

# Sauropod Marine Seismic Survey

## Invitation for Consultation

**28 May 2021**

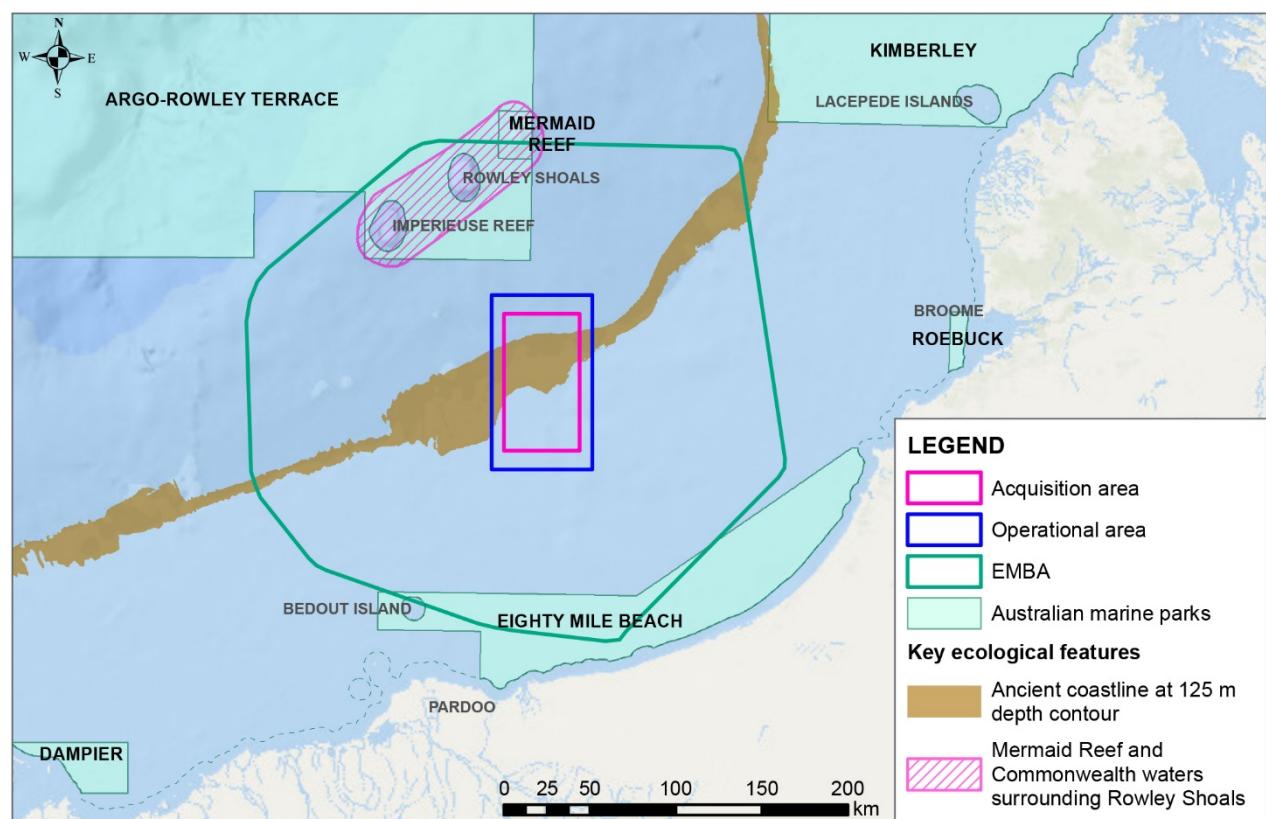
### Introduction

CGG Services Australia (CGG) is proposing to undertake the Sauropod 3D marine seismic survey (MSS), which covers an area of 6,600 km<sup>2</sup> off the north-west coast of Western Australia. The purpose of the Sauropod 3D MSS is to collect 3D geophysical data about the underlying rock types, to inform oil and gas exploration in exploration permit area WA-527-P, which is located on the North West Shelf in the Roebuck Basin (Figure 1; Table 1). An Environment Plan (EP) was previously accepted by NOPSEMA for this activity on 13 July 2020. It was developed and submitted by 3D Oil Limited (3D Oil). As part of the EP process, 3D Oil consulted with relevant stakeholders and closed out all consultation to the satisfaction of NOPSEMA. CGG is now planning to conduct and manage the survey in WA-527-P under a revised and updated EP.

