lost overboard.

Making sure that all trash receptacles have tight fitting lids and that the lids are used.

Providing and using secure cigarette butt containers. Cigarette butts are one of the most common forms of marine debris. Many cigarette butts contain some form of plastic and do not decompose in the ocean. Cigarette butts pose a major threat to marine wildlife as they resemble food and cause gut blockages and starvation when ingested.

Do your part to eliminate marine debris. Encourage others to be responsible about marine debris by making suggestions to secure potential marine debris on your boat or structure or by participating in a beach cleanup.

Attachment 3: The Bureaus' Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocols (in Bureaus' Focused BA Appendix A.3)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the GOA. Reporting requirements are included where appropriate.

A.3 Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocols

These protocols will be required by BOEM, BSEE, and provide guidelines to operators in complying with the ESA (16 U.S.C. §§ 1531-1544) and MMPA (16 U.S.C. §§1361- 1423h). The measures contained herein apply to all vessels associated with the federally regulated oil and gas program in the Gulf of America.

A.3.1 Aquatic Protected Species Identification

Crew and supply vessel personnel should use a Gulf of America reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., species that are not marine mammals and ESA- listed such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark; hereafter collectively termed "other aquatic protected species") that may be encountered in the Gulf of America OCS or anywhere activity occurs. Vessel operators must comply with the below measures except under extraordinary circumstances when the **safety of the vessel or crew is in doubt or the safety of life at sea is in question**.

A.3.2 Vessel strike avoidance

1. Vessel operators and crews must maintain a vigilant watch for all aquatic protected species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any protected species. A single aquatic protected species at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised. A visual observer aboard the vessel must monitor a vessel strike avoidance zone (species-specific distances detailed below) around the vessel according to the parameters stated below, to ensure the potential for strike is minimized. Visual observers monitoring the vessel strike avoidance zone can be either third-party observers or crew members (e.g., captain), but crew members responsible for these duties must be provided sufficient training to distinguish aquatic protected species to broad taxonomic groups, as well as those specific species detailed further below.
2. Vessel speeds must also be reduced to 10 knots or less when mother-calf pairs, pods, or large assemblages (greater than three) of any marine mammal are observed near a vessel.
3. All vessels must maintain a minimum separation distance of 100 m from sperm whales, and 500 m from any baleen whale to specifically protect the Rice's whale. If the species is indistinguishable, then operators should assume it is a Rice's whale and act accordingly.
4. All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all "other aquatic protected species" including sea turtles and manatees, with an exception made for those animals that approach the vessel.
5. When aquatic protected species are sighted while a vessel is underway, the vessel should take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If aquatic protected species are sighted within the relevant separation distance, the vessel should reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This does not apply to any vessel towing gear (e.g., source towed array and site clearance trawling).

6. All vessels 65 ft or greater in support of oil and gas activities must have a functioning AIS onboard and operating at all times as required by the USCG. Even if the USCG does not require AIS for the vessel, it is strongly encouraged. At minimum, the reporting (as specified) must be followed and include trackline (e.g., time, location, and speed) data with Automatic Identification System (AIS) Maritime Mobile Service Identity (MMSI) numbers, if available.

The above requirements do not apply in any case where compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of that restriction, is unable to comply.

A.3.3 Injured and/or dead protected species reporting

At all times, vessel operators must report sightings of any injured or dead aquatic protected species as soon as possible but no greater than 24 hours, regardless of whether the injury or death was caused by the operator's vessel. If the injury or death was caused by a collision with the operator's vessel, the operator must immediately report the incident to the appropriate NMFS contact below for 24-hour response. The operator must further notify BOEM, BSEE, and NMFS immediately of the strike by email to protectedspecies@boem.gov and protectedspecies@bsee.gov and takereport.nmfsser@noaa.gov. The report must include the following information:

1. Name, telephone number, and email of company providing the report;
2. The vessel name at time of activity;
3. The lease number;
4. Time, date, and location (latitude and longitude [lat/long]) of the incident;
5. Species identification (if known) or description of the animal(s) involved;
6. Vessel's speed during and leading up to the incident;
7. Vessel's course/heading and what operations were being conducted (if applicable);
8. Status of all sound sources in use;
9. Description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike;
10. Environmental conditions (e.g., wind speed and direction, Beaufort Sea State, cloud cover, visibility) immediately preceding the strike;
11. Estimated size and length of animal that was struck;
12. Description of the behavior of the marine mammal immediately preceding and following the strike;
13. If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;
14. Estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and
15. To the extent practicable, photographs or video footage of the animal(s).

A.3.4 Incidents requiring immediate reporting

Review of your proposed activities identified use of equipment that has the potential for entanglement and/or entrapment of protected species (i.e., species protected under the ESA and/or MMPA) that could be present during operations. In case of entrapment, procedures and measures for reporting are dependent upon the situation at hand.

Certain scenarios or incidents require immediate reporting to Federal agencies; these are

described below. Should any of the following occur at any time, **immediate reporting** of the incident is required after personnel and/or diver safety is ensured:

- Entanglement or entrapment of a protected species (i.e., an animal is entangled in a line or cannot or does not leave a moon pool of its own volition).
- Injury of a protected species (e.g., the animal appears injured or lethargic).
- Interaction or contact with equipment by a protected species.
- Any observation of a leatherback sea turtle within a moon pool (regardless of whether it appears injured, or an interaction with equipment or entanglement and/or entrapment is observed).

As soon as personnel and/or diver safety is ensured, any of the incidents listed above must be reported to NMFS by contacting the appropriate expert for 24-hour response. If an immediate response is not received, the operator must keep trying until contact is made. Any failed attempts should be documented. Contact information for reporting is as follows:

- Marine mammals: contact WHALE HELPLINE at 877-942-5343.
- Sea turtles: contact NMFS Veterinary Medical Officer at 352-283-3370. If no answer, contact 301-310-3061. This includes the immediate reporting of any observation of a leatherback sea turtle within a moon pool.
- Other protected species (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon): contact the ESA Section 7 biologist at 301-427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfs@noaa.gov.

The report must include the following information:

1. Time, date, water depth and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
2. Name, type, and call sign of the vessel in which the event occurred;
3. Equipment being used at time of observation;
4. Species identification (if known) or description of the animal(s) involved;
5. Approximate size of animal;
6. Condition of the animal(s) during the event and any observed injury and/or behavior;
7. Photographs or video footage of the animal(s), if able; and
8. General narrative and timeline describing events that took place.

After the appropriate contact(s) have been made for guidance and/or assistance as described above, the operator may call BSEE at 985-722-7902 (24 hours/day) for questions or additional guidance on recovery assistance needs (if still required) and continued monitoring requirements. The operator may also contact this number if a timely response from the appropriate contact(s) listed above were not received. Minimum post-incident reporting includes all information described above in addition to the following:

9. NMFS liaison or stranding hotline that was contacted for assistance;
10. For moon pool observations or interactions:
11. Size and location of moon pool within vessel (e.g., hull door or no hull door);
12. Whether activities in the moon pool were halted or changed upon observation of the animal; and
13. Whether the animal remains in the pool at the time of the report, or if not, the time and date the animal was last observed.

Post-incident reporting should be made to BOEM/BSEE and NMFS (protectedspecies@boem.gov, protectedspecies@bsee.gov, takereport.nmfsser@noaa.gov).

Attachment 3

Attachment 4: The Bureaus' Vessel Transit within the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the Gulf of America. Reporting requirements are included where appropriate.

Revised Protocol A.6

A.6 Vessel Transit within the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA)

Operators or their recognized representative must follow requirements below as appropriate when transiting through the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA; see figure below) when this transit is associated with either an initial plan/application or as part of a change to an existing plan/application when either vessel route and/or support base changes.

If transiting through any portion of the 2020 RWA, the BOEM Permit/Plan holder must submit a Post Transit Report upon completion to fulfil the reporting requirements as stated below to BOEM and BSEE (protectedspecies@boem.gov and protectedspecies@bsee.gov). Please be advised that changes to the use of a support base may trigger a revised plan (e.g., 30 CFR § 550.283), revised application, or modified permit (for geological and geophysical [G&G] activities). In the revised plan, application or permit, operators are required to follow the requirements defined in the most current Biological Opinion, as amended, by the National Marine Fisheries Service (NMFS).

1. In the 2020 RWA, vessel operators and crews must maintain a vigilant watch for Rice's whales at all times and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any Rice's whale. Visual observers monitoring the 500 m vessel strike avoidance zone for Rice's whales can be either third-party observers or crew members (e.g., captain), but crew members responsible for these duties must be provided sufficient training to distinguish aquatic protected species to broad taxonomic groups, as well as those specific species detailed further below. If the species is indistinguishable, then operators should assume it is a Rice's whale and act accordingly (see below).

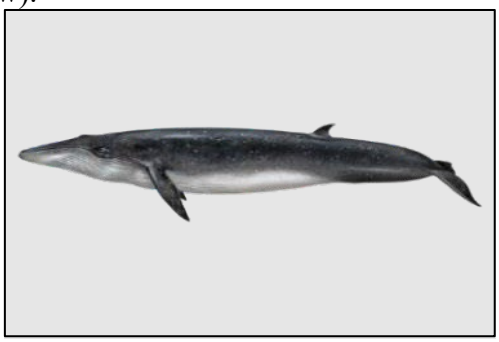

Figure depicting a Rice's whale

2. After completing transit through the 2020 RWA, you must prepare within seven (7) days a Post Transit Report describing the time the vessel entered and departed the 2020 RWA, any Rice's whale sightings or interactions (e.g., vessel avoidance) that occurred during transit, and any other marine mammal sightings or interactions. Post Transit Reports must be submitted to protectedspecies@boem.gov and protectedspecies@bsee.gov. The subject line of the email should include "Post Transit Report through 2020 RWA". Minimum reporting information is described below:

a. The plan, permit or other BOEM or BSEE number used to identify the activity;
b. Port used for mobilization and demobilization;
c. Automatic Identification System (AIS) including Maritime Mobile Service Identity (MMSI) numbers, if available;
d. Time and date vessel entered and exited the 2020 RWA;
e. Time, date, water depth, and location (latitude/longitude) of the first sighting of the animal;
f. Name, type, and call sign of the vessel in which the sighting occurred;
g. Species identification (if known) or description of the animal involved;
h. Approximate size of animal (if known);
i. Condition of the animal during the event and any observed injury / behavior (if known);
j. Photographs or video footage of the animal, if available;
k. General narrative and timeline describing the events that took place;
l. Time and date vessel departed 2020 RWA;
m. Trackline (e.g., time, location, and speed) of vessel while within 2020 RWA; and
n. Environmental conditions, including Beaufort Sea State (BSS) and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon.

