Application for Letter of Authorization for the Non-Lethal Taking of Marine Mammals:

Zero Offset Vertical Seismic Profile (VSP) Survey in bp Keltics South Prospect Area
BOEM G&G Permit: Pending
Outer Continental Shelf, Gulf of Mexico

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Application for Letter of Authorization for the Non-Lethal Taking of Marine Mammals: Zero Offset Vertical Seismic Profile (VSP) Survey in bp Keltics South Prospect Area, Outer Continental Shelf, Gulf of Mexico

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List of Acronyms and Abbreviations

µPa	micropascal
2D	two-dimensional
3D	three-dimensional
BOEM	Bureau of Ocean Energy Management
bp	bp Exploration & Production Inc.
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
dB	decibel
EWG	expert working group
FR	Federal Register
GOMx	Gulf of Mexico
ITR	incidental take regulation
JASCO	JASCO Applied Sciences
LOA	Letter of Authorization
MMPA	Marine Mammal Protection Act
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NUT	New or Unusual Technology
OBN	ocean bottom node
OCS	Outer Continental Shelf
Lpk	zero-to-peak sound pressure level
PTS	permanent threshold shift
re	referenced to
ROV	remotely operated vehicle
SL	source level
SPL	root-mean-square sound pressure level
VSP	vertical seismic profile

1.0 Description of Proposed Activities

In accordance with the final incidental take regulation (ITR) published 19 January 2021 (86 *Federal Register* [FR] 5322) and revised 5 January 2023 (88 FR 916), bp Exploration & Production Inc. (bp), hereinafter referred to as the "Applicant", submits this request for a Letter of Authorization (LOA) for the non-lethal, unintentional taking of small numbers of marine mammals resulting from a zero offset vertical seismic profile (VSP) geophysical surveys conducted in the Gulf of Mexico (GOMx). The information provided in this document is submitted in accordance with the final ITR published 19 January 2021 (86 FR 5322), any relevant updates from the 2023 proposed ITR (88 FR 916), and the requirements of 50 Code of Federal Regulations (CFR) § 216.104 to allow for take by incidental harassment of small numbers of marine mammals resulting from geophysical surveys for oil and gas exploration activities.

1.1 PROJECT DESCRIPTION

The Applicant proposes to conduct a zero offset VSP survey within the Keltics South bp prospect in the Bureau of Ocean Energy Management's (BOEM's) Central Planning Area of the GOMx that overlaps with ITR assessment zone 7 (**Figure 1**). The survey is expected to begin no earlier than November 2023 but no later than July 2024.

The prospect area under consideration is located in the Mississippi Canyon (MC) lease areas in protraction block MC 956. Between 2023 and 2024 the Applicant anticipates a single zero offset VSP survey within this prospect area.

