

Transmitted via email to: pr.itp.applications@noaa.gov

November 1, 2024

Jolie Harrison, Division Chief Permits and Conservation Division, Office of Proteced Resources 1315 East-West Highway, F/PR1 Room 13805 Silver Spring, Maryland 20910

RE: Incidental Take Authorization

Wellbore Seismic Acquisition (Vertical Seismic Profile) Lease OCS-G 22868/24064, Mississippi Canyon Block 300/255 Well No. 003 ST01 (API No. 608174148900)

Ms. Harrison:

Please find the attached request for an incidental take authorization under section 101(a)(5) of the Marine Mammal Protection Act of 1972 (MMPA), as amended, for the potential take of marine mammals incidental to conducting a Borehole Seismic Survey by Murphy Exploration & Production Company – USA (Murphy).

Murphy as the designated operator of Lease OCS-G 22868/24064 Mississippi Canyon Blocks 300/255; proposes to conduct Seismic Profile (VSP) operations on the following:

<u>MC255, Well No. 003 ST01</u>: MC Block 300/255, Well No. 003 ST01, API No. 608174148900 (Revised Exploration Plan, Control No R-7056), and any sidetrack or bypass thereof.

No explosives will be used in this operation.

Murphy's upcoming walkaway VSP survey is subject to the provisions of the MMPA and the Regulations Governing Taking Marine Mammals Incidental to Geophysical Surveys Related to Ancillary Oil and Gas Activities in the Gulf of Mexico (50 CFR § 217, Subpart S); therefore, Murphy respectfully requests issuance of a Letter of Authorization (LOA) for the proposed activities.

In support of this request, please find attached the following information:

- Letter of Authorization application
- Shapefiles
- NMFS LOA Application_Murphy Oil 2024 (Estimated take)



Murphy will be on location with the *Noble Stanley Lafosse* on or around December 16, 2024 and ready to conduct the survey as early as February 1, 2025, which has an estimated duration of 5 days.

Should you have any questions or require additional information, please contact Sara Dingwall at 281-546-4036.

Sincerely,

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Sara Dingwall Supervisor, Offshore Regulatory & Environment



Letter of Authorization Application BOEM Control Number A-000057

Requested period of Effectiveness:

Start Date: February 1, 2025 End Date: April 30, 2025

Type of Survey:

Borehole Seismic Survey (VSP)

Survey Area:

Question:	Response
Overall Duration of the Activity (days):	5-7 days
Areal extent of the survey area : (in OCS lease blocks or km2)	Mississippi Canyon Block 300 and Block 255. OCS-G 22868/24064
(Attach GIS file(s) of survey lines and/or survey area perimeter)	See attached shapefiles.
G&G ITR/PEIS Modeling Zone(s) in which the activity will occur (1-7):	Zone 7
Number of days during the overall activity	5-7 days of active source operations, planned for Q1-Q2
period on which the sound source(s) listed in Section C will operate:	2025. Desired effective dates February 1, 2025-April 30, 2025.
(If the activity will occur in more than one Modeling Zone, provide the number of operating days within each modeling zone.)	For analysis purposes, all days have been calculated under the "winter" schedule.



Sound Sources:

The Air gun array model proposed is G-Guns manufactured by Sercel. This is a Dual Magnum 12 gun array (6×150 cu.in + 6×250 cu.in @ 2,000psi nominal pressure). The tow depth will be 5m [16.5ft]. Final SP interval will be dictated by modeling, but a good assumption is every 20m [65.5ft]. The source will not be stationery, and it is not a point source.