3. All vessels, regardless of size, must observe a 10-knot, year-round speed restriction in the 2020 RWA. The only exception to the 10-knot vessel speed restriction would be when observing the speed restriction would cause the safety of the vessel or crew to be in doubt or the safety of life at sea to be in question.
4. No transit is permissible through the 2020 RWA at nighttime or during low visibility conditions (e.g., BSS 4 or greater) except for emergencies (i.e., when the safety of the vessel or crew would otherwise be in doubt or the safety of life at sea is in question).
5. All vessels must maintain a minimum separation distance of 500 m from Rice's whales. If a whale is observed but cannot be confirmed as a species other than a Rice's whale, the vessel operator must assume that it is a Rice's whale and take appropriate action.
6. All vessels 65 feet (ft) or greater associated with oil and gas activity (e.g., source vessels, chase vessels, supply vessels) must have a functioning Automatic Identification System (AIS) onboard and operating at all times as required by the USCG. If the USCG does not require AIS for the vessel, it is strongly encouraged. At minimum, the reporting (as specified herein) must be followed and include trackline (e.g., time, location, and speed) data, with Automatic Identification System (AIS) Maritime Mobile Service Identity (MMSI) numbers, if available.
7. If an operator while operating within the 2020 RWA
    a. exceeds the 10-knot vessel speed,
    b. does not maintain a 500 m minimum separation distance from a Rice's whale, and/or
    c. conducts transit in the 2020 RWA during nighttime or during low visibility conditions (e.g., BSS 4 or greater),

    the operator must notify BSEE and BOEM by emailing protectedspecies@bsee.gov and protectedspecies@boem.gov within 24 hours. The notification must be reported as a

separate and distinct notification to the Post Transit Report with the title "Transit Deviation through 2020 RWA" in the subject line. The notification must provide a detailed explanation as to why the transit deviation occurred.

8. This Protocol does not remove or alter the need to comply with any other applicable regulatory or legal requirements with respect to vessel operations, including as outlined in A3 - *Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocols*.

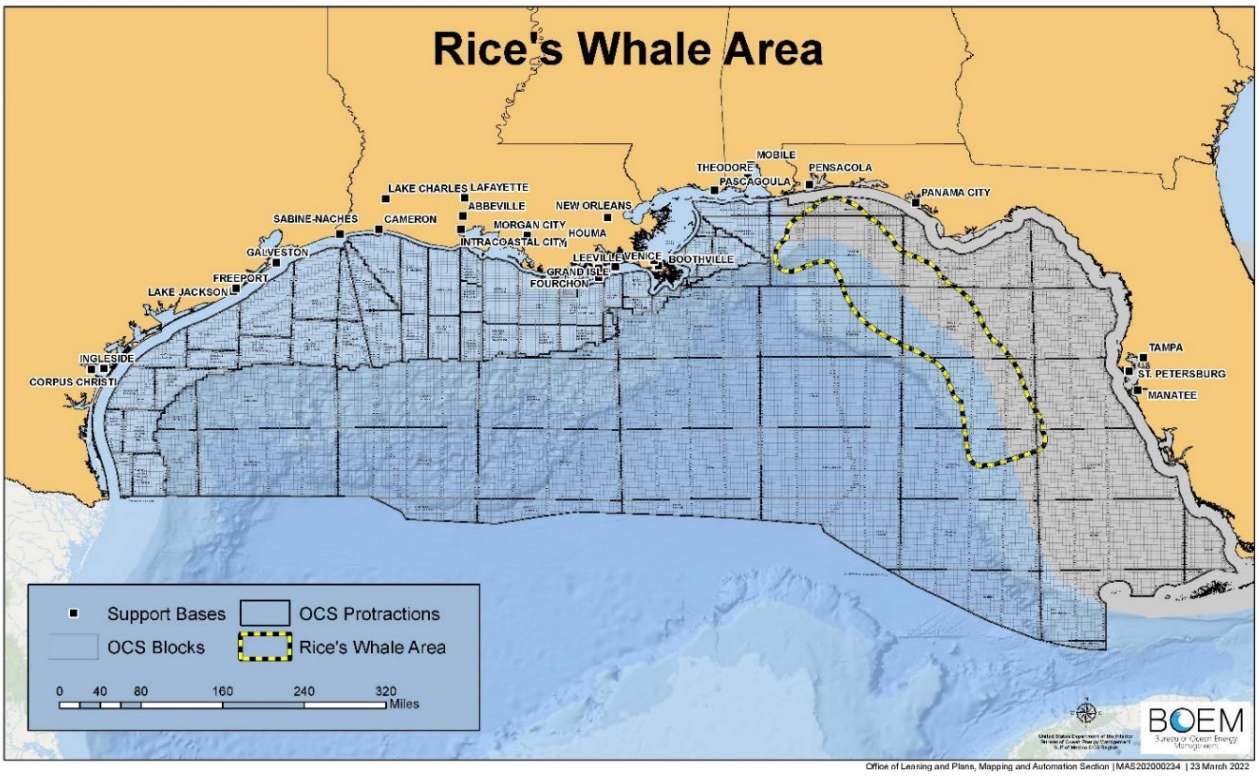

Figure depicting the 2020 RWA.

Attachment 5: The Bureaus' In-water Line Precaution Protocol (in Bureaus' Focused BA Appendix A.4)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the Gulf of America. Reporting requirements are included where appropriate.

A.4 In-water Line Precaution Protocol

If operations require the use of flexible, small diameter lines to support operations (with or without divers), operators and/or contractors must reduce the slack in the lines, except for human safety considerations, to prevent accidental entanglement of protected species (i.e., species protected under the ESA and/or MMPA). This requirement includes tether lines attached to remotely operated equipment. The requirements below must be followed for any activities entailing use of flexible, small diameter lines that will not remain continuously taut, except when complying with these requirements would put the safety of divers, crew, or the vessel at risk:

- Operators must use tensioning tools and/or other appropriate procedures to reduce unnecessary looseness in the lines and/or potential looping;
- The lines must remain taut, as long as additional safety risks are not created by this action;
- A line tender must be present at all times during dive operations and must monitor the line(s) the entire time a diver is in the water; and
- Should the line tender and/or diver become aware of an entanglement of an individual protected species, the reporting requirements described above (A.3.4) must be followed as soon as safety permits.

Attachment 6: The Bureaus' Moon Pool Monitoring Protocol (in Bureaus' Focused BA Appendix A.5)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the GULF OF AMERICA. Reporting requirements are included where appropriate.

A.5 Moon Pool Monitoring

The following protocol would apply to all activities entailing use of the moon pool, except under circumstances when complying with these requirements would put the safety of the vessel or crew at risk. If any protected species (i.e., species protected under the ESA and/or the MMPA) is detected in the moon pool, you are required to follow the appropriate procedures described in *Reporting Requirements* below (see A.5.4).

Application of these measures includes, but is not limited to, dive support vessels, service vessels, pipelaying vessels, drillships, floating platforms (e.g., SPAR), mobile offshore drilling units, and other facilities with enclosed moon pools (e.g., well in the hull of a vessel, with or without a door).

A.5.1 General requirements

- Where the moon pools have hull doors, the operator(s) should keep the doors closed as much as reasonably practicable when no activity is occurring within the moon pool, unless the safety of crew or vessel require otherwise. This will prevent protected species from entering the confined area during periods of non-activity.
- Use of a moon pool requires regular monitoring while open to the water column and if a vessel is not underway. Regular monitoring means 24-hour video monitoring with hourly recurring checks for at least five minutes of the video feed, or hourly recurring visual checks of the moon pool for at least five minutes by a dedicated crew observer with no other tasks during that short visual check.
- If water conditions are such that observers are unable to see within a meter of the surface, operations requiring the lowering or retrieval of equipment through the moon pool must be conducted at a rate that will minimize potential harm to protected species.

A.5.2 Closure of the hull door

- Should the moon pool have a hull door that can be closed, then before and after closure, the moon pool must be monitored continuously by a dedicated crew observer with no other tasks to ensure that no individual protected species is present in the moon pool area. If visibility is not clear to the hull door from above (e.g., turbidity or low light), 30 minutes of monitoring is required before hull door closure.
- If a protected species is observed in the moon pool before the closure of the hull door, the hull door must not be closed, except for human safety considerations. Once the observed animal leaves the moon pool, the operator may commence closure. If the observed animal remains in the moon pool, contact NMFS or BSEE before the closure of the hull doors according to reporting requirements (see Reporting Requirements under Reporting of Observations of Protected Species within an Enclosed Moon Pool).

A.5.3 Movement of the vessel (no hull door) and equipment deployment and/or retrieval

- Before movement of the vessel and/or the deployment and/or retrieval of equipment, the moon pool must be monitored continuously for a minimum of 30 minutes, by a dedicated crew observer with no other tasks, to ensure no individual protected species is present in the moon pool area.

- If a protected species is observed in the moon pool before movement of the vessel, the vessel must not be moved and equipment must not be deployed or retrieved, except for human safety considerations. If the observed animal leaves the moon pool, the operator may commence activities. If the observed animal remains in the moon pool, contact BSEE before planned movement of the vessel according to reporting requirements (see Reporting Requirements under Reporting of Observations of Protected Species within an Enclosed Moon Pool).
- Should a protected species be observed in a moon pool before activity commences (including lowering or retrieval of equipment), recovery of the animal or other actions specific to the scenario may be required from NMFS to prevent interaction with the animal. If protected species are observed during activity, only reporting is required. Operators must not take such action except at the direction of, and after contact with, NMFS.

A.5.4 Reporting requirements

A.5.4.1 Reporting of Observations of Protected Species within an Enclosed Moon Pool

If a protected species is observed within an enclosed moon pool and does not demonstrate any signs of distress or injury or an inability to leave the moon pool of its own volition, measures described in this section must be followed (only in cases where they do not jeopardize human safety). Although this particular situation may not require immediate assistance and reporting as described under *Incidents Requiring Immediate Reporting* (see Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocol; A.3.4), a protected species could potentially become disoriented with their surroundings and may not be able to leave the enclosed moon pool of their own volition. In order for operations requiring use of a moon pool to continue, the following reporting measures must be followed.

After 24 hours of any observation, and daily after that for as long as an individual protected species remains within a moon pool (i.e., in cases where an ESA-listed species has entered a moon pool but entrapment or injury has not been observed), the following information must be reported to BOEM and BSEE (protectedspecies@boem.gov, protectedspecies@bsee.gov):

1. For an initial report, the information should include:
   a) Time, date, water depth and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
   b) Name, type, and call sign of the vessel in which the event occurred;
   c) Equipment being utilized at time of observation;
   d) Species identification (if known) or description of the animal(s) involved;
   e) Approximate size of animal;
   f) Condition of the animal(s) during the event and any observed injury / behavior;
   g) photographs or video footage of the animal(s), if able; and
   h) General narrative and timeline describing events that took place.
2. For subsequent daily reports:
   a) Describe the animal's status to include external body condition (e.g., note any injuries or noticeable features), behaviors (e.g., floating at surface, chasing fish, diving, lethargic, etc.), and movement (e.g., has the animal left the moon pool and returned on multiple occasions?);
   b) Description of current moon pool activities, if the animal is in the moon pool;

c) Description of planned activities in the immediate future related to vessel movement or deployment of equipment;
d) Any additional photographs or video footage of the animal, if possible;
e) Guidance received and followed from NMFS liaison or stranding hotline that was contacted for assistance;
f) Whether activities in the moon pool were halted or changed upon observation of the animal; and
g) Whether the animal remains in the pool at the time of the report, or if not, the time and date the animal was last observed.