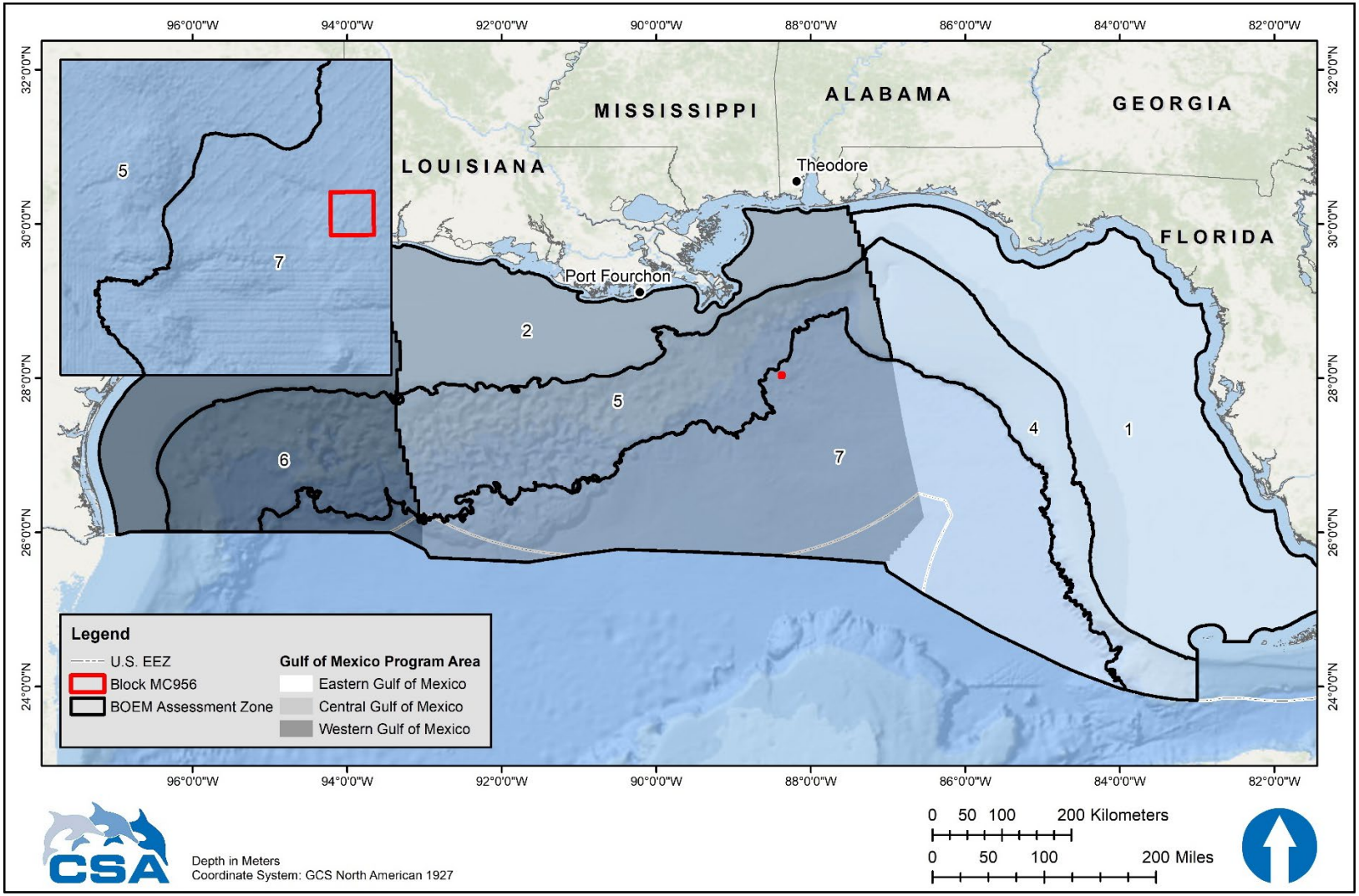

Figure 1. Location of the proposed zero offset vertical seismic profile (VSP) survey in Mississippi Canyon block 956 in bp Exploration & Production Inc. Keltics South prospect area located within the Bureau of Ocean Energy Management's (BOEM's) Gulf of Mexico Central Planning Area in relation to the assessment zones identified in the incidental take regulation (ITR) (86 Federal Register (*FR*) 5322). EEZ = exclusive economic zone.

1.1.1 Activities Considered in Application

The zero offset VSP was categorized as a two-dimensional (2D) survey; however, it should be noted that zero offset VSPs are different from standard 2D, three-dimensional (3D), or four-dimensional seismic surveys due to their stationary or near-stationary deployment very close to an active drilling platform, small array volumes and intensities, and short duration. During zero offset VSP surveys, the seismic source array is typically deployed from a drilling rig or from one to two source vessels. For the proposed survey, the seismic source will be deployed from the Black Hornet Rig drillship which will operate in stationary mode. The seismic receivers (i.e., geophones) are deployed from a distributed acoustic sensing (DAS) wireline in which the fiberoptic cable embedded into the wireline will act as seismic receivers distributed along the entire wellbore. The seismic source is operated at or near the borehole to collect geophysical information. For these operations, a single zero offset VSP survey consists of one drillship operating in stationary mode from which a seismic source array will operate.

A single zero offset VSP survey is expected to begin no earlier than November 2023 but no later than July 2024 in the Keltics South prospect area. The total duration of the zero offset VSP survey is estimated to be up to 2 days. The survey may occur in either fall or winter.

Table 1 provides a summary of information used in take estimations employed in this Application. Input parameters for the NMFS Exposure Estimation Tool are provided in **Section 6.1**.

Table 1. Approximate location, duration, and season within which the proposed zero offset vertical seismic profile (VSP) survey activities used for the analysis in this Application.