Energy Source	Manufacturer & Model	Duration of Use: (Number of Days or Percent of Active Sound Source Days)
Air Gun	Sercel G-Guns	5 days active sourcing

- 12 x G-Guns
- Peak to Peak output: 47 +/- 0.678 (4.7 +/- 0.0678 MPa, ~ 253 db re 1 muPa. at 1m.) (15' depth)*
- RMS Pressure in bar-m 3.3 (0.33 MPa, 230 db re 1 muPa. at 1m.) *
- SEL (Sound Exposure Level) 154.1 dB re 1muPa^2-s (Mxx) (10Hz 25 kHz) 148.1 at 500 M*
- Total Volume 2400 in3 / Firing Pressure 2,000 PSI



Take Estimate:

See attached document titled NMFS LOA Application_Murphy Oil 2024

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



Mitigation and Monitoring Efforts:

Question:	Response:
Please indicate which set of monitoring and mitigation measures from the ITR apply to the planned activity:	All mitigation and monitoring methods specified in the ITR for arrays >1500 in3 will be applied to the planned activity.
Confirm that you will apply this set of monitoring and mitigation measures during the activity:	Yes



Map of Survey Area and Transit Route







MURPHY OIL CORPORATION

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

Outer Continental Shelf, Gulf of Mexico





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	2024).

Table of Abbreviations

AUV	Autonomous underwater vehicle
BOEM	Bureau of Ocean Energy Management
dB	decibels
ft	feet
GOM	Gulf of Mexico
ITR	Incidental take regulation
LOA	Letter of Authorization
m	meter
NMFS	National Marine Fisheries Service
OCS	Outer continental shelf
PAM	Passive acoustic monitoring
PSO	Protected Species Observers
ROV	Remotely operated underwater vehicle
VSP	Vertical seismic profile

1 MARINE MAMMAL SPECIES AND ABUNDANCES

The published ITRs (89 Federal Register 31488) provides information about marine mammal protection status, distribution, and predicted mean/maximum abundances for marine mammal species (Table 1).

Common Name	Scientific Name	Stock	ESA Status ¹	NMFS Stock Abundance (CV, Nmin, most recent abundance survey)	Predicted Mean Abundance
Rice's whale	Balaenoptera edeni	GOM	E/D	51 (0.50; 34; 2017-2018)	37
Sperm whale	Physeter macrocephalus	GOM	E/D	1,180 (0.22; 983; 2017-2018)	3,007
Pygmy sperm whale ²	Kogia breviceps	GOM	Ν	336 (0.35; 34; 2017-2018)	980
Dwarf sperm whale ²	K. sima	GOM	Ν	336 (0.35; 34; 2017-2018)	
Cuvier's beaked whale ³	Ziphius cavirostris	GOM	Ν	18 (0.75, N/A, 2020)	
Gervais beaked whale ³	Mesoplodon europaeus	GOM	N	20 (0.98, N/A, 2020)	
Blainville's beaked whale ³	M. densirostris	GOM	Ν	N/A	803
Unidentified Mesoplodont species	N/A	GOM	N	98 (0.46, N/A, 2020)	
Unidentified Ziphiids	N/A	GOM	Ν	181 (0.31, N/A, 2020)	
Rough-toothed dolphin	Steno bredanensis	GOM	Ν	3,509 (0.67; Unk.; 2009)	4,853
Common bottlenose dolphin	Tursiops truncatus truncatus	GOM Oceanic, Continental Shelf, Coastal Northern, and Coastal Western	N	7,462 (0.31; 5,769; 2017- 2018; Oceanic) 63,280 (0.11; 57,917; 2017- 2018; Continental Shelf) 11,543 (0.19; 9,881; 2017- 2018; Coastal, Northern) 20,759 (0.13; 18,585; 2017- 2018; Coastal, Western) 103,044 (Total)	155,453 (Shelf) 9,672 (Oceanic) 165,125 (Total)

Table 1.Summary information of species of marine mammals occurring in the northern Gulf of
Mexico.