CGG is inviting inputs from relevant persons regarding changes in the proposed activity, and particularly how proposed changes to the activity and controls that were presented in the accepted EP, detailed in Table 2, may affect your functions, interests and activities in the area. The full acoustic source power would only be used in the Acquisition Area in Figure 1.

**Table 1 Co-ordinates of the Sauropod MSS acquisition and operational areas (GDA 94)**

Operational Area		Acquisition Area	
Latitude	Longitude	Latitude	Longitude
-17° 55' 47.93"	120° 3' 24.12"	-18° 1' 49.19"	119° 59' 24.25"
-18° 50' 45.74"	120° 4' 22.48"	-18° 44' 52.37"	120° 0' 8.93"
-18° 51' 15.77"	119° 31' 2.71"	-18° 45' 14.87"	119° 35' 4.56"
-17° 56' 16.4"	119° 30' 14.87"	-18° 2' 10.75"	119° 34' 26.08"



**Figure 1 The Sauropod MSS acquisition and operational areas**

**Table 2 Proposed changes to the environment plan**

Aspect	Accepted in 3D Oil EP	Proposed by CGG
Activity window	Jan - April 2021	Jan - May 2022
Source volume	3090 in <sup>3</sup>	2820 in <sup>3</sup> (approx. 10% smaller array volume)
Distance between sail lines	450 m	675 – 716 m (approx. 35-40% reduction in line density)
Distance between streamers	75 m	112.5 m (broader receiver array to reduce line number)
Distance from seismic vessel bow to tail	7,525 m	8,000 m

## Timing

The Sauropod 3D MSS will take a maximum of 60 days to acquire and will be undertaken within the acquisition window of January to May in 2022. The precise timing of the survey is subject to vessel availability, weather conditions and other operational considerations. The final timing of the survey will be communicated to stakeholders in advance of the survey commencing. The proposed schedule and temporal window for the Sauropod 3D MSS (January to May) was determined taking into account:

- The timing of sensitive periods for key environmental and socio-economic receptors;
- The hearing ability and sensitivity of those receptors to sound from the seismic survey;
- The proximity of sensitive areas to the seismic survey area;
- The likely presence of all life stages of protected species, based on their known distribution and range;
- Species vulnerability / conservation status;
- The potential for impacts to protected, commercially and ecologically important species, at an individual level and at a population level;
- Potential for effects on existing fishing activities in the survey area.

The proposed survey timing was selected primarily to avoid the humpback whale migration through the region (June to October), as well as to reduce potential exposure of pygmy blue whales during their migrations through the Operational Area (April – August and October – December). The spawning periods of the many different key indicator fish species for the commercial fisheries active in the region extend throughout the majority of the year but can vary significantly between species. It is noted that most key indicator species spawn between October and March, April or May. Analysis of DPIRD FishCube data for the fisheries monthly catch and effort since 2014 indicates very low levels of fishing effort in the survey area and, therefore, does not highlight key times for fishing activity or supporting processes.

## Survey details

The seismic survey vessel will tow the seismic source array with a total volume up to approximately 2,820 in<sup>3</sup> at 5-10 m beneath the sea surface. Twelve hydrophone streamers, each up to 7.05 km long and spaced 112.5 m apart, will be towed behind the vessel at a depth of approximately 15 m beneath the sea surface. When acquiring data, the vessel will travel at approximately 4.5 knots, discharging the seismic source approximately every 12.5 m (5.4 seconds).

The seismic survey vessel will typically acquire seismic data along a series of adjacent and parallel lines in a “race-track” pattern. At the end of each line, the vessel will turn in a wide arc to position for another parallel line in the opposite direction, offset approximately 1,350 – 1,432 m from the previous line. This pattern is repeated until the required coverage is completed.

The vessel will sail lines that have a north-south orientation.

## Environment Plan

In accordance with the OPGGS (E) Regulations, CGG will submit an EP to NOPSEMA for the seismic survey activity. The EP will include all records of stakeholder consultation, an assessment of the

environmental impacts and risks of the activity, control measures to manage the potential environmental impacts and risks to levels that are as low as reasonably practicable (ALARP) and acceptable.