Category	Ocean Bottom Node Survey
Bureau of Ocean Energy Management Planning Area	Central
Incidental take regulations (ITR) assessment zone	7
bp Exploration & Production Inc. prospect area	Keltics South
Season in which surveys would occur[1]	Summer or Winter
Total survey duration (days)	2

LOA = Letter of Authorization.
[1]The modeling used in the take assessment of the ITR reflects only two seasons, winter (December–March) and summer (April-November). Because the survey period includes October and November and the proposed survey could occur at any time between November 2023 and July 2024, only the winter season was used in this assessment as it reflects the most conservative exposure estimates as well as the season which encompasses the majority of the months over which the surveys will occur.

1.1.2 Acoustic Sources

The sound source for the proposed zero offset VSP surveys consists of a horizontal, planar array of individual compressed air chambers (i.e., air guns) of different sizes towed behind the source vessels. This source is a tuned compressed air system with suitable frequency range for achieving the geological objectives. The main characteristics of the pressure signal generated by a single-source element are the strong initial peak and the subsequent bubble pulses. The amplitude of the initial peak depends primarily on the operating pressure and chamber volume of the element, whereas the period and amplitude of the bubble pulses depend on the chamber volume and source array towing depth. Both the volume of the air guns and size of the array are selected based on the needs of the survey. The proposed zero offset VSPs use seismic receivers deployed on a wireline from a drilling rig. The source will also be deployed from the Black Hornet Rig operating in stationary mode.

The Applicant intends to use a source array with a maximum volume 2,400 in^3 which will comprise up to 12 air guns ranging in size from 150 to 250 in^3 (**Figure 2**).

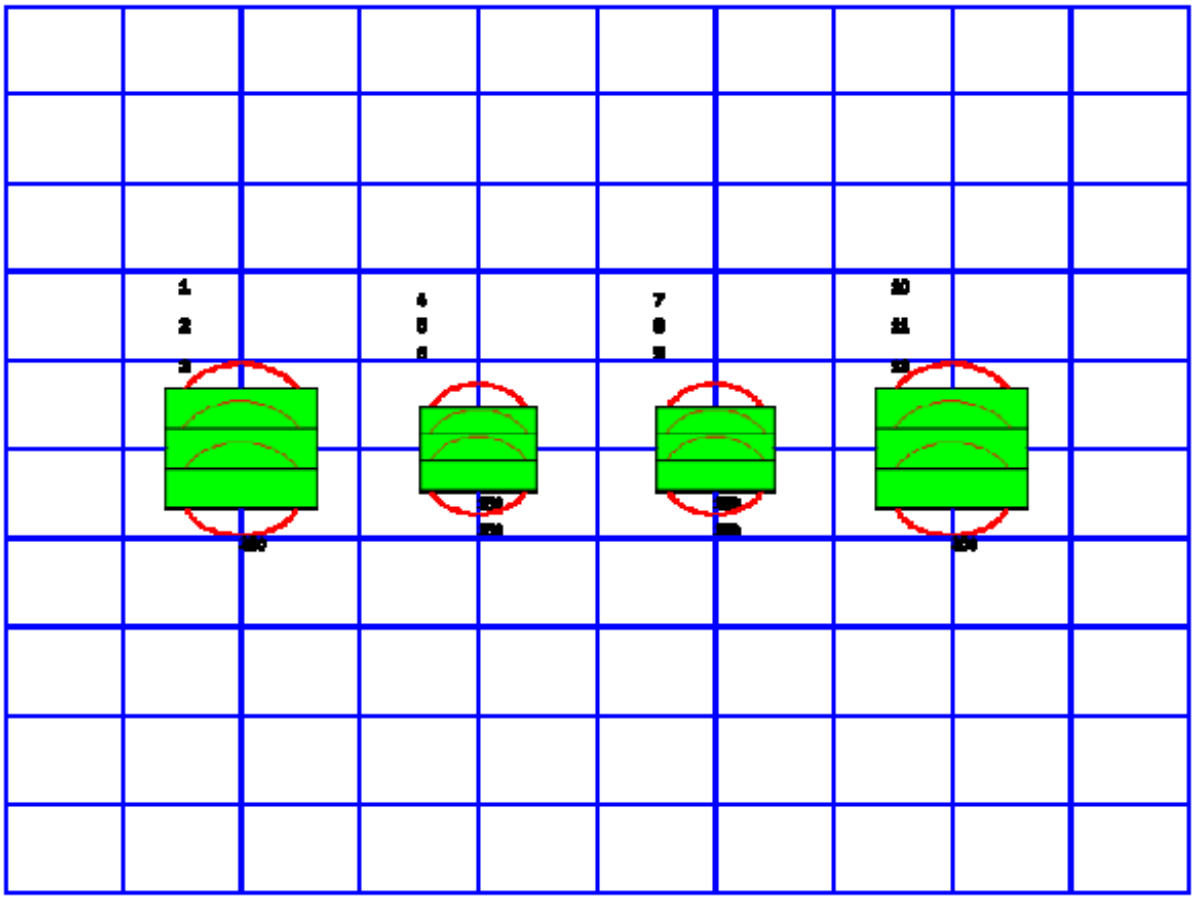

Figure 2. Source array configuration for the proposed zero offset vertical seismic profile (VSP) survey.