Attachment 7: The Bureaus' Pile Driving Protocol (in Bureaus' Focused BA Appendix A.9)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the GULF OF AMERICA. Reporting requirements are included where appropriate.

A.9 Pile Driving Monitoring and Reporting Requirements Protocol

This Protocol will be implemented by BSEE, BOEM, and provide requirements to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544). These measures contained herein apply to impact of pile driving activities (i.e., stationary activity) in water less than 100 meters approved by BOEM and/or BSEE and associated with the Federally regulated oil and gas program in the Gulf of America. Impact pile driving in depths greater than 100 meters or use of other pile driving types (e.g., vibratory) may require supplemental mitigations to those in this protocol and will be determined on a case-by-case basis.

A.9.1 Background

Pile driving (e.g., impact hammer) activities may have an impact on marine wildlife. Many marine species are protected under the ESA and all marine mammals (including manatees) are protected under the MMPA. Table 9 provides the Gulf of America species listed under the ESA:

Table 9. Gulf of America Species Listed Under the ESA

Species
Rice's whale (*Balaenoptera ricei*)
Sperm whale (*Physeter macrocephalus*)
Green turtle (*Chelonia mydas*) – North Atlantic DPS and South Atlantic DPS
Hawksbill turtle (*Eretmochelys imbricata*)
Kemp's ridley turtle (*Lepidochelys kempii*)
Leatherback turtle (*Dermochelys coriacea*) - Northwest Atlantic DPS
Loggerhead turtle (*Caretta caretta*) – Northwest Atlantic Ocean DPS
Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
Oceanic whitetip shark (*Carcharhinus longimanus*)
Giant manta ray (*Manta birostris*)
West Indian manatee (*Trichechus manatus*)*

*Managed by the USFWS

Note that this list can change as other species are listed/delisted, and this Protocol must be applied to any ESA-listed species (and all marine mammals) that occur in the Gulf of America, including rare and extralimital species, such as blue whales (*Balaenoptera musculus*).

BSEE and BOEM consult jointly with the NMFS and the USFWS under Section 7 of the ESA to ensure that BOEM- or BSEE-authorized activities do not jeopardize the continued existence of ESA-listed species nor result in destruction or adverse modification of designated critical habitat. Incidental take of ESA-listed species is prohibited except as exempted pursuant to an Incidental Take Statement. In the case of pile driving activities, please refer to the Incidental Take Statement associated with the 2025 Programmatic BiOp or its successor BiOp(s). This Protocol is the result of coordination between BOEM, BSEE, NMFS, and industry and is based on terms and conditions and reasonable and prudent measures identified in the 2025 Programmatic BiOp issued to the Bureaus. BSEE is tasked as the lead agency for compiling lessee or operator reporting data required under current BiOp applicable to both Bureaus. Therefore, all data collection reports described herein must be submitted to BSEE. Some other reporting requirements may also include BOEM and NMFS where specified below.

In order to protect ESA-listed species and marine mammals during pile driving operations, operators will be required to follow specific protocols when operating. Suction piles do not

require said protocols. Operators must comply with the below measures except under extraordinary circumstances when the **safety of the vessel or crew is in doubt or the safety of life at sea is in question**.

A.9.2 Definitions

Terms used in this Protocol have the following meanings:

1. **Protected species** means any species listed under the ESA and/or protected by the MMPA. Requirements discussed herein focus on marine mammals and sea turtles since these species are the most likely to be observed during pile driving activities. However, other ESA-listed species (e.g., giant manta rays) are also protected and observations of them should be reported as detailed below in Reporting Requirements.
2. **Pile driving activity** means stationary activities that utilize an impact hammer for the setting of foundations for but not limited to Caisson Structures, Fixed Platforms, Tension Leg Platforms, and shallow water conductors as approved in a permit or plan.
3. **Soft start (sometimes referred to as "ramp-up")** means the gradual and systematic increase of emitted sound levels from a pile driving activity. The use of a soft start procedure is believed to provide additional protection to protected species by "warning" and/or providing them a chance to leave the area prior to full operation.
4. **Operational level** means the highest energy level at which the pile driving activity will operate for the majority of the time. The strikes from the impact hammer at operational level will be at a higher energy level than the initial strikes during soft start, if possible.
5. **Shutdown zone (formerly exclusion zone)** means the area to be monitored for pre-clearance and possible mitigation actions (such as delays to soft start or shutdowns) in order to reduce or eliminate the potential for injury of protected species. The shutdown zone encompasses the area at and below the sea surface from the edges of the pile driving activity out to a radius of 500 ft (152 m) upon detection of protected species within or entering that zone.
6. **Pre-clearance** means the visual monitoring of the shutdown zone for protected species to determine if the zone has been clear of protected species for at least 30 minutes before the soft start may begin. If a protected species is observed entering or within the shutdown zone prior to the initiation of impact pile driving activities, pile driving must be delayed and will not begin until either the protected species has voluntarily left the shutdown zone or when specific time periods have elapsed with no further sightings have occurred (i.e., 30 minutes). Visual monitoring should extend beyond the shutdown zone for detecting protected species that may be traveling to or entering the shutdown zone.
7. **Shutdown** means the immediate cessation of pile driving activity when technically feasible, as described below in General Requirements. This does not include cessation of pile driving at full operational level that may result in pile instability or refusal, or human safety concerns.
8. **Visual monitoring** is intended to establish and maintain (when visual conditions allow) a zone around the pile driving activity that is clear of protected species, thereby reducing or eliminating the potential for auditory injury before operational level is achieved. Visual monitoring of the full extent of adjacent waters is intended to aid in establishing and maintaining the shutdown zone by alerting all relevant personnel of protected species that are outside of, but may approach and enter, the shutdown zone.

A.9.3 General requirements

1. A copy of this Protocol must be in the possession of the operator, other relevant personnel, the observer(s), and any other relevant designees operating under the authority of the approved Permit and/or Plan.
2. Monitoring must be conducted by qualified, NMFS-approved observers, which can include crew members, in accordance with the following conditions:
    a. Observers must be dedicated, NMFS-approved (in advance of the activity; see Visual Observer(s) Qualifications) and have no other assigned tasks during monitoring periods. For visual monitoring, at a minimum one individual must be designated with all the authority and appropriate qualifications to conduct protected species monitoring and shutdown requests, as needed. Crew members responsible for these duties must be provided sufficient training to distinguish aquatic protected species to broad taxonomic groups, as well as those ESA-listed species detailed above.
    b. A minimum of one designated NMFS-approved observer must be on duty during the required monitoring period (30 minutes before piling is initiated to 30 minutes after piling is complete) and have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards).
    c. At least one experienced (or "lead") observer on a project must have prior experience performing the duties of an observer during pile driving activity. This observer must have sufficient experience in monitoring and mitigation with pile driving and can work independently on a project.
    d. Additional observer(s) may substitute other relevant experience, education (degree in biological science or related field), or training for prior experience performing the duties of an observer during pile driving activity. Additional observer(s) need(s) to gain experience on a pile driving project by training alongside an experienced observer for at least one shift before working independently. This training must include monitoring, collecting data, and communicating with and instructing relevant crew with regard to the presence of protected species and mitigation requirements. This training shift should be a 'dry run' completed prior to the required monitoring period during pile driving operations, when feasible.
    e. The operator must ensure relevant personnel (including but not limited to applicable rig and platform personnel) are notified of the observers' authority with regard to the measures described in this Protocol. Designated observers must participate in all pre-operation briefings (job safety analysis [JSA] / job safety and environmental analysis [JSEA] meetings) to ensure that responsibilities, communication procedures, protected species monitoring protocols, operational procedures, and permit requirements are clearly understood. This briefing procedure must be repeated at each shift change and JSA/JSEA meeting, and before work commences or recommences.

3. The observer(s) must be granted access to relevant instrumentation to document real-time log information.
4. The observer(s) must be granted access to the most appropriate observation posts to safely conduct visual monitoring of the shutdown zone. The observation posts should provide an unobstructed view of the entire shutdown zone and adjacent waters to the maximum extent practicable.
5. Monitoring by observer(s) must take place from 30 minutes prior to initiation of pile driving activity (i.e., pre-clearance monitoring before soft start) through 30 minutes post-completion of pile driving activity.
6. Pile driving may commence only during daylight hours (i.e., between dawn/dusk for visual monitoring) and during good visibility (i.e. when full shutdown zone is visible, as determined by the lead observer), unless the field engineer, or other qualified personal, determine that delaying pile driving until daylight hours has the potential to result in pile instability or refusal, or human safety concerns. In order for pile driving to commence outside of daylight hours, observer(s) must be equipped with alternative monitoring equipment (e.g. night vision, thermal cameras, etc.) that ensures the shutdown zone can be adequately monitored.
7. Pile driving may not continue during low visibility (i.e., when weather and/or nighttime prevent monitoring of the entire shutdown zone without use of alternative monitoring equipment) unless the field engineer, or other qualified personnel, determine that delaying pile driving until adequate visibility has the potential to result in pile instability or refusal, or human safety concerns. In order for pile driving to continue during low visibility, observer(s) must be equipped with alternative monitoring equipment (e.g. night vision, thermal cameras, etc.) that ensures the shutdown zone can be adequately monitored.
8. Observers must be able to identify and document behaviors of protected species at this distance (and preferably beyond) for implementation of mitigation measures described herein. If pile driving activity is intended to occur during nighttime hours, initiate soft start during daylight hours so that pre-clearance checks can be effective or use low light alternative monitoring equipment.
9. Soft start procedures are required at the beginning of the activity and at any time following a cessation of pile driving activity of more than 30 minutes.
10. If a protected species is observed within or entering the shutdown zone, the observer must call for a shutdown of activity by communicating such to the field engineer, or other qualified personnel.
    a. The field engineer, or other qualified personnel, will determine if a shutdown is technically feasible and inform the observer if they can, or cannot, implement a shutdown. A shutdown would not be considered technically feasible if it has the potential to result in pile instability or refusal, or human safety concerns. If shutdown cannot safely occur, the hammer, if safe to do so, should be reduced in energy to the lowest practical level. If not technically feasible, then the operator/engineer must provide the reasoning details to the observer for reporting.
    b. The field engineer/qualified personnel must closely monitor tubular penetration, soil data, real-time hammer log information, and any other relevant information needed to determine if a cessation of activity is technically feasible to ensure a timely response to any call for a shutdown by an observer.