Common Name	Scientific Name	Stock	ESA Status ¹	NMFS Stock Abundance (CV, Nmin, most recent abundance survey)	Predicted Mean Abundance
Clymene dolphin	Stenella clymene	GOM	N	513 (1.03; 250; 2017-2018)	4,619
Atlantic spotted dolphin	S. frontalis	GOM	N	21,506 (0.26; 17,339; 2017- 2018)	6,187 (Shelf) 1,782 (Oceanic) 7,969 (Total)
Pantropical spotted dolphin	S. attenuata attenuata	GOM	N	37,195 (0.24; 30,377; 2017- 2018)	67,225
Spinner dolphin	S. longirostris longirostris	GOM	N	2,991 (0.54; 1,954; 2017- 2018)	5,548
Striped dolphin	S. coeruleoalba	GOM	N	1,817 (0.56; 1,172; 2017- 2018)	5,634
Fraser's dolphin	Lagenodelphis hosei	GOM	N	213 (1.03; 104; 2017-2018)	1,665
Risso's dolphin	Grampus griseus	GOM	N	1,974 (0.46; 1,368; 2017- 2018)	1,501
Melon-headed whale	Peponocephala electra	GOM	N	1,749 (0.68; 1,039; 2017- 2018)	
Pygmy killer whale	Feresa attenuata	GOM	N	613 (1.15; 283; 2017-2018)	6,113
False killer whale	Pseudorca crassidens	GOM	N	494 (0.79; 276; 2017-2018)	
Killer whale	Orcinus orca	GOM	N	267 (0.75; 152; 2017-2018)	
Short-finned pilot whale	Globicephala macrorhynchus	GOM	N	1,321 (0.43; 934; 2017-2018)	2,741

¹ESA status: (E) – Endangered, (D) – Depleted, (N) – Not listed or designated as depleted under the Marine Mammal Protection Act.

²These species are too difficult to differentiate at sea and are grouped together in their abundance estimate.

³These species are too difficult to differentiate at sea and are grouped together in their abundance estimate.

2 TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

The Applicant requests an LOA pursuant to Section 101 (a)(5)(D) of the Marine Mammal Protection Act (MMPA) for incidental take of small numbers of marine mammals by Level B harassment in the specific ITR Zone 7. The sound source from the proposed investigation may exceed established acoustic thresholds for Level A or B marine mammal harassment (NMFS, 2018).

3 MARINE MAMMAL TAKE ESTIMATES

The GOM exposure estimation tool that was provided by the National Marine Fisheries Service (NMFS) was used to estimate exposures of each marine mammal species in the investigation area (NMFS, 2024). The tool applies modeling by Zeddies et al. (2015) to estimate exposure. The smallest sized investigation option of the exposure calculator was a single air gun of a 4,130 in³ volume, and it was deemed unsuitable to divide those estimated exposure metrics to equal the size of the air gun array used in this investigation. With the air gun array to be used consisting of a volume of only 2,400 in³, it must be noted that this is a conservative estimate of the exposure to marine mammals for the proposed investigation.

Acoustic thresholds are outlined by the NMFS to identify the received level of underwater sound at which marine mammals would be expected to have disrupted behavioral patterns or injury. Level B harassment is considered a disruption in behavior, but it can be difficult to assess as individuals will react differently depending on their activity at the time of sound or previous exposure to sound. Different species will also react differently, but NMFS considers 160 dB as an acoustic threshold for impulsive sources (air guns) and 120 dB for continuous sources (NMFS, 2018). Level A harassment is defined as having the potential to injure a marine mammal or marine mammal stock in the wild.

 Table 2.
 Representative species of marine mammal hearing groups from the NMFS exposure estimation tool (NMFS, 2020).

Marine Mammal Hearing Group	Species
Low-frequency cetaceans	Baleen whales
Mid-frequency cetaceans	Dolphins, toothed whales, beaked whales, bottlenose whales
High-frequency cetaceans	True porpoises, Kogia, river dolphins, cephalorhynchid
Phocid pinnipeds	True seals
Otariid pinnipeds	Sea lions and fur seals

3.1 Level A Harassment of Marine Mammals

According to the Gulf of Mexico Seismic Survey Exposure Calculator (NOAA 2024) Level A harassment from this seismic investigation is not expected, with minimal Zone 7 exposures to GOM marine mammal populations (Table 3). Only high-frequency hearing Kogia sp. (Dwarf and pygmy sperm whales) are estimated to have Level A harassment occur to 0.55 individuals, or 0.06% of the population during this survey. NMFS determined that the potential for Level A harassment of mid-frequency cetaceans is de minimis. Therefore, the exposure calculator tool does not calculate incidents of Level A harassment for those species.

