



# **ATLANTIC SHORES OFFSHORE WIND GEOPHYSICAL SURVEY LEASE AREA OCS-A 0541 2022 FINAL PROTECTED SPECIES OBSERVER REPORT**

Prepared for: Atlantic Shores Offshore Wind on behalf of Fugro



Final Report  
December 22, 2023

## FINAL REPORT

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# List of Acronyms

ASOW – Atlantic Shores Offshore Wind

BOEM – Bureau of Ocean Energy Management

BMP – Best Management Practices

BZ – Buffer Zone

CPA – Closest Point of Approach

COP – Construction and Operations Plan

CV – Curriculum Vitae

DMA – Dynamic Management Area

DSLR – Digital Single Lens Reflex

DST – Daylight Saving Time

ECC – Export Cable Corridor

EMP- Environmental Management Plan

EOL – End of Line

EZ – Exclusion Zone

ESA – Endangered Species Act

G&G – Geophysical and Geotechnical

GPS – Global Positioning System

HF – High Frequency

HRG – High Resolution Geophysical

IHA – Incidental Harassment Authorization

kHz – Kilohertz

km – Kilometer

LF – Low Frequency

LLC- Limited Liability Corporation

MBES – Multibeam Echo Sounder

MUHRS – Multi Channel Ultra High Resolution Seismic

NARW – North Atlantic Right Whale

NJ – New Jersey

m – Meter

MZ – Monitoring Zone

NMFS – National Marine Fisheries Service

NOAA – National Oceanographic and Atmospheric Administration

NVD – Night-Vision Device

OCS – Outer Continental Shelf

PEP – Project Execution Plan

PDC – Project Design Criteria

PSO – Protected Species Observer

R/V – Research Vessel

SAP – Site Assessment Plan

SBP – Sub Bottom Profiler

SOL – Start of Line

SSS – Side Scan Sonar

SSDM – Seabed Survey Data Mode

SUHRS – Single Channel Ultra High Resolution Seismic

SZ – Shutdown Zone

TVG – Transverse Gradiometer

USBL – Ultra Short Baseline

UTC – Coordinated Universal Time

VSA – Vessel Strike Avoidance

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# 1 EXECUTIVE SUMMARY

This is the Protected Species Observer (PSO) Final Report for the Atlantic Shores 2022-2023 Offshore Windfarm High Resolution Geophysical (HRG) Survey of Outer Continental Shelf (OCS) Lease Area OCS-A 0541, referred to here forth as Lease, which was conducted within state and federal waters off the coast of New Jersey (NJ), by Atlantic Shores Offshores Wind LLC (ASOW) (the Lessee). HRG survey data acquisition was conducted by Fugro on behalf of ASOW within the parameters defined in the ASOW 2022-2023 Offshore Windfarm HRG Survey-Lease 0541 Project Execution Plan (PEP).

Fugro acquired geophysical data within the Lease from 01 September 2022 to 08 August 2023. Geophysical surveys were undertaken by the Research Vessel (R/V) *Fugro Enterprise* in the Lease. Protected species monitoring was conducted in accordance with Bureau of Ocean Energy Management (BOEM) and National Marine Fisheries Service (NMFS) standards, as well as Geophysical Survey Plan Approval Conditions for the Lease (Appendix A). This report covers the protected species mitigation and monitoring efforts undertaken by Protected Species Observers (PSOs) that were provided by RPS and deployed on the HRG survey vessel.

Four PSOs (five PSOs during daylight savings time (DST) 30 November 2022 – 28 February 2023) provided by RPS were on board the R/V *Fugro Enterprise* to undertake 24-hour visual monitoring and implement mitigation protocols in accordance with the requirements in the Incidental Harassment Authorization (IHA) and the BOEM Lease conditions (Appendix B). Mitigation protocols for this survey included establishment of pre-clearance zones (CZ) and exclusion zones (EZ) around the low-frequency (LF) sound sources, implementation of delay to initiation of and shutdowns of active LF sound sources, and vessel strike avoidance (VSA) maneuvering for marine mammals and other protected species, including sea turtles.

Visual observations were conducted by PSOs for a total of 5,646 hours and 3 minutes. A total of 300 visual detection events of protected species were made during the survey with a total of 1,598 animals observed. Visual detections of marine mammals consisted of four whale species and four delphinid species. Whale species observed included fin whales (*Balaenoptera physalus*), minke whales (*Balaenoptera acutorostrata*), a sperm whale (*Physeter macrocephalus*), and humpback whales (*Megaptera novaeangliae*). Delphinids observed included bottlenose dolphins (*Tursiops truncatus*), common dolphins (*Delphinus delphis*), and Atlantic spotted dolphins (*Stenella frontalis*). There were also additional unidentified whales, an unidentified cetacean, and unidentified delphinids observed.

There were 70 sightings made of sea turtles that included leatherback sea turtles (*Dermochelys coriacea*), loggerhead sea turtles (*Caretta caretta*), Kemp's Ridley sea turtles (*Lepidochelys kempii*), and unidentified sea turtles.

There were sightings made of a deceased humpback whale, an entangled humpback whale, and a humpback whale that had sustained a tail injury. In each sighting event, the animal was observed to be injured or in distress, but there were no indications that the ASOW survey activities had caused or contributed to the injury or entanglement of the animal and the events were reported to NMFS and BOEM as described further in this report and as required by the Lease and IHA.

In accordance with stipulations set forth in BOEM Lease and the NMFS IHA conditions, a total of 54 mitigation actions were implemented for the HRG sound sources including shutdowns of the acoustic sources (40 times) and delays to activation of the acoustic sources (14 times). VSA maneuvers were executed on 146 occasions during protected species detections, 91 times for dolphins, 16 times for whales, and 39 times for sea turtles.

NMFS issued an IHA authorizing level B takes for 15 species of marine mammals, including six whale species, six delphinids, two pinniped species and one porpoise species. No Level A takes were authorized for any species.

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A total of 348 marine mammals from four distinct species were observed within the predicted 160 decibel radius (where there is a potential for a behavioral response) while an HRG source was active, constituting potential Level B takes during the survey. Potential Level B takes included one humpback whale, six bottlenose dolphins, and 334 short-beaked common dolphins, and seven Atlantic spotted dolphins, which were within the takes authorized by the NMFS-issued IHA.



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## 2 INTRODUCTION

ASOW selected Fugro to conduct a geophysical survey off the coast of New Jersey on the Outer Continental Shelf, covering the Lease (Figure 1), ECC, and along SAP buoy locations (Figure 2). This report covers the duration of the 2022 geophysical survey (01 September 2022 – 08 August 2023).

The survey was completed utilizing multibeam echo sounder (MBES) bathymetry and backscatter, side scan sonar (SSS), magnetometer operating in transverse gradiometer configuration (TVG), sub-bottom profiler (SBP), multichannel ultra-high resolution seismic (MUHRS), and single channel ultra-high-resolution seismic (SUHRS). Classification of site conditions included bathymetry, seafloor morphology, subsurface geology, environmental and biological sites, seafloor obstructions, soil conditions, and locations of any, historical, or archaeological resources were defined accordance with BOEM and NMFS guidelines.

Protected species monitoring and mitigation measures, as outlined in the NMFS IHA and the BOEM Lease conditions were required for equipment operating below 180 kilohertz (kHz). The equipment used on the R/V *Fugro Enterprise* that required mitigation included; The High Resolution Innomar SES-2000 Medium-100 Parametric Sub-Bottom Profiler (SBP) (2-22 kHz) and the medium penetrating dual seismic sparker (1 Hz – 10 kHz)

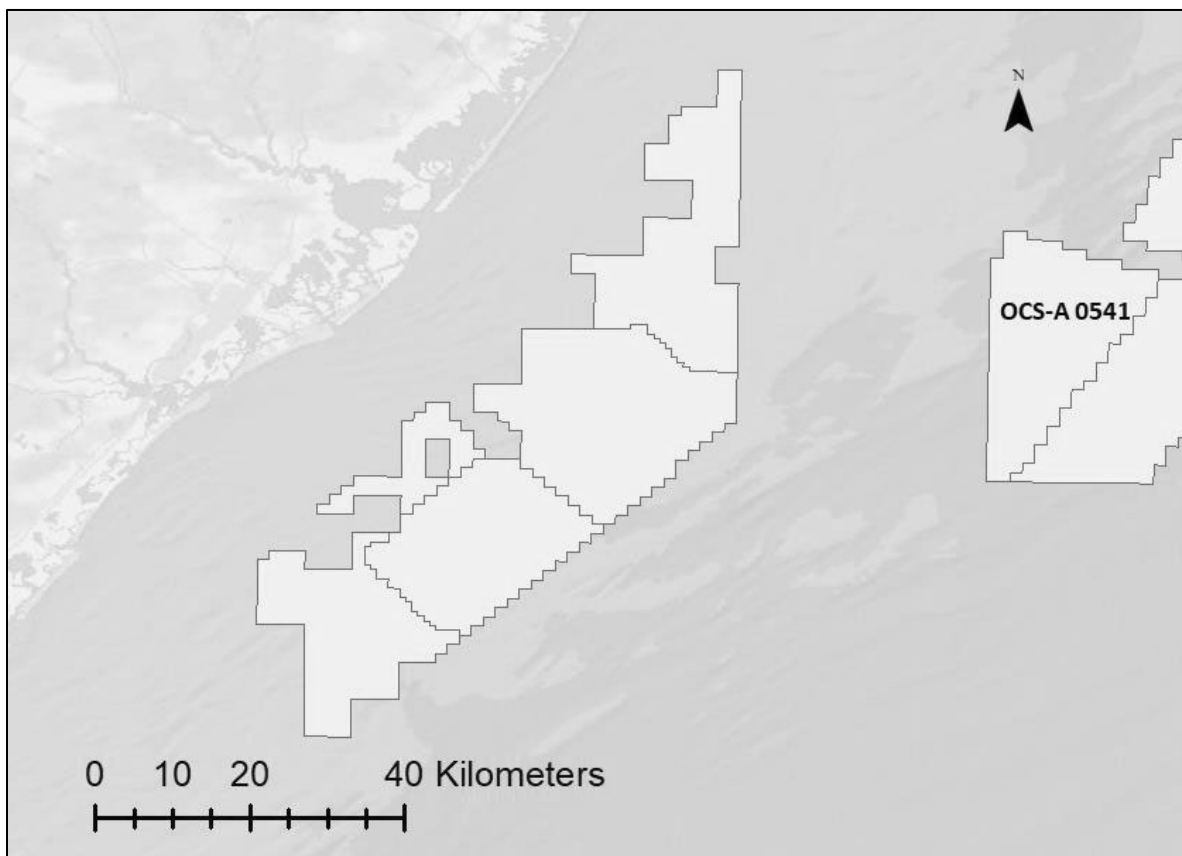
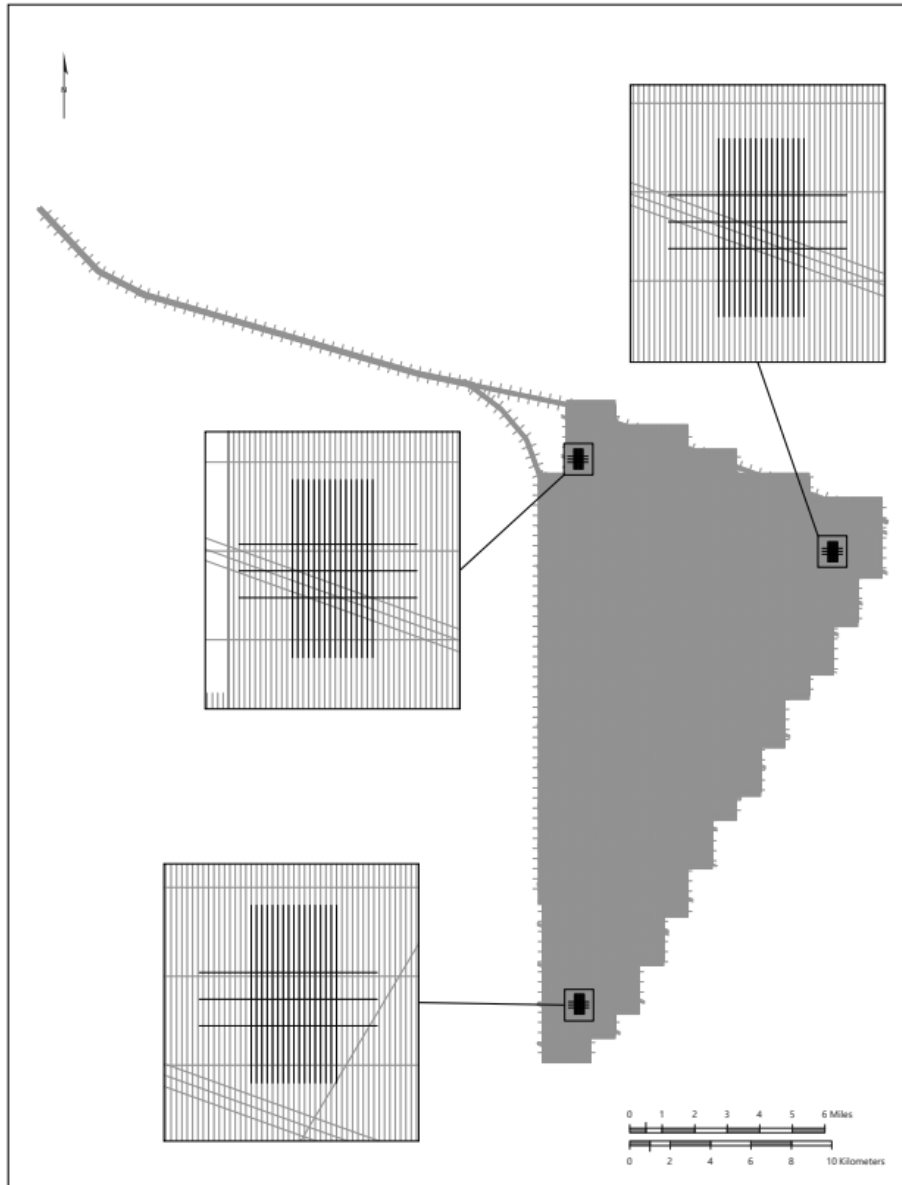


Figure 1: ASOW 2022 survey areas in the BOEM lease (OCS-A 0541)

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**Figure 2. BOEM Lease (OCS-A 0541) SAP Buoy Survey Plot**

NMFS and BOEM have advised that sound-producing survey equipment operating in the hearing range of marine species (less than 180 kHz) has the potential to cause acoustic harassment to marine mammals. Protected species monitoring was conducted in accordance with BOEM and NMFS standards, as well as the ASOW Geophysical and Geotechnical (G&G) 2022 Survey Plan.

Fugro was responsible for contracting PSOs through a third-party provider to conduct monitoring and mitigation for protected species, including marine mammals and sea turtles, during their activities where RPS was contracted to fulfill this scope of work. Monitoring and mitigation procedures that were implemented during the ASOW 2022-2023 surveys are described in section 4 of this report.

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### 2.1 BOEM Reporting Requirements

This report summarizes the information required by the Lease and the IHA identified in Table 1. A copy of the Lease and the NMFS IHA are in Appendix A and Appendix B.

An Environmental Management Plan (EMP) prepared by RPS and reviewed by Fugro, ASOW and BOEM containing the monitoring, mitigation and reporting procedures that were adhered to throughout the survey is in 0.

**Table 1: BOEM reporting requirements per Lease and the NMFS IHA location within this technical report.**

Required Content	Source Reference	Location Addressed in Technical Report
The Lessee must ensure that sightings of any dead or injured protected species (e.g., marine mammals, sea turtles, or sturgeon) are reported to the Lessor, NMFS, and the NMFS Greater Atlantic (Northeast) Region's Stranding Hotline (866-755-6622) within 24 hours of sighting, regardless of whether the injury is caused by a vessel. In addition, if the injury or death was caused by a collision with a project-related vessel, the Lessee notify the Lessor of the strike within 24 hours. The Lessee must use the form included as Appendix A to Addendum "C" to report the sighting or incident. If the Lessee's activity is responsible for the injury or death, the Lessee must ensure the vessel assist in any salvage effort as requested by NMFS.	BOEM Lease Section 4.5.1	Section 6.4.4
The Lessee must report any observed takes of listed marine mammals, sea turtles, or sturgeon resulting in injury or mortality within 24 hours to the Lessor and NMFS	BOEM Lease Section 4.5.2.1	Section 6.4.2
The Lessee must report any observations concerning any impacts on Endangered Species Act listed marine mammals, sea turtles or sturgeon to the Lessor and NMFS Northeast Region's Stranding Hotline within 48 Hours.	BOEM Lease Section 4.5.2.2	Section 6.4.4, 4.5.3
The Lessee must ensure that the protected species observers record all observations of protected species using standard marine mammal observer data collection protocols. The required elements are Vessel name, Observers' name and affiliations, date, time and latitude/longitude when daily visual survey began, time and latitude/longitude when daily visual survey ended, Average environmental conditions (wind speed, wind direction, sea state, swell, overall visibility), species, certainty of identification, total number of animals, number of juveniles, characteristic description, direction of animal's travel relative to the vessel, behavior of animals, and activity of vessel when sighting occurred.	BOEM Lease Section 4.5.3	Section 6
Each report must include a summary of survey activities.	BOEM Lease Section 4.5.4	Section 6.1

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Required Content	Source Reference	Location Addressed in Technical Report
Each report must include a summary of all protected species observers	BOEM Lease Section 4.5.4	Appendix D
Each report must include an estimate of the number of listed marine mammals and sea turtles observed and/or taken during these activities.	BOEM Lease Section 4.5.4	Section 6.4, 6.4.1, 6.4.2
A monitoring report must be provided to NMFS within 90 days after completion of survey activities. The report must fully document the methods and monitoring protocols, summarizes the data recorded during monitoring, estimates the number of marine mammals that may have been taken during survey activities, describes, assesses, and compares the effectiveness of monitoring and mitigation measures.	NMFS IHA Section 6 (a)	This technical report
PSO datasheets or raw sightings data must also be provided with the draft and final monitoring report.	NMFS IHA Section 6 (a)	Appendix H
If a North Atlantic right whale is observed at any time by PSOs or personnel on any project vessels, during surveys or during vessel transit, Atlantic Shores must immediately report sighting information to the NMFS North Atlantic Right Whale Sighting Advisory System: (866) 755-6622. North Atlantic right whale sightings in any location may also be reported to the U.S. Coast Guard via channel 16.	NMFS IHA Section 6 (b) (i)	Section 6.4.3
In the event that personnel involved in the survey activities covered by the authorization discover an injured or dead marine mammal, Atlantic Shores must report the incident to the NOAA Fisheries Office of Protected Resources (OPR) (301-427-8401), and to the NOAA Fisheries New England/Mid-Atlantic Regional Stranding Coordinator (978-282-8478) as soon as feasible. The report must include the following information: Time, date, location, species identification or description of the animal, condition of the animal(s), observed behaviors (if alive), photographs or video footage, and general circumstances under which the animal(s) was discovered.	NMFS IHA Section 6 (c) (i)	Section 6.4.4
In the event of a vessel strike of a marine mammal by any vessel involved in the activities covered by the authorization, the Atlantic Shores must report the incident to NOAA Fisheries OPR (301-427-8401) and to the NOAA Fisheries New England/Mid-Atlantic Regional Stranding Coordinator (978-282-8478) as soon as feasible. The report must include the following information: Time, date, location, species identification or description of the animal(s), vessel's speed during and leading up to the incident, vessel's course/heading and what operations were being conducted, status of all sound sources in use, description of avoidance	NMFS IHA Section 6 (c) (ii)	Section 4.5.3

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<b>Required Content</b>	<b>Source Reference</b>	<b>Location Addressed in Technical Report</b>
measures/requirements that were in place at the time of the strike and what additional measures were taken to avoid strike, environmental conditions, estimated size and length of animal that was struck, description of behavior of the marine mammal immediately preceding and following the strike, estimated fate of the animal and photographs or video footage.		

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### 3 PROGRAM OVERVIEW

ASOW contracted Fugro to conduct HRG surveys of Renewable Energy Lease OCS-A 0541 and proposed ECC which commenced September 2022 off the coast of New Jersey. Fugro performed geophysical data acquisition within the lease area OCS-A 0541, ECC, and along SAP buoy locations. The data collected will inform ASOW technical design envelope planning and be used to support the information requirements for a Construction and Operations Plan (COP) for Energy Lease Number OCS-A 0541. The technical objectives of the HRG surveys are referenced from the Project Execution Plan (PEP) and are as described below:

- Obtain accurate water depths within development area to aid in design of facilities,
- Obtain seafloor morphology and identification of seabed features, hazards, and cultural materials,
- Provide relevant information to endure safe, secure, and efficient installation of facilities,
- To detect and delineate any shallow seabed and sub-seabed geohazards,
- Detect, map, interpret, and report historic or archaeological resources,
- Process, interpret, and produce the following reports in general accordance with OGP 373-18-1 and BOEM guidelines: a Marine Site Investigation Report and a Factual Geophysical Report for each project area,
- Deliver final data and maps in the Seabed Survey Data Model (SSDM).

Data will be acquired using a MBES and backscatter SSS, TVG, SBP, and SUHRS.

*R/V Fugro Enterprise* dates of HRG operations are summarized in Table 2. A high-level overview of survey events for the vessel is outlined in Table 3.

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**Table 2: Summary of R/V *Fugro Enterprise* dates on project for the ASOW HRG Survey Lease**

Vessel Name	Days on Survey	Dates on Project- Lease Area OCS-A 0541
<i>R/V Fugro Enterprise</i>	271	01 September 2022– 08 August 2023

**Table 3: Summary of key survey events on R/V *Fugro Enterprise* in Lease**

Event	R/V <i>Fugro Enterprise</i>
Kick-off meetings for surveys in OCS-A 0499 and OCS-A 0541 Lease areas	22 April 2022
Vessel transits to Lease area OCS-A 0541 to begin data acquisition. PSO monitoring continued from survey work in OCS-A 0499	01 September 2022
Vessel transits to lease area OCS-A 0499 to complete remaining data acquisition	10 September – 13 September 2022
Vessel transits back to lease area OCS-A 0541	13 September 2022
Data acquisition complete	08 August 2023
PSO monitoring for OCS-A 0541 complete	08 August 2023

### 3.1 Vessel and Geophysical Equipment Specifications

The ASOW HRG Survey was undertaken by the R/V *Fugro Enterprise* in Lease. Specifications for the vessel are provided in Table 4 and photos of the vessel are included in Appendix E.

**Table 4: Vessel specifications**

Vessel Name	Length (meters)	Speed (knots)	Vessel Configuration description
<i>R/V Fugro Enterprise</i>	52	10 (transit) 3-5 (survey)	Multi-role survey vessel for coastal and offshore survey areas

### 3.2 Summary of Geophysical Survey Equipment Used

The survey equipment operated on the R/V *Fugro Enterprise* is summarized in Table 5. Sources (operating below 180 kHz), for which monitoring, and mitigation were conducted to minimize potential impacts to protected species, are hereafter referred to as the regulated sound sources. Other equipment that either did not produce sound or produced sound outside of the hearing range of protected species and, as such,

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not regulated by BOEM or NMFS, was operated by the survey vessels but it is not considered further in this technical report.

**Table 5: Summary of geophysical equipment used during the ASOW Survey.**

<i>R/V Fugro Enterprise</i>	
Energy Source	Frequency/Energy Specifications
MBES	400 kHz
SSS	300/600 kHz (600 kHz primary)
SBP	10 kHz
SUHRS	100-2000 J
MUHS	100-2000 J



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# 4 MITIGATION AND MONITORING METHODS

The PSO monitoring programs on the *R/V Fugro Enterprise* were established to meet the standards approved by BOEM in the Survey Plan. Survey mitigation measures were designed to minimize potential impacts of the survey activities on marine mammals, sea turtles, and other protected species of interest. The following monitoring protocols were implemented to meet these objectives.

### *R/V Fugro Enterprise*

- Visual observations were conducted day and night to provide real-time sighting data, allowing for the implementation of mitigation procedures as necessary.
- Species-specific CZs and EZs were established around the regulated HRG sound sources where delays to initiation and shutdowns of active sources were implemented when protected species were detected inside.

## 4.1 Monitoring: Protected Species Observers

There were four trained and experienced PSOs, and five PSOs 30 November 2022 – 28 February 2023 during DST, on board the vessel during survey activities to conduct monitoring for protected species, record and report detections, and request mitigation actions in accordance with the established regulatory requirements and monitoring plan.

RPS, the PSO Provider, was responsible for ensuring that each PSO deployed met the minimum requirements set forth by BOEM in Lease stipulations and by NMFS. NMFS issued approval notifications for each PSO to be deployed on an offshore wind farm and BOEM were required to review and approve each PSO prior to their deployment as an observer on the ASOW Lease. BOEM and NMFS PSO requirements include training in protected species identification and behavior in addition to field experience in protected species observation in the Atlantic Ocean.

RPS was responsible for the provision of training certifications, NMFS approval notifications and curriculum vitae (CV) to be reviewed and approved by ASOW and BOEM prior to deployment on the vessel.

RPS was responsible for providing the PSOs with vessel-specific and survey contractor-specific training, and environmental project inductions specific to ASOW. These were provided by RPS, Fugro and ASOW during project kick-off meetings, conducted prior to the start of survey operations and prior to scheduled crew changes.

All PSOs who were deployed during the ASOW geophysical survey operations are listed in Appendix D.

## 4.2 Visual Monitoring: Protocols and Methods

A team of four PSOs (five PSOs during DST) were deployed on the survey vessel to meet the monitoring requirements of that vessel as outlined in Table 6. PSOs monitored while the vessel was in transit, prior to, and during all LF sound source operations conducted by the vessel. Visual monitoring was also conducted during all periods between LF sound source activities to collect additional protected species data. PSOs rotated monitoring shifts as needed to maximize concentration and to meet the watch requirements of the Lease and IHA (watch periods not to exceed four hours without a minimum two-hour break, and a maximum duration of 12 hours in a 24-hour period).

Visual monitoring locations on each vessel were selected to maximize and consideration of the following factors:

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1. To afford PSOs a 360-degree viewpoint around the vessel and acoustic sources, such that the EZs around the sound sources and the VSA separation distances could be simultaneously monitored,
2. Provide the highest vantage point possible to allow for monitoring out to the greatest distances ahead and around the vessel,
3. Provide shelter from inclement weather, as needed,
4. Provide real-time communication with vessel and equipment operators.

PSOs conducted their visual monitoring by actively scanning with the naked eye out to the furthest observation points visible, methodically sweeping areas closer to the vessel, focusing on the CZs and EZs and ahead of the vessel. PSOs conducted regular sweeps of the surrounding areas using magnification devices as described below. PSOs monitored for cues that might indicate the presence of protected species including but not limited to splashing, footprints, blows, and presence of other marine species (diving seabirds, fish feeding activity).

**Table 6: Visual monitoring methodology on the survey vessel**

<b>Vessel</b>	
<b><i>R/V Fugro Enterprise</i></b>	
# of PSOs on watch during day	1
Visual monitoring equipment- day	Reticle binoculars 10x50 & 7x50 magnification
Low-frequency source operations conducted at night	Yes
# of PSOs on watch during night	2
Visual monitoring equipment during night	Night vision goggles
Range estimation	Calibrated reticle binoculars
Primary monitoring location	Bridge, Bridge wings (outside bridge deck)

Displays inside the bridge showed current information about the vessel (e.g., position, speed, heading, etc.), sea conditions (e.g., water depth, sea temperature, etc.), and weather (e.g., wind speed and direction, air temperature, etc.). Environmental conditions, along with vessel and acoustic source activity, were recorded at least once an hour, or every time there was a change of one or more of the variables.

### 4.2.1 Daylight Visual

The PSOs on board were equipped with reticle binoculars (7x50 and 10x50 magnification), as well as DSLR cameras with 200 mm and 300 mm zoom lens to aid in visual monitoring watches conducted during the day. PSO teams used field notebooks to record data while on watch and laptops were used to enter data.