A.9.4 Visual observers

A.9.4.1 Qualifications

Operator must use a dedicated, NMFS-approved observer(s). A minimum of one designated NMFS-approved observer must be on duty during the required monitoring period (30 minutes before piling is initiated to 30 minutes after piling is complete) and have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards). To become a NMFS-approved observer specific to oil and gas related pile driving, an individual submits qualifications/credentials to NMFS at nmfs.psoreview@noaa.gov with subject line "Gulf of America pile driving observer". Training and experience provided in a resume/CV must be sufficient to perform necessary tasks of species identification, safety, communication and data collection/reporting. However, if already NMFS- approved as a protected species observer for geophysical surveys in the U.S., then that would qualify an individual to act in this role, and their name(s) and approval dates would be submitted to the email above for project-specific notification/approval.

A.9.4.2 Equipment

The BSEE- or BOEM-approved Permit and/or Plan holder is required to work with the relevant personnel to ensure that the observer has all equipment needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed protected species. Such equipment should include but is not limited to:

a. Reticle binoculars (e.g., 7 x 50) of appropriate quality (plus backup);
b. Digital single lens reflex (SLR) camera with a telephoto lens;
c. Radios for communication among rig/platform crew and observer (plus backups);
d. Any other tools necessary to adequately perform necessary observer tasks; and
e. Low light alternative monitoring equipment (e.g., night vision, thermal cameras, etc.)

The Permit and/or Plan holder is responsible for ensuring the observer has the proper equipment specified in (a) through (d) above required to perform the duties specified within this Protocol.

A.9.4.3 Visual monitoring

An observer schedule showing that the number of observer(s) used is sufficient to effectively monitor the area for the project and record the required data must be included. The observer must not be on watch for more than 4 consecutive hours, with at least a 1-hour break after a 4-hour watch. The observer must not be on active duty observing for more than 12 hours in any 24-hour period during multiple-day operations, if applicable.

1. Observer(s) must monitor from 30 minutes prior to initiation of pile driving activity (i.e., pre-clearance monitoring before soft start) through 30 minutes post-completion of pile driving activity. Observer(s) must record all protected species detections, regardless of distance from the pile driving activity, and must document detection distance and any behavioral reactions.
2. Observer(s) must be located at the best vantage point(s) in order to ensure 360° visual coverage around the activity and must conduct visual observations using the camera, binoculars, and the naked eye while free from distractions and in a consistent, systematic, and diligent manner, while still maintaining a safe work environment. If possible, the observer should photograph any detected protected species for Data Collection and Reporting Requirements.

3. Observer(s) must establish and monitor the shutdown zone or activities cease, whichever comes first. This zone must be based upon the radial distance from the pile that will be driven. Detections of protected species that are seen outside the shutdown zone and in adjacent waters should be communicated to the operator to prepare for the potential shutdown of the activity.
4. Any observations of protected species by crew members aboard any vessel or platform associated with the pile driving activity must be relayed to the observer immediately.

A.9.4.4 Pre-clearance and soft start

The intent of pre-clearance observation (30 minutes) is to ensure no protected species are observed within or entering the shutdown zone prior to the beginning of soft start. The intent of soft start is to warn protected species of pending pile driving activities and to allow sufficient time for those animals to leave the immediate vicinity. A soft start procedure, involving an initial set of strikes at a reduced energy level, is required at the beginning of each day's pile driving activity and at any time following a cessation of activity of more than 30 minutes. If this cessation of activity occurs, then an operator must wait to conduct pre-clearance and soft start for the next round of activity. All operators must adhere to the following pre-clearance and soft start requirements:

1. The observer on duty has the authority to delay the beginning of soft start procedures or to call for shutdown (see Shutdown) of activity if a protected species is detected within the shutdown zone.
2. The operator must notify the designated observer of the planned start of soft start as agreed upon with the observer; the notification time should not be less than 60 minutes prior to the planned soft start in order to allow the observer time to monitor the shutdown zone for 30 minutes prior to the initiation of soft start (pre-clearance).
3. The observer conducting pre-clearance observations must be notified again immediately prior to initiating soft start procedures and the operator must receive confirmation from the observer to proceed.
4. Soft start may not be initiated if any protected species is observed within the shutdown zone. If a protected species is observed within the shutdown zone during the 30-minute pre-clearance period, soft start may not begin until the animal(s) has been observed exiting the shutdown zone or until an additional time period of 30 minutes has elapsed with no further sightings.
5. If the activity is shut down for brief periods (i.e., less than 30 minutes) for reasons other than that described below in Shutdown (e.g., mechanical difficulty), it may be activated again without soft start procedures if the observer has maintained constant visual observation and no detections of protected species have occurred within the shutdown zone.
6. If cessation of the activity is longer than 30 minutes, soft start procedures must be utilized if the field engineer, or other qualified personnel, determines it is technically feasible.
7. Soft start must begin by activating the hammer at a reduced energy level for the initial strikes and must continue by increasing the energy level in stages as determined by the field engineer. The operator must provide information to the observer documenting that appropriate procedures were followed. An example scenario for soft start:

- Soft start procedure: A soft start must be implemented at the start of each impact pile driving operation, any time pile driving has been shutdown or delayed due the presence of a listed species, and following cessation of pile driving for a period of 30 minutes or longer. Hammer operators must begin with an initial set of strikes at no more than half the operational power, followed by a 30 second waiting period, then a second set of reduced power strike followed by another 30 second waiting period. Following this soft start procedure, operational impact pile driving may commence and continue provided listed species remain absent from the shutdown zone.

A.9.4.5 Shutdown

The Permit and/or Plan holder must adhere to the following shutdown requirements:

1. The observer must monitor the shutdown zone and adjacent waters during soft start and operations. If a protected species is observed within or entering the shutdown zone, the observer must call for a shutdown, after which the field engineer or other qualified personnel determines whether a shutdown is technically feasible (see General Requirements). If the field engineer, or other qualified personnel, determines a shutdown can be implemented, the activity must be halted immediately by cessation of strikes.
2. If determined by the field engineer, or other qualified personnel, to be not feasible (e.g., pile damage or hammer pile alignment), the operator or field engineer will provide the observer details for why it is not feasible, and this information must be included in the comprehensive report.
3. Upon implementation of shutdown, the activity may recommence after the protected species has been observed exiting the shutdown zone, or if 30 minutes have elapsed since the last observation and no other protected species were observed in the shutdown zone. Soft start procedures must be utilized after implementation of a shutdown.
4. The operator must establish and maintain clear lines of communication directly between the observer on duty and relevant crew operating the pile driver to ensure that shutdowns are conveyed swiftly while allowing the observer(s) to maintain watch.

A.9.5 Data collection

The observer must use data collection forms, whether hard copy or electronic. Observer must record detailed information about any implementation of mitigation requirements, including the distance of animals to the pile driving activity and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, if shutdown was implemented, and the length of time before any subsequent soft start of the pile driving activity. If required mitigation was not implemented, observer should record a description of the circumstances. At a minimum, the following information must be recorded:

1. Operator name and facility information;
2. Observer names and affiliations/company;
3. Date and participants of observer briefings (as discussed in General Requirements) or a copy of the signed JSA(s)/JSEA(s);
4. Observation shifts/times;
5. Observer monitoring location;
6. Date and time monitored pile driving activity begins or ends;
7. Environmental conditions during monitoring periods (at beginning and end of visual observer shift and whenever conditions change significantly, including BSS, cloud cover,

fog, sun glare, overall visibility and estimated observable distance), noting time when change occurs;

8. Factors that may have contributed to impaired observations (e.g., vessel traffic obstructing views);
9. Upon visual observation of any protected species, the following information:
    a. Watch status (sighting made by observer during watch, by personnel or crew, etc.);
    b. Date and time of observation;
    c. Location of observation (Lat/Long coordinates);
    d. Distance of the animal from visual observer and/or construction activity (feet or meters, please specify);
    e. Pile driving activities occurring during observation;
    f. Species, numbers, and, if possible, size, sex and age class;
    g. Description of any observable behavior patterns (e.g., feeding, traveling, etc.), including bearing and direction of travel and distance from activity; and
    h. Description of implementation of mitigation measures (e.g., delay or shutdown) including detailed circumstances and reasoning for any shutdown that could not be implemented and the specifics of the pile driving activity at that time.
10. Pile driving logs and/or activity information, such as energy output of hammer while in operation (e.g., amount of "reduced energy output" during soft start and amount of "full energy output" after completion of soft start and up to operational energy level), number of strikes per pile, pile size and any other notes of significance (i.e., pre-clearance, soft start, shutdown, operational energy level, end of operations, etc.). Specific minimal requirements for logs are further outlined here:
    a. Operator
    b. OCS Lease
    c. Area Block
    d. Well Name/Structure Name
    e. API/Complex ID
    f. Plan number (EP, DOCD)
    g. Start Date
    h. Completion Date (e.g., total duration of activity for which actively hammering)
    i. Type of Impact Hammer Used (impact)
    j. Drive Pipe / Pile diameter, (in)
    k. Drive Depth, (ft)
    l. Drive Depth BML, (ft)
    m. Water Depth (ft)
    n. Substrate Type(s) (e.g., silt, mud, sand, gravel, etc.)
    o. Type of Pile Driven (e.g., drive pipe or conductor, piling, etc.)
    p. Pile Material (e.g., steel, concrete, etc.)
    q. Number of piles driven
    r. Number of strikes per pile
    s. Total number of strikes
    t. Whether hammer is operating (dry) or below (wet) the water surface
    u. Number of Soft Starts
    v. Duration of Soft Starts (mins)
    w. Duration at Full/Operating Power (HH:MM)
    x. Hammer low energy output (KIP or kJ)
    y. Duration at low energy (HH:MM)

z. Hammer highest energy output (KIP or kJ)
aa. Duration at highest energy levels (HH:MM)
bb. Number of hammer pauses
cc. Total duration of pauses (HH:MM)

A.9.6 Reporting requirements

1. The Permit and/or Plan holder, or observer on behalf of your company, must submit data collection reports (see Data Collection for details) to BSEE (protectedspecies@bsee.gov) detailing all protected species observations within 15 days of completing operations. BSEE is tasked as the lead agency and will submit reports to other agencies as appropriate.
2. The Permit and/or Plan holder, or observer on behalf of your company, must submit a comprehensive report to BSEE (protectedspecies@bsee.gov) and BOEM (protectedspecies@boem.gov) on all pile driving activities and monitoring results within 30 days of completing operations. This comprehensive report will utilize the information from the data collection reports to provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates of the pile driving activities conducted and all protected species observations.
3. If a Rice's whale, or what is presumed to be Rice's whale, is observed at any time by visual observer(s) or construction personnel, the Permit and/or Plan holder must immediately report the sighting information to NMFS via nmfs.psoreview@noaa.gov as soon as feasible but no longer than 24 hours after the sighting. Information must include at minimum: time of sighting, location, and number of Rice's whales observed. Please also include images or any other relevant information. For other applicable information, see Data Collection (A.9.5). The subject line for the information must include for tracking purposes: Gulf of America presumed Rice's whale observation and "date".
4. Dead and Injured species reporting:
    - For injured or dead non-marine mammal aquatic protected species, report incidents to the hotlines listed at https://www.fisheries.noaa.gov/report (phone numbers vary by state). For reporting dead or injured marine mammals, refer to Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocol.
    - Marine mammals: contact WHALE HELPLINE at 877-942-5343.