Table 3.Maximum Level A exposures for the three-day proposed seismic survey during winter 2025
estimated using the NMFS exposure estimation tool within ITR Zone 7 (NMFS, 2024).

Common Name	Hearing Group	Predicted Mean Abundance	Zone 7 Exposures	Maximum Population Affected
Rice's (Bryde's) whale	Low- frequency	37	< 0.01	0%
Kogia sp. (Dwarf, pygmy sperm whale)	High- frequency	980	0.55	0.06%
Sperm whale	Mid- frequency	3,007	0	0%
Beaked whales (Cuvier's/Blainville's/Gervais)	Mid- frequency	803	0	0%
Rough-toothed dolphin	Mid- frequency	4,853	0	0%
Common bottlenose dolphin	Mid- frequency	103,044	0	0%
Clymene dolphin	Mid- frequency	4,619	0	0%
Atlantic spotted dolphin	Mid- frequency	7,969	0	0%
Pantropical spotted dolphin	Mid- frequency	67,225	0	0%
Spinner dolphin	Mid- frequency	5,548	0	0%
Striped dolphin	Mid- frequency	5,634	0	0%
Fraser's dolphin	Mid- frequency	1,665	0	0%
Risso's dolphin	Mid- frequency	1,501	0	0%
Melon-headed whale	Mid- frequency		0	0%
Pygmy killer whale	Mid- frequency	6,113	0	0%
False killer whale	Mid- frequency		0	0%
Killer whale	Mid- frequencv		0	0%
Short-finned pilot whale	Mid- frequency	2,741	0	0%

3.2 Level B Harassment of Marine Mammals

Level B exposures were calculated using the NMFS exposure estimation tool (NMFS, 2024) using the sound source information and the investigation location in the ITR Zone 7 of exposures. Exposure to level B harassment of marine mammals within the investigation area is expected to be low, with striped dolphins potentially having the highest percentage of the population impacted at 3.43% or 193.5 individuals in winter months (Table 4). The only population with any expected Level B harassment of

greater than 2.0% is the blackfish guild (killer whale, false killer whale, pygmy killer whale, and melonheaded whale) at 146.55 individuals (2.40%). Other marine mammals expected to have between 1% and 2% of their populations experiencing Level B harassment are 89.39 individual Clymene dolphins (1.94%), 14.3 individual Kogia sp. (1.46%), and 18.02 individual Fraser's dolphins (1.08%). All other populations of marine mammals are estimated to have < 1% of their population exposed to Level B harassment.

Table 4.	Maximum Level B exposures for the three-day proposed seismic survey estimated using the
	NMFS exposure estimation tool during winter months in ITR Zone 7 (NMFS, 2024).

Common Name	Hearing Group	Predicted Mean Abundance	Zone 7 Exposures	Maximum Population Affected
Rice's (Bryde's) whale	Low- frequency	37	< 0.01	0%
Kogia sp. (Dwarf, pygmy sperm whale)	High- frequency	980	14.30	1.46%
Sperm whale	Mid- frequency	3,007	12.99	0.43%
Beaked whales (Cuvier's/Blainville's/Gervais)	Mid- frequency	803	4.61	0.57%
Rough-toothed dolphin	Mid- frequency	4,853	38.73	0.80%
Common bottlenose dolphin	Mid- frequency	103,044	0.28	< 0.01%
Clymene dolphin	Mid- frequency	4,619	89.39	1.94%
Atlantic spotted dolphin	Mid- frequency	7,969	< 0.01	< 0.01%
Pantropical spotted dolphin	Mid- frequency	67,225	616.33	0.92%
Spinner dolphin	Mid- frequency	5,548	2.75	0.05%
Striped dolphin	Mid- frequency	5,634	193.49	3.43%
Fraser's dolphin	Mid- frequency	1,665	18.02	1.08%
Risso's dolphin	Mid- frequency	1,501	3.12	0.21%
Melon-headed whale ^c	Mid- frequency	6,113	146.55	2.40%
Pygmy killer whale ^c	Mid- frequency			
False killer whale ^c	Mid- frequency			
Killer whale ^c	Mid- frequency			
Short-finned pilot whale	Mid- frequency	2,741	< 0.01	< 0.01%