Range estimates were made by comparison to an object of known distance, as well as with reticle binoculars. Reticle binoculars were calibrated whenever possible to ensure accuracy of distance data. These reticle calibration tables are provided in Appendix F.

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### 4.2.2 Nighttime and Reduced Visibility Visual Observations

Two PSOs conducted visual monitoring during all nighttime operations, whenever the vessel was not in port or at anchor. If visibility became reduced (largest EZ was not fully visible). PSOs on the R/V *Fugro Enterprise* were equipped with infrared LED handheld spotlights and night vision devices (NVD) with head mounts and thermal clip-ons. Specifications for the night monitoring equipment can be found in Appendix G.

### 4.3 Monitoring: Data Collection

During or immediately after each sighting event, the PSOs recorded detection details in a standardized detection datasheet provided to them by RPS. Excel data forms included tabs for project data, monitoring effort data, geophysical operations data, and protected species detection data. RPS supplied a set of standardized variables for specific data fields that were to be implemented on the data form provided to their PSOs.

Each sighting event was linked to an entry on an effort datasheet where specific environmental conditions and vessel activity were logged.

Species identifications were made whenever the distance of the animal(s), length of the sighting, and visual observation conditions allowed. Whenever possible during detections, photographs were taken with DSLR cameras with telephoto lenses. Marine mammal and sea turtle identification manuals were consulted, and photos were examined during observation breaks to confirm identifications.

#### 4.3.1 Data collection Requirements and Methods

Data was collected to meet the BOEM and NMFS requirements as summarized previously in Table 1.

PSOs collected data in handwritten notepads or on portable / tablet devices during watches. During watch breaks and at the end of daylight hours, data was compiled in proprietary data forms on laptop computers and backed up on portable hard drives.

#### 4.3.2 North Atlantic Right Whale (NARW) External Sighting Monitoring Protocol

PSOs monitored for Dynamic Management Areas (DMA) in their permitted survey area and surrounding areas regularly:

1. Lead PSOs checked the NMFS website for new DMAs at the start of each day.
2. PSOs used mobile devices to check the web application Whale Alert.
3. RPS project managers were subscribed to receive automatic notifications of DMAs and NARW sightings throughout survey operations.

### 4.4 Mitigation Measures

The PSO monitoring and mitigation program implemented on the survey vessels was established to meet the BOEM Lease requirements and to minimize potential impacts of the survey activities on marine mammals and sea turtles. The following mitigation protocols were implemented during the Fugro ASOW Lease HRG survey. All protocols were implemented as described.

- VSA separation distances

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Vessel speed was restricted to 10 knots or less inside any established DMA. Vessel speed was to be restricted to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans were observed near a vessel.

- The survey vessel maintained or enacted actions to maintain a separation distance of 500 meters or greater from any sighted NARW.
- The survey vessel maintained or enacted actions to maintain a separation distance of 500 meters or greater from any ESA-listed species or other unidentified marine mammal visible at the surface.
- The survey vessel maintained or enacted actions to maintain a separation distance of 500 meters or greater from any sighted non-ESA listed baleen whales, including humpback whales and minke whales.
- The survey vessel maintained or enacted actions to maintain a separation distance of 500 meters (as visually feasible with environmental conditions) or greater from any sighted sea turtles or manta rays.
- The survey vessel maintained or enacted actions to maintain a separation distance of 50 meters or greater from any sighted small cetacean (dolphin and porpoise) or pinniped.
- Establishment of MZs
 

Prior to the initiation of sound sources operating below 180 kHz from silence, a clearance search period of 30 minutes was completed. The 500 meter CZ for ESA-listed species and 200 meter CZ for non-ESA-listed marine mammals was monitored. Note that visual observations for all marine protected species was extended to the furthest observable distances even though the CZs and EZs around the sound sources will apply.
- Establishment of CZs
 

During use of sources with the potential to result in marine mammal harassment (i.e., anytime the acoustic source is active, including ramp-up), occurrences of marine mammals within the CZ was communicated to the vessel operator to prepare for potential shutdown of the acoustic source.

  - 500 meters: NARW
  - 100 meters: All other ESA-listed species and marine mammals with the exception of voluntarily approaching delphinids.
  - 100 meters: Sea turtles
  - 141 meters: Level B harassment zone for marine mammals. (Shutdowns are required at this distance for marine mammals where take has not been granted or where the authorized takes have been met.)
- Following a detection of a protected species within its respective CZ required delays to initiation of sound sources operating below 180 kHz. The delays were implemented until:
  - All marine protected species that were observed inside the CZ were confirmed to have left their relevant CZ  
OR
  - An additional time period has lapsed with no further sightings within the relevant CZ
    - 15 minutes for small cetaceans (porpoises and dolphins), pinnipeds, and giant manta rays
    - 30 minutes for all large whales including NARW
    - 30 minutes for sea turtles

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- A shutdown of sound sources operating below 180 kHz was implemented when protected species entered their respective EZ. Shutdown of SBP and Sparker were implemented for NARW and sea turtles, while only the Sparker was shut down for all other marine mammals.
- An exception was applied to shutdown procedures for some delphinid species and some pinniped species that are observed voluntarily approaching the vessel where the following requirements apply:
  - The exception applies only to delphinids in the genera *Steno*, *Delphinus*, *Lagenorhynchus*, *Stenella* or *Tursiops*.
  - The exception applies only to gray seals or harbor seals.
  - If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the genera for which shutdown is waived), PSOs used their best professional judgment in making the decision to call for a shutdown.
  - If delphinids from the shut-down exempt genera are observed within or entering the EZ but do not voluntarily approach the vessel or towed survey equipment, shutdown would be required and implemented.
  - The determination of whether the animal has “voluntarily” approached was made by the PSO on watch.
  - Shutdowns are required for marine mammals where take has not been granted or where the authorized takes have been met even if those species fall into the exemption genera.

### 4.5 Reporting

Reporting requirements of the BOEM Lease and the IHA were outlined in Table 1. Both agencies require a final survey report be prepared detailing operations, PSO effort, and detection of protected species.

#### 4.5.1 Injured or Dead Protected Species

Any injured or dead marine mammal or sea turtle observed either by a PSO on watch or by a crew member was required to be reported to BOEM and NMFS, refer to Table 1 for a detailed overview of reporting requirements. Reporting requirements included a phone notification to the NMFS Regional Stranding hotline as soon as practicably possible, made by either the Lead PSO or shore based PSO Project Manager, as communications permitted from the vessel.

The Lead PSO would also prepare a written report in accordance with NMFS standard reporting guidelines and using the template provided by BOEM in the lease, which would be submitted to ASOW for submittal to the agencies.

#### 4.5.2 NARW Sightings

Reporting of NARW sightings to external monitoring resources was a requirement of the IHA.

PSOs were to use the following applications to report any NARW sightings made during survey operations:

1. PSO would report to their onshore Project Manager who would then inform the ASOW permitting team.
2. PSOs would then prepare a sighting report including a description of the detection event including date, time, distance to vessel, vessel and geophysical equipment activity, observed behaviors and any photographs or screenshots taken during the sighting.

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3. RPS would make the notification to the NARW Sightings Hotline.

### 4.5.3 Vessel Strike of a Protected Species

In the event of a ship strike of a marine mammal or other protected species by any vessel involved in survey activities are required to be reported under the IHA. Reporting requirements included a phone notification to the NMFS Regional Stranding hotline and by email as soon as feasible. These notifications would be completed by the RPS Project Manager. The Lead PSO would prepare a written report in accordance with NMFS standard reporting guidelines in the IHA.

### 4.5.4 Final Report

RPS has prepared this Technical Report to be consistent with the BOEM Lease and NMFS IHA reporting requirements outlined in Table 1 of this report and a final report in this format will be prepared upon completion of survey activities. Each of the elements required in the final PSO reporting is provided in **Error! Reference source not found.** with the section in this report in which the element is addressed.

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## 5 DATA RECORDS AND ANALYSIS METHODS

### 5.1 Operation Activity

PSOs collected the regulated HRG equipment's operational status each day that they were deployed on the vessel.

The geophysical vessel recorded the start of line (SOL) times and the end of line (EOL) times for the equipment during acquisition. The vessel also recorded the status of the equipment while acquisition occurred by noting full power or shutdowns due to mitigation actions. These entries were made for each regulated source or for combinations of regulated sources (for example, SBP and sparker).

### 5.2 Monitoring Effort

PSOs recorded monitoring effort by entering start of watch and end of watch times into data sheets where the vessel position and environmental data was also documented for that duration.

Total monitoring effort was calculated by summing the durations of each watch period. Where the monitoring effort entry did not also indicate the source status for that monitoring period, source data was cross referenced during analysis to calculate the duration of monitoring conducted while regulated sources were on and off.

Visual monitoring while the acoustic source was off included monitoring conducted during transit to survey sites and any other recorded silent periods (mitigation action, equipment downtime, or weather standby time).

#### 5.2.1 Summary of Environmental Conditions

Each PSO monitoring effort data form included environmental conditions present during that watch period. Environmental variables were recorded every 60 minutes or when conditions changed.

Beaufort Sea State was recorded for each monitoring period using the accepted scale (Table 7):

**Table 7: Beaufort Sea State scale**

Beaufort number	Description	Wave height	Sea conditions
0	Calm	0 m	Sea like a mirror
1	Light air	0–0.3 m	Ripples with appearance of scales are formed, without foam crests
2	Light breeze	0.3–0.6 m	Small wavelets still short but more pronounced; crests have a glassy appearance but do not break
3	Gentle breeze	0.6–1.2 m	Large wavelets: crests begin to break; foam of glassy appearance; perhaps scattered white horses
4	Moderate breeze	1–2 m	Small waves becoming longer; fairly frequent white horses
5	Fresh breeze	2–3 m	Moderate waves taking a more pronounced long form; many white horses are formed; chance of some spray
6	Strong breeze	3–4 m	Large waves begin to form; the white foam crests are more extensive everywhere; probably some spray
7	High wind	4–5.5 m	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins to be seen

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Beaufort number	Description	Wave height	Sea conditions
8	Gale	5.5–7.5 m	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind
9	Severe gale	7–10 m	High waves; dense streaks of foam along the direction of the wind; sea begins to roll; spray affects visibility
10	Storm	9–12.5 m	Very high waves with long overhanging crests; resulting foam in great patches is blown in dense white streaks along the direction of the wind; on the whole the surface of the sea takes on a white appearance; rolling of the sea becomes heavy; visibility affected
11	Violent storm	11.5–16 m	Exceptionally high waves; small- and medium-sized ships might be for a long time lost to view behind the waves; sea is covered with long white patches of foam; everywhere the edges of the wave crests are blown into foam; visibility affected
12	Hurricane force	>14 m	The air is filled with foam and spray; sea is completely white with driving spray; visibility very seriously affected

Swell heights in meters were recorded by the vessel PSO team. The swell heights were either provided as the actual estimated height in meters (m) or categorized (< 2 m, 2 – 4 m, and > 4 m). To calculate the overall monitoring effort across vessels for each swell height, the data was assigned to the appropriate swell height category.

PSOs categorized visibility during monitoring effort in kilometers (km) and/or m where values were selected from categories.

### 5.3 Visual Sightings of Protected Species

PSOs used standardized reporting forms provided by RPS to record all detections of marine mammals and sea turtles made during survey operations. These records were completed any time a sighting was made, regardless of distance, not just for detections where mitigation was implemented.

Sighting ID or detection event numbers were assigned chronologically for all protected species observed on the vessel throughout the vessel's survey activity. A new detection number was assigned for a new species sighting or when enough time had passed between observations of animals of the same species such that PSOs could not be certain that they were observing the same animals previously documented. A standard duration of time was to be applied between observations: 15 minutes for delphinid and pinniped detections and 30 minutes for large whales. If there were multiple species in a single detection, the same sighting ID or detection event was used.

Protected species movement relative to the vessel, pace, and initial and subsequent behavior states were recorded for each protected species sighting where standardized categories for each were provided as controlled fields in the provided data form.

#### 5.3.1 Closest Point of Approach (CPA)

PSOs recorded CPA and the sound source status at CPA (active or inactive if deployed) for all marine mammal and sea turtle detections.



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### 5.3.2 Detection Rate

Detection rate was calculated using the number of protected species events per hour of monitoring effort for all vessels. wherein cases with more than one PSO was on watch simultaneously, effort was not duplicated: one hour of monitoring effort by two PSOs consisted of one hour of effort for the purpose of detection rate calculations.

### 5.4 Mitigation Measures Implemented

Mitigation measures were implemented on the R/V *Fugro Enterprise* as previously described in Section 4.4. The onboard PSO team communicated requested mitigation in real time to survey operators who operated the regulated sound sources or to the vessel crew operating the vessel, depending on the action required. Communications were conducted over handheld radios or in person.

Implemented mitigation actions were recorded on PSO data sheets in the detection data form and also in the operations activity logs.

For each mitigation action, the mitigation downtime associated with that action was calculated. Mitigation downtime was the duration of the break in regulated source operations as required by the regulatory protocols: the duration of time that an animal was observed inside an exclusion zone and any additional clearance time required before regulated sources could be activated. Mitigation downtime did not include any additional downtime that a survey operator needed to resume acquisition, which may include additional vessel maneuvering time, time to deploy or calibrate equipment etc. Some detections included this additional downtime as a different field, production loss, but this variable was not recorded for every mitigation action taken.

### 5.5 Data Quality Control

The RPS data analysts reviewed all the PSO data sets received from the vessel and conducted Quality Control as described in Table 8.

**Table 8: Summary of data quality control protocols**

Data type	Data field	Corrections made
Monitoring effort	Start of watch / End of watch	<ul style="list-style-type: none"> <li>Times were corrected or added where error was evident, typically by inconsistency with adjacent times.</li> </ul>
	Day time vs. Nighttime	<ul style="list-style-type: none"> <li>Failures to adjust time to UTC were corrected.</li> <li>Times were corrected when end of effort overlapped with start of subsequent effort.</li> </ul>
Protected species detections	Position	<ul style="list-style-type: none"> <li>Positions that plotted out of place were corrected using effort positions of corresponding times, where available</li> <li>When positions could not be corrected and position was on land, detection was removed from detection plots.</li> </ul>
	Combining Unidentified categories	<ul style="list-style-type: none"> <li>Unidentified baleen whale was combined with the Unidentified whale category for data analysis.</li> </ul>

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# 6 RESULTS

This section of the report details sound source operations protected species monitoring effort, environmental conditions during monitoring effort and distribution, and sighting data inside and outside the Lease during source operation and source silence.

The monitoring effort, source operations and protected species detections for each vessel are provided as an excel dataset in Appendix H.

## 6.1 Operation Activity

HRG survey operations began in Lease following the completion of data acquisition for geophysical operations in Lease Area OCS-A 0499. Survey operations were briefly suspended when necessary for weather, equipment maintenance, or port calls for provisions and crew change.

The dates of operation and total hours of regulated source operations by survey vessel are provided in Table 9.

**Table 9: Summary of geophysical operations on R/V *Fugro Enterprise***

Vessel	Dates of Operation	Total Hours of LF Source Operations (HH.HH)
R/V Fugro Enterprise	01 September 2022 – 08 August 2023	3061.08

## 6.2 Monitoring Effort

Visual and monitoring effort for the R/V *Fugro Enterprise* during the ASOW HRG Survey is summarized in Table 10. It provides the breakdown in visual monitoring effort and concurrent visual monitoring effort undertaken during day and night with source activity status.

**Table 10: Summary of visual monitoring effort and source activity status during operations on R/V *Fugro Enterprise***

Visual Monitoring Effort by Source Activity	Visual (HH.HH)
Source active- Daytime	1753.300
Source silent- Daytime	1256.050
<b>Total</b>	<b>3009.350</b>
Source active- Nighttime	1307.783
Source silent- Nighttime	1328.917
<b>Total</b>	<b>2636.700</b>

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### 6.3 Environmental Conditions

Environmental conditions can have an impact on the probability of detecting protected species in a survey area. The environmental conditions present during visual observations undertaken during this survey program were mild to moderate.

Less than half of visual monitoring effort (45% of the overall visual monitoring effort) for the survey was conducted in conditions where visibility extended to 5 km or greater and could be considered to be excellent conditions for the detection of protected species (Table 11).

**Table 11: Summary of visibility conditions during the survey**

Visibility	Duration (HH.HH)	% of Overall Monitoring Effort
Greater than 5 km	2547.883	45%
2 to 5 km	265.183	5%
Less than 2 km	2832.983	50%

Monitoring effort was conducted in Beaufort Sea States ranging from Level 0 through Level 7. Majority of monitoring effort was accumulated at sea states at or below Level 3, which is generally considered to be favorable conditions for monitoring for most marine mammal species (Table 12). Visual observations at Level 3 Beaufort Sea States or below accounted for 61% of the total visual monitoring effort.

**Table 12: Summary of Beaufort Sea State during visual monitoring during the survey**

Beaufort Sea State	Duration (HH.HH)	% of Overall Monitoring Effort
B0	1.000	<1%
B1	156.700	3%
B2	1145.017	20%
B3	2159.517	38%
<b>B0 through B3</b>	<b>3462.23</b>	<b>61%</b>
B4	1406.450	25%
B5	664.267	12%
B6	98.100	2%
B7	15.000	<1%

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<b>B4 through B7</b>	<b>2183.82</b>	<b>39%</b>
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Swell heights during visual observations were generally low, with swells of less than 2 m recorded for 86% of visual monitoring effort (Table 13).

**Table 13: Summary of swell height during visual monitoring during the survey**

Swell Height	Duration (HH.HH)	% of Overall Monitoring Effort
Less than 2 meters	4872.6000	86%
2 to 4 meters	765.4500	14%
Greater than 4 meters	8.0000	<1%

Glare during visual observations was as follows. Sixty percent of monitoring effort occurred during periods with no glare; however, 22% of monitoring occurred under severe glare conditions (Table 14).

**Table 14: Summary of glare during visual monitoring during the survey**

Glare	Duration (HH.HH)	% of Overall Monitoring Effort
None	3442.30	61%
Mild	399.98	7%
Moderate	553.20	10%
Severe	1250.57	22%

Precipitation during visual observations varied between clear, rain, fog and haze during monitoring effort. Visibility conditions were clear of precipitation for 82% of the monitoring effort, 5% were conditions with rain, and fog was present for 6% during the survey (Table 15).

**Table 15: Summary of precipitation during visual monitoring during the survey**

Precipitation	Duration (HH.HH)	% of Overall Monitoring Effort
Clear	4603.47	82%
Heavy Rain	61.62	1%
Light Rain	244.85	4%
Heavy Fog	144.33	3%
Thin Fog	169.38	3%
Haze	415.57	7%
Snow	0.00	<1%

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### 6.4 Visual Sightings

This section of the report summarizes visual sightings of protected species (marine mammals and sea turtles) made during the ASOW HRG survey. Detections are recorded regardless of if equipment is active or not active. Each individual detection event is catalogued within the month PSO reports submitted by RPS, and within these reports are details as to what equipment (if any) and/or mitigation took place by the vessel or survey team. There were a total of 300 protected species detection events both inside and outside the Lease, consisting of 230 marine mammal detections and 70 sea turtle sightings. Marine mammal sightings consisted of delphinids and whales (145 delphinid detections, 84 whale detections, and 1 unidentified cetacean). Detections consisted of seven different marine mammal species (three delphinid species and four whale species). There were 26 detections of unidentified whales, one detection of an unidentified cetacean and four detections of unidentified dolphins.

The 70 sea turtle sightings consisted of three species, leatherback sea turtles, loggerhead sea turtles, and Kemp's Ridley sea turtles. There were three unidentified sea turtles.

No Atlantic sturgeon or giant manta rays were sighted during any of the survey activities.

Of the 300 detection events, 89% (266 events) were of animals that were identified to the species level while the remaining animals (34 detection events) were identified to family level or a higher taxonomic level (classified as unidentified delphinids, unidentified whales, and unidentified sea turtle). Table 16 shows the total number of detection records and the number of individuals detected for each protected species during the survey program.

A table of all protected species detections is provided as part of an excel datasheet attachment Appendix H.

The distribution of protected species detections both inside and outside the Lease Area is provided in the maps below (Figure 3–Figure 6).

Photographs of the identified protected species visually detected during the survey are provided in Appendix I.

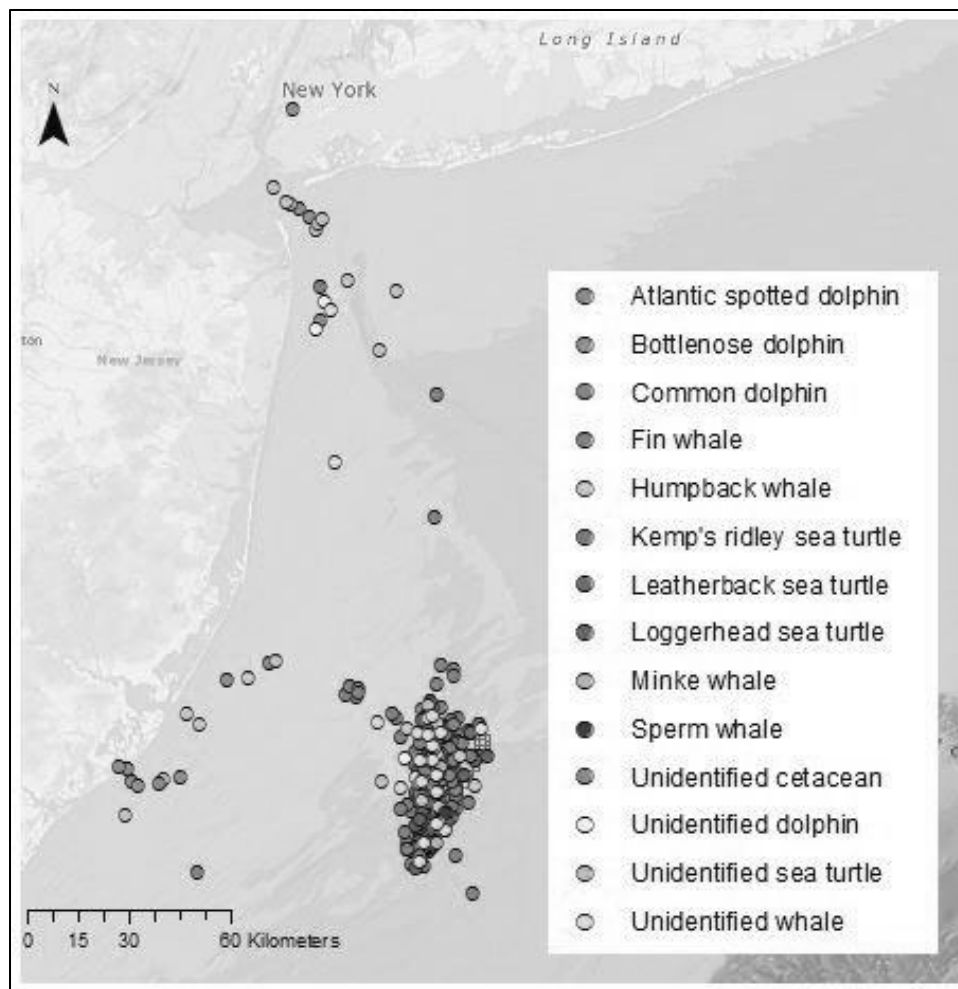
**Table 16: Number of detection records collected for each protected species during the survey.**

Species	Total Number of Detection Records	Total Number of Detected Animals Recorded
Unidentified cetacean	1	1
<b>Whales</b>		
Fin whale	29	48
Humpback whale	23	33
Minke whale	5	6
North Atlantic right whale	0	0
Sperm whale	1	2

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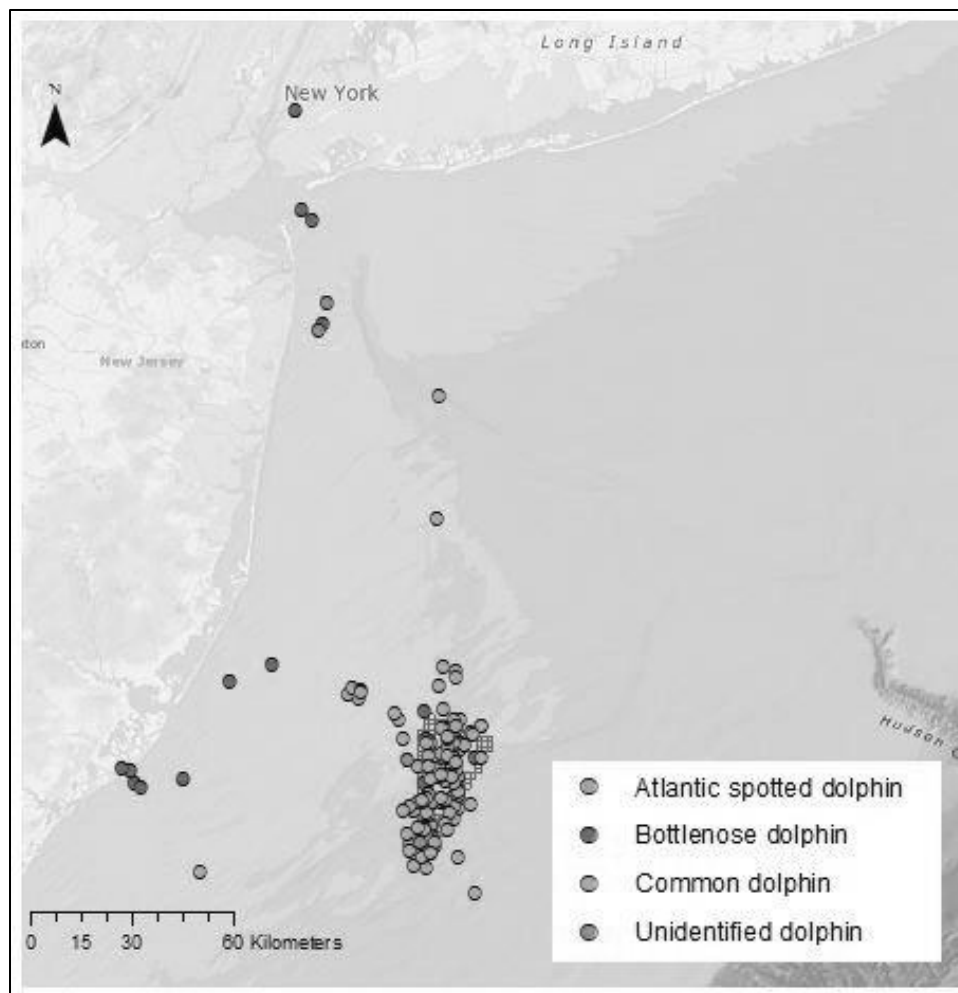
Unidentified whale	26	39
<b>Dolphins</b>		
Atlantic spotted dolphin	2	22
Bottlenose dolphin	17	155
Common dolphin	122	1141
Unidentified dolphins	4	79
<b>Sea turtles</b>		
Leatherback sea turtle	4	4
Loggerhead sea turtle	62	64
Kemp's Ridley sea turtle	1	1
Unidentified sea turtle	3	3
<b>Total</b>	<b>300</b>	<b>1598</b>

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**Figure 3: Distribution of all protected species detections during the survey**