Attachment 8: The Bureaus' Explosive-Severance Scenario Mitigation Protocol (in Bureaus' Focused BA Appendix A.8)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the GULF OF AMERICA. Reporting requirements are included where appropriate.

A.8 Explosive-Severance Scenario Mitigation Package

A.8.1 *Sargassum* habitat monitoring

"*Sargassum* habitat" is defined as the presence of *Sargassum* in sufficient amounts that serve as developmental habitat in which small juvenile sea turtles are likely to be found. Small juvenile turtles are extremely difficult to detect and *Sargassum* habitat will be used as the primary indicator of their presence in an impact zone. Typically, the occasional presence of a few, small *Sargassum* "clumps" are not considered developmental habitat. *Sargassum* habitat for sea turtles is visually described as mats, continuous lines, broken windrows (short lines or non-linear clumps), or scattered patches (Table 4). NMFS PSOs will be required to monitor local conditions to determine if *Sargassum* habitat is present based on the hourly conditions at a decommissioning site and implement the appropriate measures in Tables 6a and 6b.

Table 4. Description of Sea Turtle Sargassum Habitat Types

Sargassum Habitat Type	Description
Mat	One or more consolidated areas of Sargassum forming a mat large enough to provide shelter and/or food for a small sea turtle.
Continuous Line	One or more contiguous meandering lines or scattered patches along a linear path. Lines may be narrow or wide. These lines are often associated with convergence zones.
Broken Windrows	Many parallel, short lines or clumps that may or may not be distributed linearly.
Scattered Patches	Numerous patches scattered over an area.

Witherington et al., 2012

A.8.2 Requirements for establishing impact zones

a) Impact zones in both shallow and deep water are determined by the net explosive weights used during a decommissioning event. The impact distance(s) must be based on the largest charge size proposed to be used during a removal event when multiple charges are used. The measures herein apply to any charge size up to 500 pounds (lb). The charge weight establishes the specific mitigation scenario that must be adhered to as a permit condition.

b) Impact zones for each scenario must be calculated using the most recent version of the Underwater Calculator (UWC) that has been reviewed and approved by NMFS. The current required impact zones (Table 5) are based on UWC version 1.5.3 that is the latest approved version at the time of this opinion. Review and approval of UWC revisions will be completed according to the second tier consultation procedures.

Table 5. Impact zones for net explosive weights based on underwater calculator version 1.5.3

Net Explosive Weight (lb)	Impact Zone Distance BLM	Impact Zone Distance AML
1–10	261 m (856 ft)	293 m (961 ft)
>10–20	373 m (1,224 ft)	522 m (1,714 ft)
>20–80	631 m (2,069 ft)	829 m (2,721 ft)
>80–200	941 m (3,086 ft)	1,126 m (3,693 ft)
>200–500	1,500 m (4,916 ft)	1,528 m (5,012 ft)

c) NMFS understands all decisions on explosive composition, configuration, and usage need to be made by the qualified explosive contractors in accordance with the applicable explosive-related laws and regulations. BSEE or their permittee must provide a written blasting plan to the PROP Program Manager prior to the anticipated blasting date. The blasting plan must include the number of and type of structures, number of decommissioning events, type of explosives, and weight of explosives. Any changes to the net explosive weights detailed in the blasting plan must be submitted in writing to the Platform Removal Observer Program (PROP) program manager or lead PSO on site. The PROP Program Manager or lead PSO will determine the appropriate scenario measure (described below) and impact zone required based on the final net explosive weights used for the removal.

d) PSOs may use binoculars and the naked eye to monitor the zones. The sighting distance of all listed species and Sargassum habitat that result in delays must be recorded.

e) Buoys or some visible markers will be necessary for visual reference of the impact zone when only surface monitoring is required. The perimeter of impact zones should be demarcated (e.g., brightly colored buoys, vessels, or other markers) for visual reference.

f) If any ESA-listed species, or Sargassum habitat indicative of small juvenile sea turtles are present in the impact zone, a detonation must not proceed. Steps for tracking animals, inspecting Sargassum habitat, delay periods, and additional monitoring are detailed below.

A.8.3 Requirements for differing scenario mitigations

a) Permittees must fully comply with the relevant measures according to impact zones in Table 5 and the mitigation scenarios in Table 6. Table 5 provides the impact zone distances required based on the net explosive weight used. Table 6 summarizes the required mitigation and monitoring surveys, and duration of monitoring required. Sea turtles can remain submerged on a single dive for well over 30 minutes, hence the reason for increasing the pre-detonation aerial survey to 45 minutes (Byles, 1989; Renaud, 1995; Gitschlag, 1996).

Table 6a. Mitigation overview for net explosive weights used in any configuration in shallow water (SW; less than 200 m)

Mitigation Scenario Number	Net Explosive Weight (lb)	Pre-Det Surface Survey (min)	Pre-Det Aerial Survey (min)	Pre-Det PAM (min)	Animal Sightings Waiting Period (min)	Sargassum Habitat Waiting Period	Post-Det Surface Survey (min)	Post-Det Aerial Survey (min)	Post-Post-Det Aerial Survey within One Week
SW-1	1–10	60	N/A	N/A	30	Until visually inspected or Sargassum floats out of Impact Zone	30	N/A	No
SW-2	>10–20	90	45	N/A	30	Until visually inspected or Sargassum floats out of Impact Zone	N/A	45	No
SW-3	>20–80	90	45	N/A	30	Until visually inspected or Sargassum	N/A	45	No

Mitigation Scenario Number	Net Explosive Weight (lb)	Pre-Det Surface Survey (min)	Pre-Det Aerial Survey (min)	Pre-Det PAM (min)	Animal Sightings Waiting Period (min)	Sargassum Habitat Waiting Period	Post-Det Surface Survey (min)	Post-Det Aerial Survey (min)	Post-Post-Det Aerial Survey within One Week
						floats out of Impact Zone			
SW-4	>80–200	120	60	N/A	30	Until visually inspected or Sargassum floats out of Impact Zone	N/A	45	No
SW-5	>200–500	150	90	N/A	45	Until visually inspected or Sargassum floats out of Impact Zone	N/A	45	No

Table 6b. Mitigation overview for net explosive weights used in any configuration in deep water (DW; greater than 200 m)

Mitigation Scenario Number	Net Explosive Weight (lb)	Pre-Det Surface Survey (min)	Pre-Det Aerial Survey (min)	Pre-Det PAM (min)	Animal Sightings Waiting Period (min)	Sargassum Habitat Waiting Period	Post-Det Surface Survey (min)	Post-Det Aerial Survey (min)	Post-Post-Det Aerial Survey within One Week
DW-1	1–10	90	N/A	N/A	45	Until visually inspected or Sargassum floats out of Impact Zone	30	N/A	No
DW-2	>10–20	90	45	N/A	45	Until visually inspected or Sargassum floats out of Impact Zone	N/A	45	No
DW-3	>20–80	90	60	150	45	Until visually inspected or Sargassum floats out of Impact Zone	N/A	45	Yes
DW-4	>80–200	150	60	180	45	Until visually inspected or Sargassum floats out of Impact Zone	N/A	45	Yes
DW-5	>200–500	180	90	270	45	Until visually inspected or Sargassum floats out of Impact Zone	N/A	45	Yes

b) Permittees must stagger the detonation of multiple charges in a series by an interval of at least 0.9 sec (900 msec) between blasts. Otherwise, the combined charge sizes (or net explosive weight) will be used to determine the impact zone.

c) Detonations must only occur during daylight and during a time that would allow for post- detonation surveys. Monitoring will cease if the lead PSO determines that

weather or marine conditions are not adequate for visual observations.

d) Scare charges must not be used to clear impact zones of sea turtles or ESA-listed whales (i.e., sperm whale).
e) Images/pictures taken during any surveys are the property of the U.S. Government and should not be sold, duplicated or used in any way other than for which the project it was intended.
f) Unusual Circumstances: Occasionally, sea turtle(s) remain within the impact zone or are present in high numbers. On rare occasions, very small turtles may be seen in absence of Sargassum habitat near vessels from which monitoring is occurring. During these unusual circumstances, the on-site NMFS PSO must exercise discretion in the implementation of measures or modification of the mitigation procedures that serve to avoid or minimize impacts to sea turtle(s). Typically, modifications of mitigations include increasing the duration of monitoring periods, increasing the number of PSOs, delaying blasting, or a combination of measures. The lead PSO will coordinate with the PROP Manager, appropriate BSEE personnel, and NMFS ESA section 7 consulting biologist when circumstances necessitate additional monitoring.

A.8.4 Requirements for surface monitoring surveys

a) A surface monitoring survey is required for all blasting scenarios and must be conducted for the length of time indicated for the net explosive weights in Table 6a and Table 6b.
b) Surface monitoring is generally conducted by at least two PSOs. Surface monitoring surveys are to be conducted from the highest vantage point(s) and/or other location(s) that provide the best, clear view of the entire impact zone. These vantage points may be on the structure being removed or proximal surface vessels such as crew boats and derrick barges. Additional PSOs will be positioned around the decommissioning site, as determined by the PROP manager/coordinator in consultation with the lead PSO for additional structures, large net explosive weights, or other circumstances as needed.
c) Surface monitoring must be conducted in adequate light during daylight hours (sunrise to sunset) and with an adequate line of sight including meteorological conditions free of rain or fog, and free of other visual obstructions such as other work vessels.
d) For mitigation scenarios requiring only surface monitoring and no aerial monitoring, surface monitoring must be conducted under good environmental conditions that are conducive for monitoring for sea turtles and marine mammals. Surface-only monitoring must be delayed if: 1.) Sea conditions exceed Beaufort Wind Force Scale 4.5 (see Table 7), or 2.) inadequate line of sight including poor light conditions, meteorological conditions (e.g., rain or fog) and other visual obstructions such as other work vessels.

Table 7. Beaufort Sea State Scale

Beaufort State	Wind (mph)	Wind (knots)	Wave Height (ft)	Description
0 (calm)	0–1	0–1	0	Sea surface like a mirror
1 (light air)	1–3	1–3	0.33–0.65	Ripples with the appearance of scales, but no foam crests
2 (light breeze)	4–7	4–6	0.66–1.9	Small wavelets, more pronounced. Crests have glassy appearance, but do not break
3 (gentle breeze)	8–12	7–10	2–3.2	Large wavelets. Crests begin to break. Foam of glassy appearance. Perhaps scattered white horses
4 (moderate breeze)	13–18	11–16	3.3–6.5	Small waves, becoming larger; fairly frequent white horses
4.5 (moderate-fresh breeze)	≤15.5	≤13.5	≤4.9	Small waves, crests break, scattered but regular white horses
5 (fresh breeze)	19–24	17–21	6.6–9.8	Moderate waves, more pronounced long form, many white horses, some spray possible

e) For charge sizes between 0-10 lb, the detonation may proceed if ESA-listed species or Sargassum habitat is not sighted.
f) If a listed species is sighted, or sighted heading inbound toward the impact zone, a waiting period is required (see Waiting Periods in "F" below), or
g) If Sargassum habitat is sighted in the impact zone, a waiting period is required until the Sargassum habitat drifts out of the impact zone (see Waiting Periods in "F" below). Alternatively, a vessel-based PSO could inspect the Sargassum for juvenile sea turtles. This must be done from a small vessel or inflatable boat so that an observer will be close to the water surface and can see small turtles. If no sea turtles are sighted, the waiting period ends and the survey can continue for the remaining period required under the mitigation. If a sea turtle(s) is sighted, the waiting period must continue until the Sargassum drifts out of the impact zone.