Operating frequencies for the source arrays are expected to range from 10 to 2,000 Hz, with most energy below 200 Hz. The far-field source level (SL) expressed as zero-to-peak sound pressure level (Lpk) of the source array was estimated to be 248 decibels (dB) referenced to (re) 1 micropascal (µPa) m. However, predicted SLs are based on far-field measurements that are back calculated to approximate the conditions 1 m from a monopole source. This methodology, while widely accepted for estimated SLs, does not fully capture the near-field characteristics of the source. In the case of an air gun array, which is a distributed source in the near-field rather than a monopole source as is assumed, near-field characteristics can have substantial bearing on the propagation of that source. This results in reported SLs that are conservative, often overestimated, and lacking in specific spectral information. The total area covered by the proposed zero offset VSP survey will be approximately 200 m^2 (**Table 2**).

Table 2 provides a summary of the acoustic properties of the sources to be used during the proposed OBN survey included in this Application.

Table 2. Survey specifications for the source arrays to be used during the proposed surveys in the U.S. Gulf of Mexico included in this Application.

Source Information	OBN Survey
Mean Vessel Survey Speed (knots)	0[1]
Approximate Total Survey Area (km^2)	200 m^2
Array Maximum Total Volume (in^3)	2,400
SL (Lpk) in dB re 1 µPa m	248
SL (SPL) in dB re 1 µPa m	228
Frequency Range (Hz)	10–2,000
Peak Frequency (Hz)	200
Pulse Duration (s)	0.5
Pulse Rate (s)[2]	0.05

µPa = micropascal; dB = decibel; Lpk = zero-to-peak sound pressure level; re = referenced to; SL = source level; SPL = root-mean-square sound pressure level.
[1]The proposed source will be operated from a stationary drillship.
2The estimated pulse interval for the proposed survey will be variable, but the smallest interval will be 20 s which is what the pulse rate was based on.

2.0 Survey Dates, Duration, and Specific Geographic Region

2.1 SURVEY ACTIVITY DATES AND DURATION

Survey activities considered under this Application will occur no earlier than November 2023 but no later than July 2024. The zero offset VSP survey will take up to 2 days (**Table 1**).

2.2 SPECIFIC GEOGRAPHIC REGION

The Applicant's survey activities will occur within the Keltics South proposed prospect area within BOEM's Central Planning Area of the GOMx (**Figure 1**). The proposed prospect area falls within ITR assessment zone 7.

3.0 Species and Numbers of Marine Mammals

Marine mammal species occurring in the U.S. GOMx were identified and provided in the published ITR (86 FR 5322) and updated with new information in the 2023 proposed update (88 FR 916). Information about each species distribution, abundance, and status can be found in that document. A summary of the GOMx species with modeled abundance estimates from the ITR (86 FR 5322; 88 FR 916) is provided in **Table 3**.

Table 3. Summary of marine mammals of the northern Gulf of Mexico.