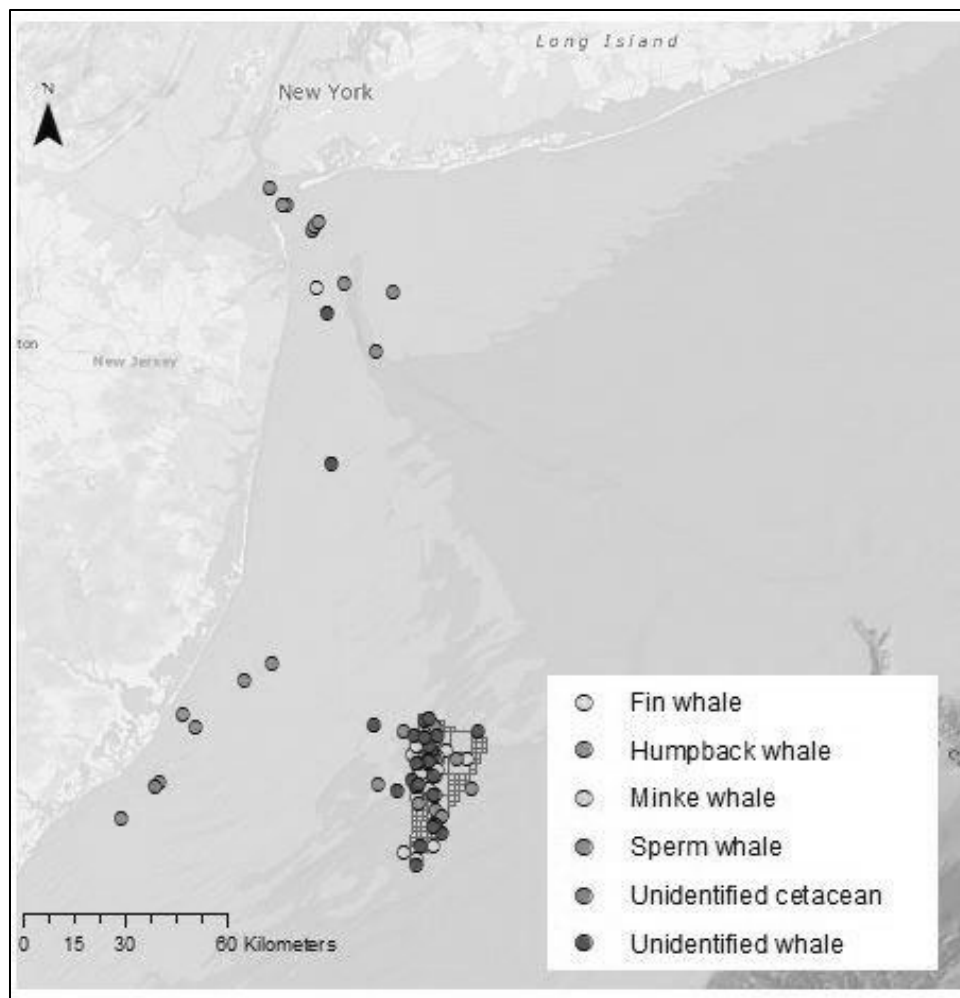
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**Figure 4: Distribution of dolphin species detected during the survey.**

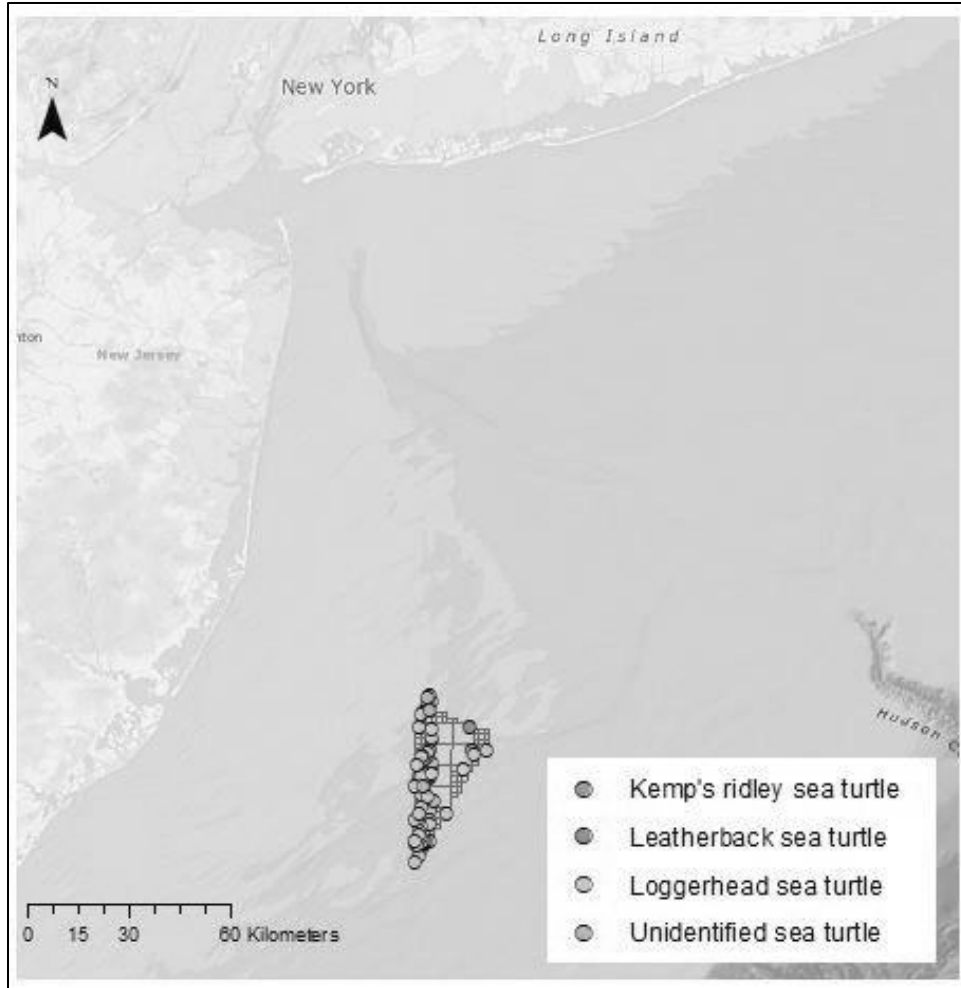


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**Figure 5: Distribution of whale and unidentified cetacean during the survey**

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**Figure 6: Distribution of sea turtles during the survey**

### 6.4.1 Detection and Distance Summaries

Atlantic spotted dolphins had a larger mean group size than any other identified species (11) followed by the common dolphins (9). Common dolphins were the most frequently sighted dolphin species during the survey (122) and were observed much more often than the next most observed identified species, bottlenose dolphins (17) (Table 17). The number of detection events, approximate number of animals observed, mean group size and detection rate for each species detected over the course of the survey is provided in Table 17: Detection summary of dolphins through Table 17.

Common dolphin detections had the closest mean distance at first detection of 203 meters, followed by bottlenose dolphins at 237 meters. Unidentified dolphins had the greatest mean distance at first detection at 905 meters.

**FINAL REPORT****Table 17: Detection summary of dolphins**

<b>Dolphins</b>	<b>Atlantic spotted dolphin</b>	<b>Bottlenose dolphin</b>	<b>Common dolphin</b>	<b>Unidentified dolphin</b>
# of Detection Records	2	17	122	4
Estimated # of individuals detected	22	155	1141	79
Mean Group Size	11	9	9	20
Mean Distance (m) at first detection	300	237	203	905
Detection rate (detection per visual effort hours of survey)	0.000354	0.003011	0.021608	0.000708

Sperm whales had a larger mean group size than any other species (2) (Table 18). Additionally, fin whales had the highest number of detection records (29) and detected individuals (48). Minke whales had the closest mean distance at first detection of 960 meters. Sperm whales had the greatest mean distance at first detection of 4,500 meters.

**Table 18: Detection summary for whales**

<b>Whales</b>	<b>Fin whale</b>	<b>Humpback whale</b>	<b>Minke whale</b>	<b>Sperm whale</b>	<b>Unidentified whale</b>
# of Detection Records	29	23	5	1	26
Estimated # of individuals detected	48	33	6	2	39
Mean Group Size	1.7	1.4	1.2	2	1.5
Mean Distance (m) at first detection	1925	1223	960	4500	1634
Detection rate (detection per visual effort hours of survey)	0.005136	0.004074	0.000886	0.000177	0.004605

Sea turtle detections commonly consist of one animal, and mean distances at first detection were typically small with sightings occurring quite close to the vessel. Both trends of which can be seen in the sea turtle sighting data collected during this Survey (Table 19).

**FINAL REPORT****Table 19: Visual detection summary for sea turtles**

<b>Turtles</b>	<b>Kemp's Ridley sea turtle</b>	<b>Leatherback sea turtle</b>	<b>Loggerhead sea turtle</b>	<b>Unidentified sea turtle</b>
# of Detection Records	1	4	62	3
Estimated # of individuals detected	1	4	64	3
Mean Group Size	1	1	1	1
Mean distance (m) at first detection	20	125	141	247
Detection rate (detection per visual effort hours of survey)	0.000177	0.000708	0.010981	0.000531

The mean CPA to the active and inactive HRG sources was calculated for all species groups (Table 20). All marine mammal groups had closer mean CPA when the HRG sources were not active.

**Table 20: Average closest observed approach of protected species to regulated sources while active and inactive with source deployed.**

<b>Species Detected</b>	<b>Regulated Source Active</b>		<b>Regulated Source Inactive</b>	
	<b>Number of detections</b>	<b>Mean CPA to source (meters)</b>	<b>Number of detections</b>	<b>Mean CPA to source (meters)</b>
Atlantic spotted dolphin	1	12.0	0	-
Bottlenose dolphin	5	270.0	2	77.5
Common dolphin	69	166.8	17	67.9
Unidentified dolphin	1	2300.0	0	-
<b>All dolphin species</b>	<b>76</b>	<b>199.8</b>	<b>19</b>	<b>68.9</b>
Fin whale	23	1522.0	4	722.5
Humpback whale	5	977.0	2	57.5
Minke whale	4	645.0	0	-

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Species Detected	Regulated Source Active		Regulated Source Inactive	
	Number of detections	Mean CPA to source (meters)	Number of detections	Mean CPA to source (meters)
Sperm Whale	1	3650.0	0	-
Unidentified whale	20	1640.2	4	457.8
<b>All whale species</b>	<b>53</b>	<b>1489.3</b>	<b>10</b>	<b>483.6</b>
<b>Unidentified cetacean</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>-</b>
Kemp's Ridley sea turtle	1	30.0	1	20.0
Leatherback sea turtle	3	73.0	2	45.0
Loggerhead sea turtle	51	123.6	40	48.1
Unidentified sea turtle	3	48.0	1	5.0
<b>All turtle species</b>	<b>58</b>	<b>115.5</b>	<b>44</b>	<b>46.3</b>

#### 6.4.2 Incidental Harassment Authorization (IHA) Level B Exposures

NMFS issued an IHA for the ASOW HRG survey where a total of 2,345 takes were authorized for 15 marine mammal species/species groups. During the survey, 348 marine mammals from four species/species groups were observed within 370 m of the active LF sound sources (Table 21), constituting Level B takes as defined by this IHA.

**Table 21: IHA authorized Level B takes and takes from the survey.**

Species common name	IHA Authorized Level B Takes	Total Number of Animals Observed Inside the IHA-defined Level B Harassment Zone
North Atlantic right whale	24	0
Humpback whale	8	1
Fin whale	16	0
Sei whale	2	0
Minke whale	8	0

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Species common name	IHA Authorized Level B Takes	Total Number of Animals Observed Inside the IHA-defined Level B Harassment Zone
Sperm whale	3	0
Long finned pilot whale	20	0
Bottlenose dolphin	232	6
Common dolphin	911	334
Atlantic white-sided dolphin	108	0
Atlantic spotted dolphin	100	7
Risso's dolphin	30	0
Harbor porpoise	357	0
Harbor seal	263	0
Gray Seal	263	0
Unidentified dolphin	N/A	0
Unidentified whale	N/A	0

### 6.4.3 NARW Sightings Reporting

There were no observations of NARW made during survey operations.

### 6.4.4 Protected Species Incident Reporting

There were three observations of dead or injured protected species during the 2022-2023 ASOW geophysical survey during operations in Lease. All observations were reported to the NMFS stranding hotline, and all consisted of injured protected species. In both instances the PSOs concluded that there were no indication the animal's injuries were related to the ASOW geophysical survey operations.

Protected species incidents are summarized below, and the reports that were provided by ASOW to BOEM and NMFS are included in Appendix J.

On 18 January 2023 at 13:15 UTC, an object was sighted at the water surface, approximately 2,800 m from the port bow of the vessel, *R/V Fugro Enterprise*. The object seemed large, more than five meters in length, but the identity was inconclusive. No movement was noticed. The vessel changed heading to 035 degrees and slowed to 4.5 kts to investigate the large object. As the vessel proceeded towards the object, distinguishing characteristics helped identify the object as a dead humpback whale, estimated at 10–12 meters in length, at 13:34 UTC. The throat grooves, white underside and bumps on the flippers and head, confirmed the species to be a humpback whale. The vessel slowly approached the carcass and photos

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were taken. The CPA was 20 meters to the carcass. The carcass was floating upside down with the white underside visible. The body was bloated with no signs of scavenging. A few birds were observed hovering above the carcass.

On 12 May 2023 at 18:53 UTC, a Humpback whale was observed free swimming and blowing at approximately 25 meters off the port bow of the R/V *Fugro Enterprise* at a bearing of 320 degrees. The animal was swimming parallel and in the opposite direction as the vessel, at the time the animal was sighted the vessel was conducting survey acquisition with the survey equipment operating at full volume. The vessel conducted appropriate strike avoidance maneuvers and mitigation actions. The body of the whale was observed with a fishing line tied around it. The animal could be seen with a fishing line behind the blowhole and another line seen ahead of the flippers.

On 6 June 2023 at 21:52 UTC, a humpback whale was observed at 800 meters off the starboard bow of the R/V *Fugro Enterprise* at a bearing of 020 degrees. The whale was observed stationary, lobtailing with only half of the tail, at a vigorous pace. It was noticed that the wounds on the fluke did not look completely healed. As the vessel was moving forward, the humpback whale continued tail slapping and blowing for seven minutes. At 21:58 UTC, the humpback whale was last observed at a bearing of 080 degrees at 800 meters distance from the starboard beam. The vessel was transiting to the survey site and the sound source was secured on deck, not deployed. The whale was observed outside the separation distance therefore, no additional vessel strike avoidance maneuvers were required. The vessel maintained the distance from the animal during the entire detection.

### 6.4.5 Summary of Dynamic Management Areas (DMAs)

There was a DMA created in the ASOW survey region during the time-period covered by this report.

NMFS did report the presence of an entangled NARW in the region of the ASOW lease area during the survey period where vessels were requested to monitor closely for this animal and report any additional observations.

**Table 22: DMAs and NARW reported observations in the ASOW lease area during survey operations.**

	Effective Start Date	Effective End Date	Reason for DMA	General Location	Restrictions
NARW Reporting	17 November 2022	2 December 2022	Acoustic buoy detections of right whales east of Ocean City MD, and southeast of New York, NY	East of Ocean City, MD and Southeast of New York City, NY	Mariners are requested to avoid or transit at 10 knots or less inside defined Acoustic Slow Zones where the right whales were detected

## 6.5 Summary of Mitigation Measures Implemented

Mitigation was implemented as described in previous sections of this report to minimize potential adverse impacts to protected species including physical interactions with vessels and / or towed equipment (VSA mitigation) or from exposure to potentially harmful levels and frequencies of sound (delays to initiation of and shutdowns of active LF HRG sound sources).

## FINAL REPORT

There were 54 mitigation actions implemented for the HRG sound sources during the survey period (Table 23). These mitigation actions resulted in 27 hours and nine minutes of mitigation downtime. Mitigation downtime accounts only for the period of time during which survey operations were delayed or shut down for the presence of a protected species inside a buffer or exclusion zone and the additional regulatory-required time period that must pass before sound source operations can resume. Additional downtime is frequently incurred for necessary operational activities such as gear deployment and/or repositioning the vessel.

**Table 23: Number and duration of mitigation actions by species groups implemented during the survey.**

Mitigation Action	Dolphins		Whales		Sea turtles		All Species	
	Number	Mitigation Downtime (HH.HH)	Number	Mitigation Downtime (HH.HH)	Number	Mitigation Downtime (HH.HH)	Number	Mitigation Downtime (HH.HH)
Delay to initiation of source	8	05.83	0	00.00	6	03.08	14	08.92
Shutdown of active source	0	00.00	4	02.40	36	15.83	40	18.23
<b>All mitigation actions</b>	<b>8</b>	<b>05.83</b>	<b>4</b>	<b>02.40</b>	<b>45</b>	<b>18.92</b>	<b>54</b>	<b>28.15</b>

There were 146 instances where the vessel executed VSA maneuvers during protected species detections, due to the animal being within the separation distance. The VSA maneuvers consisted of a reduction in speed and altering course, maintaining speed, and maintaining course to maintain separation distances. VSA maneuvers were conducted 16 times for whale detections, 91 times for dolphin detections, and 39 times for sea turtles. Each VSA maneuver undertaken is described in the collected data forms provided in Appendix K.



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# 7 SUMMARY

## 7.1 Interpretation of the Results

All the marine mammal and sea turtle species that were detected during the ASOW 2022-2023 Survey in Lease were species that occur commonly in the region and that are regularly observed by PSOs during HRG survey operations. Each species detected was observed within its predicted range with no species encounters occurring outside of that species' normal range.

For all the marine mammal species groups, the mean distance at initial detection and at CPA was greater when the regulated sound sources were active and during many detection events animals were observed to change their direction of travel. However, it is not possible from this data to determine whether the animals were reacting to the vessel, to the sound source or to another environmental or behavioral factor. No behaviors were observed during any encounter that suggested that a protected species was exhibiting an adverse reaction to survey activities.

## 7.2 Effectiveness of all monitoring tasks

To minimize the potential impacts to marine mammals and sea turtles, PSOs onboard all the survey vessels were prepared to implement mitigation measures whenever protected species were detected approaching, entering, or within the designated mitigation zones. Mitigation actions for regulated sound sources were implemented successfully during 54 detection events. PSOs searched the mitigation zones prior to activation of regulated sound sources or deployment / retrieval of sources and survey crew confirmed that applicable zones were clear prior to source operations.

Strike avoidance maneuvering was conducted 146 times to prevent potential physical interactions between the survey vessels and marine mammals or sea turtles. In each case the maneuvers were executed as necessary - PSOs detected the animals in sufficient time to alert the vessel of the need for maneuvering and maneuvering was carried out successfully to avoid physical impacts to the animals. There were seven detections when the vessel altered course, four detections when the vessel altered course and reduced speed, one detection when the vessel altered course and maintained speed, 101 detections when the vessel kept course and maintained speed, one when the vessel remained stationary, two detections when the vessel maintained speed, and 29 when the vessel kept course.

If a dead protected species was discovered during the survey program, and the lead visual observer determined that the cause of death was unknown or unrelated to the activities of the vessel, the incident was to be immediately reported. There were three sightings of injured or deceased animals, one deceased humpback whale, and two injured humpback whales, all of which were reported to NMFS, and in each case, the PSOs determined that the deaths were not related to the activities of the ASOW geophysical or geotechnical surveys.

Visual observations yielded a total 300 protected species detections both inside and outside the Lease Area and included marine mammals and sea turtles. While it is likely that PSOs did not identify all the animals present in the area around the vessel, it is unlikely that protected species were not detected inside the mitigation zones since the radii were relatively small and PSOs were equipped with multiple tools to augment the efficacy of the monitoring. The environmental conditions present during visual and acoustic monitoring were generally good for detecting protected species, especially inside the mitigation zones.

For the ASOW 2022-2023 survey program, a total of 1,585 individual marine from 15 marine mammal species/species groups were authorized for takes in the IHA. During the survey activities, a total of 348 protected species were observed within the predicted Level B harassment radius. This total represents 22% of the authorized Level B takes for the survey program. Although PSOs likely did not detect all the marine mammals present; it is highly unlikely that the actual number of animals present during survey operations reached anywhere near the fully authorized levels for all species.

## Appendix A : BOEM Lease OCS-A-0541

## Appendix B : NMFS 2022 IHA

## Appendix C: Environmental Management Plan

## Appendix D : Protected Species Observers Onboard



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## Appendix E : Vessel Photos



## Appendix F : Reticle Binoculars Calibration Tables



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## Appendix G : Night Vision Equipment Specifications





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## **Appendix H : Excel Data Sheets of Monitoring Effort, Source Operations and Detections of Protected Species During the Survey**



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## **Appendix I :Photographs of Identified Protected Species Visually Detected during the Survey**



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## **Appendix J: Dead and Injured Protected Species Detection Reports**



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## **Appendix K : Summary of Vessel Strike Avoidance Actions**

APR 25 2022

<p style="text-align: center;">UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF OCEAN ENERGY MANAGEMENT</p> <p style="text-align: center;"><b>COMMERCIAL LEASE OF SUBMERGED LANDS FOR RENEWABLE ENERGY DEVELOPMENT ON THE OUTER CONTINENTAL SHELF</b></p> <p><i>Paperwork Reduction Act of 1995 statement: This form does not constitute an information collection as defined by 44 U.S.C. § 3501 et seq. and therefore does not require approval by the Office of Management and Budget.</i></p>	Office  Sterling, VA	Renewable Energy Lease Number Office of Renewable Energy Programs OCS-A 0541
	Cash Bonus and/or Acquisition Fee \$780,000,000.00	Resource Type  Wind
	Effective Date  May 1, 2022	Block Number(s)  See Addendum A

This lease, which includes any addenda hereto, is hereby entered into by and between the United States of America, ("Lessor"), acting through the Bureau of Ocean Energy Management ("BOEM"), its authorized officer, and

Lessee	Interest Held
Atlantic Shores Offshore Wind Bight, LLC	100%

("Lessee"). This lease is effective on the date written above ("Effective Date") and will continue in effect until the lease terminates as set forth in Addendum "B." In consideration of any cash payment heretofore made by the Lessee to the Lessor and in consideration of the promises, terms, conditions, covenants, and stipulations contained herein and attached hereto, the Lessee and the Lessor agree as follows:

### Section 1: Statutes and Regulations.

This lease is issued pursuant to subsection 8(p) of the Outer Continental Shelf Lands Act ("the Act"), 43 U.S.C. §§ 1331 *et seq.* This lease is subject to the Act and regulations promulgated pursuant to the Act, including but not limited to, offshore renewable energy and alternate use regulations at 30 CFR Part 585 as well as other applicable statutes and regulations in existence on the Effective Date of this lease. This lease is also subject to those statutes enacted (including amendments to the Act or other statutes) and regulations promulgated thereafter, except to the extent that they explicitly conflict with an express provision of this lease. It is expressly understood that amendments to existing statutes, including but not limited to the Act, and regulations may be made, and/or new statutes may be enacted or new regulations promulgated, which do not explicitly conflict with an express provision of this lease, and that the Lessee bears the risk that such amendments, regulations, and statutes may increase or decrease the Lessee's obligations under the lease.

### Section 2: Rights of the Lessee.

(a) The Lessor hereby grants and leases to the Lessee the exclusive right and privilege, subject to the terms and conditions of this lease and applicable regulations, to:

(1) submit to the Lessor for approval a Site Assessment Plan (SAP) and Construction and Operations Plan (COP) for the project identified in Addendum "A" of this lease; and (2) conduct activities in the area identified in Addendum "A" of this lease ("leased area") and/or Addendum "D" of this lease ("project easement(s)"), that are described in a SAP or COP that has been approved by the Lessor. This lease does not, by itself, authorize any activity within the leased area.

- (b) The rights granted to the Lessee herein are limited to those activities described in any SAP or COP approved by the Lessor. The rights granted to the Lessee are limited by the lease-specific terms, conditions, and stipulations required by the Lessor per Addendum "C."
- (c) This lease does not authorize the Lessee to conduct activities on the Outer Continental Shelf (OCS) relating to or associated with the exploration for, or development or production of, oil, gas, other seabed minerals, or renewable energy resources other than those renewable energy resources identified in Addendum "A."

### **Section 3: Reservations to the Lessor.**

- (a) All rights in the leased area and project easement(s) not expressly granted to the Lessee by the Act, applicable regulations, this lease, or any approved SAP or COP, are hereby reserved to the Lessor.
- (b) The Lessor will decide whether to approve a SAP or COP in accordance with the applicable regulations in 30 CFR Part 585. The Lessor retains the right to disapprove a SAP or COP based on the Lessor's determination that the proposed activities would have unacceptable environmental consequences, would conflict with one or more of the requirements set forth in subsection 8(p)(4) of the Act (43 U.S.C. § 1337(p)(4)), or for other reasons provided by the Lessor pursuant to 30 CFR 585.613(e)(2) or 30 CFR 585.628(f)(2). Disapproval of plans will not subject the Lessor to liability under the lease. The Lessor also retains the right to approve with modifications a SAP or COP, as provided in applicable regulations.
- (c) The Lessor reserves the right to suspend the Lessee's operations in accordance with the national security and defense provisions of Section 12 of the Act and applicable regulations.
- (d) The Lessor reserves the right to authorize other uses within the leased area and project easements(s) that will not unreasonably interfere with activities described in an approved SAP and/or COP, pursuant to this lease.

### **Section 4: Payments.**

- (a) The Lessee must make all rent payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, unless otherwise specified in Addendum "B."
- (b) The Lessee must make all operating fee payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, as specified in Addendum "B."

### **Section 5: Plans.**

The Lessee may conduct those activities described in Addendum "A" only in accordance with a SAP or COP approved by the Lessor. The Lessee may not deviate from an approved SAP or COP except as provided in applicable regulations in 30 CFR Part 585.

## **Section 6: Associated Project Easement(s).**

Pursuant to 30 CFR 585.200(b), the Lessee has the right to one or more project easement(s), without further competition, for the purpose of installing gathering, transmission, and distribution cables, pipelines, and appurtenances on the OCS, as necessary for the full enjoyment of the lease, and under applicable regulations in 30 CFR Part 585. As part of submitting a COP for approval, the Lessee may request that one or more easement(s) be granted by the Lessor. If the Lessee requests that one or more easement(s) be granted when submitting a COP for approval, such project easements will be granted by the Lessor in accordance with the Act and applicable regulations in 30 CFR Part 585 upon approval of the COP in which the Lessee has demonstrated a need for such easements. Such easements must be in a location acceptable to the Lessor, and will be subject to such conditions as the Lessor may require. The project easement(s) that would be issued in conjunction with an approved COP under this lease will be described in Addendum "D" to this lease, which will be updated as necessary.

## **Section 7: Conduct of Activities.**

The Lessee must conduct, and agrees to conduct, all activities in the leased area and project easement(s) in accordance with an approved SAP or COP, and with all applicable laws and regulations.

The Lessee further agrees that no activities authorized by this lease will be carried out in a manner that:

- (a) could unreasonably interfere with or endanger activities or operations carried out under any lease or grant issued or maintained pursuant to the Act, or under any other license or approval from any Federal agency;
- (b) could cause any undue harm or damage to the environment;
- (c) could create hazardous or unsafe conditions; or
- (d) could adversely affect sites, structures, or objects of historical, cultural, or archaeological significance, without notice to and direction from the Lessor on how to proceed.

## **Section 8: Violations, Suspensions, Cancellations, and Remedies.**

If the Lessee fails to comply with (1) any of the applicable provisions of the Act or regulations, (2) the approved SAP or COP, or (3) the terms of this lease, including associated Addenda, the Lessor may exercise any of the remedies that are provided under the Act and applicable regulations, including, without limitation, issuance of cessation of operations orders, suspension or cancellation of the lease, and/or the imposition of penalties, in accordance with the Act and applicable regulations.

The Lessor may also cancel this lease for reasons set forth in subsection 5(a)(2) of the Act (43 U.S.C. § 1334(a)(2)), or for other reasons provided by the Lessor pursuant to 30 CFR 585.437.

Non-enforcement by the Lessor of a remedy for any particular violation of the applicable provisions of the Act or regulations, or the terms of this lease, will not prevent the Lessor from exercising any remedy, including cancellation of this lease, for any other violation or for the same violation occurring at any other time.