^c Blackfish guild density (false killer whale, killer whale, melon-headed whale, and pygmy killer whale)

4 EFFECTS ON MARINE MAMMALS OR STOCKS

The results of an analysis of 10 years of geophysical activities in the GOM following an expert working group (Southall et al. 2014) shows that the total take from all approved activities will have negligible impacts on all impacted marine mammal stocks within the GOM (86 *Federal Register* 5322). Level A harassment of marine mammal populations is expected to be low to non-existent during the proposed three day investigation, with only 0.55 individuals of Kogia sp. or 0.06% of the population estimated to be exposed. The only populations with greater than 2% estimated exposure to Level B harassment are of the striped dolphin (3.43%) and the blackfish guild (2.40%). All other GOM marine mammal species are expected to have $\leq 2\%$ of their populations exposed to Level B harassment.

The take estimates of this investigation are conservatively estimated using a larger 4,130 in³ air gun array as the closest available survey type in the GOM exposure estimator tool instead of the proposed 2,400 in³ air gun array. Minimal to no negative impacts to marine mammal populations are expected to occur. Take estimates represent the entirety of the ITR Zone 7, but this investigation will occur within a portion of nine lease blocks. The NMFS exposure estimation tool also does not factor mitigation efforts, which would be expected to negate any potential for Level A exposures and greatly reduce the risk of Level B harassment. Minimal to no negative effects to marine mammal stocks are anticipated from this proposed project by the Applicant.

5 MINIMIZATION OF ADVERSE EFFECTS TO SUBSISTENCE USES

NMFS requires any marine mammal stocks within the investigation area that are used for subsistence hunting to be identified and any adverse effects to be minimized. There are no subsistence hunting areas near the proposed investigation location, and no stocks of marine mammals that are used for subsistence uses will be impacted.

6 ANTICIPATED IMPACTS ON HABITAT

Disturbance of the benthic environment is expected to be non-existent, as no contact of any equipment with the seafloor is expected. No use of ROVs is required for this investigation, and no nodes or receivers are being placed on the seafloor.

7 ANTICIPATED EFFECTS OF HABITAT IMPACTS ON MARINE MAMMALS

The effects to marine mammals from loss or modification of habitat from the proposed investigation will be negligible and undetectable.

8 MITIGATION AND MONITORING EFFORTS

Following the final ITR (86 *Federal Register* 5322), the investigation will aim to have the "least practicable adverse impact" on the affected species or stocks and their habitat.

Survey operations will be undertaken in accordance with the provisions of the Regulations Governing Taking Marine Mammals Incidental to Geophysical Survey Activities in the Gulf of Mexico (50 CFR Part 217, Subpart S), where those provisions include monitoring for marine protected species and implementation of mitigation actions.

Protected Species Observers (PSOs) will conduct visual monitoring for marine protected species including all marine mammals during all daytime operations of the acoustic source and during preclearance searches prior to initiation of the source. PSOs will implement monitoring watches consistent with the requirements outlined in Appendix A Seismic Survey Mitigation and Protected Species Observer Protocols of the Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico.

Passive Acoustic Monitor (PAMs) Operators will conduct acoustic monitoring all marine mammals during all daytime and nighttime operations of the acoustic source and during pre-clearance searches prior to initiation of the source. PAMs will implement monitoring watches consistent with the requirements outlined in Appendix A Seismic Survey Mitigation and Protected Species Observer Protocols of the Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico.