Common Name	Scientific Name	Stock	ESA/MMPA Stock Status	Modeled Abundance Estimates[2]
Rice's whale[1]	*Balaenoptera ricei*	Northern Gulf of Mexico	E/S	37
Sperm whale	*Physeter macrocephalus*	Northern Gulf of Mexico	E/S	3,007
Atlantic spotted dolphin	*Stenella frontalis*	Northern Gulf of Mexico	NS	1,782[3]
Beaked whale	*Ziphius cavirostris* and *Mesoplodon* spp.	Northern Gulf of Mexico	NS	803[4]
Common bottlenose dolphin	*Tursiops truncatus*	Northern Gulf of Mexico	NS	9,672[5]
Clymene dolphin	*Stenella clymene*	Northern Gulf of Mexico	NS	4,619
False killer whale	*Pseudorca crassidens*	Northern Gulf of Mexico	NS	494
Fraser's dolphin	*Lagenodelphis hosei*	Northern Gulf of Mexico	NS	1,665
Killer whale	*Orcinus orca*	Northern Gulf of Mexico	NS	267
Melon-headed whale	*Peponocephala electra*	Northern Gulf of Mexico	NS	6,113
Pantropical spotted dolphin	*Stenella attenuata*	Northern Gulf of Mexico	NS	67,225
Pygmy killer whale	*Feresa attenuata*	Northern Gulf of Mexico	NS	613
Risso's dolphin	*Grampus griseus*	Northern Gulf of Mexico	NS	1,501
Rough-toothed dolphin	*Steno bredanensis*	Northern Gulf of Mexico	NS	4,853
Short-finned pilot whale	*Globicephala macrorhynchus*	Northern Gulf of Mexico	NS	2,741
Spinner dolphin	*Stenella longirostris*	Northern Gulf of Mexico	NS	5,548
Striped dolphin	*Stenella coeruleoalba*	Northern Gulf of Mexico	NS	5,634
Kogia spp.	*Kogia breviceps* and *Kogia sima*	Northern Gulf of Mexico	NS	980[4]

ESA = Endangered Species Act; E = endangered; MMPA = Marine Mammal Protection Act; NS = non-strategic stock; S = strategic stock.

[1]The original 2021 rule (86 FR 5322) referred to the Bryde's whale (*Balaenoptera edeni*), and these whales were subsequently described as a new species, the Rice's whale (Rosel et al. 2021).

[2]Abundance estimates from modeled estimates in the proposed 2023 incidental take regulation (ITR) update (88 FR 916), or the most recent 2022 stock assessment report from the National Marine Fisheries Service (Hayes et al. 2023) for species for which the ITR did not have any predicted abundances (i.e., pygmy killer whale, false killer whale, killer whale).

[3]The mean abundance for Atlantic spotted dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916).

[4]Due to difficulty in identifying to species level during visual surveys, *Kogia* spp. and beaked whale species are grouped into guilds and abundance estimates are provided for these guilds rather than each species.

[5]The mean abundance for common bottlenose dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916).

4.0 Affected Species Status and Distribution

Affected species status and distribution were examined by the National Marine Fisheries Service (NMFS) within the scope of the proposed regulation, and more information can be found in the published ITR (86 FR 5322) and the proposed 2023 update (88 FR 916).

5.0 Type of Incidental Taking Authorization Requested

The Applicant requests an LOA pursuant to Section 101 (a)(5)(D) of the Marine Mammal Protection Act (MMPA) for incidental take by behavioral harassment of small numbers of marine mammals during geophysical surveys conducted as part of oil and gas exploration and production activities within the U.S. GOMx. Proposed activities, as outlined in **Section 1.0**, have the potential to impact marine mammals from sounds generated by the vessel and survey equipment.

The seismic source used during the proposed OBN survey produces sound levels that may exceed established acoustic thresholds for marine mammals (Wood et al., 2012; NMFS 2023). Acoustic thresholds are received sound levels that meet current scientific criteria as sufficient for eliciting the onset of a permanent threshold shift (PTS), termed Level A harassment, or a behavioral response, termed Level B harassment.

Level A harassment is not expected to result from the proposed activities due to the expected source levels and implementation of mitigation measures. Level A takes were assessed in the Application but are not requested. Level B harassment may occur as a result of proposed activities; therefore, the Applicant is requesting authorization for small numbers of Level B takes of marine mammals. The species potentially taken are described fully in the published ITR and listed in **Table 3** for reference. Each species has a geographic distribution that includes the lease areas in which survey activities may occur and has at least a minimal potential to occur.

6.0 Take Estimates for Marine Mammals

To ensure that only small numbers of marine mammals are exposed during the proposed survey activities, the maximum number of exposures for each species that can reasonably be expected to occur were estimated in this Application using the GOMx exposure estimation tool provided by NMFS (2021) and developed in May 2021. This tool applies modeling conducted by Zeddies et al. (2015) using an 8,000 in^3 source array in various survey configurations, including 2D surveys, which were used to represent the zero offshore VSP survey in this assessment. As discussed in **Section 1.1.2**, estimated SLs for air gun arrays used in propagation modeling often do not fully capture the near-field characteristics of the source that can have substantial bearing on the propagation of that source. This results in reported SLs that are conservative, often overestimated, and lacking in specific spectral information. Additionally, the exposure modeling in the proposed 2023 ITR update (88 FR 916) includes updated marine mammal densities from Garrison et al. (2022) and updated species movement and behavior data used in the animal movement model (Weirathmueller et al., 2022) which have not been incorporated into the GOMx exposure estimation tool (NMFS, 2021). Furthermore, mitigation was not accounted for in the exposure estimation tool when calculating potential exposures. Therefore, the number of exposures for each species estimated in this Application should be considered as highly conservative estimates. Requested takes from the Applicant are provided in **Section 6.2**; however, the final number of takes will be determined during the consultation process with NMFS.