## **Section 9: Indemnification.**

The Lessee hereby agrees to indemnify the Lessor for, and hold the Lessor harmless from, any claim caused by or resulting from any of the Lessee's operations or activities on the leased area or project easement(s) or arising out of any activities conducted by or on behalf of the Lessee or its employees, contractors (including Operator, if applicable), subcontractors, or their employees, under this lease, including claims for:

- a. loss or damage to natural resources,
- b. the release of any petroleum or any Hazardous Materials,
- c. other environmental injury of any kind,
- d. damage to property,
- e. injury to persons, and/or
- f. costs or expenses incurred by the Lessor.

Except as provided in any addenda to this lease, the Lessee will not be liable for any losses or damages proximately caused by the activities of the Lessor or the Lessor's employees, contractors, subcontractors, or their employees. The Lessee must pay the Lessor for damage, cost, or expense due and pursuant to this Section within 90 days after written demand by the Lessor. Nothing in this lease will be construed to waive any liability or relieve the Lessee from any penalties, sanctions, or claims that would otherwise apply by statute, regulation, operation of law, or could be imposed by the Lessor or other government agency acting under such laws.

"Hazardous Material" means

1. A "hazardous substance" or a "pollutant or contaminant" as defined by the *Comprehensive Environmental Response, Compensation, and Liability Act* at 42 U.S.C. §§ 9601(14) and (33);
2. Any "regulated substance" as defined by the Resource Conservation and Recovery Act ("RCRA") at 42 U.S.C. § 6991(7), whether or not contained in or released from underground storage tanks, and any hazardous waste regulated under RCRA pursuant to 42 U.S.C. §§ 6921 *et seq.*;
3. "Oil," as defined by the Clean Water Act at 33 U.S.C. § 1321(a)(1) and the Oil Pollution Act at 33 U.S.C. § 2701(23); or
4. Other substances that applicable Federal, state, tribal, or local laws define and regulate as "hazardous."

## **Section 10: Financial Assurance.**

The Lessee must provide and maintain at all times a surety bond(s) or other form(s) of financial assurance approved by the Lessor in the amount specified in Addendum "B." As required by the applicable regulations in 30 CFR Part 585, if, at any time during the term of this lease, the Lessor requires additional financial assurance, then the Lessee must furnish the additional financial assurance required by the Lessor in a form acceptable to the Lessor within 90 days after receipt of the Lessor's notice of such adjustment.

## **Section 11: Assignment or Transfer of Lease.**

This lease may not be assigned or transferred in whole or in part without written approval of the Lessor. The Lessor reserves the right, in its sole discretion, to deny approval of the Lessee's application to transfer or assign all or part of this lease. Any assignment will be effective on the date



the Lessor approves the Lessee's application. Any assignment made in contravention of this section is void.

#### **Section 12: Relinquishment of Lease.**

The Lessee may relinquish this entire lease or any officially designated subdivision thereof by filing with the appropriate office of the Lessor a written relinquishment application, in accordance with applicable regulations in 30 CFR Part 585. No relinquishment of this lease or any portion thereof will relieve the Lessee or its surety of the obligations accrued hereunder, including but not limited to, the responsibility to remove property and restore the leased area and project easement(s) pursuant to section 13 of this lease and applicable regulations.

#### **Section 13: Removal of Property and Restoration of the Leased Area and Project Easement(s) on Termination of Lease.**

Unless otherwise authorized by the Lessor, pursuant to the applicable regulations in 30 CFR Part 585, the Lessee must remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seafloor of all obstructions created by activities on the leased area and project easement(s) within two years following lease termination, whether by expiration, cancellation, contraction, or relinquishment, in accordance with any approved SAP, COP, or approved Decommissioning Application, and applicable regulations in 30 CFR Part 585.

#### **Section 14: Safety Requirements.**

The Lessee must:

- a. maintain all places of employment for activities authorized under this lease in compliance with occupational safety and health standards and, in addition, free from recognized hazards to employees of the Lessee or of any contractor or subcontractor operating under this lease;
- b. maintain all operations within the leased area and project easement(s) in compliance with regulations in 30 CFR Part 585 and orders from the Lessor and other Federal agencies with jurisdiction, intended to protect persons, property and the environment on the OCS; and
- c. provide any requested documents and records, which are pertinent to occupational or public health, safety, or environmental protection, and allow prompt access, at the site of any operation or activity conducted under this lease, to any inspector authorized by the Lessor or other Federal agency with jurisdiction.

#### **Section 15: Debarment Compliance.**

The Lessee must comply with the Department of the Interior's non-procurement debarment and suspension regulations set forth in 2 CFR Parts 180 and 1400 and must communicate the requirement to comply with these regulations to persons with whom it does business related to this lease by including this requirement in all relevant contracts and transactions.

## **Section 16: Equal Opportunity Clause.**

During the performance of this lease, the Lessee must fully comply with paragraphs (1) through (7) of Section 202 of Executive Order 11246, as amended (reprinted in 41 CFR 60-1.4(a)), and the implementing regulations, which are for the purpose of preventing employment discrimination against persons on the basis of race, color, religion, sex, or national origin. Paragraphs (1) through (7) of Section 202 of Executive Order 11246, as amended, are incorporated in this lease by reference.

## **Section 17: Certification of Nonsegregated Facilities.**

By entering into this lease, the Lessee certifies, as specified in 41 CFR 60-1.8, that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. As used in this certification, the term "facilities" means, but is not limited to, any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees. Segregated facilities include those that are segregated by explicit directive or those that are in fact segregated on the basis of race, color, religion, sex, or national origin, because of habit, local custom, or otherwise; provided, that separate or single-user restrooms and necessary dressing or sleeping areas must be provided to assure privacy as appropriate. The Lessee further agrees that it will obtain identical certifications from proposed contractors and subcontractors prior to awarding contracts or subcontracts unless they are exempt under 41 CFR 60-1.5.

## **Section 18: Notices.**

All notices or reports provided from one party to the other under the terms of this lease must be in writing, except as provided herein and in the applicable regulations in 30 CFR Part 585. Written notices and reports must be delivered to the Lessee's or Lessor's Lease Representative, as specifically listed in Addendum "A," either electronically, by hand, by facsimile, or by United States first class mail, adequate postage prepaid. Each party must, as soon as practicable, notify the other of a change to their Lessee's or Lessor's Contact Information listed in Addendum "A" by a written notice signed by a duly authorized signatory and delivered by hand or United States first class mail, adequate postage prepaid. Until such notice is delivered as provided in this section, the last recorded contact information for either party will be deemed current for service of all notices and reports required under this lease. For all operational matters, notices and reports must be provided to the party's Operations Representative, as specifically listed in Addendum "A," as well as the Lease Representative.

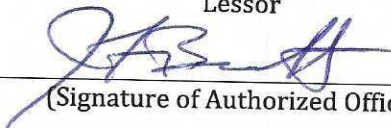
## **Section 19: Severability Clause.**

If any provision of this lease is held unenforceable, all remaining provisions of this lease will remain in full force and effect.

**Section 20: Modification.**

Unless otherwise authorized by the applicable regulations in 30 CFR Part 585, this lease may be modified or amended only by mutual agreement of the Lessor and the Lessee. No such modification or amendment will be binding unless it is in writing and signed by duly authorized signatories of the Lessor and the Lessee.

Atlantic Shores Offshore Wind Bight, LLC  
Lessee  
  
\_\_\_\_\_  
(Signature of Authorized Officer)  
Joris Veldhoven  
\_\_\_\_\_  
(Name of Signatory)  
President  
\_\_\_\_\_  
(Title)  
April 19, 2022  
\_\_\_\_\_  
(Date)

The United States of America  
Lessor  
  
\_\_\_\_\_  
(Signature of Authorized Officer)  
James F. Bennett  
\_\_\_\_\_  
(Name of Signatory)  
Program Manager, Office of  
Renewable Energy Programs  
\_\_\_\_\_  
(Title)  
APR 28 2022  
\_\_\_\_\_  
(Date)

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF OCEAN ENERGY MANAGEMENT

**ADDENDUM "A"**

DESCRIPTION OF LEASED AREA AND LEASE ACTIVITIES

Lease Number OCS-A 0541

**I. Lessor and Lessee Contact Information**

Lessee Company Number: 15119

**(a) Lessor's Contact Information**

	<b>Lease Representative</b>	<b>Operations Representative</b>
<b>Title</b>	Program Manager, Office of Renewable Energy Programs	Same as Lease Representative
<b>Address</b>	U.S. Department of the Interior Bureau of Ocean Energy Management 45600 Woodland Road Sterling, Virginia 20166	
<b>Phone</b>	(703) 787-1300	
<b>Fax</b>	(703) 787-1708	
<b>Email</b>	renewableenergy@boem.gov	

**(b) Lessee's Contact Information**

	<b>Lease Representative</b>	<b>Operations Representative</b>
<b>Name</b>	Joris Veldhoven	Joris Veldhoven
<b>Title</b>	President	President
<b>Address</b>	Atlantic Shores Offshore Wind Bight, LLC 1 Dock 72 Way, Floor 7 Brooklyn, NY 11205	Atlantic Shores Offshore Wind Bight, LLC 1 Dock 72 Way, Floor 7 Brooklyn, NY 11205
<b>Phone</b>	(646) 919-9838	(646) 919-9838
<b>Fax</b>	N/A	N/A
<b>Email</b>	joris.veldhoven@atlanticshoreswind.com	joris.veldhoven@atlanticshoreswind.com

**II. Description of Leased Area**

The total acreage of the leased area is approximately 79,351 acres.

This area is subject to later adjustment, in accordance with applicable regulations (*e.g.*, contraction, relinquishment).

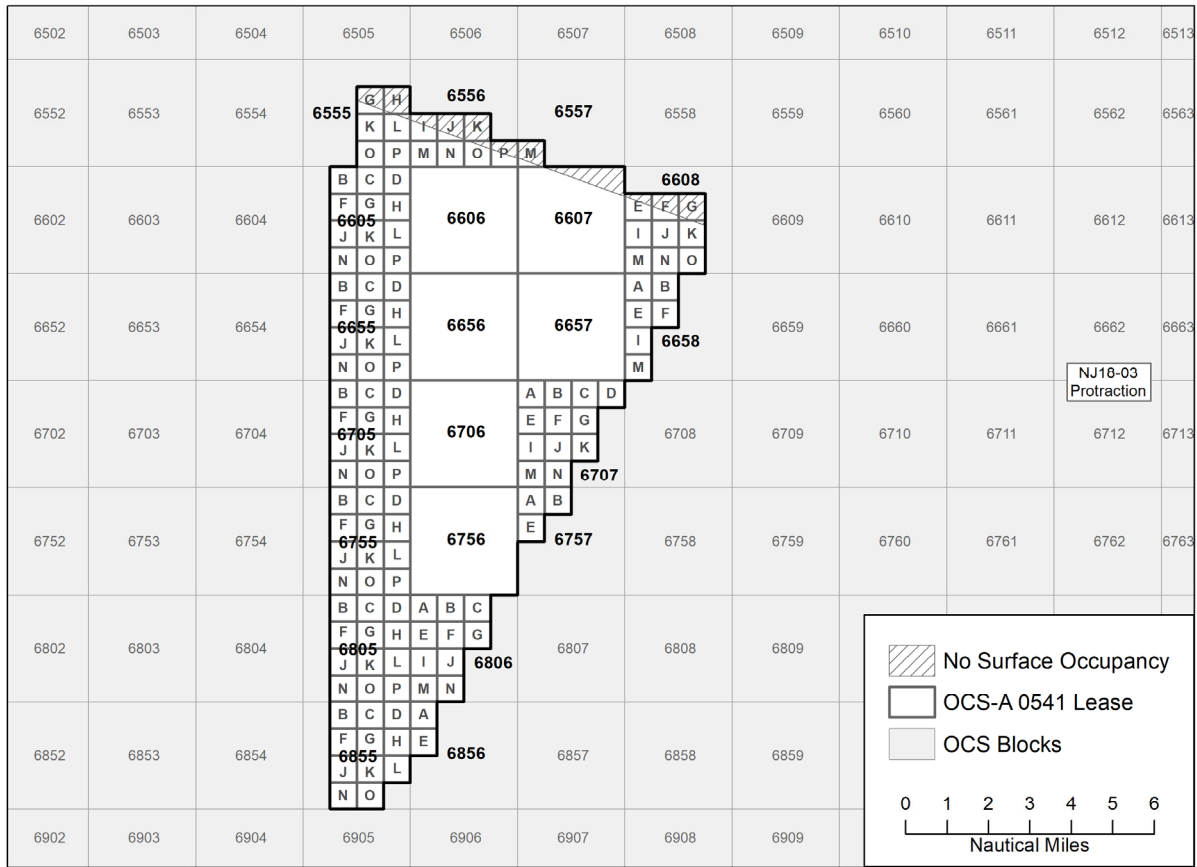
**Lease OCS-A 0541**

The following Blocks or portions of Blocks lying within Official Protraction Diagram Hudson Canyon NJ18-03, are depicted on the map below and comprise 79,351 acres, more or less.

- 1) Block 6555, S1/2 of NE1/4, SE1/4
- 2) Block 6556, SW1/4, NW1/4 of SE1/4, S1/2 of SE1/4
- 3) Block 6557, SW1/4 of SW1/4
- 4) Block 6605, E1/2, E1/2 of W1/2
- 5) Block 6606, All of Block
- 6) Block 6607, All of Block
- 7) Block 6608, SW1/4 of NE1/4, S1/2 of NW1/4, SW1/4, W1/2 of SE1/4
- 8) Block 6655, E1/2, E1/2 of W1/2
- 9) Block 6656, All of Block
- 10) Block 6657, All of Block
- 11) Block 6658, NW1/4, W1/2 of SW1/4
- 12) Block 6705, E1/2, E1/2 of W1/2
- 13) Block 6706, All of Block
- 14) Block 6707, N1/2 of NE1/4, SW1/4 of NE1/4, W1/2, NW1/4 of SE1/4
- 15) Block 6755, E1/2, E1/2 of W1/2
- 16) Block 6756, All of Block
- 17) Block 6757, N1/2 of NW1/4, SW1/4 of NW1/4
- 18) Block 6805, E1/2, E1/2 of W1/2
- 19) Block 6806, W1/2 of NE1/4, W1/2
- 20) Block 6855, NE1/4, E1/2 of W1/2, N1/2 of SE1/4, SW1/4 of SE1/4
- 21) Block 6856, W1/2 of NW1/4

For the purposes of these calculations, a full Block is 2,304 hectares. The acreage of a hectare is 2.471043930.

**New York Bight - Hudson South (OCS-A 0541 Lease Area)**



OREP-2021-1040

The No Surface Occupancy area totals 3,212 acres. It is depicted on the lease map and is subject to Addendum "C", No Surface Occupancy Stipulation No. 8.2 and includes the portion of the lease area lying northeast of a line extending from point number 1 to point number 2.

Point Number	Direction	Longitude DD	Latitude DD
1	Start (NW to SE)	-73.632632	39.480460
2	End (NW to SE)	-73.452425	39.427638

Coordinate System/Datum - Geographic NAD83, Decimal Degrees

III. Renewable Energy Resource

Wind

IV. Description of the Project

A project to generate energy using wind turbine generators and any associated resource assessment activities, located on the Outer Continental Shelf in the leased area, as well as associated offshore substation platforms, inter-array cables, and subsea export cables.

V. Description of Project Easement(s)

Once approved, the Lessor will incorporate Lessee's project easement(s) in this lease as ADDENDUM "D."

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF OCEAN ENERGY MANAGEMENT

**ADDENDUM "B"**

LEASE TERM AND FINANCIAL SCHEDULE

Lease Number OCS-A 0541

I. Lease Term

The duration of each term of the lease is described below. The terms may be extended or otherwise modified in accordance with applicable regulations in 30 CFR Part 585.

<b>Lease Term</b>	<b>Duration</b>
Preliminary Term	1 year
Site Assessment Term	5 years
Operations Term	33 years

Schedule: Addendum "C" includes a schedule and reporting requirements for conducting site characterization activities.

Renewal: The Lessee may request renewal of the operations term of this lease, in accordance with applicable regulations in 30 CFR Part 585. The Lessor, at its discretion, may approve a renewal request to conduct substantially similar activities as were originally authorized under this lease or in an approved plan. The Lessor will not approve a renewal request that involves development of a type of renewable energy not originally authorized in the lease. The Lessor may revise or adjust payment terms of the original lease as a condition of lease renewal.

II. Definitions

"Lease Issuance Date" refers to the date on which this lease has been signed by *both* the Lessee and the Lessor.

"Effective Date" has the same meaning as "effective date" in the Bureau of Ocean Energy Management (BOEM) regulations provided in 30 CFR 585.237.

"Lease Anniversary" refers to the anniversary of the Effective Date of the lease.

"End Date" refers to the earlier of a) the last calendar day of the last month of the Operations Term; or b) the date on which the lease terminates in the event of a lease termination for another reason under 30 CFR 585.432.

"Commercial Operations" means the generation of electricity or other energy product for commercial use, sale, or distribution.

"Commercial Operation Date," or "COD," refers to the date on which the Lessee first begins Commercial Operations on the lease.



“Delivery Point” is the meter identified in the Construction and Operations Plan (COP) where the Lessee’s facility interconnects with the electric grid to deliver electricity for sale.

An individual wind generation turbine is said to be “available for Commercial Operations” on or after the first day that it engages in Commercial Operations on the lease; and to be no longer available for Commercial Operations on or after the day when it is permanently decommissioned. These dates are determined by the COP, the Facility Design Report (FDR) or Fabrication Installation Report (FIR).

### III. Payments

Unless otherwise authorized by the Lessor in accordance with the applicable regulations in 30 CFR Part 585, the Lessee must make payments as described below.

(a) **Rent.** The Lessee must pay rent as described below:

Rent payments prior to the COD, or prior to the lease End Date in the event that the lease terminates prior to the COD, are calculated by multiplying the acres in the leased area times the rental rate per acre. The acreage for your lease is documented in Addendum A. For example:

- Acres: 100,000
- Annual Rental Rate: \$3.00 per acre or fraction thereof
- Rental Fee for Entire Leased Area:  $\$3.00 \times 100,000 = \$300,000$

The first year’s rent payment is due within 45 days of the date that the lease is received by the Lessee for execution, in accordance with 30 CFR 585.503. Rent for the entire leased area for the next year and for each subsequent year is due on or before each Lease Anniversary through the year in which the COD occurs. The rent for each year subsequent to the COD on the imputed portion of the lease not authorized for Commercial Operations is due on or before each Lease Anniversary.

Once a portion of the lease begins commercial operations, rent will only be due for the undeveloped or non-operating acreage. The rent calculation becomes a three-step process:

- (1) rent is calculated on the portion of the lease not authorized for commercial operations.
- (2) rent is calculated on the portion of the lease authorized for commercial operations, but without operating turbines.
- (3) the sum of (1) and (2) yield the rent due.

**Step (1):** The Lessee will continue to pay rent at the lease rate for acreage outside the approved commercial project area. The demarcation between acreage for a commercial project and undeveloped acreage will be defined in the COP or supplemental documents approved by BOEM. For example, if the total lease acreage is 100,000 acres and exactly three-quarters of the lease acreage is approved for commercial operations, 25,000 acres is not authorized for commercial operations.

- Acres: 25,000
- Annual Rental Rate: \$3.00 per acre or fraction thereof
- Rental Fee for Undeveloped Leased Area:  $\$3.00 \times 25,000 = \$75,000$

**Step (2):** Acreage for the approved project area subject to rent will be the complement of the operating name plate capacity divided by the total nameplate capacity,  $\frac{M_t}{\sum N_w}$ , as defined in Section III (b) (4) below, prior to any adjustments as specified in the most recent approved COP for turbine maintenance, replacements, repowering, or decommissioning. If contiguous acreage for an approved project cannot be developed due to buffers or other surface occupancy restrictions, it will be considered part of the operating area of the lease and covered by the lease's operating fee payment.

- Acres: 75,000
- Annual Rental Rate: \$3.00 per acre or fraction thereof
- Rental Fee for Undeveloped Acreage Authorized for Commercial Operations:  $\$3.00 \times 75,000 \times \left(1 - \frac{M_t}{\sum N_w}\right) = \$\text{Rent}$

Using the summed capacity of 14.21 megawatt (MW) from the 30 MW project in Table 1 from Section III (b) (4) below, the rental calculation for the project area is:  $\$3.00 \times 75,000 \times (1 - 0.473667) = \$118,425$

**Step (3):** Summing the rent due in steps (1) & (2):  $\$75,000 + \$118,425 = \$193,425$ .

- The Adjusted Annual Rent Payment will be rounded up to the nearest dollar.

All rent payments must be made as required in 30 CFR 1218.51. Late rent payments will be charged interest in accordance with 30 CFR 1218.54.

Advance lease rent and operating fee payments are due annually, before the lease anniversary date. All rent payments, including the last rent payment, are payable for the full year and will not be prorated to the COD or other installation milestones. If the installation schedule proceeds more quickly than projected by the lessee, lease payments may need to be reconciled. The Lessee should work with BOEM's Office of Renewable Energy Programs and the Office of Natural Resources Revenue on any payment reconciliation as instructed in Section III (c).

**(1) Project Easement.**

Rent for any project easement(s) is described in ADDENDUM "D".

**(2) Relinquishment.**

If the Lessee submits an application for relinquishment of a portion of the leased area within the first 45 calendar days following the date that the lease is received by the Lessee for execution, and the Lessor approves that application, no rent payment will be due on that relinquished portion of the leased area. Later relinquishments of any leased area will reduce the Lessee's rent payments due the year following the Lessor's approval of the relinquishment, through a reduction in the Acres in Leased Area and the corresponding Rental Fee for the Entire Leased Area and any related Adjusted Annual Rent Payments.

**(b) Operating Fee.** The Lessee must pay an operating fee as described below:

**(1) Initial Operating Fee Payment.**

The Lessee must pay an initial prorated operating fee within 45 calendar days after the COD. The initial operating fee payment covers the first year of Commercial Operations on the lease and will be calculated in accordance with subsection (4) below, using an operating fee rate of 0.02 and a capacity factor of 0.4.

**(2) Annual Operating Fee Payments.**

The Lessee must pay the operating fee for each subsequent year of Commercial Operations on or before each Lease Anniversary following the formula in subsection (4) below. The Lessee must calculate each operating fee annually subsequent to the initial operating fee payment using an operating fee rate of 0.02 through the thirty-three year operations term of the lease. If the Lessor determines that the Lessee has met the threshold for the supply chain incentive under section 7.2 of Addendum C, then the operating fee rate will be 0.01 instead of 0.02 for five years starting the year after the Lessor makes the determination. After five years at 0.01, the operating fee rate will be 0.02 for the remainder of the lease. The capacity factor of 0.4 will remain in effect until the Lease Anniversary of the year in which the Lessor adjusts the capacity factor.

**(3) Final Operating Fee Payment.**

The final operating fee payment is due on the Lease Anniversary prior to the End Date. The final operating fee payment covers the last year of Commercial Operations on the lease and will be calculated in accordance with the formula in subsection (4) below.

**(4) The formula for calculating the operating fee in year *t*.**

$F_t$	=	$M_t$	*	$H$	*	$c_p$	*	$P_t$	*	$r_t$
(annual operating fee)		(nameplate capacity)		(hours per year)		(capacity factor)		(power price)		(operating fee rate)

Where:

$t =$	the year of Commercial Operations on the lease starting from each Lease Anniversary, where $t$ equals 1 represents the year beginning on the Lease Anniversary prior to, or on, the COD.
$F_t =$	the dollar amount of the annual operating fee in year $t$ .
$M_t =$	<p>the nameplate capacity expressed in megawatts (MW) rounded to the nearest second decimal place in year <math>t</math> of Commercial Operations on the lease. The capacity calculation is a two-step process: (1) scaling each turbine’s nameplate capacity in proportion to the number of days in the year that it is operational and (2) summing these scaled values across all turbines.</p> <p>The value of <math>M_t</math>, reflecting the availability of turbines, will be determined based on the FDR or FIR. This value will be adjusted to reflect any changes to installed capacity approved by BOEM as of the date each operating fee payment is due, in accordance with the calculation in Equation 1, for each year of Commercial Operations on the lease.</p> $(1) M_t = \sum_{w=1}^{W_t} \left( N_w \times \left[ \frac{Y_{w,t}}{D} \right] \right)$

Where:

$W_t$  = Number of individual wind generation turbines,  $w$ , that will be available for Commercial Operations during any day of the year,  $t$ , per the FDR or FIR.

$N_w$  = Nameplate capacity of individual wind generation turbine,  $w$ , per the FDR or FIR expressed in MW.

$Y_{w,t}$  = Number of days that turbine  $w$  is commercially available during year.

$D$  = Days in the year set equal to 365 in all years for purposes of this calculation.

$M_t$  may be reduced only in the event that installed capacity is permanently decommissioned.  $M_t$  will not be changed in response to routine or unplanned maintenance of units, including the temporary removal of a nacelle for off-site repair or replacement with a similar unit.

EXAMPLE: Table 1 illustrates the calculations represented by Equation (1) for a single lease year for a lease on which the lessee plans to erect six turbines, each with a nameplate capacity of 5 MW. Based on the days in each turbine's commercial operations period (column B), the exhibit shows the number of days during the year that the turbine is available for operation. Dividing this value by 365 (column D) yields the percent of days during the year that the turbine is available for operation (column E). For each turbine, the resulting percentage (column E) is multiplied by its nameplate capacity (column A) to calculate its scaled capacity for the year (column F). The individual values in column F are then summed across all six turbines to calculate total capacity ( $M_t$ ).

**Table 1: Example of  $M_t$  Calculations for Installation**

Turbine	Nameplate Capacity ( $N_w$ ) [A]	Days in Turbine's Commercial operations Period [B]	Number of days Turbine is available for operation in year $t$ ( $Y_{w,t}$ ) [C]	Number of days in the Year [D]	Percent of days available for Commercial Operation $\left(\frac{Y_{w,t}}{D}\right)$ [E = C ÷ D]	Turbine capacity scaled based on percent of days in commercial operation $N_w \times \frac{Y_{w,t}}{D}$ [F = A × E]
#1	5	January 1 to December 31	365	365	100%	5.00
#2	5	January 1 to December 31	365	365	100%	5.00
#3	5	October 1 to December 31	92	365	25.2%	1.26
#4	5	October 1 to December 31	92	365	25.2%	1.26
#5	5	October 1 to December 31	92	365	25.2%	1.26
#6	5	December 1 to December 31	31	365	8.5%	0.42
Available capacity summed across all turbines: $M_t = \sum_{w=1}^{W_t} \left( N_w \times \left[ \frac{Y_{w,t}}{D} \right] \right) = 14.21$						

The same calculation would be performed for the lease during the decommissioning phase.