In addition, the sound sources will be turned on following ramp-up procedures are described in Appendix A and delays to initiation of the source and shut-downs of the active source will be implemented for marine protected species observed inside clearance and shut-down zones (respectively) established around the source.

Additional Measures to Protect the Rice's Whale

BOEM (NTL No. 2023-G01) recommends to lessees and operators that all oil and gas activity within the Expanded Rice's Whale Area (100 - 400 meters depth) should be conducted in accordance with the following measures:

Use trained visual observers to monitor the vessel strike avoidance zone (500 meters). Such
observers may be either third-party observers or crew members but crew members responsible
for these duties should be provided with sufficient training to distinguish aquatic protected species
to broad taxonomic groups.

- If transiting within the Expanded Rice's Whale Area, document and retain records for three years on details of transit, including what port is used for mobilization and demobilization.
- Observe on all vessels, regardless of size, at all times a 10-knot or less, year-round speed
 restriction in the Expanded Rice's Whale Area (as described in NTL No. 2023-G01 and Figure 3).
 This recommendation would not apply when compliance would place the safety of the vessel or
 crew, or the safety of life at sea, in doubt. To the maximum extent practicable, lessees and
 operators should avoid transit through the Expanded Rice's Whale Area after dusk and before
 dawn, and during other times of low visibility to further reduce the risk of vessel strike of Rice's
 whales.
- Maintain on all vessels a minimum separation distance of 500 meters from Rice's whales. If a
 whale is observed but cannot be confirmed as a species other than a Rice's whale, the vessel
 operator should assume that the whale is a Rice's whale and take appropriate action.
- Include a functioning Automatic Identification System (AIS) onboard all vessels 65 feet or greater associated with oil and gas activity (e.g., source vessels, chase vessels, supply vessels) that is operating at all times, as required by the U.S. Coast Guard. If the vessel does not require AIS, it is strongly encouraged that the operator document and retain records of the transit, including trackline (e.g., time and speed) data and visual marine mammal sightings.

9 ARCTIC PLAN OF COOPERATION

This plan is not applicable for this application as this is only for activities that occur in Alaskan waters north of 60°N latitude, and the proposed investigation is in the Gulf of Mexico.

10 **REFERENCES**

50 Code of Federal Regulations (CFR) § 216.104. 2023. Submission of Requests.

- 50 Federal Register (FR) 31488. 2024. Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Geophysical Surveys in the Gulf of Mexico. 24 April 2024.
- 86 Federal Register (FR) 5322. 2018. Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Geophysical Surveys Related to Oil and Gas Activities in the Gulf of Mexico. 19 January 2021.
- BOEM NTL No. 2023-G01. 2023. Notice to Lessees and Operators of Federal Oil and Gas, and Sulphur Leases in the Gulf of Mexico Outer Continental Shelf. Expanded Rice's Whale Protection Efforts During Reinitiated Consultation with NMFS.

National Marine Fisheries Service (NMFS). 2018. 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). NOAA Technical Memorandum NMFS-OPR-59. 167 pp.

National Marine Fisheries Service (NMFS). 2024. Gulf of Mexico exposure estimation tool.

- Southall BL, Ellison WT, Clark CW, Tollit D. 2014. Analytical Framework for Assessment Potential Effects of Seismic Airgun Surveys on Marine Mammals in the Gulf of Mexico (GOMEX). Expert Working Group (EWG) Final Report. 55 pp.
- Zeddies DG, Zykov M, Yurk H, Deveau T, Bailey L, Gaboury I, Racca R, Hannay D, Carr S. 2015. Acoustic Propagation and Marine Mammal Exposure Modeling of Geological and Geophysical Sources in the Gulf of Mexico: 2016-2025 Annual Acoustic Exposure Estimates for Marine Mammals. Technical Report by JASCO Applied Sciences for the U.S. Department of the Interior, Bureau of Ocean Energy Management. JASCO Document 00976, Version 3.0. 385 pp.