6.1 ESTIMATED NUMBERS OF MARINE MAMMALS THAT MIGHT BE TAKEN BY HARASSMENT

The parameters used as input into the NMFS (2021) exposure estimation tool to estimate takes which may result from the zero offset VSP survey activities are provided in **Table 4**.

Table 4. Parameters used in the National Marine Fisheries Service (NMFS) exposure estimation tool (NMFS, 2021).

Parameter	OBN Tool Input
Survey Type	2D
Survey Days[1]	Zone 7 = 2

2D = two-dimensional.
[1]All survey days input into the exposure estimation tool were assumed to occur in the winter season to provide a conservative estimate of take and to encompass the majority of the months in which the surveys may occur.

6.1.1 Level A Harassment of Marine Mammals

No level A exposures are expected to result from any of the described survey activities due to a combination of mitigation measures (**Section 11.0**) that prevent Level A exposures and animal movement and behavior that would serve to avoid Level A exposures. The ITR assessment determined there was a negligible potential for Level A exposures of mid-frequency cetaceans, so the NMFS exposure estimation tool does not calculate incidents of Level A exposure for this group (86 FR 5353; NMFS, 2021). Level A exposures calculated for low-frequency (i.e., Rice's whale) and high-frequency (i.e., *Kogia* spp.) cetaceans, reduced in the exposure estimation tool by 80% to account for the effects of aversion (NMFS, 2021) are provided in **Table 5** using the parameters provided in **Table 4**.

Table 5. Maximum annual Level A exposures[1] for the proposed ocean bottom node (OBN) survey estimated using the National Marine Fisheries (NMFS) exposure estimation tool (NMFS, 2021).

Common Name	Abundance[3]	Zone 7 Exposures	Maximum Population Affected
Low-frequency cetaceans			
Rice's whale[2]	37	0	0%
Mid-frequency cetaceans			
Sperm whale	3,007	0	0%
Atlantic spotted dolphin[4]	1,782	0	0%
Beaked whale[5]	803	0	0%
Common bottlenose dolphin[6]	9,672	0	0%
Clymene dolphin	4,619	0	0%
False killer whale	494	0	0%
Fraser's dolphin	1,665	0	0%
Killer whale	267	0	0%
Melon-headed whale	6,113	0	0%
Pantropical spotted dolphin	67,225	0	0%
Pygmy killer whale	613	0	0%
Risso's dolphin	1,501	0	0%
Rough-toothed dolphin	4,853	0	0%
Short-finned pilot whale	2,741	0	0%
Spinner dolphin	5,548	0	0%
Striped dolphin	5,634	0	0%
High-frequency cetaceans			
Kogia spp.[6]	980	0.26	0.0%

[1]Level A takes were calculated for some marine mammal species; however, it is unlikely an animal will remain in an ensonified area around the source to receive sound sufficient to result in Level A take and they are therefore not expected to occur.
[2]The original 2021 rule (86 FR 5322) referred to the Bryde's whale (*Balaenoptera edeni*), and these whales were subsequently described as a new species, the Rice's whale (Rosel et al. 2021).
[3]Abundance estimates from modeled estimates in the proposed 2023 incidental take regulation (ITR) update (88 FR 916), or the most recent 2022 stock assessment report from the National Marine Fisheries Service (Hayes et al. 2023).
[4]The mean abundance for Atlantic spotted dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916).
[5]Due to difficulty in identifying to species level during visual surveys, *Kogia* spp. and beaked whale species are grouped into guilds and abundance estimates are provided for these guilds rather than each species.
[6]The mean abundance for common bottlenose dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916.

6.1.2 Level B Harassment of Marine Mammals

Level B exposures, like the Level A exposures provided in **Section 6.1.1**, were calculated using the NMFS exposure estimation tool (NMFS, 2021) using the parameters provided in **Table 5**.

Exposures in **Table 6** assume the zero offset VSP survey will have a duration of 2 days and only one survey will be conducted under the scope of this Application.