H =	the number of hours in the year for billing purposes which is equal to 8,760 for all years of Commercial Operations on the lease.																																								
$c_p$ =	<p>the “Capacity Factor” in Performance Period <math>p</math>, which represents the share of anticipated generation of the facility that is delivered to where the Lessee’s facility interconnects with the electric grid (i.e. the Delivery Point) relative to its generation at continuous full power operation at the nameplate capacity, expressed as a decimal between zero and one.</p> <p>The initial Capacity Factor (<math>C_0</math>) will be set to 0.4.</p> <p>The Capacity Factor will be subject to adjustment at the end of each Performance Period. After the sixth year of Commercial Operations on the lease has concluded, the Lessee will utilize data gathered from years two through six of Commercial Operations on the lease and propose a revised Capacity Factor to be used to calculate subsequent annual payments, as provided for in Table 2 below. A similar process will be conducted at the conclusion of each five-year Performance Period, thereafter.</p> <p><b>Table 2: Definition of Performance Periods</b></p> <table border="1"> <thead> <tr> <th>Performance Period (<math>p</math>)</th> <th>Commercial Operation Years (<math>t</math>)</th> <th>Payments Affected by Adjustment</th> <th>Capacity Factor (<math>C</math>)</th> <th>Date End Year (<math>n</math>)</th> </tr> </thead> <tbody> <tr> <td>0 (COD)</td> <td>Not Applicable</td> <td>Payments 1 to 7</td> <td><math>C_0=0.4</math></td> <td>--</td> </tr> <tr> <td>1</td> <td><math>t = 2</math> to 6</td> <td>Payments 8 to 12</td> <td><math>C_1</math></td> <td><math>n_1=6</math></td> </tr> <tr> <td>2</td> <td><math>t = 7</math> to 11</td> <td>Payments 13 to 17</td> <td><math>C_2</math></td> <td><math>n_2=11</math></td> </tr> <tr> <td>3</td> <td><math>t = 12</math> to 16</td> <td>Payments 18 to 22</td> <td><math>C_3</math></td> <td><math>n_3=16</math></td> </tr> <tr> <td>4</td> <td><math>t = 17</math> to 21</td> <td>Payments 23 to 27</td> <td><math>C_4</math></td> <td><math>n_4=21</math></td> </tr> <tr> <td>5</td> <td><math>t = 22</math> to 26</td> <td>Payments 28 to 32</td> <td><math>C_5</math></td> <td><math>n_5=26</math></td> </tr> <tr> <td>6</td> <td><math>t = 27</math> to 31</td> <td>Payment 33</td> <td><math>C_6</math></td> <td><math>n_6=31</math></td> </tr> </tbody> </table> <p><b>Adjustments to the Capacity Factor</b></p> <p>The Actual 5-year Average Capacity Factor (<math>X_p</math>) is calculated for each Performance Period after COD (<math>p &gt; 0</math>) per Equation 2 below. <math>X_p</math> represents the sum of actual, metered electricity generation in megawatt-hours (MWh) at the Delivery Point to the electric grid (<math>A_t</math>) divided by the amount of electricity generation in MWh that would have been produced if the facility operated continuously at its full, stated capacity (<math>M_t</math>) in all of the hours (<math>h_t</math>) in each year, <math>t</math>, of the corresponding five-year period.</p> $(2) X_p = \frac{\sum_{t=n-4}^n A_t}{(\sum_{t=n-4}^n M_t \times h_t)}$ <p>Where:</p> <p><math>M_t</math> = Nameplate Capacity as defined above.</p> <p><math>n</math> = “Date End Year” value for the Performance Period, <math>p</math>, as defined in Table 2.</p> <p><math>p</math> = Performance Period as defined in Table 2.</p> <p><math>A_t</math> = Actual generation in MWh associated with each year of Commercial Operations, <math>t</math>, on the</p>	Performance Period ( $p$ )	Commercial Operation Years ( $t$ )	Payments Affected by Adjustment	Capacity Factor ( $C$ )	Date End Year ( $n$ )	0 (COD)	Not Applicable	Payments 1 to 7	$C_0=0.4$	--	1	$t = 2$ to 6	Payments 8 to 12	$C_1$	$n_1=6$	2	$t = 7$ to 11	Payments 13 to 17	$C_2$	$n_2=11$	3	$t = 12$ to 16	Payments 18 to 22	$C_3$	$n_3=16$	4	$t = 17$ to 21	Payments 23 to 27	$C_4$	$n_4=21$	5	$t = 22$ to 26	Payments 28 to 32	$C_5$	$n_5=26$	6	$t = 27$ to 31	Payment 33	$C_6$	$n_6=31$
Performance Period ( $p$ )	Commercial Operation Years ( $t$ )	Payments Affected by Adjustment	Capacity Factor ( $C$ )	Date End Year ( $n$ )																																					
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4	$t = 17$ to 21	Payments 23 to 27	$C_4$	$n_4=21$																																					
5	$t = 22$ to 26	Payments 28 to 32	$C_5$	$n_5=26$																																					
6	$t = 27$ to 31	Payment 33	$C_6$	$n_6=31$																																					

	<p>lease that is transferred at the Delivery Point; Delivery Point meter data supporting the values submitted for annual actual generation must be recorded, preserved, and timely provided to the Lessor upon request. The generation data for the facility must be the same data reported on the Energy Information Administration’s EIA-923.</p> <p><math>h_t</math> = Hours in the year on which the Actual Generation associated with each year of Commercial Operations, <math>t</math>, on the lease is based; this definition of “hours in the year” differs from the definition of H in the operating fee equation above. The hours in the year for purposes of calculating the capacity factor must take into account the actual number of hours, including those in leap years.</p> <p>The value of the Capacity Factor at the outset of Commercial Operations (<math>p = 0</math>) is set to 0.4 as stated in equation 3:</p> <p><b>(3)</b> <math>c_0 = 0.4</math></p>
$P_t =$	<p>a measure of the annual average wholesale electric power price expressed in dollars per MW hour.</p> <p>The Lessee must calculate <math>P_t</math> at the time each operating fee payment is due, subject to approval by the Lessor. The Price (<math>P_t</math>) must equal the simple average of the “on-the-hour” spot price indices for the NYISO NYC-J power market for the most recent calendar year of data available as reported by the Federal Energy Regulatory Commission (FERC). Alternatively, <math>P_t</math> may be based on aggregated data from commercial subscription services such as S&amp;P Global Market Intelligence Platform or Hitachi ABB Velocity Suite. BOEM will post the power price data it intends to use for the lessee’s reference.</p> <p>The source of data used in the calculations must be noted in the Lessee’s documentation supporting their estimate of the value of <math>P_t</math> each year for review and approval by the Lessor. BOEM will use the posted prices to verify the lessee’s calculations.</p>
$r_t =$	<p>the operating fee rate of 0.02 (2%) or 0.01 (1%), as applicable.</p>

**(c) Reporting, Validation, Audits, and Late Payments.**

The Lessee must submit the values used in the operating fee formula to the Lessor at the time the annual payment based on these values is made. Submission of this and other reporting, validation, audit and late payment information as requested by the Lessor must be sent to the Lessor using the contact information indicated in Addendum “A”, unless the Lessor directs otherwise. Failure to submit the estimated values and the associated documentation on time to the Lessor may result in penalties as specified in applicable regulations.

Within 60 days of the submission by the Lessee of the annual payment, the Lessor will review the data submitted and validate that the operating fee formula was applied correctly. If the Lessor validation results in a different operating fee amount, the amount of the annual operating fee payment will be revised to the amount determined by the Lessor.

The Lessor also reserves the right to audit the meter data upon which the Actual 5-year Average Capacity Factor is based at any time during the lease term. If, as a result of such audit, the Lessor

determines that any annual operating fee payment was calculated incorrectly, the Lessor has the right to correct any errors and collect the correct annual operating fee payment amount.

If the annual operating fee is revised downward as a result of the Lessee's calculations, as validated by the Lessor, or an audit of meter data conducted by the Lessee or Lessor, the Lessee will be refunded the difference between the amount of the payment received and the amount of the revised annual operating fee, without interest. Similarly, if the payment amount is revised upward, the Lessee is required to pay the difference between the amount of the payment received and the amount of the revised annual operating fee, plus interest on the balance, in accordance with 30 CFR § 1218.54.

Late operating fee payments will be charged interest in accordance with 30 CFR § 1218.54.

#### IV. Financial Assurance

The Lessor will base the determination for the amounts of all Site Assessment Plan (SAP), COP, and decommissioning financial assurance requirements on estimates of the cost to meet all accrued lease obligations. The Lessor will determine the amount of supplemental and decommissioning financial assurance requirements on a case-by-case basis. The amount of financial assurance required to meet all lease obligations includes:

- (a) **Initial Financial Assurance.** Prior to the Lease Issuance date, the Lessee must provide an initial lease-specific bond, or other approved means of meeting the Lessor's initial financial assurance requirements in an amount equal to \$100,000.
- (b) **Additional Financial Assurance.** In addition to the initial lease-specific financial assurance discussed above, the Lessee is also required to provide additional supplemental bonds associated with the SAP and COP, or other form of financial assurances and a decommissioning bond or other approved means of meeting the Lessee's decommissioning obligations.
  - (1) Prior to the Lessor's approval of a SAP, the Lessor will require an additional supplemental bond or other form of financial assurance in an amount determined by the Lessor based on the complexity, number, and location of all facilities involved in the site assessment activities planned in the SAP, and estimates of the costs to meet all accrued obligations, in accordance with applicable BOEM regulations (30 CFR 585.515-537). The supplemental financial assurance requirement is in addition to the initial lease-specific financial assurance in the amount of \$100,000. The Lessee may meet these obligations by providing a new bond or other acceptable form of financial assurance, or increasing the amount of its existing bond or other form of financial assurance.
  - (2) Prior to the Lessor's approval of a COP, the Lessor may require an additional supplemental bond or other form of financial assurance in an amount determined by the Lessor based on the complexity, number, location of all facilities, activities and Commercial Operations planned in the COP, and estimates of the costs to meet all

accrued obligations, in accordance with applicable BOEM regulations (30 CFR 585.515-537). The supplemental financial assurance requirement is in addition to the initial lease-specific financial assurance in the amount of \$100,000 and an additional supplemental bond or other form of financial assurance required with the SAP. The Lessee may meet this obligation by providing a new bond or other acceptable form of financial assurance, or increasing the amount of its existing bond or other form of financial assurance.

- (3) The Lessor will require a decommissioning bond or other form of financial assurance based on the anticipated decommissioning costs in accordance with applicable BOEM regulations (30 CFR 585.515-537). The decommissioning obligation must be guaranteed through an acceptable form of financial assurance and will be due according to the schedule beginning before commencement of the installation of commercial facilities on a date or dates to be determined by the Lessor.

- (c) **Adjustments to Financial Assurance Amounts.** The Lessor reserves the right to adjust the amount of any financial assurance requirement (initial, supplemental, or decommissioning) associated with this lease and/or reassess the Lessee's cumulative lease obligations, including decommissioning obligations, at any time. If the Lessee's cumulative lease obligations and/or liabilities increase or decrease, the Lessor will notify the Lessee of any intended adjustment to the financial assurance requirements and provide the Lessee an opportunity to comment in accordance with applicable BOEM regulations.



U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF OCEAN ENERGY MANAGEMENT

**ADDENDUM "C"**

LEASE-SPECIFIC TERMS, CONDITIONS, AND STIPULATIONS

Lease Number OCS-A 0541

The Lessee's rights to conduct activities on the leased area are subject to the following terms, conditions, and stipulations. The Lessor reserves the right to impose additional terms and conditions incident to the future approval or approval with modifications of plans, such as a Site Assessment Plan (SAP) or Construction and Operations Plan (COP).

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## 1 DEFINITIONS

- 1.1 Definition of “Archaeological Resource”: The term “archaeological resource” has the same meaning as “archaeological resource” in the Bureau of Ocean Energy Management (BOEM) regulations provided in 30 CFR 585.112.
- 1.2 Definition of “Effective Date”: The term “Effective Date” has the same meaning as “effective date” in BOEM regulations provided in 30 CFR 585.237.
- 1.3 Definition of “Geological and Geophysical Survey (G&G Survey)”: The term “G&G Survey” serves as a collective term for surveys that collect data on the geology of the seafloor and landforms below the seafloor. High resolution geophysical surveys and geotechnical (sub-bottom) exploration are components of G&G surveys.
- 1.4 Definition of “Geotechnical Exploration”: The term “Geotechnical Exploration,” also referred to as “Sub-bottom Sampling,” or “Geotechnical Testing,” is used to collectively refer to site specific sediment and underlying geologic data acquired from the seafloor and the sub-bottom and includes geotechnical surveys utilizing deep borings, vibracores, and cone penetration tests.
- 1.5 Definition of “High Resolution Geophysical Survey (HRG Survey)”: The term “HRG Survey” means a marine remote-sensing survey using, but not limited to, such equipment as side-scan sonar, magnetometer, shallow and medium (Seismic) penetration sub-bottom profiler systems, narrow beam or multibeam echo sounder, or other such equipment employed for the purposes of providing data on geological conditions, identifying shallow hazards, identifying archaeological resources, charting bathymetry, and gathering other site characterization information.
- 1.6 Definition of “Protected Species”: The term “protected species” includes marine mammals (those protected under the Endangered Species Act and those protected under the Marine Mammal Protection Act), sea turtles, sturgeon, and giant manta ray.
- 1.7 Definition of “Site Assessment Activities”: The term “site assessment activities” or “site assessment,” has the same meaning as “site assessment activities” in 30 CFR 585.112.
- 1.8 Definition of “Qualified Marine Archaeologist”: The term “qualified marine archaeologist” means a person retained by the Lessee who meets the Secretary of the Interior’s Professional Qualifications Standards for Archaeology (48 FR 44738- 44739), and has experience analyzing marine geophysical data.

## 2 SITE CHARACTERIZATION

- 2.1 **Survey Plan(s):** Prior to conducting each physical, biological, or cultural resources survey in support of the submission of a plan, the Lessee must submit to the Lessor a survey plan. Each distinct survey effort (e.g., mobilization) must be addressed by a survey plan, although a single survey plan may cover more than one survey effort and may cover multiple types of activities (e.g., geotechnical and geophysical surveys on lease and along cable routes).

Each survey plan must include details of activities to be conducted and timelines of each survey effort necessary to support the submission of a plan (i.e., necessary to satisfy the information requirements in the applicable regulations, including but not limited to 30 CFR 585.606, 610, 611, 621, 626, 627, et al.). The Lessor will not accept survey plans that do not provide sufficient detail for review, including but not limited to specific description and illustration of the geographic areas to be surveyed, specific discussion of the survey methods and equipment to be employed, and a schedule of survey activities.

The Lessee must demonstrate compliance with each of the lease stipulations in Section 4 of Addendum "C" and include any waiver requests in its initial survey plan. Each survey plan must be consistent with the Lessee's Fisheries Communication Plan (FCP) (see 3.1.2.1) and Native American Tribal Communications Plan (NATCP) (see 3.1.2.2), and include a description of the Lessee's intentions to coordinate with the U.S. Coast Guard (USCG) to prepare a Notice to Mariners for the specific survey activities described in the survey plan.

The Lessee must submit a survey plan to the Lessor at least 90 calendar days prior to commencement of any survey activities described in the survey plan. Within 30 calendar days from receipt, the Lessor may request the Lessee modify the survey plan to address any comments the Lessor submits to the Lessee on the contents of the survey plan. Comments must be addressed by the Lessee in a manner deemed satisfactory by the Lessor prior to commencement of the survey activities. If the Lessor does not respond with comments or objections within 30 calendar days of receipt of the survey plan, the Lessee may proceed with the survey activities per the proposed schedule. The lack of Lessor comment or objection to the survey plan does not ensure acceptance of the survey results with the SAP and/or COP. If the Lessee is proposing a fisheries survey that could result in the take of species listed under the Endangered Species Act, additional time should be allowed for consultation and/or permits authorizing the activity (see Section 5.1.4).

- 2.2 Pre-Survey Meeting(s) with the Lessor: If requested by the Lessor, the Lessee must hold a pre-survey meeting with the Lessor prior to the commencement of survey activities to discuss the applicable survey plan. The Lessee must ensure the presence at this meeting of any relevant subject matter experts, as requested by the Lessor.

### 3 REPORTING

- 3.1 **Progress Report**: The Lessee must submit to the Lessor a progress report every six months (unless BOEM directs otherwise) through the duration of the site assessment term that includes a brief narrative of the overall progress since the last progress report, or – in the case of the first report – since the Effective Date. Within 60 calendar days from receipt, the Lessor may request the Lessee modify the progress report to address any comments the Lessor submits to the Lessee on the contents of the document. The Lessee must address comments in a manner deemed satisfactory by the Lessor. Should the Lessee not address the comments provided by the Lessor in a timely and adequate manner, BOEM reserves the right to require specific mitigation such as, but not limited to, third party verification/mediation at the Lessee's expense, adjustment of required reporting frequency, or designation that the Lease is not in good standing. This obligation does not expire at the end of the site assessment term and continues until approval of a Construction and Operations Plan.

- 3.1.1 Engagement: The Lessee shall make reasonable efforts to consult with "Tribes and parties,"

that may be potentially affected by the project activities on the OCS, which include, but are not limited to:

- Coastal Communities
- Commercial and Recreational Fishing Industries
- Educational and Research Institutions
- Environmental and Public Interest Non-Governmental Organizations
- Federal, State, and Local Agencies
- Federally recognized Tribes (see 5.3.3)
- Mariners and the Maritime Industry
- Ocean Users
- Submarine Cable Operators
- Underserved Communities, as defined in Section 2 of Executive Order 13985

The Lessee shall make reasonable efforts to implement the project in a manner that minimizes, mitigates, and/or redresses the project's adverse effects, if any, on Tribes and parties. To facilitate consultation under this section, the Lessee should work collaboratively with federal, state, and local governments, community organizations, and Tribes.

The Progress Report must:

- Identify Tribes and parties applicable to the project;
- Document, and update for subsequent reports, engagement with Tribes and parties since the previous reporting period;
- Document potential adverse effects from the Lessee's project to the interests of Tribes and parties;
- Document how, if at all, the design or implementation of the project has been informed by or altered to address these potential effects (including by investing in, or directing benefits to Tribes and parties).
- The report must also include a description of any anticipated or scheduled engagement activities for the next reporting period.
- The report must also include feedback from engagement with Tribes and parties regarding transmission planning, prior to proposing any export cable route.
- The report must provide information that can be made available to the public and posted on the BOEM website.

The intent of this requirement is to improve Lessee communication and transparency with Tribes, parties, and the general public, and to encourage lessees to identify and engage with underserved communities, including environmental justice communities that may be disproportionately impacted by the Project's OCS activities, in order to avoid, minimize, and mitigate potential adverse effects by, for example, investing in these communities.

BOEM will protect privileged or confidential information that you submit, as required by the Freedom of Information Act (FOIA) and 30 CFR 585.113. Exemption 4 of FOIA applies to "trade secrets and commercial or financial information that you submit that is privileged or confidential." 5 U.S.C. 552(b)(4). If you wish to protect the confidentiality of such

information, clearly mark it “Contains Privileged or Confidential Information” and consider submitting such information as a separate attachment. BOEM will not disclose such information, except as required by FOIA. Information that is not labeled as privileged or confidential may be regarded by BOEM as suitable for public release. Further, BOEM will not treat as confidential aggregate summaries of otherwise nonconfidential information.

3.1.2 Communication Plans: The Progress Report must include a section with plan(s) on how the Lessee will communicate with fisheries, federally recognized Tribes, and agencies (see 3.1.2.1, 3.1.2.2, 3.1.2.3). In addition to the plans, each progress report should provide updates on the progress of communication efforts with those and other affected stakeholder or ocean user groups during the reporting period (see 3.1.1).

3.1.2.1 Fisheries Communications Plan and Fisheries Liaison: The Lessee must develop a draft FCP and make it publicly available within 120 days of lease execution. The Lessee must update and refine the FCP from time to time, in response to feedback obtained by engagement with Tribes and parties and BOEM consultation. If the Lessee does not develop a project website, the Lessee must make the FCP available to the Lessor and the public upon request. The plan must include the following:

- A description of the strategies that the Lessee intends to use for communicating with commercial and recreational fisheries prior to and during activities in support of the submission of a plan (e.g. SAP or a COP). This description must include mechanisms to distribute notices to Federal and state fisheries license holders known to operate near the lease area through a local “Notice to Mariners” and outreach to, e.g., Fisheries Management Councils, newsletters, websites, Fisheries Liaison Officers and/or Fisheries Representatives, and applicable state agencies.
- The contact information for an individual retained by the Lessee as its primary point of contact with commercial and recreational fisheries (i.e., Fisheries Liaison).
- The strategy and general timing of discussions with commercial and recreational fisheries regarding the reduction of conflicts with facility designs, pursuant to Lease stipulation 3.1.1.
- A process to file a complaint with the offshore wind operator and seek the replacement of or compensate for lost gear.
- Plans to coordinate with commercial and recreational fisheries to identify peak fishing seasons and, to the extent practicable, avoid interaction offshore between survey vessels and commercial fishermen.

Additionally, the Lessee is required to (i) notify applicable ocean users two weeks in advance of any geological and geophysical survey activities and, (ii) provide an annual summary of filed complaint claims and outcomes to BOEM to better understand the frequency and extent of gear interactions.

3.1.2.2 Native American Tribes Communication Plan: The Lessee must develop a publicly available NATCP that describes the strategies that the Lessee intends to use for communicating with federally recognized Tribes, and that should outline specific methods for engaging with and disseminating information to federally recognized Tribes with cultural and/or historical ties to the lease area. The NATCP must include the contact information for an individual retained by the Lessee as its primary point of contact with federally recognized Tribes (i.e., a Tribal Liaison). The NATCP should include detailed information and protocols for regular engagement with federally recognized Tribes

including, but not limited to, the types of engagement activities (e.g., one-on-one meetings, group meetings, open houses, open information sharing meetings, etc.); the frequency of proposed engagements/meetings (e.g., monthly, quarterly, bi-annually, annually, etc.); meeting locations and/or virtual platforms; and contact information (e.g., telephone numbers, email addresses, website addresses, etc.). The Lessee must make the NATCP available to the Lessor and the federally recognized Tribes upon request. The Lessee must provide a draft NATCP to BOEM and federally recognized Tribes for review and comment, and hold a meeting with federally recognized Tribes to discuss the NATCP, within 120 days of lease execution. The Lessee must invite federally recognized Tribes with cultural and historical ties to the lease area to participate in the development of the NATCP. If a federally recognized Tribe wishes to participate, the Lessee should request that the Tribe designate a Tribal Representative from each Tribe to serve as the Tribe's primary point of contact for communicating with the Lessee. If a federally recognized Tribe does not wish to participate in the development of the NATCP, the Lessee is no longer required to include them in NATCP communications. If a Tribe does not respond to outreach from the Lessee, the Lessee will continue to invite the Tribe to participate in NATCP engagement opportunities until the Tribe provides a written response to the Lessee or Lessor.

3.1.2.3 Agency Communication Plan (ACP): The Lessee must develop a publicly available ACP that describes the strategies that the Lessee intends to use for communicating with federal, state and local agencies with authority related to the lease area and should outline specific methods for engaging with and disseminating information related to permits and trust resources to these agencies. The purpose of the ACP is to ensure early and active information sharing, focused discussion of potential issues, and collaborative identification of solutions in order to improve the quality and efficiency of various agency decision-making processes, and to promote the sustainable development of offshore wind energy projects. The ACP must include the contact information for an individual retained by the Lessee as its primary point of contact with agencies, (i.e., an Agency Liaison). The ACP should include detailed information and protocols for regular engagement with permitting and resource agencies including, but not limited to, the types of engagement activities (e.g., one-on-one meetings, interagency meetings, open information sharing meetings, etc.); the frequency of proposed engagements/meetings (e.g., monthly, quarterly, bi-annually, annually, etc.); meeting locations and/or virtual platforms; and contact information (e.g., telephone numbers, email addresses, etc.). The Lessee must make the ACP available to the Lessor and other agencies upon request. The Lessee must provide a draft ACP to BOEM and other permitting and resource agencies with authority related to the lease area for review and comment, and host a meeting with each interested agency, to discuss the ACP within 120 days of lease execution. Meetings may include multiple agencies. The Lessee must invite agencies with permitting roles and/or resource expertise to participate in the ACP. The Lessee should request that the agency designate a primary point of contact(s) for communicating with the Lessee. If an agency states in writing to the Lessee or Lessor that it does not wish to participate in the ACP, the Lessee need no longer include that agency in ACP communications and must document this change in the ACP. If an agency does not respond to outreach from the Lessee, the Lessee will continue to invite the agency to participate in ACP engagement opportunities until the agency provides a response. Note that a decision to not participate in the ACP in no way changes the agency regulatory authority or the need to communicate with that agency. The Lessee must update the ACP or provide other written summary of how the Lessee used information gained during agency engagement to inform project planning and

development.

- 3.1.2.4 **Coordinated Engagement:** To the maximum extent practicable, the Lessee must coordinate engagement activities for Tribes and parties (see Section 3.1.1) with other regional lessees and document their activities in the Progress Report. Lessee(s) must design coordinated engagement activities to decrease the communication and consultation burden on Tribes and parties. BOEM appreciates that not all engagement can be coordinated.
- 3.1.3 **Survey Plans:** The progress report must include an update regarding progress in executing the activities included in the survey plan(s), and include as an enclosure an updated survey plan(s) accounting for any modifications in schedule.

#### **4 NATIONAL SECURITY AND MILITARY OPERATIONS**

- 4.1 **Hold and Save Harmless:** Whether compensation for such damage or injury might be due under a theory of strict or absolute liability or otherwise, the Lessee assumes all risks of damage or injury to persons or property, which occur in, on, or above the Outer Continental Shelf (OCS), to any persons or to any property of any person or persons in connection with any activities being performed by the Lessee in, on, or above the OCS, if such injury or damage to such person or property occurs by reason of the activities of any agency of the United States Government, its contractors, or subcontractors, or any of its officers, agents or employees, being conducted as a part of, or in connection with, the programs or activities of the individual military command headquarters (hereinafter “the appropriate command headquarters”) listed in the contact information provided as an enclosure to this lease.

Notwithstanding any limitation of the Lessee’s liability in Section 9 of the lease, the Lessee assumes this risk whether such injury or damage is caused in whole or in part by any act or omission, regardless of negligence or fault, of the United States, its contractors or subcontractors, or any of its officers, agents, or employees. The Lessee further agrees to indemnify and save harmless the United States against all claims for loss, damage, or injury in connection with the programs or activities of the command headquarters, whether the same be caused in whole or in part by the negligence or fault of the United States, its contractors, or subcontractors, or any of its officers, agents, or employees and whether such claims might be sustained under a theory of strict or absolute liability or otherwise.

- 4.2 **Evacuation or Suspension of Activities:**
- 4.2.1 **General:** The Lessee hereby recognizes and agrees that the United States reserves and has the right to temporarily suspend operations and/or require evacuation on this lease in the interest of national security consistent with Section 3(c) of this lease.

- 4.2.2 **Notification:** Every effort will be made by the appropriate military agency to provide as much advance notice as possible of the need to suspend operations and/or evacuate. Advance notice will normally be given before requiring a suspension or evacuation. Temporary suspension of operations may include, but is not limited to the evacuation of personnel and appropriate sheltering of personnel not evacuated. "Appropriate sheltering" means the protection of all Lessee personnel for the entire duration of any Department of Defense activity from flying or falling objects or substances and will be implemented by an order (oral and/or written) from the BOEM, Office of Renewable Energy Programs (OREP) Program Manager, after consultation with the appropriate command headquarters or other appropriate military agency, or higher Federal authority. The appropriate command headquarters, military agency, or higher authority will provide information to allow the Lessee to assess the degree of risk to, and provide sufficient protection for, the Lessee's personnel and property.
- 4.2.3 **Duration:** Suspensions or evacuations for national security reasons will not generally exceed seventy-two (72) hours; however, any such suspension may be extended by order of the OREP Program Manager. During such periods, equipment may remain in place, but all operations, if any, must cease for the duration of the temporary suspension if so directed by the OREP Program Manager. Upon cessation of any temporary suspension, the OREP Program Manager will immediately notify the Lessee such suspension has terminated and operations on the leased area can resume.
- 4.2.4 **Lessee Point-of-Contact for Evacuation/Suspension Notifications:** The Lessee must inform the Lessor of the persons/offices to be notified to implement the terms of 4.2.2 and 4.2.3.
- 4.2.5 **Coordination with Command Headquarters:** The Lessee must establish and maintain early contact and coordination with the appropriate command headquarters, in order to avoid or minimize the potential to conflict with and minimize the potential effects of conflicts with military operations.
- 4.2.6 **Reimbursement:** The Lessee is not entitled to reimbursement for any costs or expenses associated with the suspension of operations or activities or the evacuation of property or personnel in fulfillment of the military mission in accordance with 4.2.1 through 4.2.5 above.
- 4.3 **Electromagnetic Emissions:** The Lessee, prior to entry into any designated defense operating area, warning area, or water test area, for the purpose of commencing survey activities undertaken to support SAP or COP submittal must enter into an agreement with the commander of the appropriate command headquarters to coordinate the electromagnetic emissions associated with such survey activities. The Lessee must ensure that all electromagnetic emissions associated with such survey activities are controlled as directed by the commander of the appropriate command headquarters.