A.8.5 Requirements for pre-det aerial surveys

a) Aerial monitoring surveys are to be conducted from helicopters running standard low-altitude search patterns over the extent of the decommissioning area, including the impact zone that corresponds to the appropriate mitigation scenario.
b) Aerial surveys will be restricted to daylight hours only and cannot begin until the requisite surface monitoring survey has been completed.
c) Aerial surveys will cease if the lead PSO determines that weather or marine conditions are not adequate for visual observations, or when the pilot/removal supervisor determines that helicopter operations must be suspended.
d) When two or more PSOs are on site, NMFS may decide two PSOs conduct the aerial survey or have one or more PSOs continue surface monitoring while the other observer flies the survey. The helicopter will traverse the impact zone at low speed/altitude in the specified survey pattern.
e) Flight patterns during pre-detonation and post-detonation surveys must follow the procedures listed in **Table 8**. At any time during the survey period, the flight path may be altered to investigate sightings and confirm their location in reference to the impact zone.

Table 8. Flight Patterns During Pre-detonation Surveys

Flight Path	30-minute	45-minute	60-minute	90-minute
Follow a spiraling or corkscrewing flight path out from the center of the impact zone to the perimeter of the impact zone. This should be followed by a gradually contracting spiral flight path until the aircraft returns to the center of the impact zone. Repeat the pattern for the specified time period.	10 minutes	20 minutes	25 minutes	40 minutes
Unless higher priority targets (ex. turtles, dolphins, Sargassum) are present, the aircraft should survey outside of the impact zone to a distance approximately equal to the radius of the impact zone to determine if any protected species (sea turtles or marine mammals) might be moving into the area. Expanding and contracting spirals should again be used for the flight path.	5 minutes	5 minutes	5 minutes	5 minutes
The aircraft should survey inside the impact zone and follow the same procedures as during the first part of the survey. However, near the end of the survey period the flight path should usually be concentrated near the center of the impact zone since this is where animals will have the highest risk of severe impact.	15 minutes	20 minutes	30 minutes	45 minutes

All surveys should begin at the center of the impact zone. At any time during the entire survey period it may be necessary to alter the flight path to investigate sightings and confirm their location in reference to the impact zone.

f) For charge sizes greater than 10-500 lb, the detonation may proceed if listed species are not sighted.
g) If listed species are sighted, or sighted heading inbound toward the impact zone, a waiting period is required (see Waiting Periods below).
h) If Sargassum habitat is sighted, a waiting period is required until either a) a vessel-based PSO inspects the Sargassum from a small vessel or inflatable boat for juvenile sea turtles to determine if a Sargassum waiting period is required, or b) no vessel-based inspection occurs and a waiting period is triggered until the Sargassum has drifted out of the impact zone. If no sea turtles are sighted during a PSO inspection, the surface monitoring can continue for the remainder of the required monitoring period.

A.8.6 Requirements for passive acoustic monitoring (PAM)

a) BOEM and BSEE must require operators to provide for review a plan for the use of passive acoustic monitoring for marine mammal detection in the relevant deepwater mitigation scenarios (DW-3, DW-4, and DW-5). The plan must include on-site monitoring protocols, description of the passive acoustic system, software used, recording and storage of data, and other aspects of acoustic monitoring.
b) Persons conducting acoustic surveys will be required to comply with NMFS-approved passive acoustic monitoring protocols and use approved devices and technicians.

c) Acoustic surveys will be run concurrent with requisite pre-detonation surveys, beginning with the surface observations and concluding at the finish of the aerial surveys when the detonation(s) is allowed to proceed. Operators must also report on an assessment of the usefulness, effectiveness, and problems encountered with the use of the method. PAM operators must notify NMFS PSOs immediately when any acoustic targets are detected.

d) For mitigation Scenarios DW-3, DW-4, and DW-5, the detonation may proceed if ESA-listed whales (i.e., sperm whale) are not detected with PAM and the other pre-det surveys do not detect listed species or Sargassum habitat. If ESA-listed whales are detected with PAM (or listed species or Sargassum habitat are otherwise sighted), a waiting period is required (see Waiting Periods below).

A.8.7 Requirements for waiting periods for surface, aerial, and PAM surveys

a) For pre-det surveys. If sea turtle, Sargassum habitat or ESA-listed whales (i.e., sperm whale) are observed within (or about to enter, heading inbound) the impact zone of any pre-detonation survey, detonations must be delayed until no protected species are inside the impact zone or the Sargassum has drifted out of the impact zone. The waiting period must be completed before the monitoring protocol for the requisite mitigation, and following measures can continue. The purpose of a waiting period is to allow any inbound animal(s) within the impact zone to exit the impact zone under their own volition. For small juvenile sea turtles, the purpose of the waiting period is to allow floating Sargassum habitat to drift out of the area or to confirm no turtles are present in the Sargassum.

b) For surface, aerial, PAM surveys. When listed species are inside the impact zone or inbound toward the impact zone during a surface, aerial or PAM survey:

i. Halt the detonation countdown and implement the waiting period,

ii. Continue opportunistic monitoring during the required waiting period after the last sighting.

iii. If additional sightings occur inside the impact zone or animals sighted heading inbound during the waiting period, then continue surface surveys and start a new waiting period after the occurrence of the last sighting.

iv. Except for waiting periods triggered by *Sargassum* habitat, anytime a waiting period for an aerial survey or for a surface survey for blast scenarios with surface only surveys (when no aerial survey is required) is triggered by a sea turtle or marine mammal sighting, the interrupted survey must be completed over in its entirety. For blast scenarios that include both survey types, only the aerial survey would need to be repeated.

v. Anytime a surface survey waiting period is due only for *Sargassum* habitat, a waiting period is required until either a) a vessel-based PSO inspects the *Sargassum* and determines no turtles are present, or b) no vessel-based inspection occurs and a waiting period is triggered until the Sargassum has drifted out of the impact zone. If no sea turtles are sighted during a PSO inspection of Sargassum habitat, the surface monitoring can continue for the remainder of the required monitoring period.

vi. Anytime an aerial survey waiting period is triggered only due to Sargassum habitat (no marine mammals or large juvenile or adult sea turtles sighted), only the aerial survey needs to be repeated.

vii. Other than in the case of waiting periods described above, any interrupted surface or aerial surveys must be repeated in their entirety. Also, the post-detonation aerial survey must begin immediately following completion of the pre-detonation surface survey.

A.8.8 Requirements for post-detonation and post-post detonation monitoring surveys

The primary purpose of post-det and post-post-det surveys is to detect any listed species that may have been impacted (stunned, injured or killed) by the detonation and monitor the effectiveness of the pre-det mitigation requirements. Post-det and post-post-det surveys must follow the following measures.

a) A 45-minute post-detonation aerial survey must be conducted by the PSO(s) for all explosive use greater than 10 lb. The aerial survey must be conducted immediately upon conclusion of the detonation.
b) For deepwater, mitigation scenarios DW-3, DW-4 and DW-5, post-post-detonation aerial monitoring surveys must be conducted within 2-7 days after detonation activities conclude, by either helicopter or fixed-wing aircraft. Any distressed, stunned, injured, or dead marine mammals will be noted in the survey report, and if possible, tracked and collected after notifying the National Marine Fisheries Service.
c) Detonations must not occur if the post-detonation survey cannot be concluded prior to sunset.
d) For post-detonation surveys, follow a spiraling or corkscrewing flight path out from the center of the impact zone to the perimeter of the impact zone. This should be followed by gradually contracting spiral flight path until the aircraft returns to the center of the impact zone. If strong currents are present, the down current area should be surveyed outside the impact zone to an appropriate distance. Repeat the pattern for the specified time period.
e) For post-post-detonation surveys, survey a 7x7 nautical mile (nmi) grid centered over the removal site. This grid includes eight, parallel transect lines each measuring 7 nmi long and spaced approximately 1 nmi apart. If strong currents are determined to be present, the the grid may be shifted in the down current direction to an appropriate distance. Any injured or dead sea turtle or marine mammal must be recorded in the survey report and reported to the appropriate stranding network. The stranding network may request that the carcass be tracked and collected if possible.

A.8.9 Requirements for the recovery of sea turtles

a) BOEM and BSEE must allow an option for trained diver(s) to attempt capture of sea turtles known to be present around a structure slated for removal by explosive severance. NMFS SERO must be notified prior to any capture attempts and the capture, handling, holding, and release of sea turtles must be under the guidance and supervision of NMFS PSOs
b) Sea turtles that are observed to be stunned, injured, or killed during post-det surveys or follow-up aerial surveys must be recovered by PSOs when it is possible to do so. The company and offshore service contractors on site must make assets available, such as vessels, divers, so PSOs can capture or recover stunned, injured, or dead turtles and transport them to shore.
c) Impacted sea turtles that are recovered alive or dead must be immediately transported to shore in coordination with NMFS. Turtles must be transported to an authorized rehabilitation facility for veterinary treatment, or properly stored for necropsy to document the injuries and cause of death.
d) If a sperm whale is unintentionally exposed to a blast, the incident must immediately be reported to the Marine Mammal Stranding Network at 1-877-WHALE-HELP (1-877-942-5343).

A.8.10 PSO requirements

a) NMFS PSOs are required to perform surface and aerial surveys. These PSOs are qualified NMFS employees or contractors delegated under the PROP of NMFS' Galveston Laboratory. Explosive-severance contractors or operators enter into agreements with the NMFS Galveston Laboratory to provide PSO monitoring. Under the agreements, NMFS achieves full cost recovery for the goods and services provided. Generally, at least 2 or 3 NMFS PSOs are required to conduct surveys for the mitigation scenarios. When simultaneous surface, aerial, or PAM surveys are required, teams of PSOs may be required. The PROP Manager will determine the required number of teams and PSOs depending on the complexity of severance activities, structure configurations, adequacy of structures and vessels to conduct effective monitoring, and other environmental monitoring conditions.
b) PSOs must brief affected crew and severance contractors of the monitoring efforts and notify topsides personnel to report any sighted animals or Sargassum habitat to the lead PSO immediately;
c) PSOs must establish an active line of communication (such as 2-way radio) with company and blasting personnel;
d) PSOs must devote the entire, uninterrupted survey time to listed species monitoring; and,
e) For aerial surveys, a PSO should sit in one of the seats in the front of the cockpit. This is typically on the port side of the aircraft next to the pilot. Whenever possible, a second PSO should sit on the opposite side of the aircraft so that both sides of the aircraft are surveyed. If additional PSOs are available, seating should be adjacent to a window. Communications equipment should be provided which allows the pilot and PSOs to talk to each other and which provides clear communications.