Table 6. Maximum annual Level B exposures for the proposed zero offset vertical seismic profile (VSP) survey estimated using the National Marine Fisheries (NMFS) draft exposure estimation tool (NMFS, 2021).

Common Name	Abundance[2]	Zone 7 Exposures	Maximum Population Affected
Low-frequency cetaceans			
Rice's whale[1]	37	0	0%
Mid-frequency cetaceans			
Sperm whale	3,007	13	0%
Atlantic spotted dolphin[3]	1,782	0	0%
Beaked whale[4]	803	147	18%
Common bottlenose dolphin[5]	9,672	1	0%
Clymene dolphin	4,619	58	1%
False killer whale	494	17	3%
Fraser's dolphin	1,665	10	1%
Killer whale	267	2	1%
Melon-headed whale	6,113	41	1%
Pantropical spotted dolphin	67,225	577	1%
Pygmy killer whale	613	15	2%
Risso's dolphin	1,501	10	1%
Rough-toothed dolphin	4,853	18	0%
Short-finned pilot whale	2,741	3	0%
Spinner dolphin	5,548	14	0%
Striped dolphin	5,634	30	1%
High-frequency cetaceans			
Kogia spp.[4]	980	8	1%

[1]The original 2021 rule (86 FR 5322) referred to the Bryde's whale (*Balaenoptera edeni*), and these whales were subsequently described as a new species, the Rice's whale (Rosel et al. 2021).
[2]Abundance estimates from modeled estimates in the proposed 2023 incidental take regulation (ITR) update (88 FR 916), or the most recent 2022 stock assessment report from the National Marine Fisheries Service (Hayes et al. 2023).
[3]The mean abundance for Atlantic spotted dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916).
[4]Due to difficulty in identifying to species level during visual surveys, *Kogia* spp. and beaked whale species are grouped into guilds and abundance estimates are provided for these guilds rather than each species.
[5]The mean abundance for common bottlenose dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916).

6.2 Requested Takes

No Level A takes are requested for zero offset VSP surveys. Requested takes for Level B were estimated using the exposure estimation tool (NMFS, 2021) and are provided in **Table 7**.

Table 7. Requested Level B exposures for the proposed ocean bottom node (OBN) survey.

Common Name	Abundance[2]	Total Requested Level B Exposures	Maximum Population Affected
Low-frequency cetaceans			
Rice's whale[1]	37	0	0%
Mid-frequency cetaceans			
Sperm whale	3,007	13	0%
Atlantic spotted dolphin[3]	1,782	0	0%
Beaked whale[4]	803	147	18%
Common bottlenose dolphin[5]	9,672	1	0%
Clymene dolphin	4,619	58	1%
False killer whale	494	17	3%
Fraser's dolphin	1,665	10	1%
Killer whale	267	2	1%
Melon-headed whale	6,113	41	1%
Pantropical spotted dolphin	67,225	577	1%
Pygmy killer whale	613	15	2%
Risso's dolphin	1,501	10	1%
Rough-toothed dolphin	4,853	18	0%
Short-finned pilot whale	2,741	3	0%
Spinner dolphin	5,548	14	0%
Striped dolphin	5,634	30	1%
High-frequency cetaceans			
Kogia spp.[4]	980	8	1%

[1]The original 2021 rule (86 FR 5322) referred to the Bryde's whale (*Balaenoptera edeni*), and these whales were subsequently described as a new species, the Rice's whale (Rosel et al. 2021).
[2]Abundance estimates from modeled estimates in the proposed 2023 incidental take regulation (ITR) update (88 FR 916), or the most recent 2022 stock assessment report from the National Marine Fisheries Service (Hayes et al. 2023).
[3]The mean abundance for Atlantic spotted dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916).
[4]Due to difficulty in identifying to species level during visual surveys, *Kogia* spp. and beaked whale species are grouped into guilds and abundance estimates are provided for these guilds rather than each species.
[5]The mean abundance for common bottlenose dolphins is based on the oceanic population in the proposed 2023 ITR update (88 FR 916).

7.0 Effects on Marine Mammal Species or Stocks

Anticipated impacts on marine mammal habitat were examined by NMFS within the scope of the proposed regulation, and more information can be found in the published ITR (86 FR 5322) and proposed 2023 ITR update (88 FR 916).