## 5 STANDARD OPERATING CONDITIONS

### 5.1 General Requirements

- 5.1.1 Prior to the start of operations, the Lessee must hold a briefing to establish responsibilities of each involved party, define the chains of command, discuss communication procedures,



provide an overview of monitoring procedures, and review operational procedures. This briefing must include all relevant personnel, crew members and Protected Species Observers (PSOs). New personnel must be briefed as they join the work in progress.

- 5.1.2 The Lessee must ensure that all vessel operators and crew members, including PSOs, are familiar with, and understand, the requirements specified in this ADDENDUM “C”.
- 5.1.3 The Lessee must ensure that a copy of ADDENDUM “C” and the Project Design Criteria and Best Management Practices listed in Appendix B of the NMFS Letter of Concurrence issued by the National Marine Fisheries Service (NMFS) on June 29, 2021, is made available on every project-related vessel. The 2021 Biological Assessment and letter of concurrence may be found here: (<https://www.boem.gov/environmental-consultations>).
- 5.1.4 Endangered Species Act (ESA) Consultation for Biological Surveys: The Lessee must consult with BOEM, the NMFS, and the U.S. Fish and Wildlife Service (USFWS) prior to designing and conducting biological surveys intended to support offshore renewable energy plans that could interact with ESA-listed species. Please see the 2021 Biological Assessment (BA) and letter of concurrence here: (<https://www.boem.gov/renewable-energy/nmfs-esa-consultations>) for data collection activities that have been previously consulted upon.

## 5.2 **Protected Species**

- 5.2.1 Protected Species: Unless otherwise authorized by BOEM, Lessee’s OCS activities must comply with the standards in the Project Design Criteria and Best Management Practices found in BOEM’s notice (<https://www.boem.gov/sites/default/files/documents//PDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf>) last revised on November 22, 2021. The 2021 BA and letter of concurrence from which these measures were derived may be found here: (<https://www.boem.gov/renewable-energy/nmfs-esa-consultations>). At the Lessee’s option, the Lessee, its operators, personnel, and contractors may satisfy this requirement by complying with the NMFS-approved measures to safeguard protected species that are most current at the time an activity is undertaken under this lease, including but not limited to new or updated versions of the 2021 BA or 2021 NMFS Letter of Concurrence, or through new or activity-specific consultations.

## 5.3 **Archaeological Survey Requirements**

- 5.3.1 Archaeological Survey Required: The Lessee must provide the results of an archaeological survey with its plans.
- 5.3.2 Qualified Marine Archaeologist: The Lessee must ensure that the analysis of archaeological survey data collected in support of plan (e.g., SAP and/or COP) submittal and the preparation of archaeological reports in support of plan submittal are conducted by a Qualified Marine Archaeologist.
- 5.3.3 Tribal Pre-Survey Meeting: The Lessee must coordinate a tribal pre-survey meeting by sending a letter through certified mail, and following up with email or phone calls as necessary, to the following Tribes:
  - Absentee-Shawnee Tribe of Indians of Oklahoma;
  - Delaware Tribe of Indians;
  - Eastern Shawnee Tribe of Oklahoma;

- Mashantucket Pequot Tribal Nation;
- Mashpee Wampanoag Tribe;
- Mohegan Tribe of Connecticut;
- Shawnee Tribe;
- Stockbridge-Munsee Community Band of Mohican Indians;
- The Delaware Nation;
- The Narragansett Indian Tribe;
- The Shinnecock Indian Nation; and
- Wampanoag Tribe of Gay Head (Aquinnah).

The purpose of this meeting will be for the Lessee and the Lessee's Qualified Marine Archaeologist to discuss the Lessee's Survey Plan and consider requests to monitor portions of the archaeological survey and the geotechnical exploration activities, including the visual logging and analysis of geotechnical samples (e.g., cores, etc.). Notification of the tribal pre-survey meeting must be sent at least 15 calendar days prior to the date of the proposed tribal pre-survey meeting. The meeting must be scheduled for a date at least 30 calendar days prior to commencement of survey activities performed in support of plan submittal and at a location and time that affords the participants a reasonable opportunity to participate. The anticipated date for the meeting must be identified in the timeline of activities described in the applicable survey plan (see 2.1). The Lessee must provide the Lessor with documentation of compliance with this stipulation prior to commencement of surveys.

- 5.3.4 **Geotechnical Exploration:** The Lessee may only conduct geotechnical exploration activities performed in support of plan (i.e., SAP and/or COP) submittal in locations where an analysis of the results of geophysical surveys has been completed. This analysis must include a determination by a Qualified Marine Archaeologist as to whether any potential archaeological resources are present in the area. Except as allowed by the Lessor under 4.2.6, the geotechnical exploration activities must avoid potential archaeological resources by a minimum of 50 meters (164 feet), and the avoidance distance must be calculated from the maximum discernible extent of the archaeological resource. A Qualified Marine Archaeologist must certify, in the Lessee's archaeological reports, that geotechnical exploration activities did not impact potential historic properties identified as a result of the HRG surveys performed in support of plan submittal, except as follows: in the event that the geotechnical exploration activities did impact potential historic properties identified in the archaeological surveys without the Lessor's prior approval, the Lessee and the Qualified Marine Archaeologist who prepared the report must instead provide a statement documenting the extent of these impacts.
- 5.3.5 **Monitoring and Avoidance:** The Lessee must inform the Qualified Marine Archaeologist that he or she may elect to be present during HRG surveys and bottom-disturbing activities performed in support of plan (i.e., SAP and/or COP) submittal to ensure avoidance of potential archaeological resources, as determined by the Qualified Marine Archaeologist (including bathymetric, seismic, and magnetic anomalies; side scan sonar contacts; and other seafloor or sub-surface features that exhibit potential to represent or contain potential archaeological sites or other historic properties). In the event that the Qualified Marine Archaeologist indicates that he or she wishes to be present, the Lessee must reasonably facilitate the Qualified Marine Archaeologist's presence, as requested by the

Qualified Marine Archaeologist, and provide the Qualified Marine Archaeologist the opportunity to inspect data quality.

- 5.3.6 **No Impact without Approval:** In no case may the Lessee knowingly impact a potential archaeological resource without the Lessor's prior approval.
- 5.3.7 **Post-Review Discovery Clauses:** If the Lessee, while conducting geotechnical exploration or any other bottom-disturbing site characterization activities in support of plan (i.e., SAP and COP) submittal and after review of the location by a Qualified Marine Archaeologist under 4.2.4, discovers an unanticipated potential archaeological resource, such as the presence of a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of historic objects, piles of ballast rock) or evidence of a pre-contact archaeological site (e.g. stone tools, pottery or other pre-contact artifacts) within the project area, the Lessee must:
- 5.3.7.1 Immediately halt seafloor/bottom-disturbing activities within the area of discovery;
  - 5.3.7.2 Notify the Lessor within 24 hours of discovery;
  - 5.3.7.3 Notify the Lessor in writing via report to the Lessor within 72 hours of its discovery;
  - 5.3.7.4 Keep the location of the discovery confidential and take no action that may adversely impact the archaeological resource until the Lessor has made an evaluation and instructs the applicant on how to proceed; and
  - 5.3.7.5 If (1) the site has been impacted by the Lessee's project activities; or (2) impacts to the site or to the area of potential effect cannot be avoided, conduct additional investigations, as directed by the Lessor, to determine if the resource is eligible for listing in the National Register of Historic Places (30 CFR 585.802(b)). If investigations indicate that the resource is potentially eligible for listing in the National Register of Historic Places, the Lessor will inform the Lessee how to protect the resource or how to mitigate adverse effects to the site. If the Lessor incurs costs in protecting the resource, then, under Section 110(g) of the National Historic Preservation Act, the Lessor may charge the Lessee reasonable costs for carrying out preservation responsibilities under the OCS Lands Act (30 CFR 585.802(c-d)).

#### 5.4 **Avian and Bat Survey and Reporting Requirements**

- 5.4.1 **Lighting:** Any lights used to aid marine navigation by the lessee during construction, operations, and decommissioning of a meteorological buoy must meet USCG requirements for private aids to navigation [[https://www.uscg.mil/forms/cg/CG\\_2554.pdf](https://www.uscg.mil/forms/cg/CG_2554.pdf)] and BOEM's Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development [<https://www.boem.gov/2021-lighting-and-marking-guidelines>]. For any additional lighting, the lessee must use such lighting only when necessary, and the lighting must be hooded downward and directed when possible, to reduce upward illumination and illumination of adjacent waters.
- 5.4.2 **Motus Wildlife Tracking System:** To help address information gaps on offshore movements of birds and bats, including ESA-listed species, the Lessee must install Motus stations on meteorological or environmental data buoys in coordination with U.S. Fish and Wildlife Service's Offshore Motus network.

- 5.4.3 **Bird Deterrents:** To minimize the attraction of birds, the Lessee must install bird deterrent devices (e.g., anti-perching), where appropriate.
- 5.4.4 **Avian Annual Reporting:** The Lessee must provide an annual report to the Lessor and USFWS using the contact information provided as an Enclosure to this lease, or updated contact information as provided by the Lessor. This report must document any dead or injured birds or bats found during activities conducted in support of plan submittal. The first report must be submitted within 6 months of the start of the first survey conducted in support of plan submittal, and subsequent reports must be submitted annually thereafter until all surveys in support of plan submittal have concluded and all such birds and bats have been reported. If surveys are not conducted in a given year, the annual report may consist of a simple statement to that effect. An annual report must be provided to BOEM and USFWS documenting any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. The report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with Federal or research bands must be reported to the United States Geological Survey Bird Band Laboratory, available at <https://www.pwrc.usgs.gov/bbl/>.
- 5.4.5 **Survey Results and Data:** The Lessee must provide the results of avian surveys and data to BOEM and USFWS with its plans.

## 6 PROJECT LABOR AGREEMENTS

The Lessee must make every reasonable effort to enter a Project Labor Agreement(s) (PLA) covering the construction stage of any project proposed for the leased area.

## 7 SUPPLY CHAIN

- 7.1 **Supply Chain Statement of Goals:** The Lessee must submit to the Lessor a statement of goals in which the Lessee will describe any plans by Lessee for contributing to the creation of a robust and resilient US-based offshore wind supply chain. The Statement of Goals must include the Lessee's plans for investments in supply chain improvements, if any, to support the offshore wind industry, including investments in:

- Installation, downpipe, survey and other vessels,
- Port infrastructure,
- Grid upgrades,
- Research & development,
- Manufacturing of components and facilities,
- Supply chain architecture like fabrication and assembly halls, port storage, laydown areas,
- Dry docks and navigation channels,
- Onshore and offshore docking and refueling stations for autonomous vehicles,
- Workforce diversity, training, and development, and
- Ensuring equal access to contracting opportunities.

Annually following COP approval, the Lessee must send updates to the Lessor on the Supply Chain Statement of Goals, and the Lessee's progress in meeting those goals. This

information may be provided as part of the certification of compliance statement pursuant to 30 CFR 585.633(b).

The Lessee must submit an evaluation of the Lessee's success in meeting these goals no later than the last required Fabrication and Installation Report submission. The Lessee must submit a version of the Statement of Goals, updates, and final report that do not contain confidential information, so that BOEM can make them publicly available.

7.2 **Supply Chain Operating Fee Credit:** To promote the development of the United States' offshore wind supply chain, the Lessee is encouraged to procure major offshore wind components domestically. The Lessee may be eligible for an operating fee rate of 1% for a period of five years. To qualify, the Lessee must satisfy four or more of the following conditions:

- All nacelles for the project are assembled in the United States;
- All turbine blades are manufactured in the United States;
- All towers are manufactured in the United States;
- All foundations are manufactured in the United States;
- All transition pieces are manufactured in the United States;
- All inter-array cables are manufactured in the United States;
- All export cables are manufactured in the United States;
- The offshore substations are manufactured in the United States.

The domestic assembly and manufacturing conditions described above must be meaningful and substantial, as determined by BOEM. For example, a nacelle that is assembled abroad with minor components added in the United States would not satisfy the requirement.

To qualify for the operating fee credit, Lessees must request the credit and must provide to BOEM evidence that four or more of the above-listed conditions were met. Upon BOEM's review and determination that the requesting Lessee has met the criteria to earn the operating fee rate adjustment, the operating fee rate starting in the year after the completion of the review and determination will be 0.01 for five years.

## 8 SITING CONDITIONS

8.1 **Surface Structure Layout and Orientation:** If the Lessee's lease area abuts a neighboring BOEM lease area, in its COP project design, the Lessee must endeavor to design a structure layout that contains two common lines of orientation across the adjacent leases (as described in Navigation and Vessel Inspection Circular 01-19). If the Lessee and the neighboring BOEM lessee cannot agree on such a structure layout, the Lessee must incorporate a 1 nautical mile setback from the boundary of the neighboring lease, within which the Lessee must not construct any surface structures. Rent will be collected on all areas assigned to the lessee, as outlined in Addendum A, regardless of potential restrictions.

8.2 **No Surface Occupancy:** This lease is subject to no surface occupancy for areas identified in Addendum A. No surface occupancy is defined as a prohibition on the permanent placement of an object on the ocean surface within a specific space.

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF OCEAN ENERGY MANAGEMENT

**ADDENDUM "D"**

PROJECT EASEMENT

Lease Number OCS-A 0541

This section includes a description of the Project Easement(s), if any, associated with this lease, and the financial terms associated with it. This section will be updated as necessary.

I. Rent

The Lessee must begin submitting rent payments for any project easement associated with this lease commencing on the date that BOEM approves the Construction and Operations Plan or modification of the COP describing the project easement. Annual rent for a project easement 200 feet wide, centered on the transmission cable, is \$70.00 per statute mile. For any additional acreage required, the Lessee must also pay the greater of \$5.00 per acre per year or \$450.00 per year.

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF OCEAN ENERGY MANAGEMENT

**ADDENDUM "E"**

RENT SCHEDULE

Lease Number OCS-A 0541

This section includes a description of the schedule for rent payments that will be determined if the Construction and Operations Plan has been approved or approved with modifications. BOEM will update this section as necessary.

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF OCEAN ENERGY MANAGEMENT

Lease Number OCS-A 0541

**CONTACT INFORMATION FOR REPORTING REQUIREMENTS**

The following contact information must be used for the reporting and coordination requirements specified in ADDENDUM "C", Stipulation 5.4:

**United States Fleet Forces (USFF) N46**  
**1562 Mitscher Ave, Suite 250**  
**Norfolk, VA 23551**  
**(757) 836-6206**

All Other Reporting Requirements in Stipulation 5.3:

Bureau of Ocean Energy Management  
Environment Branch for Renewable Energy  
Phone: 703-787-1340  
Email: [renewable\\_reporting@boem.gov](mailto:renewable_reporting@boem.gov)

**ENCLOSURE**



# Atlantic Shores Offshore Wind LLC

## Protected Species Management Plan

with reference to BOEM Lease OCS-A 0541, BOEM NTL 2016-G01, and  
Atlantic Shores Survey Plan

Prepared by: RPS

For: Fugro

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## 1 DOCUMENT INFORMATION

<b>Project Name:</b>	<b>Atlantic Shores</b>
<b>Procedure:</b>	Environmental Management Plan for protected Species

### REVISION

<b>Date</b>	<b>Version</b>	<b>Revision made</b>
21 April 2022	1.0	Draft issued to Fugro
13 June 2022	2.0	Draft issued to Fugro
12 July 2022	3.0	Draft issued to Fugro
13 March 2023	4.0	Draft issued to Fugro

### APPROVAL

<b>Author</b>	<b>Validation Date</b>	<b>Approval</b>
Stephanie Milne (RPS)		

## 2 INTRODUCTION

Fugro has been contracted by Atlantic Shores Offshore Wind LLC (Atlantic Shores) to conduct geotechnical and high resolution geophysical (HRG) surveys within Lease Area OCS-A 0541. The details of the survey activities to be executed by Fugro are provided in the *Survey Plan*.

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) and the Bureau of Ocean Energy Management (BOEM) have advised that sound-producing survey equipment operating below 180 kilohertz (kHz) has the potential to cause acoustic harassment to marine species, in particular marine mammals. NOAA Fisheries and BOEM have also acknowledged vessel strike as a potential risk to marine species. As the proposed survey activities on behalf of Atlantic Shores will be conducted 24-hours per day and include the use of equipment operating below 180 kHz, Fugro has contracted with RPS to develop and execute an Environmental Management Plan (EMP) for Protected Species to ensure that marine mammals, sea turtles, and other protected marine species are not adversely affected by equipment noise or vessels.

### 2.1 Applicable Regulatory Documents and Permits

BOEM Lease OCS-A 0541 and the NOAA Fisheries GARFO Programmatic Consultation pursuant to Section 7 of the Endangered Species Act contains monitoring and mitigation requirements that apply to marine mammals, marine turtles, and other protected marine species.

NOAA authorized an Incidental Harassment Authorization (IHA) pursuant to Section 101(a)(5) of the MMPA and 50 CFR § 216 Subpart I on April 18, 2021 (which began April 20, 2022 and expires April 19, 2023). Atlantic Shores will submit for a renewal, to ensure consistent IHA coverage. Waiver approved so that Passive Acoustic Monitoring (PAM) is not required for geophysical or geotechnical operations.

## 3 MARINE PROTECTED SPECIES

Marine protected species or protected species refers to any marine species for which dedicated monitoring and mitigation procedures will be implemented, including:

- All marine mammals (whales, dolphins, seals, porpoise)
- Sea turtles
- Endangered Species Act (ESA) listed Atlantic sturgeon and giant manta rays

## 4 PROTECTED SPECIES OBSERVERS FOR GEOPHYSICAL SURVEY OPERATIONS

### 4.1 Staffing Plan

A team of four Protected Species Observers (PSOs) supplied by RPS will be on board each vessel that will be conducting 24-hour survey operations to undertake visual watches, implement mitigation and conduct data collection and reporting in accordance with the Atlantic Shores Survey Plan, the IHA the requirements in the BOEM Lease and BOEM Waiver Modifications.

A team of two Protected Species Observers (PSOs) supplied by RPS will be on board each vessel that will be conducting 12-hour/daylight only survey operations to undertake visual watches, implement mitigation and conduct data collection and reporting in accordance with the Atlantic Shores Survey Plan, the IHA the requirements in the BOEM Lease and BOEM Waiver Modifications.

### 4.2 Roles and Responsibilities

#### Lead PSO

- Coordinate and Oversee PSO Operations and ensure compliance with monitoring requirements

- Visually monitor, detect, and identify marine mammals and determine distance to source
- Record and report marine mammal sightings, survey activities and environmental conditions according to survey plan
- Monitor and advise on sound source and vessel operations for compliance with the environmental requirements for the survey plan
- Communicate with the crew to implement mitigation actions as required by environmental protocols (including delays to initiation of survey equipment operating below 180kHz)
- Participate in daily meetings and drills with crew when appropriate

#### **PSO**

- Visually monitor, detect, and identify protected species
- Record and report according to survey plan
- Monitor and advise on sound source and vessel operations for compliance with the environmental requirements for the survey plan
- Communicate with the crew to implement mitigation actions as required by environmental protocols
- Participate in daily operation meeting with crew when appropriate

### **4.3 PSO Requirements**

All PSOs will have completed a BOEM/NMFS approved protected species observer training program. PSOs will have relevant observation experience in the Atlantic or Gulf of Mexico. The CVs, PSO training certifications and NMFS approvals of all proposed PSOs will be submitted to Fugro and Atlantic Shores such that they can be submitted to BOEM for review and approval at least two weeks prior to the start of survey operations.

## **5 MONITORING EQUIPMENT**

### **5.1 Visual Monitoring Equipment**

#### **5.1.1 Day-time monitoring equipment**

The PSO on duty will monitor for marine protected species using the naked eye and hand-held reticle binoculars. Digital single-lens reflex camera equipment will be provided to record sightings and verify species identification.

#### **5.1.2 Night-time monitoring equipment**

The PSOs on duty will monitor for marine protected species using night vision goggles that will either be equipped with a thermal clip-on or a hand-held FLIR monocular will be provided. The specifications of this equipment are provided in Appendix A.

1. The NVDs will be military specification high-performance night vision goggles AND
2. A Thermal Acquisition Clip-on System OR a handheld FLIR thermal scope to enhance the performance of the night vision goggles

RPS has used this equipment on multiple renewable wind leases and have collected data on the detection distances of various species groups.

Note that this equipment will only be utilized on the vessels conducting 24-hour operations. The night vision equipment can provide full mitigation zone coverage. However, the effective distance can be impacted by environmental conditions (white caps, moon light) as well as background lighting from the vessel, other vessels in the area and any onshore lights. These are known impacts and will be monitored as necessary.

### **5.1.3 Distance estimation and calibration of equipment of visual monitoring equipment**

Reticle binoculars have the capability to localize the distance to detected animals.

Monitoring equipment will be calibrated when possible throughout the duration of survey using the vessel radar, by comparing estimated distances to known distances and will be conducted during varying sea states and both at night and during the day.

At night, if reticles cannot be used to localize a detection, distance to detected animals will be determined using range finder sticks or by comparing the location of the animal to known distances, such as the length of the vessel.

## **6 VISUAL MONITORING PROCEDURES**

### **6.1 Visual Monitoring Watches**

24-Hour Operations Vessels:

- One PSO will be on watch at all times during transit.
- One PSO will be on watch at all times during daylight source operations.
- Two PSO will be on watch at all times during nighttime operations.

12-Hour/Day-light only Operations Vessels:

- One PSO will be on watch at all times during transit.
- One PSO will be on watch at all times during daylight source operations.

The following guidelines will apply to these watch periods:

- Other than brief alerts to bridge personnel of maritime hazards and the collection of ancillary wildlife data, no additional duties may be assigned to the PSO during his/her visual observation watch
- No PSO will be allowed more than four consecutive hours on watch as a visual observer before being allocated a two-hour break from visual monitoring
- No PSO will be assigned a combined watch schedule of more than 12 hours in a 24-hour period

The PSOs will stand watch in a suitable location that will not interfere with the navigation or operation of the vessel and affords an optimal view of the sea surface. PSOs will maintain 360° coverage surrounding the EZs of the vessel.

Visual monitoring will begin no less than 60 minutes prior to the initiation of the sound sources operating below 180kHz and continue until source operations cease for a significant duration.

If a protected species is observed, the PSO should first take care of any necessary mitigation actions, or if no mitigation actions are required, they will note and monitor the position (including latitude/longitude of the vessel and relative bearing and estimated range to the animal) until the animal dives or moves out of visual range of the observer.

### **6.2 Monitoring During Day-time Reduced Visibility**

During periods of reduced visibility (any time any of the EZs are not fully visible) during the day, the PSO on visual watch will continue observations. There will not be additional PSOs added to augment the visual monitoring until visibility has returned.

### 6.3 Proposed Monitoring Schedule for PSOs: 24 Hour Operations

	LOCAL	A	B	C	D		LOCAL	PSO	PSO
<b>Night</b>	20:00	PSO	PSO			<b>Night</b>	20:00	A	B
	21:00	PSO	PSO				21:00	A	B
	22:00	PSO		PSO			22:00	A	C
	23:00	PSO		PSO			23:00	A	C
	0:00		PSO		PSO		0:00	B	D
	1:00		PSO		PSO		1:00	B	D
	2:00	PSO		PSO			2:00	C	A
	3:00	PSO		PSO			3:00	C	A
	4:00			PSO	PSO		4:00	C	D
	5:00			PSO	PSO		5:00	C	D
<b>Day</b>	6:00				PSO	<b>Day</b>	6:00		D
	7:00				PSO		7:00		D
	8:00			PSO			8:00		C
	9:00			PSO			9:00		C
	10:00			PSO			10:00		C
	11:00				PSO		11:00		D
	12:00				PSO		12:00		D
	13:00		PSO				13:00		B
	14:00		PSO				14:00		B
	15:00		PSO				15:00		B
	16:00	PSO					16:00		A
	17:00	PSO					17:00		A
	18:00		PSO				18:00		B
	19:00		PSO				19:00		B
<b>Monitoring hours</b>		8	9	9	8				
<b>Sleep break</b>		12	11	11	11				

## 6.4 Proposed Monitoring Schedule for PSOs: 12 Hour Operations

LOCAL TIME	A	B
20:00	<i>PSO</i>	<i>PSO</i>
21:00		<i>PSO</i>
22:00		
23:00		
0:00		
1:00		
2:00		
3:00		
4:00		
5:00		
6:00	PSO	
7:00	<i>PSO</i>	
8:00	PSO	
9:00		PSO
10:00		<i>PSO</i>
11:00		PSO
12:00	PSO	
13:00	<i>PSO</i>	
14:00	PSO	
15:00		PSO
16:00		<i>PSO</i>
17:00		PSO
18:00	PSO	
19:00	<i>PSO</i>	<i>PSO</i>
Watch	7-9	7-9

*Shifts shown in red will be performed by either PSO A or B, depending on the time of sunset (and when watch will terminate). Watches will be divided evenly between the PSOs and such that each person has 11 hrs off to sleep*

**NIGHT**

**DAY**



## **7 MITIGATION PROCEDURES: STRIKE AVOIDANCE**

### **7.1 Vessel Speed Restriction**

Vessel speed will be restricted to 10 knots or less inside any established Dynamic Management Area (DMA).

### **7.2 Separation Distances**

#### **7.2.1 North Atlantic Right Whale**

**All survey vessels will maintain a separation distance of 500 meters or greater from any sighted North Atlantic right whale (NARW)**

- If underway, steer a course away from any sighted NARW at 10 knots until the separation distance is achieved
- If sighted within 200 meters to underway vessel, reduce speed and shift the engine to neutral until the NARW has moved beyond 500 meters and out of path, then re-engage engines and steer away at 10 knots

#### **7.2.2 Any sighted ESA-listed species (to include sea turtles and giant manta rays) or unidentified large marine mammal visible at the surface**

**All survey vessels will maintain a separation distance of 500 meters or greater from any ESA-listed species or other unidentified large marine mammal visible at the surface.**

#### **7.2.3 Non-delphinoid Cetaceans (Baleen whales, Beaked whales, Sperm whales)**

**All vessels will maintain a separation distance of 500 meters or greater from any sighted non-delphinoid (i.e., mysticetes and sperm whales) cetacean, OR large assemblages of delphinoid cetaceans**

- If sighted within 200 meters to underway vessel, reduce speed and shift the engine to neutral until the animal has moved beyond 500 meters

#### **7.2.4 Small Cetaceans (Dolphins and Porpoise) and Seals**

**All vessels will maintain a separation distance of 50 meters or greater from any sighted small cetaceans (dolphins and porpoise) and pinnipeds**

- Underway vessel will remain parallel to a sighted delphinoid cetacean's or pinnipeds course whenever possible, avoiding speed or direction changes until the animal has moved beyond 50 meters
- Reduce vessel speed to 10 knots or less when pods (including mother/calf pairs) or large assemblages are observed
- Do not make abrupt changes to vessel course or speed

## 8 MITIGATION PROCEDURES: SOUND SOURCES

### 8.1 Survey Equipment Subject to Monitoring and Mitigation Procedures

All of the survey equipment that produces sound below 180kHz is subject to the following monitoring and mitigation protocols and for the planned survey includes the following:

- Sparker (Marine mammals and sea turtles)
- Sub-Bottom Profiler (Sea turtles only)

### 8.2 Sound Source Exclusion Zones

The following EZs apply to Atlantic Shores survey equipment operating below 180 kHz.

Note that EZs for the purposes of sound exposure mitigation are established around the survey equipment and not around the vessel itself:

- 500 meters: North-Atlantic right whales
- 100 meters: All other ESA-listed species and marine mammals with the exception of voluntarily approaching delphinids as described in Section 8.7.
- 100 meters: Sea turtles

Although mitigation will be applied for animals detected in the EZs, observations will extend to the furthest observable distances.