A.8.11 Requirements for reporting

a) Any take of listed species should be reported to NMFS at takereport.nmfsser@noaa.gov and nmfs.psoreview@noaa.gov. If the taking involves a whale, the lead PSO must also report it immediately to the Marine Mammal Stranding Network at 1-877-WHALE-HELP (1-877-942-5343).
b) Final monitoring reports (also referred to as the trip report) will be prepared for each explosive removal. The monitoring report responsibilities will be assumed by NMFS's lead PSO and completed following completion of the severance activities.
c) In addition to basic operational data (e.g., area and block, water depth, company/platform information), the trip reports must contain all of the applicable information:

i. Target: Type/Composition (pile, caisson, concrete piling, nylon mooring, etc.) and Diameter and Thickness
ii. Charge: Type (bulk, configured-bulk, linear-shaped, etc.), Charge weight/material (RDX, C4, HMX, etc.), Configuration (internal/external, cut depth [below mud line], water depth [above mud line], etc.), Deployment method (diver, ROV, from surface, etc.)
iii. Monitoring: Survey Type: (pre-det and post-det; surface, aerial, etc.), Time(s) initiated/terminated, Marine Conditions
iv. Observed/Detected summary: Type/number (basic description or species identification, if possible, during all survey types- i.e., surface, aerial, and acoustic and both during pre- and post-detonation periods), Location/orientation – inside/outside impact zone,

inbound/outbound, etc., Any "halted-detonation" details – i.e., waiting periods, re-surveys, etc., Any "Take-Event" details – actual MPS injury/mortality.

d) BOEM must provide an annual report to the NMFS consulting biologist describing the total annual structures removed, sea turtle and sperm whale sightings during pre-detonation surveys, sea turtle and sperm whale sightings during post- detonation surveys, visibility during the surveys, details of sea turtles (including loggerhead, green, Kemp's ridley, hawksbill and leatherback sea turtles) and ESA-listed whales (i.e., sperm whale) that were observed injured, killed or otherwise affected and the measures taken for each sea turtle and sperm whale. These annual reports should be combined with any MMPA reporting requirements, as appropriate.

e) The annual reports must be sent electronically by email to nmfs.psoreview@noaa.gov with "Decommissioning Protected Species Annual Report" in the subject header.

A.8.12 References

Byles RA. 1989. Satellite telemetry of Kemp's ridley sea turtle, *Lepidochelys kempi*, in the Gulf of Mexico. In: Eckert SA, Eckert KL, Richardson L, compilers. Proceedings of the Ninth Annual Workshop on Sea Turtle Conservation and Biology, 7–11 February, 1989, Jekyll Island, Georgia. Miami (FL): NOAA NMFS, Southeast Fisheries Science Center. NOAA Tech. Memo. NMFS-SEFC-232. p. 25–26.

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Renaud ML. 1995. Movements and submergence patterns of Kemp's ridley turtles (*Lepidochelys kempii*). J Herpetol. 29:370–374.

Witherington B, Hirama S, Hardy R. 2012. Young sea turtles of the pelagic Sargassum-dominated drift community: habitat use, population density, and threats. Mar Ecol Prog Ser. 463:1–22.

Attachment 9: The Bureaus' Site-clearance Trawling Protocol (in BOEM's Focused BA Appendix A.10)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the GULF OF AMERICA. Reporting requirements are included where appropriate.

A.10 Site-clearance Trawling Reporting

If trawling is used to comply with the site clearance verification requirements under 30 CFR §§ 250.1740-1743 and NTL 2019-G05, which mandates that turtle excluder devices (TEDs) be removed from the trawl nets to facilitate the collection of seabed debris, you must abide by maximum trawl times of 30 minutes, allowing for the removal of any captured sea turtles. If during your trawling activities, you capture a sea turtle in your nets, you must:

1. Resuscitate and release any captured sea turtles per NMFS' guidelines found in **Attachment 10,** *Sea Turtle Resuscitation Guidelines*;
2. Contact BSEE's Office of Environmental Compliance (OEC) at protectedspecies@bsee.gov, NMFS Southeast Turtle Stranding and Salvage Network Hotline (844-732-8785) and closest state coordinator (contact information available at www.fisheries.noaa.gov/marine-life-distress/state-coordinators-and-state-liaisons-sea-turtle-stranding-and-salvage-network), and NMFS' Southeast Regional Office (SERO) at takereport.mmfsser@noaa.gov immediately; and
3. Photograph the turtle and prepare a complete the turtle stranding reporting form. Submit report to NMFS and BSEE (to the email addresses noted above).

In addition to the items specified in NTL 2019-G05, your site clearance verification report must also include:

- Start and stop times for each survey line, based on when trawl net enters and leaves the water; and
- Average speed maintained during each survey line.

Attachment 10: The Bureaus' Sea Turtle Resuscitation Guidelines Protocol (in Bureaus' Focused BA Appendix A.7)

These protocols will be programmatically implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h). The measures contained in this attachment apply to all activities approved by the Bureaus and associated with the federally regulated oil and gas program in the Gulf of America.

BOEM and BSEE require the lessee or the lessee's representatives (e.g., operators, contractors) (collectively, the "lessee") to follow protocols, also known as "Conditions of Approval (COA)" for authorized oil and gas activities on the Outer Continental Shelf (OCS) of the GULF OF AMERICA. Reporting requirements are included where appropriate.

A.7 Sea Turtle Resuscitation Guidelines

Any sea turtles taken incidentally during the course of oil and gas activities must be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water according to the following procedures:

1. Sea turtles that are actively moving or determined to be dead (as described in paragraph (2)(iv) below) must be released over the stern of the boat. In addition, they must be released only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels.
2. Resuscitation must be attempted on sea turtles that are comatose or inactive by:
   i. Placing the turtle on its bottom shell (plastron) so that the turtle is right side up and elevating its hindquarters at least 6 inches (15.2 cm) for a period of 4 to 24 hours. The amount of elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (7.6 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.
   ii. Sea turtles being resuscitated must be shaded and kept damp or moist but under no circumstance be placed into a container holding water. A water- soaked towel placed over the head, carapace, and flippers is the most effective method in keeping a turtle moist.
   iii. Sea turtles that revive and become active must be released over the stern of the boat only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels. Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) must be returned to the water in the same manner as that for actively moving turtles.
   iv. A turtle is determined to be dead if the muscles are stiff (rigor mortis) and/or the flesh has begun to rot; otherwise, the turtle is determined to be comatose or inactive and resuscitation attempts are necessary.

Any sea turtle so taken must not be consumed, sold, landed, offloaded, transshipped, or kept below deck.

A.7.1 Reporting requirements

Incident reporting should be made to BOEM/BSEE and NMFS (protectedspecies@boem.gov, protectedspecies@bsee.gov, takereport.nmfsser@noaa.gov).

Appendices for the 2025 Biological and Conference Opinion on the Federally Regulated Oil and Gas Program in the Gulf of America

National Marine Fisheries Service

Appendix A. Fisheries Take of Turtles

Table A-1. Summary of Anticipated 3-year Take and Mortality Estimates for the Coastal Migratory Pelagic Resources in the Atlantic and Gulf of America (NMFS 2015)

Species	Take	Total
Green sea turtle North Atlantic DPS	Total	31
	Lethal	9
Loggerhead sea turtle NWA DPS	Total	27
	Lethal	7
Kemp's ridley sea turtle	Total	8
	Lethal	2
Hawksbill sea turtle	Total	1
	Lethal	1
Leatherback sea turtle	Total	1
	Lethal	1
Smalltooth sawfish	Total	1
	Lethal	0
Atlantic sturgeon GM DPS	Total	2 (12)
	Lethal	0
Atlantic sturgeon NYB DPS	Total	4 (12)
	Lethal	0
Atlantic sturgeon CB DPS	Total	3 (12)
	Lethal	0
Atlantic sturgeon Carolina DPS	Total	4 (12)
	Lethal	0
Atlantic sturgeon SA DPS	Total	10 (12)
	Lethal	0

Table A-2. Anticipated takes over 3-years for the Highly Migratory Species Atlantic Shark and Smoothhound Fisheries (NMFS 2020)

	Total Takes	Mortalities
Sperm Whale (10-year)	3	3
Leatherback Sea Turtle (3-year)	996	275 (13+262)*
Loggerhead Sea Turtle (3-year)	1,080	280 (6+274)*
"Other Hardshell" Sea Turtle (any combination of NA green, SA green, hawksbill, Kemp's ridley, or olive ridley sea turtles) (3-year)	21	8 (3+5)*
Giant Manta Ray (3-year)	366	6
Scalloped Hammerhead Shark – Central and Southwest Atlantic DPS (3-year)	576	249 (165+84)**
Oceanic Whitetip Shark (3-year)	1,362	498 (279+219)**

*Sea turtle mortalities include dead-on-retrieval and estimates of post-release mortality based on observed hooking location and gear removal. Numbers in parentheses are dead-on-retrieval + post-release mortality.

** Scalloped hammerhead and oceanic whitetip mortalities include dead-on-retrieval and estimates of post-release mortality based on post-release mortality rate from scientific

Table A-3. Anticipated takes over 3-years for the Southeast U.S. Shrimp Fisheries in Federal Waters via Otter and Skimmer Trawls (NMFS 2021)

Species	Captures	Mortalities
Kemp's Ridley Sea Turtle	84,495	8,505
Loggerhead Sea Turtle	72,670	2,150
Green Sea Turtle	21,214	1,700
Leatherback Sea Turtle	130	5
Hawksbill Sea Turtle	170	5

* *Green sea turtle takes highlighted in red are adjusted to take into consideration anticipated population growth.*

Table A-4. Anticipated take over three years starting in 2010 under the Gulf Of Mexico Reef Fish Fishery Management Plan (NMFS 2011)

Species	Commercial Bottom Longline Takes (Mortalities)	Commercial Vertical Line Takes (Mortalities)	Recreational Vertical Line Takes (Mortalities)	Vessel Strike Takes- All Lethal	Entire Fishery Takes (Mortalities)
Loggerhead	644 (397)[A] 623 (384)[B]	77 (23)	254 (75)	90(90)	1065 (585)[A] 1044 (572)[B]
Kemp's ridley	3 (3)	22 (7)	74 (22)	9 (9)	108 (41)
Green	3 (3)	14 (4)	45 (14)	54 (54)	116 (75)
Leatherback	3 (3)	1 (1)	1 (1)	6 (6)	11 (11)
Hawksbill	3 (3)	1 (1)	2 (1)	3 (3)	9 (8)
Smalltooth sawfish	2 (0)	2 (0)	4 (0)	0 (0)	8 (0)

[A]=anticipated in 2010-2012; [B]=anticipated for all subsequent three-year running totals (i.e., 2011-2013, 2012-2014, 2013-2015, etc.).