## Environmental Impact Assessment

CGG will be conducting a detailed assessment of potential impacts and risks from the proposed Sauropod 3D MSS. In consultation with stakeholders, CGG will develop a range of management measures to be adopted to reduce the identified impacts and risks to ALARP and acceptable levels. Key environmental management measures to be adopted for the survey are summarised below.

Table 3 identifies the timing of key fish indicator species sensitivities relevant for commercial fisheries that are active within the region (see fisheries assessment in Table 4).

**Table 3 Timing of Key Fish Indicator Species Relevant to the Operational Area and Wider EMBA**

Sensitivity	J	F	M	A	M	J	J	A	S	O	N	D
Proposed Sauropod 3D MSS timing												
Goldband snapper spawning (Pilbara stock) <sup>4</sup>												
Rankin cod spawning <sup>4</sup>												
Red emperor spawning <sup>4</sup>												
Blue-spotted emperor spawning <sup>4</sup>												
Giant ruby snapper spawning <sup>4</sup>												
Other demersal fish species spawning <sup>4</sup>												
Spanish mackerel spawning (Pilbara stock) <sup>4</sup> (within EMBA only)												
<i>Peak period</i>												

Source: DPIRD 2019

### Underwater sound

An independent acoustic modelling study was commissioned to assess the potential effects of underwater sound from the seismic source for the 3D Oil EP. CGG will use a smaller acoustic source array for the survey, from a different survey vessel (probably the MV Geo Coral), which will require re-assessment of the underwater sound effects. The assessment will estimate sound levels and the distances sound may travel to enable an evaluation of potential effects on sensitive receptors. Given the smaller source array, the field of effect from underwater sound is expected to be smaller than that assessed in the accepted 3D Oil EP. A full assessment will be presented in the revised EP, describing relevant management measures to be adopted. Management measures will include mitigation recommended in the Department of Fisheries (2013) Guidance statement on undertaking seismic surveys in Western Australian waters and will address specific advice from WAFIC, Recfishwest and individual fishers. Mitigation will include as a minimum:

- Precaution and observation zones, pre-start observations, soft-start procedures, low-power and shut-down procedures and night-time and low visibility procedures, in compliance with Environment Protection and Biodiversity Conservation (EPBC) Act Policy Statement 2.1
- Marine fauna observers on board the survey vessel during the survey
- Avoiding restricting movement of commercial value fish away from the source of seismic sounds – Fish movements will not be restricted

- Notifications and regular updates on the location of the seismic survey vessel to assist fishers in avoiding the temporary area of ensonification.

### Cumulative impacts of seismic surveys

Cumulative impacts from seismic surveys could occur as a result of two seismic surveys where the spatial footprint of impacts from another survey overlaps that of the Sauropod 3D MSS, thereby affecting the same receptors twice. The Keraudren Extension 3D MSS, performed by Santos WA Northwest Pty Ltd, overlaps the acquisition area of the Sauropod MSS. The survey commenced on the 28 May 2021, with the last possible date of acquisition on 31 July 2022. The 2021 portion of the survey could be completed approximately six months prior to the earliest commencement date of the Sauropod 3D MSS (i.e. by 31 July 2021). Therefore, cumulative impacts are not expected. Mitigation measures will include as a minimum:

- Development of a concurrent operations plan for any concurrent surveys identified within 40 km of the Acquisition Area
- Minimum separation distance of 40 km shall be maintained between the Sauropod 3D MSS seismic sources and other operating seismic sources (none identified at this point).

### Interactions with commercial fishing, shipping and other marine users

- Stakeholder consultation and notifications prior to commencement of the survey, during the survey and upon completion of the survey.
- Notice to Mariners issued prior to the survey.
- Maintaining a 24-hour visual, radio and radar watch.
- Tail buoys of the towed hydrophone streamers fitted with lights and radar reflectors and AIS.
- Vessels will maintain appropriate lighting and communication at all times, in compliance with Navigation Act 2012 and associated Marine Orders.
- Making regular vessel operations 'look-ahead' reports available to stakeholders throughout the survey to advise the location of the operating survey vessel and where it is planned to go next.
- Use of a support vessel when safe to do so.