### 8.3 Visual Search Periods

To activate any other equipment operating below 180kHz from silence, a minimum of a 30-minute search period must be conducted.

During the daytime, the search must be conducted visually by the PSO on watch.

During night time or other periods of reduced visibility, the search must be conducted visually by the PSOs on watch.

**Note that visual observations for all marine protected species will extend to the furthest observable distances even though the above EZs around the sound sources will apply.**

### 8.4 Delays to Initiation of the < 180 kHz Sound Sources

If any marine mammal or sea turtle was detected visually inside its respective EZ during the 60-minute search period, initiation of the sound sources operating below 180kHz must be delayed until:

- **All** marine protected species that were observed inside the relevant EZ have been confirmed by the visual observer to have been exiting the relevant EZ
- OR**
- when a marine protected species was not observed exiting the EZ, an additional time period has elapsed with no further sightings of the animal within the relevant EZ:
    - **15 minutes** for small cetaceans (porpoises and dolphins) and pinnipeds and giant manta rays
    - **30 minutes** for large whales including NARW
    - **30 minutes** for sea turtles

Both the 30-minute pre-clearance search period and the mandatory delay for animals not seen exiting the exclusion zone must be completed before source initiation.

During the day, if at any point during the 30-minute search period, the full EZs were not completely visible, then initiation of the source must be delayed until the full EZ has been visible for a full 30-minute clearance search. To summarize, in order to activate the sub-180 KHz source(s) on a vessel the EZs around the vessel's source must have remained completely visible and clear of marine mammals and sea turtles for the durations described above. Written approval can be made by ASOW to continue operations in reduced visibility conditions.

## 8.5 Ramp Up (Soft Start) Procedure

Ramp-up of the sparker will be conducted by gradually increasing the operating level from the smallest setting to the operating level over a period of approximately 20 minutes.

## 8.6 Short Breaks in Source Operations

In recognition of occasional short periods of silence for a variety of reasons other than for mitigation, the <180kHz sound sources may be silenced for periods of time not exceeding 30 minutes in duration and may be restarted for operations if:

1. Visual monitoring by PSO is continued diligently through the silent period (during visual surveys, the EZ must remain visible throughout the silent period)

**AND**

2. No marine protected species are observed in the EZ.

## 8.7 Shutdown Procedures

If any marine protected species is sighted at or within its EZ, an immediate shutdown of the survey equipment operating below 180kHz is required.

### **EXCEPT**

If delphinids voluntarily approach the vessel (e.g., to bow ride) when the sound sources are at full operating power, those sources can continue to operate; a shutdown is not required. The determination of whether the animal has "voluntarily" approached will be made by the PSO on watch.

The vessel operator must comply immediately with any shut-down request made by a PSO. Any discussion can occur only after the shutdown has been implemented.

**Subsequent restart of the survey equipment may only occur following clearance of the EZ of all marine protected species under the following conditions:**

- When all marine protected species have been confirmed by the visual observer to have been seen exiting the relevant EZ

**OR**

- When an animal was not observed exiting the EZ, and additional time period has elapsed with no further sightings of the animal within the relevant EZ:
  - **15 minutes** for small cetaceans (porpoises and dolphins) and pinnipeds
  - **30 minutes** for ESA-species, including NARW and sea turtles

## 8.8 Mitigation Communication Flowcharts

The mitigation procedures described in this Section of the EMP have been summarized in flowchart form and are provided in Appendix C.

# 9 GEOTECHNICAL OPERATIONS

Geotechnical operations will not require PSOs onboard.

During vibracore sampling and/or wireline coring geotechnical operations, a dedicated sturgeon monitor is required by New York State Department of Environmental Conservation (NYSDEC) during seasonal restriction windows, October 1 to November 30 or March 1 to June 30 while in New York state waters.

The dedicated sturgeon monitor must complete telemetric monitoring using the Vemco VR100 acoustic receiver with an omnidirectional hydrophone in the water prior to the start of geotechnical coring and vibracore sampling operations. Any Atlantic sturgeon tag code that registers on the Vemco acoustic receiver will be recorded and reported to the Mid-Atlantic Acoustic Telemetry Observation System (MATOS) database as required by NYSDEC.

RPS can provide the dedicated sturgeon monitor, Vemco VR100 acoustic receiver system, reporting access to the MATOS database, and an Atlantic sturgeon avoidance and monitoring plan for the required geotechnical surveys.

## **10 REPORTING: GEOPHYSICAL AND GEOTECHNICAL**

### **10.1 Data Forms**

RPS can provide standardized data forms that have been provided to, and approved by, BOEM and NMFS. These forms will contain, at minimum, all of the data elements listed below, and data will be recorded in the field daily by PSOs (Geophysical operations) or designated vessel crewmembers (Geotechnical operations).

- Vessel name;
- Observers' names and affiliations;
- Date and location of survey operations;
- Time and latitude/longitude when daily visual survey began;
- Time and latitude/longitude when daily visual survey ended; and
- Average environmental conditions during visual surveys, including
  - Wind speed and direction;
  - Sea state (glassy, slight, choppy, rough, or Beaufort scale, tidal state);
  - Swell (low, medium, high, or swell height in meters); and
  - Weather conditions (i.e., percent cloud cover, visibility, percent glare); and
  - Overall visibility (poor, moderate, good);
- Species (or identification to lowest possible taxonomic level, sex, age, classification [if known], numbers);
- Certainty of identification (sure, most likely, best guess);
- Total number of animals;
- Number of juveniles;
- Time and location (i.e., distance from sound source) of observation;
- Description (as many distinguishing features as possible of each individual seen, including length, shape, color and pattern, scars or marks, shape and size of dorsal fin, shape of head, and blow characteristics);
- Direction of animal's travel – related to the vessel (drawing preferably);
- Reaction of the animal(s) to relevant sound source (if any) and behavior - as explicit and detailed as possible; note any observed changes in behavior (e.g., avoidance, approach) including bearing and direction of travel; and
- Activity of vessel when sighting occurred.

## 10.2 Reporting Observed Impacts to Protected Species

It will be the responsibility of the Lead PSO or designated geotechnical vessel crewmember to report any impacts to an ESA species to NMFS, BOEM and onshore Project Managers as soon as practicably possible but no more than 48 hours of any observations concerning impacts to ESA listed species and no more than 24 hours of the take of any ESA listed species.

The report must include the following information:

- a. Name, telephone, and email of the person providing the report;
- b. The vessel name;
- c. The Lease Number;
- d. Time, date, and location (latitude/longitude) of the incident;
- e. Species identification (if known) or description of the animal(s) involved;
- f. Vessel's speed during and leading up to the incident;
- g. Vessel's course/heading and what operations were being conducted (if applicable);
- h. Status of all sound sources in use;
- i. 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;
- j. Environmental conditions (wave height, wind speed, light, cloud cover, weather, water depth);
- k. Estimated size and length of animal that was struck;
- l. Description of the behavior of the species immediately preceding and following the strike;
- m. If available, description of the presence and behavior of any other protected species immediately preceding the strike;
- n. Disposition of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, last sighted direction of travel, status unknown, disappeared); and
- o. To the extent practicable, photographs or video footage of the animal(s).

The Project Manager will send reports to:

**On-board:**

- Fugro Onboard Party Chief
- Atlantic Shores Client Representative

**On-shore:**

- Fugro Project Manager
- Atlantic Shores Permit Manager

### 10.3 Injured or Dead Protected Species Reporting

1. The PSO or designated geotechnical vessel crewmember on watch will report the sightings of a dead and/or injured marine species to the onshore project manager, on board client representative and Fugro Party Chief.
2. The Lead PSO or designated geotechnical vessel crewmember will report any observed injury or mortality in accordance with NMFS standard reporting guidelines, as well as to the stranding hotline for BOEM and NMFS coordination of proper response. This will occur as soon as practicably possible but no more than 24 hours of the detection
3. A report will be sent to the onshore project manager on the first break.
4. The onshore project manager will submit the report, which will include details of the BOEM and NMFS notifications, to the following distribution list within 12 hours of the detection:

**On-board:**

- Fugro Onboard Party Chief
- Atlantic Shores Client Representative

**On-shore:**

- Fugro Project Manager
- Atlantic Shores Permit Manager
- Atlantic Shores Project Manager

It will be the responsibility of the Atlantic Shores Development Director to provide the report to NOAA and BOEM.

**Unless otherwise directed by BOEM, NOAA Fisheries, or NOAA, the dead or injured marine mammal or sea turtle SHOULD NOT be touched!** Dead and injured marine mammals and sea turtles are still protected by the ESA and the MMPA and touching the animals in any manner is considered harassment and is punishable by law.

### 10.4 Daily Progress Report for Geophysical Operations

A daily detection spreadsheet will be completed and submitted to the Fugro Party chief, Atlantic Shores onboard client representative and RPS project manager. If there were no detections that day, the Lead PSO will email the distribution list noting that there were no detections on that day.

### 10.5 Final Report for Geophysical Operations

The PSO team will develop a final report summarizing the Atlantic Shores HRG survey activities and all PSO observations. The RPS Project Manager will provide the finalized report to the Fugro Project Manager within 45 days of project completion for review.

The RPS Project Manager will submit the final report to BOEM.

## **Appendix A: Night Monitoring Equipment Specifications**

## Night Monitoring Equipment Specifications

Night monitoring watches were conducted night vision goggles with head mounts and thermal clip-ons or a hand-held FLIR monocular. Regular night vision binoculars work by enhancing the disponsible light to allow a brighter image with the use of phosphor screen. The night vision goggles (Figure 1) withstand water immersion and runs on two AA batteries for more than 40 hours. Also provided were three pairs of batteries and a batteries charger with the equipment.



Figure 1: Night vision goggles with thermal clip.

The thermal clip on the night vision binocular enabled the capture of infrared light, which provided thermal imaging. The infrared LED handheld is a spotlight that increases the natural radiation that hot subjects emit, making them easier to observe. The infrared lamp used a rechargeable lithium ion battery (Figure 2).

### Night Vision Goggle Technical Specifications

- Generation: 3 U.S.
- Resolution: 64 lp/mm (Min)
- Film: Thin-filmed
- Magnification: 1x
- Field of View: 40°
- Objective Lens: 25mm f/1.2
- Eyepiece Lens EFL: 26 mm
- Diopter Adjustment: +2 to -6
- Interpupillary Adjustment: 55 to 71 mm
- Range of Focus: 20cm to infinity
- Battery Type: Two (2) AA batteries
- Weight w/batteries: 24 oz / 680 grams
- Dimensions: 6 3/8"(L) x 6"(W) x 3"(H)
- Operating Temperature: -51°C to +52° C
- Weather Resistant: Yes
- IR Illuminator: Yes (built in)

### Thermal Acquisition Clip-On Technical Specifications

- Field of View: 20° circular (centered)
- Magnification: 1X, optical unity
- Sensor: 320 x 240 Vox uncooled LWIR microbolometer
- Display Brightness: Adjustable



- Polarity: White hot/black hot
- Calibration: Manual
- Range: Detection – 300m, Recognition – 260m
- Compatibility: PVS-7
- Interface: Standard quick connect
- Battery Type: CR123, 3V lithium
- Battery Life: >3.0 hours (23°C), 2.5 hours (0°C)
- Dimensions: 38 x 64 x 89 mm (W x H x L)
- Weight: 166g with battery

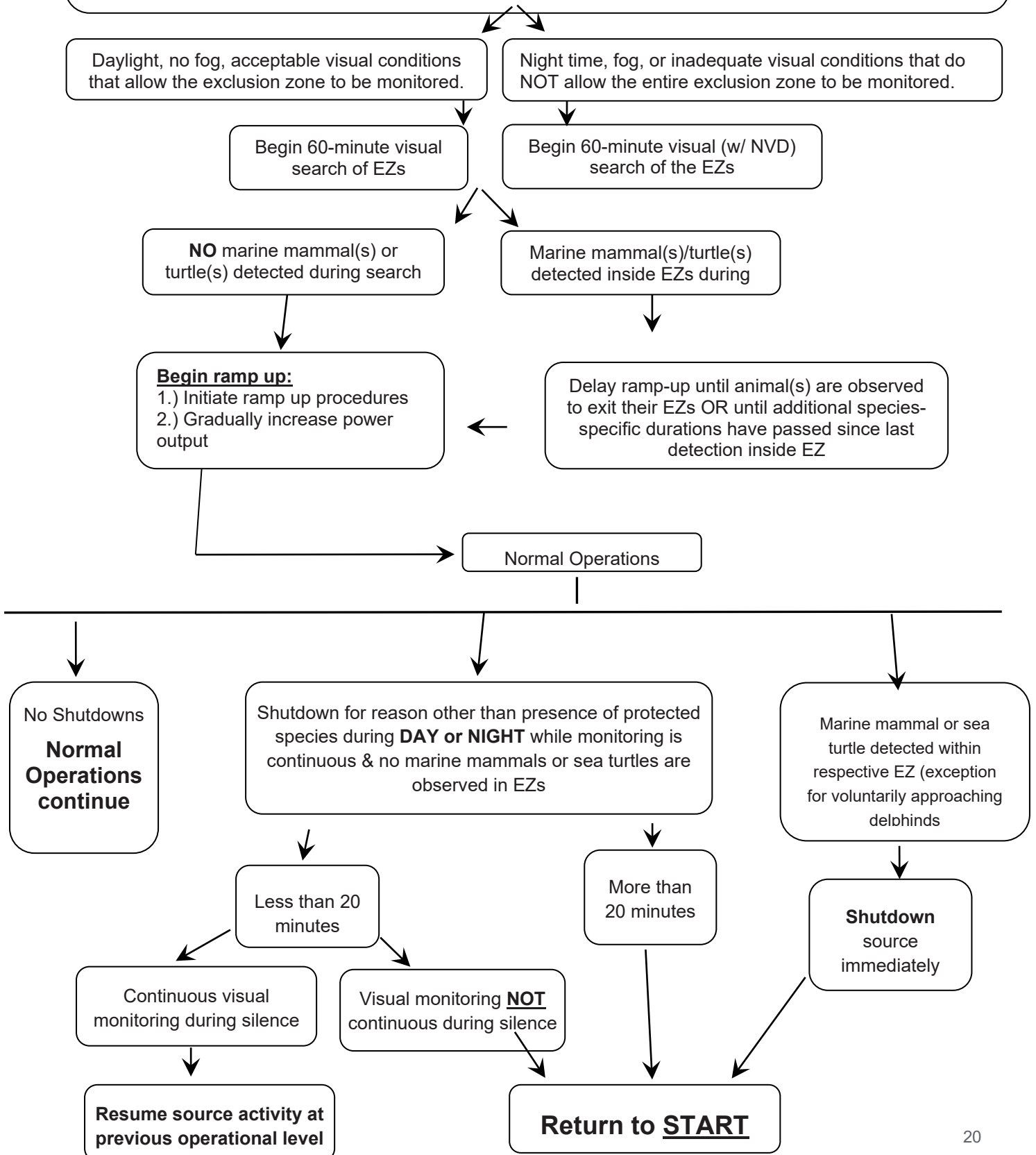
## **FLIR Breach Monocular**

- Detector type: 320 x 256 VOx Microbolometer
- Refresh Rate: 60 Hz
- Start Up: < 1.5 seconds
- Image Processing: FLIR Proprietary Digital Detail Enhancement™
- Lens System: 9.1 mm; F/1.04
- Optical Magnification: 1×
- Field of View (H x V): 24° x 19°
- Digital e-Zoom: 1× - 4× continuous
- Diopter Adjustment Range: -5 to +5 dpt
- Focusing Range: 0.25 m to infinity
- Eye Relief: 16 mm
- Display: Quad-VGA (1280 x 960) FLCOS
- Video Output: Digital Video
- Internal Memory: Up to 1,000 images and 2.5 hours of video on internal memory
- Temperature Imaging Modes (Image Palettes): White Hot, Black Hot, Rainbow HC, Ironbow, Sepia, Arctic, Outdoor Alert

## **Appendix B: Communication Flowcharts for Geophysical Operations**

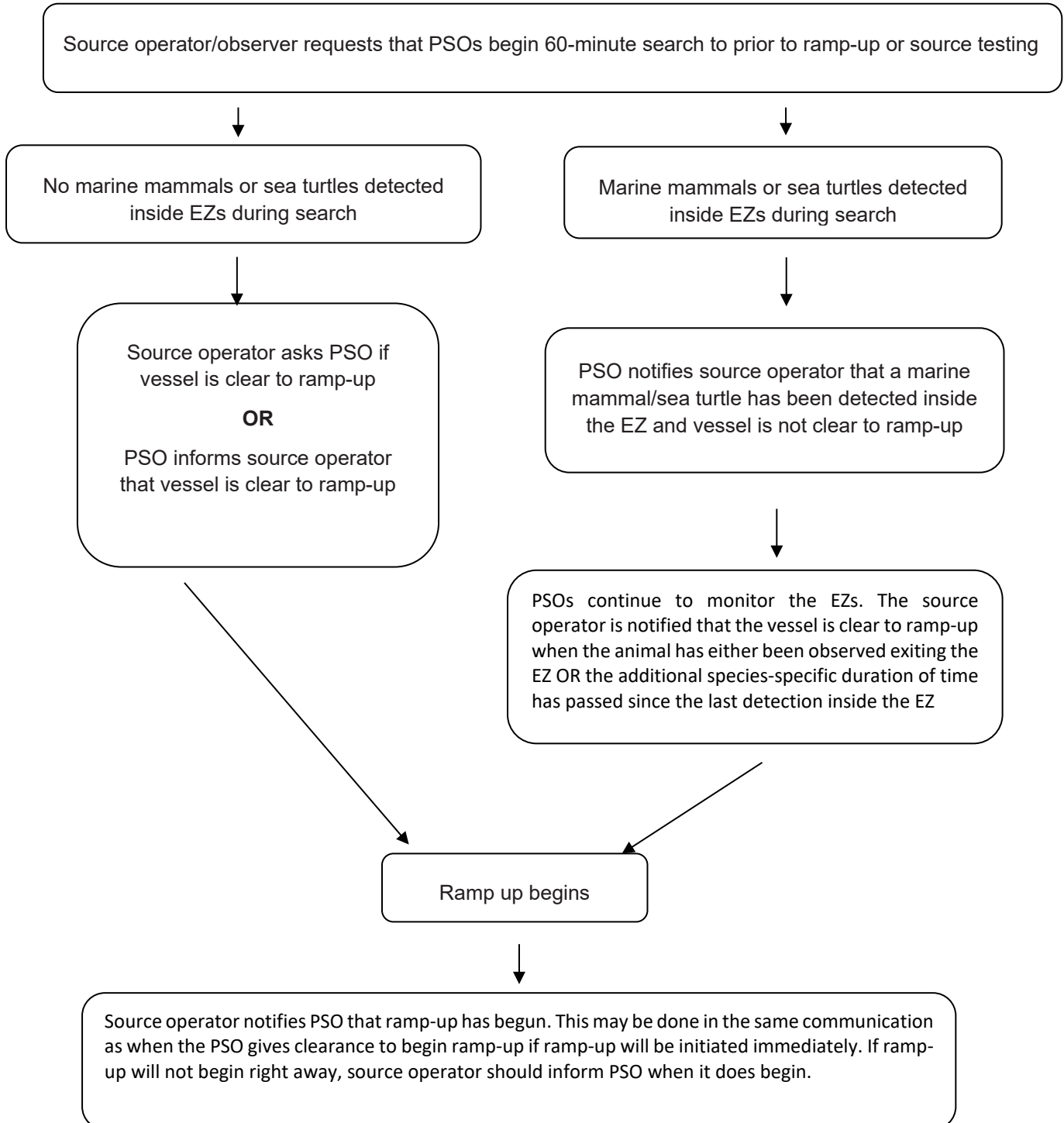
## Mitigation Decision Flowchart for Geophysical Operations

**START:** One certified, approved PSO must be on watch during all daylight hours. Two certified, approved PSOs and must be on watch during all hours of reduced visibility. PSOs must be able to monitor the full **exclusion zone** around the LF sources. PSOs may conduct an active watch for 4 hours and then must have a 2-hour break before returning to watch.



## Ramp-up Communication Procedure for PSOs

The source operator / observer on duty notifies by phone the PSOs (day) on watch in person, via VHF radio or by phone that the vessel would like to activate the source for ramp-up or source testing at least 60 minutes prior to the intended time of the initiation of the source. *(The operator may notify the PSO more than 60 minutes in advance of the intended source operations, if the initiation time is uncertain (i.e. source testing following array deployment) but a 60-minute search must be completed prior to activation of the source.)* After 60 minutes have passed, the source operator / observer calls or radios the PSO on watch to ask if the vessel is clear to initiate ramp-up **OR** after 30 minutes have passed, the PSO informs the source operator / observer via radio that the vessel is clear to initiate ramp-up. Ramp-up begins. Source operator / observer informs PSO that ramp-up has begun.



**APPENDIX D: PROTECTED SPECIES OBSERVERS ONBOARD**

<b>Names of Protected Species Observers</b>	<b>Dates</b>
Jordan Boliver	09/02/2022-09/07/2022
Erendira Penfield	09/02/2022-09/07/2022
Pedro Westendarp	09/02/2022-10/19/2022
Yoselin Mazondo	09/02/2022-09/29/2022
Cassi Frey	09/07/2022-10/19/2022
Shelby Yahn	09/07/2022-10/19/2022
Jordan Boliver	09/29/2022-11/09/2022
Keishan Ramsaran	10/19/2022-11/18/2022
Jo-Ann Sookar	10/19/2022-11/18/2022
Elizabeth Breton	10/19/2022-11/18/2022
Ruth Vega	11/09/2022-12/22/2022
Ana Lira Tirado	11/30/2022-01/11/2023
Jordan Boliver	11/30/2022-01/11/2023
Axel Maldonado	11/30/2022-12/22/2022
Eren Penfield	11/30/2022-12/22/2022
Luiza Brito	12/22/2022-02/02/2023
Rosario Garcia	12/22/2022-02/02/2023
Islam Ibrahim	12/22/2022-02/02/2023
Keishan Ramsaran	01/11/2023-02/22/2023
Jo-Ann Sooker	01/11/2023-02/22/2023
Alejandrs Otero	02/02/2023-03/16/2023
Edgar Brunnet	02/22/2023-04/05/2023
Ana Cardenas	02/22/2023-04/05/2023
Gloria Ponce	04/05/2023-05/17/2023

**APPENDIX D: PROTECTED SPECIES OBSERVERS ONBOARD**

Elizabeth Breton	04/26/2023-06/07/2023
Karen Zepeda	04/26/2023-06/07/2023
Adriana Mastrangelli	04/26/2023-06/07/2023
María de los Ángeles Milagros Laurel	05/17/2023-06/29/2023
Ana Lira	06/08/2023-07/20/2023
Brenda Gomez	06/08/2023-07/20/2023
Abel Trejo	06/08/2023-07/20/2023
Jaime Santiago	06/29/2023-07/09/2023
Elizabeth Breton	07/20/2023-07/24/2023
Izchel Gomez	07/20/2023-07/23/2023
Aline Hilado	07/20/2023-07/23/2023
Elsy Olivares	7/10/2023-07/23/2023

APPENDIX E: VESSEL PHOTOS



Figure 1: Research Vessel *Fugro Enterprise*

APPENDIX F: RETICLE BINOCULARS CALIBRATION TABLES

Week #	Date	Observer Name	Reticle Binocular Estimated Distance (m)	True Distance from Radar (m)	Sea State (Beaufort)	Wind Force (knots)	Swell (m)	Comments
2	9/5/2022	JB	854	977	2	7	<2	Josephine Miller vessel
2	9/10/2022	Pedro Westendarp	418	398	6	3	<2	F/V
3	9/14/2022	Shelby Yahn	277	250	3	10	<2	F/V
3	9/14/2022	Cassandra Frey	415	370	4	9	<2	F/V
5	9/18/2022	Cassandra Frey	1803	2111	4	18	<2	F/V
6	9/19/2022	Pedro Westendarp	750	615	3	14	<2	F/V
7	9/25/2022	Shelby Yahn	830	800	3	11	<2	F/V
7	9/28/2022	Cassandra Frey	1670	1703	4	13	<2	Clam fishing vessel, F/V Christy
7	10/28/2022	Jo-Ann Sookar	-	-	-	-	-	Absent of a reference point
10	10/31/2022	Elizabeth Flores	1190	1296	3	7	<2	Fishing boat<
10	10/31/2022	Keishan Ramsaran	2900	2400	3	3	<2	Arthur Maersk container ship
14	12/9/2022	Ana Lira	1930	2010	4	18	<2	F/V Mary Vee
15	12/11/2022	Axel Maldonado	847	926	4	12	<2	F/V
15	12/14/2022	Jordan Boliver	965	1111	3	16	<2	F/V
15	12/17/2022	Ruth Vega	220	300	3	14	<2	F/V
16	12/22/2022	Ana Lira	1666	1590	5	30	>4	Cargo vessel
16	12/24/2022	Jordan Boliver	1340	1390	4	15	<2	F/V Joey D
17	12/25/2022	Rosario Garcia	1670	1780	4	12	<2	Fishing boat



APPENDIX F: RETICLE BINOCULARS CALIBRATION TABLES

18	1/07/2023	Jordan Boliver	1210	1187	3	9	<2	F/V
19	1/09/2023	Ana Lira	890	970	3	9	<2	F/V Joey D
20	1/19/2023	Islam Ibrahim	950	1120	3	5	<2	Christi Caroline
23	2/07/2023	Keishan Ramsaran	390	425	3	7	<2	Channel buoy
23		Jeri Butcher	-	-	-	-	-	Absent of a reference point
23	2/10/2023	Sergey Dyachkov	3100	3200	4	20	2-4	barge with tug boat
24	2/14/2023	Sergey Dyachkov	1900	1850	4	20	<2	m/v Go Pursuit
25	2/20/2023	Jo-Ann Sookar	2100	2593	4	12	<2	Texas Triumph Cargo vessel
25	2/20/2023	Keishan Ramsaran	1800	2000	4	12	<2	Texas Triumph Cargo vessel
25	2/24/2023	Sergey Dyachkov	800	756	4	16	<2	M/V Dubai Express
27	3/15/2023	Ana Cardenas	300	296	4	23	<2	Red buoy
27	3/15/2023	Edgar Brunett	420	398	2	16	<2	Vessel
27	3/15/2023	Edgar Brunett	1050	1000	2	15	<2	Go explorer
28	3/21/2023	Alejandra Otero	2800	2500	3	16	<2	container vessel
29	3/28/2023	Alejandra Otero	1500	1666	2	8	<2	Wan Hat cargo vessel
29	3/31/2023	Edgar Brunett	3340	3130	2	4	<2	Cargo vessel
30	3/4/2023	Edgar Brunett	557	583	3	18	<2	Port buoy
30	3/4/2023	Edgar Brunett	1508	1670	2	7	<2	Miss Anita Fishing boat
30	3/4/2023	Alejandra Otero	4175	4260	2	6	<2	Miss Anita Fishing boat
30	3/7/2023	Gloria Ponce	3000	2962	2	9	<2	Michael Jr Fishing boat