Appendix B. BSEE and BOEM Oil and Gas Program AIS vessel types

id	Level 5 type	Level 5 description
1	Aggregates Carrier	A single deck cargo vessel for the carriage of aggregates in bulk. Also known as a Sand Carrier. May be self discharging
2	Waste Disposal Vessel	A vessel equipped for the transportation, treatment and/or (now illegal) discharge at sea of waste material
3	Crane Vessel	A vessel equipped with a large crane for lifting operations
5	Mooring Vessel	A vessel equipped to assist with the mooring and/or anchoring of larger vessels. Typically it will have a frame to prevent the ropes and chains fouling on the superstructure
10	Crude/Oil Products Tanker	A tanker for the bulk carriage of crude oil but also for carriage of refined oil products
11	Shuttle Tanker	A tanker for the bulk carriage of crude oil specifically for operation between offshore terminals and refineries. Is typically fitted with bow loading facilities
12	Pipe Burying Vessel	A vessel equipped to carry small stones and aggregates and to deliver them via a flexible fall pipe system to bury pipes and cables on the sea bed
15	Trailing Suction Hopper Dredger	A vessel equipped to obtain material from the sea bed by use of a trailing suction pipe. The material may be carried on board and discharged elsewhere through the bottom of the vessel, either by bottom doors or a split hull, or delivered to other vessels
16	Supply Platform, semi submersible	A semi submersible offshore supply platform
17	Water Tank Barge, non propelled	A non propelled tank barge for the carriage of water
19	Asphalt/Bitumen Tanker	A tanker for the bulk carriage of asphalt/bitumen at temperatures between 150 and 200 deg C
24	Cable Repair Ship	A vessel equipped for the retrieval and repair of underwater cables

25	Pipe Layer Crane Vessel	A pipe layer also equipped with a large crane or derrick
26	Bulk Cement Barge, non propelled	A non propelled barge for the carriage of bulk cement
33	FSO, Oil	A tanker purpose built or converted to store oil produced from a field prior to its transfer to another vessel for transportation. May be self or non propelled. This type does not include vessels which are temporarily being used for storage of oil
34	Jacket Launching Pontoon, semi submersible	A semi submersible pontoon designed for positioning and launching jackets for offshore use
37	Drilling Rig, jack up	A jack up offshore drilling rig
44	Combination Gas Tanker (LNG/LPG)	A tanker for the bulk carriage of Liquefied Natural Gas (primarily methane) and/or Liquefied Petroleum Gas in independent insulated tanks
52	Research Survey Vessel	A vessel equipped for research and/or survey (e.g. geophysical, hydrographic)
53	LNG Tanker	A tanker for the bulk carriage of Liquefied Natural Gas (primarily methane) in independent insulated tanks. Liquefaction is achieved at temperatures down to -163 deg C
54	Effluent carrier	A vessel equipped for the transportation of effluents. Discharge at sea is now illegal
55	Utility Vessel	A small multi functional response vessel not dedicated to a particular function
57	Anchor Handling Tug Supply	An offshore tug/supply ship equipped with a high bollard pull and a stern roller for anchor handling
58	Accommodation Platform, semi submersible	A semi submersible offshore accommodation platform
71	Cement Storage Barge, non propelled	A barge with pumping facilities for loading & discharging cement.
82	Support Platform, jack up	A non-propelled jack up vessel for offshore support
83	Pollution Control Vessel	A vessel equipped for the primary function of pollution control. Typical types include oil spill recovery vessel and a pollution and debris collector
86	Pusher Tug	A vessel equipped to push cargo-carrying barges and pontoons.
88	Bulk/Oil Carrier (OBO)	A bulk carrier arranged for the alternative (but not simultaneous) carriage of crude oil
91	Crane Platform, jack up	A jack up offshore crane platform

94	Crane Vessel, non propelled	A non self propelled vessel equipped with a large crane for lifting operations
96	Bulk Aggregates Barge, non propelled	A non propelled barge for the carriage of bulk aggregates
99	Jacket Launching Pontoon	A pontoon designed for positioning and launching jackets for offshore use
100	Crew Boat	A vessel equipped for the transportation of crew to ships and/or installations
102	Crude Oil Tanker	A tanker for the bulk carriage of crude oil
107	Hopper/Dredger (unspecified)	A vessel equipped to obtain material from the sea bed by an unspecified means. The material may be carried on board and discharged elsewhere through the bottom of the vessel, either by bottom doors or a split hull, or delivered to other vessels, pumped a
110	FSO, Gas	A tanker purpose built or converted to store gas produced from a field prior to its transfer to another vessel for transportation. May be self or non propelled. This type does not include vessels which are temporarily being used for storage of gas
112	Barge Carrier	A cargo vessel arranged for the carriage of purpose built barges (lighters) loaded with cargo. Typically loading is by way of a gantry crane. Also known as Lighter Aboard SHip vessels (LASH)
113	Grab Dredger	A vessel equipped to obtain material from the sea bed by use of a grab. The material may be carried on board, transferred to other vessels, pumped ashore or deposited elsewhere using a spray
118	Pipe Carrier	A platform supply ship equipped with increased scantlings & longer deck space for the transportation of pipes
123	Pipe layer Platform, semi submersible	A semi submersible offshore pipe layer platform
131	LPG Tanker	A tanker for the bulk carriage of Liquefied Petroleum Gas in insulated tanks, which may be independent or integral. The cargo is pressurised (smaller vessels), refrigerated (larger vessels) or both ('semi-pressurised') to achieve liquefaction.
132	Well Stimulation Vessel	A vessel primarily equipped to maximize oil production from a well

136	Grab Hopper Dredger	A vessel equipped to obtain material from the sea bed by use of a grab or backhoe. The material may be carried on board and discharged elsewhere through the bottom of the vessel, either by bottom doors or a split hull, or delivered to other vessels, pump
147	Ore/Oil Carrier	An ore carrier arranged for the alternative (but not simultaneous) carriage of crude oil
152	Maintenance Platform, semi Submersible	A semi submersible offshore maintenance platform
153	Tug	A vessel equipped with a towing winch to tow other vessels (either in harbour or in open sea) and with manoeuvring capabilities to assist vessels to berth/unberth in ports. May also be able to push barges and other vessels
155	Pipe Layer	A vessel primarily equipped to lay solid or flexible pipes on the sea bed
156	Pile Driving Vessel	A vessel equipped for pile driving operations
158	FPSO, Oil	A vessel with the capability to control production rates from an oilfield and to store oil produced prior to its transfer to another vessel for transportation. May be self or non propelled
162	Production Platform, jack up	A jack up offshore production platform
165	Offshore Tug/Supply Ship	A vessel for the transportation of stores and goods to offshore platforms on an open stern deck and equipped with a towing facility
166	CNG Tanker	A tanker for the bulk carriage of Compressed Natural Gas. Cargo remains in gaseous state but is highly compressed
167	Offshore Support Vessel	A single or multi functional offshore support vessel
168	Accommodation Platform, jack up	A jack up offshore accommodation platform
175	Water Tanker	A tanker for the bulk carriage of water
176	Trenching Support Vessel	A vessel primarily equipped to operate submersibles for digging trenches on the sea bed for pipes and cables
177	Crude Oil Tank Barge, non propelled	A non propelled tank barge for the carriage of crude oil
180	Cable Layer	A vessel equipped to lay and repair underwater cables
182	Sheerlegs Pontoon	A pontoon with sheerlegs for lifting
184	Production Platform, semi submersible	A semi submersible offshore production Platform

186	Drilling Ship	A vessel primarily equipped for offshore drilling operations. May also be able to obtain cores for research purposes
187	Anchor Handling Vessel	A vessel equipped to assist with the handling of anchors
188	Barge Carrier, semi submersible	A barge carrier which is semi submersible for the float on loading/unloading of the barges
194	Heavy Load Carrier, semi submersible	A heavy load carrier which is semi submersible for the float on loading/unloading of the cargoes
195	LPG/Chemical Tanker	An LPG tanker additionally capable of the carriage of chemical products as defined in the International Bulk Chemical Code
210	Drilling Rig, semi submersible	A semi submersible offshore drilling rig
214	Suction Dredger Pontoon	A non propelled dredger pontoon fitted with suction equipment
218	Passenger Ship	A vessel certificated to carry more than 12 passengers, some of whom may be accommodated in cabins
222	Crew/Supply Vessel	A typically high speed vessel primarily for the transportation of crew to offshore facilities; may also have limited stores carriage capability on an open deck
228	Work/Repair Vessel	A multi functional vessel for general work and repair operations
236	Floating Dock	A submersible unit constructed and fitted out to dry dock ships whilst afloat.
237	Cement Carrier	A single deck cargo vessel fitted with pumping arrangements for the carriage of cement in bulk. There are no weather deck hatches. May be self discharging
238	Salvage Ship	A vessel equipped for salvage operations
239	Diving Support Platform, semi submersible	A semi submersible diving support platform
243	Crane Platform, semi submersible	A semi submersible offshore crane platform
244	Deck Cargo Pontoon, semi submersible	A non propelled semi submersible pontoon for the carriage of general deck cargoes
248	LPG Tank Barge, non propelled	A non propelled tank barge for the carriage of LPG
251	Suction Hopper Dredger	A vessel equipped to obtain material from the sea bed by use of a suction pipe. The material may be carried on board and discharged elsewhere through the bottom of the vessel, either by bottom doors or a split hull, or delivered to other vessels

256	Supply Platform, jack up	A supply platform, jack up
258	Accommodation Ship	A vessel providing accommodation for those working on other vessels and installations
263	Standby Safety Vessel	A vessel primarily equipped to perform safety standby duties. Will be fitted with accommodation and facilities for the rescue, reception and initial care of survivors from offshore installations accidents
271	Pipe layer Platform, jack up	A jack up offshore pipe layer platform
277	Diving Support Vessel	A vessel primarily equipped with decompression chambers for air dive operation. Does not include vessels which can only operate submersibles
281	Platform Supply Ship	A vessel for the transportation of stores and goods to offshore platforms on an open deck, typically at the stern. May also be fitted with specialist under deck tanks for water, cement and/or drilling mud
286	Cutter Suction Dredger	A vessel equipped to obtain material from the sea bed by use of a cutter wheel, which loosens the material, and a suction pipe. The material may be carried on board, transferred to other vessels, pumped ashore or deposited elsewhere using a spray
297	Production Testing Vessel	A vessel primarily equipped for testing the quality and amount of oil produced by a well
298	Mechanical Lift Dock	A lifting dock facility using winches to lower and raise platform
301	Offshore Construction Vessel, jack up	A propelled vessel with a self-elevating facility to facilitate offshore maintenance, construction and/or installation
305	Grab Dredger Pontoon	A non propelled dredger pontoon fitted with a system of grabs
318	Suction Dredger	A vessel equipped to obtain material from the sea bed by use of a suction pipe. The material may be carried on board, transferred to other vessels, pumped ashore or deposited elsewhere using a spray