### Interactions with marine fauna

- Vessels will not exceed a speed of six knots within the caution zone of a cetacean, in accordance with EPBC Regulations 2000 – Part 8 Division 8.
- Tail buoys on towed hydrophone streamers will be fitted with turtle guards.

### Biosecurity management

- Biofouling and ballast discharges will be managed in accordance with International Maritime Organisation (IMO) guidelines, the Department of Agriculture and Water Resources requirements and the Australian Ballast Water Management requirements.

### Waste and discharges

- Waste discharges and emissions will be carried out in accordance with the requirements of the Protection of the Sea (Prevention of Pollution from Ships) Act 1983 and the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).
- All vessels will have Shipboard Oil Pollution Emergency Plans (SOPEPs).
- Oil spill contingency planning will be managed in accordance with Australian Maritime Safety Authority (AMSA) requirements under the National Plan for Maritime Environmental Emergencies.

### Relevant persons consultation

CGG is committed to consultation with all relevant stakeholders regarding the survey. Interested stakeholders will have the opportunity to participate in consultation throughout the stakeholder consultation period. If you would like to comment, or would like additional information, please do not hesitate to contact us using the details below.



Please advise if you do not want to receive further updates on this project or do not consider this project relevant to your interests, functions or activities.

CGG has endeavoured to reach all relevant persons but recognises that further persons may self-identify or come to our attention in coming weeks. Please advise CGG, or pass this update on, if you are aware of any other relevant parties whose interests, functions or activities may be affected by the survey.

## Contact CGG

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**Table 4 Commercial fisheries with relevance to the Sauropod MSS**

Fishery	Licence area description	Fishing methods	Target species	Catch and effort	Relevance to Sauropod 3D MSS
<b>Commonwealth Managed Fisheries</b>					
Southern Bluefin Tuna Fishery (SBTF)	The SBTF covers the entire Australian Fishing Zone.	Purse seine, pelagic longline, minor line.	Southern bluefin tuna ( <i>Thunnus maccoyii</i> ).	The SBTF fishing season runs for 12 months, beginning 1 December. However, effort is concentrated in the Great Australian Bight and no catch or effort from the SBTF occurs in WA.	✗ No effort from the SBTF occurs in WA. Therefore, the activities of the SBTF are considered to be outside the scope of this EP. However, the only known spawning grounds of the southern bluefin tuna occurs in the Java Sea. Therefore, the Australian Southern Bluefin Tuna Industry Association (ASBTIA) will be notified of the activity as part of the consultation process.
Western Tuna and Billfish Fishery (WTBF)	The WTBF typically occurs in Australia's Exclusive Economic Zone (EEZ) and the high seas of the Indian Ocean.	Pelagic longline, minor line, purse seine.	Bigeye tuna ( <i>Thunnus obesus</i> ); Yellowfin tuna ( <i>Thunnus albacares</i> ); Striped marlin ( <i>Kajikia audax</i> ); Swordfish ( <i>Xiphias gladius</i> ); and Albacore ( <i>Thunnus alalunga</i> ).	The WTBF fishing season runs for 12 months, beginning 1 February. In recent years, effort has been concentrated off south-west WA and South Australia.	✗ Whilst effort does occur in Australia, the closest effort area is located over 700 km south-west of the Operational Area. Therefore, the activities of the WTBF are considered to be outside the scope of this EP.
Western Skipjack Tuna Fishery (WSTF)	There are two stocks of skipjack tuna in Australia, one on the east coast and the other on the west coast. (Eastern Skipjack Tuna Fishery and the Western Skipjack Tuna Fishery). However, as a whole the Skipjack Tuna Fishery covers the entire Australian Fishing Zone (AFZ).	Purse seine (predominant), pole-and-line methods.	Indian Ocean skipjack tuna ( <i>Katsuwonus pelamis</i> ).	There has been no fishing effort in the WSTF since the 2008-2009 season.	✗ The Operational Area overlaps with the management area of the WSTF, however no effort has occurred in Australia since the 2008-2009 fishing season. Therefore, the activities of the WSTF are considered to be outside the scope of this EP.
North-West Slope Trawl Fishery (NWSTF)	The NWSTF is located from the coast of the Prince Regent National Park to Exmouth between the 200 m depth contour to the outer limit of the AFZ.	Demersal trawl	Scampi ( <i>Metanephrops australiensis</i> , <i>Metanephrops boschmai</i> , and <i>Metanephrops velutinus</i> ).	The NWSTF fishing season runs for 12 months from 1 July. Effort is concentrated mostly towards the 200 m isobath boundary of the NWSTF from north of the Montebello Islands to Scott Reef.	✓ The Operational Area is located approximately 10 km south-east of the NWSTF boundary. Given the proximity of the Operational Area to the NWSTF boundary and known fished areas, the activities of the NWSTF are considered to be within the scope of the EP.