Effects of proposed seismic survey activities for a period of up to 10 years throughout the U.S. GOMx were assessed in the ITR, following the expert working group (EWG) framework developed by Southall et al. (2014). This framework considers the context within which acoustic exposures will occur, along with the vulnerability of individual marine mammal stocks, to determine the likelihood of stock-related population-level impacts. The results of this analysis found that the total take from proposed activities will have only negligible impacts on all affected GOMx marine mammal stocks. A more detailed explanation can be found in the published ITR (86 FR 5322). Furthermore, the revised 2023 ITR assessment (88 FR 916) also resulted in a negligible impact determination based on the updated information from the revised modeling (Weirathmueller et al., 2022) and marine mammal density information (Garrison et al., 2022).

Given that the scope of activities proposed in this Application are less than that of the ITR, both the original (86 FR 5322) and the 2023 proposed update (88 FR 916), both in terms of spatial and temporal extent, the activities in this Application are expected to remain within this finding of only negligible impacts. The take estimates provided in **Section 6.1** represent estimates for the entirety of zone 7, when in actuality the proposed activities would only cover up to 200 m^2 for the survey, reducing the spatial extent of potential marine mammal encounters. Additionally, the take estimates do not account for mitigation which would be expected to negate any potential for Level A takes and reduce the risk of marine mammals experiencing biologically significant Level B harassment. Therefore, it is reasonable to assume that the project activities would not negatively affect stocks.

8.0 Minimization of Adverse Effects to Subsistence Uses

This section addresses NMFS' requirement to identify methods to minimize adverse effects of the proposed activity on subsistence uses.

There are no current subsistence hunting areas in the vicinity of any of the proposed lease blocks and there are no activities related to the proposed surveys that may affect the availability of a species or stock of marine mammal for subsistence uses. Consequently, there are no available methods to minimize potentially adverse effects to subsistence uses.

9.0 Anticipated Impacts on Habitat

Anticipated impacts on marine mammal habitat were examined by NMFS within the scope of the proposed regulation, and more information can be found in the published ITR (86 FR 5322) and the proposed 2023 ITR update (88 FR 916).

10.0 Anticipated Effects of Habitat Impacts on Marine Mammals

Anticipated effects of habitat impacts on marine mammals were examined by NMFS within the scope of the proposed regulation, and more information can be found in the published ITR (86 FR 5322) and the proposed 2023 ITR update (88 FR 916).

11.0 Mitigation Measures

This section addresses NMFS' LOA requirement to assess the availability and feasibility (economic and technological) of methods and manner of conducting these proposed survey activities that have the least practicable impact upon affected species or stock, their habitat, and their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.

The Applicant has demonstrated a strong commitment to minimizing impacts to marine mammal species through a comprehensive and progressive mitigation and monitoring program. The Applicating will follow all monitoring and mitigation measures set forth in the ITR (86 FR 5322) that are applicable to air gun surveys with total source volumes above 1,500 in^3. These monitoring and mitigation measures were not revised or changed in the proposed 2023 ITR update (88 FR 916), and the only additional measures identified in the 2023 update include a process for adaptive management wherein NMFS, BOEM, the Bureau of Safety and Environmental Enforcement (BSEE), and the operators will participate in the adaptive management process through the annual comprehensive reports required of the LOA holders (detailed further in 88 FR 916).

The mitigation measures will align with those currently required under existing regulations (e.g., BOEM Notice to Lessees and Operators 2016-G02, revised 19 June 2020) as well as additional mitigation outline in the published ITR (86 FR 5322) and the NMFS 2020 Biological Opinion and its appendices (NMFS, 2020), as they apply to the proposed survey activities.

12.0 Arctic Plan of Cooperation

This requirement is applicable only for activities that occur in Alaskan waters north of 60° N latitude. The proposed survey activities will not take place within the designated region and, therefore, will not have an adverse effect on the availability of marine mammals for subsistence uses. As such, there is no need to form such a plan.

13.0 Monitoring and Reporting

The Applicant will comply with all monitoring and reporting guidelines provided in the published ITR (86 FR 5322) and the proposed 2023 ITR update (88 FR 916) as they pertain to Protected Species Observer and passive acoustic monitoring data, and reporting injured or dead marine mammal species.

14.0 Suggested Means of Coordinated Research

Relevant research efforts which may effectively supplement the monitoring and reporting requirements pursuant to issued LOAs are described in detail by NMFS in the published ITR (86 *FR* 5322) and the proposed 2023 ITR update (88 FR 916).

15.0 List of Preparers

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