APPENDIX F: RETICLE BINOCULARS CALIBRATION TABLES

31	3/11/2023	Alejandra Otero	5400	5185	2	16	<2	Cargo vessel
31	3/13/2023	Gloria Ponce	5300	5185	2	14	<2	Cargo vessel
32	4/17/2023	Gloria Ponce	3000	3200	2	10	<2	Fishing boat
32	4/18/2023	Alejandra Otero	1150	1296	2	8	<2	Tony Two fishing boat
33	4/24/2023	Alejandra Otero	1640	1852	2	12	<2	Fishing boat
34	5/3/2023	Gloria Ponce	3500	3685	2	11	<2	Fishing vessel on transit
34	5/5/2023	Elizabeth Flores	2000	1700	2	7	<2	Fishing boat as reference
35	5/11/2023	Elizabeth Flores	2000	1900	3	14	<2	Fishing boat as reference
36	5/15/2023	Elizabeth Flores	2500	2890	3	15	<2	Container ship
36	5/21/2023	Karen Zepeda	-	-	-	-	-	Absent of a reference point
36	5/21/2023	Adriana Mastrangelli	-	-	-	-	-	Absent of a reference point
37	5/27/2023	Elizabeth Flores	-	-	-	-	-	Absent of a reference point
37	5/27/2023	Karen Zepeda	-	-	-	-	-	Absent of a reference point
37	5/27/2023	Adriana Mastrangelli	-	-	-	-	-	Absent of a reference point
37	5/27/2023	Maria Laurel	-	-	-	-	-	Absent of a reference point
38	5/28/2023	Karen Zepeda	3200	3700	3	14	<2	Yatch
38	5/31/2023	Elizabeth Flores	2500	2800	3	18	<2	Container ship
38	6/2/2023	Adriana Mastrangelli	2000	2300	3	7	<2	Speed boat

APPENDIX F: RETICLE BINOCULARS CALIBRATION TABLES

38	6/2/2023	Maria Sandoval	1260	1609	1	5	<2	Yatch
39	6/10/2023	Abel Trejo	1038	900	3	9	<2	Recreational Boat
39	6/10/2023	Maria Sandoval	2360	2896	3	13	<2	R/V Go Seaeker
39	6/10/2023	Brenda Gomez	1500	1296	3	14	<2	R/V Go Seaeker
39	6/10/2023	Ana Lira	1240	1350	3	14	<2	R/V Go Seaeker
40	6/15/2023	Maria Sandoval	1250	1287	4	20	<2	Recreational vessel
40	6/16/2023	Ana Lira	1600	1490	2	5	<2	Weather buoy
40	6/17/2023	Brenda Gómez	-	-	-	-	-	Absent of a reference point
40	6/17/2023	Abel Trejo	2770	2778	4	14	<2	Recreational vessel
41	6/18/2023	Maria Sandoval	950	804	4	13	<2	Weather buoy
41	6/19/2023	Ana Lira	533	505	3	11	<2	Weather buoy
41	6/23/2023	Abel Trejo	2077	2037	3	10	<2	HOS Browning
41	6/23/2023	Brenda Gomez	-	-	-	-	-	Absent of a reference point
42	6/25/2023	Abel Trejo	2222	2077	2	6	<2	HOS Browning
42	6/26/2023	Ana Lira	1450	1510	3	11	<2	Weather buoy
42	6/30/2023	Brenda Gomez	1616	1666	3	8	<2	Lighthouse
42	6/30/2023	Jaime Santiago	-	-	-	-	-	Absent of a reference point
43	7/2/2023	Brenda Gómez	1616	1926	4	18	<2	Survey vessel
43	7/7/2023	Jaime Santiago	1720	1852	1	4	<2	Fishing vessel Ashton Matthew
43	7/7/2023	Abel Trejo	1385	1426	1	5	<2	Weather buoy
43	7/8/2023	Ana Lira	1750	1763	2	7	<2	Weather buoy
44	7/10/2023	Abel Trejo	831	792	3	9	<2	Survey vessel

APPENDIX F: RETICLE BINOCULARS CALIBRATION TABLES

								Shearwater
44	7/10/2023	Jaime Santiago	778	792	3	9	<2	Survey vessel Shearwater
44	7/14/2023	Ana Lira	1780	1820	4	14	<2	Fishing vessel
44	7/14/2023	Brenda Gómez	1616	1592	5	19	<2	Weather buoy
45	7/16/2023	Brenda Gómez	1616	1852	4	16	<2	Weather buoy
45	7/16/2023	Ana Lira	1710	1800	4	16	<2	Weather buoy
46	7/27/2023	Elizabeth Flores	1500	1204	4	23	<4	HOS Browning as reference
46	7/27/2023	Izchel Gomez	965	965	3	15	<2	Cargo ship as reference
46	7/29/2023	Jaime Santiago	-	-	-	-	-	Absence of reference point
46	7/29/2023	Aline Hilado	-	-	-	-	-	Absence of reference point
47	07/30/2023	Aline Hilado	1664	1765	4	13	<2	Fishing boat as reference
47	8/3/2023	Elizabeth Flores	925	1080	3	11	<2	Fishing vessel as reference
47	8/5/2023	Izchel Gomez	-	-	-	-	-	Absence of reference point
47	8/5/2023	Jaime Santiago	-	-	-	-	-	Absence of reference point
48	8/6/2023	Aline Hilado	555	592	2	5	<2	Fishing boat as reference
48	8/6/2023	Izchel Gomez	1660	1931	2	4	<2	Survey vessel
48	8/7/2023	Elizabeth Flores	2100	2407	4	15	<2	HOS Browning
48	8/11/2023	Elsy Olivares	900	1200	2	9	<2	Navigation buoy
49	08/13/2023	Aline Hilado	832	901	2	6	<2	Fishing boat
49	08/14/2023	Elizabeth Flores	1500	1609	2	4	<2	Fishing boat

**APPENDIX F: RETICLE BINOCULARS CALIBRATION TABLES**

49	08/14/2023	Izchel Gomez	1249	1448	2	7	<2	Cargo vessel
49	08/19/2023	Elsy Olivares	-	-	-	-	-	Absence of reference point
50	08/20/2023	Aline Hilado	555	651	3	10	<2	Fishing boat as reference
50	08/21/2023	Elizabeth Flores	825	950	3	12	<2	Container ship
50	08/23/2023	Izchel Gomez	-	-	-	-	-	Absence of reference point
50	08/23/2023	Elsy Olivares	-	-	-	-	-	Absence of reference point

## Morovision PVS-7 Gen 3 PINNACLE Goggle Delta Kit

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# TACS-M™

Rev. 21 Jan 2013

## Thermal Acquisition Clip-On System, Miniature

TACS-M shown here on a MUM-14.



Manufactured by  
**OPTICS 1**

### SPECIFICATIONS\*

Field of View	Boresight Accuracy	Magnification	F Number
20° circular (centered)	3 MOA	1X, optical unity	1.2
Sensor	Spectral Response	Pitch	NEAT
320 x 240 VOx uncooled LWIR microbolometer	8-12µm	25µm	50mK
Display Brightness	Polarity	Calibration	Display
Adjustable	White hot/black hot	Manual	Kopin (RED)
Range (Clear)	Range (Obscured)	Compatibility	Interface
Detection: 300m Recognition: 260m	Detection: 250m Recognition: 210m	PVS-7, PVS-14, PVS-15, PVS-18, PVS-23, MUM-14	Standard quick connect
Battery Type	Battery Life	Dimensions	Weight
CR123, 3V Lithium, 1ea.	>3.0 hrs (23°C) 2.5 hrs (0°C)	(W x H x L) 38 x 64 x 89mm	166g with battery

\*Specifications are subject to change without notice.

Export of the commodities described herein is strictly prohibited without a valid export license issued by the U.S. Department of State, Directorate of Defense Trade Controls as proscribed in the International Traffic in Arms Regulations (ITAR), Title 22 Code of Federal Regulation, Parts 120-130.

DISTRIBUTION: OSR 11-S-1578 Approved for public release; distribution unlimited. © 2011 Nivisys

### DESCRIPTION

The Miniature Thermal Acquisition Clip-On System (TACS-M) provides the soldier with ultimate performance in technology. Low power consumption, optimal sensor technology, and high-performance optics all seamlessly integrate to provide state of the art long wave infrared (LWIR) technology.

When added to a standard image intensified system, TACS-M provides a second channel with LWIR capability, extending engagement capabilities through obscurants. The TACS-M unit along with Nivisys experience and expertise provides the best value solution for adding low light and no light performance to currently fielded night vision systems.

The unit's waterproof and rugged construction stands up to the harshest environments and features a red display for visual security. This multi-purpose surveillance tool uses the latest in miniature thermal sensor technology and a high resolution display to provide superior imagery in the smallest package available.

**For more information on the TACS-M or other Nivisys products call (480) 970-3222 or visit us on the web at [www.nivisys.com](http://www.nivisys.com).**

Made in USA

**Atlantic Shores  
Fugro, *MV Fugro Enterprise***

**Lease OCS-A 0541  
Incident Report: Humpback Whale Mortality  
18 January 2023**

**Observer's full name:** Keishan Ramsaran

**Reporter's full name:** Keishan Ramsaran

**Reported to:** Ainsley Smith, NOAA (1-866-755-6622)

**Species Identification:** Humpback whale (*Megaptera novaeangliae*)

**Name and type of platform:** *Fugro Enterprise*, Survey vessel

**Position of vessel at time of sighting:** 39.33367°N 073.48943°W

**Date animal observed:** 18 January 2023

**Time animal observed:** 13:15 EST

**Time phone call report made:** 14:14 EST

**Date written report submitted:** 18 January 2023

**Environmental conditions at time of observation:** Clear skies, sunny conditions, NE-headed wind 18kts, seas <2m, vessel original heading was 048°, speed was 5 kts.

**Description of sighting event:**

At 13:15, an object was sighted at the water surface, approximately 2800 m from the port bow of the vessel, *Enterprise*. The object seemed large, more than five meters in length, but the identity was inconclusive. No movement was noticed. The vessel changed heading to 035° and slowed to 4.5 kts to investigate the large object. As the vessel proceeded towards the object, distinguishing characteristics helped identify the object as a dead humpback whale, estimated at 10 - 12 meters in length, at 13:34. The throat grooves, white underside and bumps on the flippers and head, confirmed the species to be a humpback whale. The vessel slowly approached the carcass and photos were taken. The closest point of approach was 20 m to the carcass.

The carcass was floating upside down with the white underside visible. The body was bloated with no signs of scavenging. A few birds were observed hovering above the carcass.

At the time of the initial sighting, the survey equipment was onboard the vessel. The vessel was conducting weather patterns and not currently conducting survey operations. The vessel suspended survey operations at 0100 (EST) due to weather conditions that were marginal for data quality.





Figure 1: Close up of visible portion of the humpback head



Figure 2: Back and tail stock of humpback whale. The flukes were not visible below the water.



Figure 3: Flipper and throat grooves visible. Back shows signs of sun exposure



Figure 4: Back and bloated belly view of the humpback whale

**Date and Time reported to NMFS Stranding Hotline:** 18 January 2023 at 14:14 EST, RPS project manager, Katherine Gideon, notification NMFS (866-755-6622). Ainsley Smith at NOAA received the call and requested photos be provided in the written report to follow.

Report will be submitted to the following email addresses:

[nmfs.gar.stranding@noaa.gov](mailto:nmfs.gar.stranding@noaa.gov)

[PR.ITP.MonitoringReports@noaa.gov](mailto:PR.ITP.MonitoringReports@noaa.gov)

[renewable\\_reporting@boem.gov](mailto:renewable_reporting@boem.gov)

[Ainsley.smith@noaa.gov](mailto:Ainsley.smith@noaa.gov)

**Atlantic Shores Wind, OCS-A 0541**  
**Fugro, Enterprise**

**Marine Mammal Incident Report: Humpback whale Injury**  
**12 May 2023**

**Observer's full name:** Gloria Ponce

**Reporter's full name:** Gloria Ponce

**Species Identification:** Humpback Whale

**Vessel name and type of platform:** *Fugro Enterprise*, Survey Vessel

**Vessel speed leading up to incident (kts):** 4.2

**Vessel heading:** 189

**Vessel activity at time of incident:** Conducting survey acquisition

**Position of vessel at time of sighting (decimal degrees):** 39.41345°N 073.58413°W

**Date animal observed (MM-DD-YYYY):** 05-12-2023

**Time animal observed (UTC; HH:MM):** 18:53

**Wind speed and direction:** 4 knots SSW

**Beaufort Sea State:** 2

**Visibility (km):** >5

**Water depth (m/ft):** 42

**Description of incident:**

On 12 May 2023 at 18:53 UTC, a Humpback whale was observed free swimming and blowing at approximately 25 meters off the port bow of the Fugro Enterprise at a bearing of 320 degrees. The animal was swimming parallel and in the opposite direction as the vessel, at the time the animal was sighted the vessel was conducting survey acquisition with the survey equipment operating at full volume. The vessel conducted appropriate strike avoidance manoeuvres and mitigation actions. The body of the whale was observed with a fishing line tied around it. The animal could be seen with a fishing line behind the blowhole and another line seen ahead of the flippers.

Photos were captured during the sighting.



*Figure 1: Humpback whale with visible fishing line around its body*



*Figure 2: Humpback whale with visible fishing line around it*



*Figure 3: Humpback whale blowing with the indentation from the fishing line visible*



*Figure 4: Humpback whale free swimming*

Photograph/Video taken: Yes, photographs provided in this report.

If Yes, was the data provided to NMFS? A request was made by David Morin with NOAA for a copy of the report as well as photographs of the entangled whale.

**Date and Time reported to NMFS Stranding Hotline:**

12 May 2023 at 15:35 CST, RPS project manager, Katherine Gideon, notification NMFS (866-755-6622). David Morin at NOAA received the call and requested photos be provided in the written report to follow.

Report will be submitted to the following email addresses:

[nmfs.gar.stranding@noaa.gov](mailto:nmfs.gar.stranding@noaa.gov)  
[PR.ITP.MonitoringReports@noaa.gov](mailto:PR.ITP.MonitoringReports@noaa.gov)  
[renewable\\_reporting@boem.gov](mailto:renewable_reporting@boem.gov)  
[david.morin@noaa.gov](mailto:david.morin@noaa.gov)

**Atlantic Shores Wind, OCS-A 0541**  
**Fugro, Enterprise**

**Marine Mammal Incident Report: Injured humpback whale**  
**06 June 2023**

**Observer's full name:** Elizabeth Flores Breton

**Reporter's full name:** Elizabeth Flores Breton

**Species Identification:** Humpback whale

**Vessel name and type of platform:** *Fugro Enterprise*, Research Vessel

**Vessel speed leading up to incident (kts):** 6.8.

**Vessel heading:** 191 degrees.

**Vessel activity at time of incident:** Transiting to the survey site.

**Position of vessel at time of sighting (decimal degrees):** 40.51402°N 073.98683°W

**Date animal observed (MM-DD-YYYY):** 06-06-2023.

**Time animal observed (UTC; HH:MM):** 21:52 (UTC)

**Wind speed and direction:** 16 knots / SW

**Beaufort Sea State:** 2

**Visibility (km):** 2-5

**Water depth (m/ft):** 17 m

**Description of incident:**

At 21:52 UTC, a humpback whale was observed at 800 meters off the starboard bow of the vessel at a bearing of 020 degrees. The whale was observed stationary, lobtailing with only half of the tail, at a vigorous pace. It was noticed that the wounds on the fluke did not look completely healed. As the vessel was moving forward, the humpback whale continued tail slapping and blowing for seven minutes. At 21:58 UTC, the humpback whale was last observed at a bearing of 080 degrees at 800 meters distance from the starboard beam. The vessel was transiting to the survey site and the sound source was secured on deck, not deployed. The whale was observed outside the separation distance; therefore no additional vessel strike avoidance manoeuvres were required. The vessel maintained the distance from the animal during the entire detection.





*Figure 1: Injured humpback whale view of the wound*



*Figure 2: Injured humpback whale with the injured fin side visible*



*Figure 3: Injured humpback whale with the tail stock visible and missing left-side tail fin*

Photograph/Video taken: Yes

If Yes, was the data provided to NMFS? NMFS requested that the photos be provided to the email address [stranding@mmsc.org](mailto:stranding@mmsc.org) for review and comparison to the other sightings they have received.

**Date and Time reported to NMFS Stranding Hotline:**

06 June 2023 at 17:45 CST, RPS project manager, Katherine Gideon, notification NMFS (866-755-6622). The New Jersey Marine Mammal Stranding Center received the call and requested photos be provided in the written report to follow.

Report will be submitted to the following email addresses:

[nmfs.gar.stranding@noaa.gov](mailto:nmfs.gar.stranding@noaa.gov)

[PR.ITP.MonitoringReports@noaa.gov](mailto:PR.ITP.MonitoringReports@noaa.gov)

[renewable\\_reporting@boem.gov](mailto:renewable_reporting@boem.gov)

[stranding@mmsc.org](mailto:stranding@mmsc.org)

**APPENDIX K: SUMMARY OF VESSEL STRIKE AVOIDANCE MANEUVERS**

<b>Vessel</b>	<b>Date</b>	<b>Detection number</b>	<b>Species</b>	<b>Number of animals</b>	<b>CPA Distance (M)</b>	<b>Strike avoidance maneuver</b>
<i>Fugro Enterprise</i>	02-May-22	VD#5	Humpback whale	5	800	Altered turn from starboard to portside
<i>Fugro Enterprise</i>	11-Dec-23	VD#28	Humpback whale	1	50	Altered course, speed reduction
<i>Fugro Enterprise</i>	22-Dec-23	VD#39	Humpback whale	1	100	Altered course
<i>Fugro Enterprise</i>	30-Dec-23	VD#43	Common dolphin	10	40	Kept course, maintained speed
<i>Fugro Enterprise</i>	02-Jan-23	VD#48	Common dolphin	7	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	12-Jan-23	VD#59	Common dolphin	4	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	17-Jan-23	VD#60	Common dolphin	3	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Jan-23	VD#61	Common dolphin	6	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	19-Jan-23	VD#62	Common dolphin	6	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	19-Jan-23	VD#64	Common dolphin	4	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	20-Jan-23	VD#65	Common dolphin	20	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	20-Jan-23	VD#66	Common dolphin	8	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	21-Jan-23	VD#67	Common dolphin	3	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	21-Jan-23	VD#68	Common dolphin	3	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	22-Jan-23	VD#69	Common dolphin	20	1	Kept course, maintained speed

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<i>Fugro Enterprise</i>	22-Jan-23	VD#70	Common dolphin	30	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	24-Jan-23	VD#71	Common dolphin	6	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	25-Jan-23	VD#72	Common dolphin	6	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	25-Jan-23	VD#73	Common dolphin	8	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	28-Jan-23	VD#75	Common dolphin	7	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	28-Jan-23	VD#76	Common dolphin	6	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	29-Jan-23	VD#77	Common dolphin	7	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	29-Jan-23	VD#78	Common dolphin	4	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	29-Jan-23	VD#79	Common dolphin	4	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	29-Jan-23	VD#80	Common dolphin	6	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	30-Jan-23	VD#81	Common dolphin	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	30-Jan-23	VD#82	Common dolphin	2	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	31-Jan-23	VD#83	Common dolphin	4	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	12-Feb-23	VD#85	Common dolphin	7	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	12-Feb-23	VD#86	Common dolphin	6	5	Kept course, maintained speed

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<i>Fugro Enterprise</i>	18-Feb-23	VD#88	Common dolphin	4	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Feb-23	VD#89	Common dolphin	14	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Feb-23	VD#90	Common dolphin	9	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	19-Feb-23	VD#91	Common dolphin	1	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	20-Feb-23	VD#92	Common dolphin	6	2	Kept course, maintained speed
<i>Fugro Enterprise</i>	20-Feb-23	VD#93	Common dolphin	8	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	20-Feb-23	VD#94	Common dolphin	7	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	21-Feb-23	VD#95	Common dolphin	1	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	21-Feb-23	VD#96	Common dolphin	10	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	21-Feb-23	VD#97	Common dolphin	5	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	24-Feb-23	VD#101	Common dolphin	3	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	26-Feb-23	VD#102	Common dolphin	2	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	27-Feb-23	VD#103	Common dolphin	2	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	19-Mar-23	VD#108	Common dolphin	4	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	22-Mar-23	VD#109	Common dolphin	8	1	Kept course, maintained speed

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<i>Fugro Enterprise</i>	22-Mar-23	VD#113	Unidentifiable baleen whale	2	150	Kept course, maintained speed
<i>Fugro Enterprise</i>	26-Mar-23	VD#119	Common dolphin	4	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	03-Apr-23	VD#122	Common dolphin	3	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	09-Apr-23	VD#124	Common dolphin	10	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	11-Apr-23	VD#125	Common dolphin	4	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	12-Apr-23	VD#126	Common dolphin	6	4	Kept course, maintained speed
<i>Fugro Enterprise</i>	13-Apr-23	VD#127	Common dolphin	5	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Apr-23	VD#129	Common dolphin	2	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	23-Apr-23	VD#132	Common dolphin	5	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	24-Apr-23	VD#134	Common dolphin	3	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	02-May-23	VD#137	Common bottlenose dolphin	4	50	Kept course, maintained speed
<i>Fugro Enterprise</i>	03-May-23	VD#138	Common dolphin	5	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	04-May-23	VD#140	Fin whale	2	400	Kept course, maintained speed
<i>Fugro Enterprise</i>	09-May-23	VD#149	Common dolphin	20	50	Kept course, maintained speed

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<i>Fugro Enterprise</i>	09-May-23	VD#154	Common minke whale	1	300	Kept course, maintained speed
<i>Fugro Enterprise</i>	09-May-23	VD#155	Common minke whale	2	150	Kept course, maintained speed
<i>Fugro Enterprise</i>	12-May-23	VD#167	Humpback whale	1	25	Kept course, maintained speed
<i>Fugro Enterprise</i>	26-May-23	VD#176	Common dolphin	6	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	27-May-23	VD#178	Loggerhead sea turtle	1	10	Altered course
<i>Fugro Enterprise</i>	29-May-23	VD#179	Common dolphin	4	5	Maintained speed
<i>Fugro Enterprise</i>	29-May-23	VD#180	Common dolphin	4	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	01-Jun-23	VD#183	Common dolphin	4	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	01-Jun-23	VD#184	Common dolphin	30	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	01-Jun-23	VD#185	Loggerhead sea turtle	1	50	Kept course, maintained speed
<i>Fugro Enterprise</i>	01-Jun-23	VD#187	Loggerhead sea turtle	1	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	02-Jun-23	VD#188	Common bottlenose dolphin	6	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	02-Jun-23	VD#191	Loggerhead sea turtle	1	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	02-Jun-23	VD#192	Loggerhead sea turtle	1	50	Kept course, maintained speed



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<i>Fugro Enterprise</i>	03-Jun-23	VD#195	Unidentifiable shelled sea turtle	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	07-Jun-23	VD#200	Loggerhead sea turtle	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	07-Jun-23	VD#201	Loggerhead sea turtle	1	50	Kept course, maintained speed
<i>Fugro Enterprise</i>	09-Jun-23	VD#203	Loggerhead sea turtle	1	30	Kept course, maintained speed
<i>Fugro Enterprise</i>	09-Jun-23	VD#204	Loggerhead sea turtle	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	11-Jun-23	VD#205	Common dolphin	3	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	12-Jun-23	VD#206	Common dolphin	10	15	Kept course, maintained speed
<i>Fugro Enterprise</i>	12-Jun-23	VD#207	Loggerhead sea turtle	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	13-Jun-23	VD#208	Loggerhead sea turtle	1	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	13-Jun-23	VD#209	Unidentifiable shelled sea turtle	1	3	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Jun-23	VD#210	Common dolphin	4	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Jun-23	VD#211	Loggerhead sea turtle	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Jun-23	VD#212	Loggerhead sea turtle	1	12	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Jun-23	VD#215	Loggerhead sea turtle	1	40	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Jun-23	VD#216	Loggerhead sea turtle	1	30	Kept course, maintained speed

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<i>Fugro Enterprise</i>	15-Jun-23	VD#217	Common dolphin	20	30	Kept course, maintained speed
<i>Fugro Enterprise</i>	15-Jun-23	VD#218	Loggerhead sea turtle	1	25	Kept course, maintained speed
<i>Fugro Enterprise</i>	16-Jun-23	VD#219	Common dolphin	30	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	17-Jun-23	VD#220	Common dolphin	6	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Jun-23	VD#221	Common dolphin	10	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Jun-23	VD#222	Common dolphin	3	3	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Jun-23	VD#223	Common dolphin	5	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Jun-23	VD#224	Common dolphin	4	3	Kept course, maintained speed
<i>Fugro Enterprise</i>	18-Jun-23	VD#226	Loggerhead sea turtle	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	19-Jun-23	VD#227	Loggerhead sea turtle	1	25	Kept course, maintained speed
<i>Fugro Enterprise</i>	23-Jun-23	VD#230	Loggerhead sea turtle	1	30	Kept course, maintained speed
<i>Fugro Enterprise</i>	23-Jun-23	VD#231	Loggerhead sea turtle	2	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	23-Jun-23	VD#232	Loggerhead sea turtle	1	3	Kept course, maintained speed
<i>Fugro Enterprise</i>	24-Jun-23	VD#233	Loggerhead sea turtle	1	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	25-Jun-23	VD#237	Loggerhead sea turtle	1	5	Kept course, maintained speed

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<i>Fugro Enterprise</i>	25-Jun-23	VD#241	Loggerhead sea turtle	1	40	Kept course, maintained speed
<i>Fugro Enterprise</i>	25-Jun-23	VD#242	Loggerhead sea turtle	1	40	Kept course, maintained speed
<i>Fugro Enterprise</i>	26-Jun-23	VD#244	Loggerhead sea turtle	1	50	Kept course, maintained speed
<i>Fugro Enterprise</i>	26-Jun-23	VD#245	Unidentifiable whale	1	150	Alter course, speed reduction
<i>Fugro Enterprise</i>	28-Jun-23	VD#247	Common dolphin	10	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	28-Jun-23	VD#248	Leatherback sea turtle	1	50	Altered course
<i>Fugro Enterprise</i>	28-Jun-23	VD#251	Loggerhead sea turtle	1	50	Kept course, maintained speed
<i>Fugro Enterprise</i>	01-Jul-23	VD#252	Fin whale	2	120	Remained stationary
<i>Fugro Enterprise</i>	01-Jul-23	VD#253	Common dolphin	80	2	Remained stationary
<i>Fugro Enterprise</i>	02-Jul-23	VD#257	Fin whale	1	415	Kept course, maintained speed
<i>Fugro Enterprise</i>	02-Jul-23	VD#258	Fin whale	2	100	Alter course, speed reduction
<i>Fugro Enterprise</i>	02-Jul-23	VD#259	Loggerhead sea turtle	1	50	Kept course, maintained speed
<i>Fugro Enterprise</i>	05-Jul-23	VD#266	Loggerhead sea turtle	1	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	07-Jul-23	VD#268	Atlantic spotted dolphin	7	1	Kept course, maintained speed
<i>Fugro Enterprise</i>	07-Jul-23	VD#269	Loggerhead sea turtle	1	10	Kept course, maintained speed

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<i>Fugro Enterprise</i>	07-Jul-23	VD#270	Loggerhead sea turtle	1	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	09-Jul-23	VD#271	Loggerhead sea turtle	1	40	Kept course, maintained speed
<i>Fugro Enterprise</i>	10-Jul-23	VD#272	Loggerhead sea turtle	1	50	Kept course, maintained speed
<i>Fugro Enterprise</i>	11-Jul-23	VD#274	Loggerhead sea turtle	1	5	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Jul-23	VD#281	Common dolphin	30	2	Kept course, maintained speed
<i>Fugro Enterprise</i>	14-Jul-23	VD#282	Fin whale	2	200	Kept course, maintained speed
<i>Fugro Enterprise</i>	16-Jul-23	VD#285	Fin whale	3	200	Kept course, maintained speed
<i>Fugro Enterprise</i>	16-Jul-23	VD#286	Fin whale	2	400	Kept course, maintained speed
<i>Fugro Enterprise</i>	17-Jul-23	VD#287	Fin whale	4	250	Altered course
<i>Fugro Enterprise</i>	31-July-23	VD#293	Kemp's Ridley sea turtle	1	10	Kept course, maintained speed
<i>Fugro Enterprise</i>	20-August-23	VD#311	Kemp's Ridley sea turtle	1	20	Kept course, maintained speed
<i>Fugro Enterprise</i>	23-August-23	VD#313	Humpback whale	1	200	Altered course, reduced speed