Fishery	Licence area description	Fishing methods	Target species	Catch and effort	Relevance to Sauropod 3D MSS
<b>State managed fisheries</b>					
Mackerel Managed Fishery (MMF)	<p>The MMF is divided into three management areas, Area 1 (Kimberley), Area 2 (Gascoyne), and Area 3 (Gascoyne-West Coast). Each area has its own management arrangements.</p> <p>The MMF predominately operates in the North Coast and Gascoyne Coast Bioregions.</p>	Surface trolling	Spanish mackerel ( <i>Scomberomorus commerson</i> )	The Area 2 (Pilbara) fishing season runs from 1 April to 30 September. In the 2016 season, 276 t of Spanish mackerel were caught across the fishery.	✓ The Operational Area is located within Area 2 of the MMF. To determine whether licence holders in the MMF fish within the Operational Area, catch and effort data was obtained from DPIRD at a scale of 10 nm x 10 nm. The data indicate some licence holders have been active nearby (but not within) the Operational Area between 2014 and 2020. Therefore, the activities of the MMF are considered to be within the scope of this EP and licence holders have been included in the consultation process.
Northern Demersal Scalefish Managed Fishery (NDSMF)	<p>The NDSMF operates off the north-west coast of Western Australia.</p> <p>The NDMSF is divided into an inshore sector (Area 1), and an offshore sector (Area 2). Area 1 occurs between the high water mark and the 30 m isobath where only line fishing is permitted. Area 2 extends from the 30 m isobath to the boundary of the AFZ, and permits handline, dropline and fish traps. Fishing access to the research-fishing zone can only be facilitated through an agreed research framework.</p>	Trap and line	Goldband snapper ( <i>Pristipomoides multidens</i> ); and Red emperor ( <i>Lutjanus sebae</i> ).	The NDSMF season runs for 12 months from 1 January. In the 2016 fishing season, the fishery reported a total catch of 1,173 t.	✓ The Operational Area partially overlaps with the far western extent of the offshore research (Zone 2) licence area of the NDSMF, and is located approximately 75 km from the inshore (Zone 1) fishing licence area. To determine whether licence holders in the NDSMF fish within the Operational Area, catch and effort data was obtained from DPIRD at a scale of 10 nm x 10 nm. The data indicate some licence holders have been active nearby (but not within) the Operational Area between 2014 and 2020. Therefore, the activities of the NDSMF are considered to be within the scope of this EP and licence holders have been included in the consultation process.
Nickol Bay Prawn Managed Fishery (NBPMF)	The NBPMF operates along the western part of the North West Shelf between Dampier and the western extend of Eighty Mile Beach.	High opening otter trawl systems	Banana prawns ( <i>Penaeus esculentus</i> )	The NBPMF season is year-round, with designated nursery areas closed between August and November. In the 2016 fishing season, a total catch of 17 t was reported.	✗ The Operational Area overlaps with the management area of the NBPMF. To determine whether licence holders in the NDSMF fish within the Operational Area, catch and effort data was obtained from DPIRD at a scale of 10 nm x 10 nm. The data indicate no licence holders are active within or nearby the Operational Area. Therefore, the activities of the NBPMF are considered to be outside the scope of this EP.

Fishery	Licence area description	Fishing methods	Target species	Catch and effort	Relevance to Sauropod 3D MSS
North Coast Shark Fishery	The northern shark fisheries comprise the state-managed WA North Coast Shark Fishery in the Pilbara and western Kimberley, and the Joint Authority Northern Shark Fishery in the eastern Kimberley.	Line	Sandbar shark ( <i>Carcharhinus plumbeus</i> ); and Blacktip shark ( <i>Carcharhinus tilstoni</i> )	This fishery has been inactive since 2008/2009.	✗ The Operational Area overlaps with the management area of the North Coast Shark Fishery. This fishery has been inactive since 2008/2009. Therefore, the activities of the North Coast Shark Fishery are considered to be outside the scope of this EP.
Pilbara Demersal Scalefish Managed Fishery (PDSMF) – Trawl	This fishery is located in the Pilbara sub region of the North Coast Bioregion.	Trawl	Red emperor ( <i>Lutjanus sebae</i> ); Bluespotted emperor ( <i>Lethrinus punctulatus</i> ); and Rankin cod ( <i>Epinephelus multinotatus</i> ).	In the 2016 fishing season it was recorded that there was a total catch of 2,150 t.  In the 2016 season, it was also recorded that there were two vessels operating in the trawl sector.	✓ The Operational Area overlaps with the management area of the PDSMF. To determine whether licence holders in the PDSMF fish within the Operational Area, catch and effort data was obtained from DPIRD at a scale of 10 nm x 10 nm. The data indicate some licence holders have been active within and nearby the Operational Area between 2014 and 2020. Therefore, the activities of the PDSMF are considered to be within the scope of this EP and licence holders have been included in the consultation process.
PDSMF – Trap		Trapping		In the 2016 fishing season it was recorded that there was a total catch of 495 t. There were three vessels recorded in the trap sector in this season.	
PDSMF – Line		Line		In the 2016 fishing season it was recorded that there was a total catch of 126 t.  There were five licenced vessels recorded in the 2016 fishing season.	
Beche-de-mer Managed Fishery	This fishery is a nearshore hand-harvest fishery operating from Exmouth Gulf to the Northern Territory Border.	Nearshore diving and wading.	Sandfish ( <i>Holothuria scabra</i> ); and Redfish ( <i>Actinopyga echinities</i> ).	The majority of effort is concentrated around the Kimberley region. However, there have been several years where substantial effort was within the Pilbara region.	✗ The Operational Area overlaps with the management area of the Beche-de-mer Managed Fishery. The fishery is a wading/shallow water fishery and is therefore considered outside the scope of this EP.
Marine Aquarium Fish Managed Fishery (MAFMF)	The MAFMF is able to operate in all State waters, between the Northern Territory border and South Australia border.	Diving, collection by hand.	The MAFMF sources up to 950 species of marine aquarium fishes, as well as coral, live rock, algae, seagrass and invertebrates.	Typically the fishery is most active in waters south of Broome and the highest amount of effort is generally around the Capes region, Perth, Geraldton, Exmouth and Dampier.	✗ The Operational Area overlaps with the management area of the MAFMF. To determine whether licence holders in the MAFMF fish within the Operational Area, catch and effort data was obtained from DPIRD at a scale of 10 nm x 10 nm. The data indicate no licence holders are active within or nearby the Operational Area.

Fishery	Licence area description	Fishing methods	Target species	Catch and effort	Relevance to Sauropod 3D MSS
					Therefore, the activities of the MAFMF are considered to be outside the scope of this EP.
Specimen Shell Managed Fishery (SSMF)	The SSMF is based on the collection of individual shells for the purposes of display, collection, cataloguing, classification and sale. The fishery covers the entire coastline of WA.	By hand by a small group of drivers in shallow waters or wading along coastal beaches. It should be noted that there are currently exemption permits that allows for the use of a ROV vehicle for depths of up to 300 m	In 2016, 224 different shell specimens were gathered.	The majority of effort is located adjacent to population centres such as Broome, Exmouth, Perth, Mandurah, the Cape Areas and Albany.	✗ The Operational Area overlaps with the management area of SSMF. To determine whether licence holders in the SSMF fish within the Operational Area, catch and effort data was obtained from DPIRD at a scale of 10 nm x 10 nm. The data indicate no licence holders are active within or nearby the Operational Area. Therefore, the activities of the SSMF are considered to be outside the scope of this EP.