

# CGG Sauropod 3D Marine Seismic Survey Environment Plan

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## 1. Purpose of this report

NOPSEMA has accepted the Sauropod 3D Marine Seismic Survey Environment Plan (the EP) submitted by CGG Services (Australia) Pty Ltd (the titleholder) for a seismic survey activity in the Roebuck Basin within the period January to May 2022.

As required by the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (the Environment Regulations), the public was provided with an opportunity to comment on the EP. There were no public comments received during the public comment period.

Following the public comment period, the titleholder submitted the EP for assessment by NOPSEMA on 15 October 2021. NOPSEMA has since completed its assessment of the EP and has determined that it is satisfied that the EP meets the criteria for acceptance<sup>1</sup> on 16 February 2022.

This report explains how NOPSEMA took into account key matters raised by relevant persons in making its decision. Comments have been grouped into 'key matters' that capture the key issues, concerns or information provided during the consultation process. This report also contains other key matters that may be of interest to the public.

This report accompanies the accepted Sauropod 3D Marine Seismic Survey Environment Plan, revision 3 submitted by CGG Services (Australia) Pty Ltd which is available on the NOPSEMA website and should be referred to for further information.

### 1.1. Information relevant to NOPSEMA's decision:

In making the decision to accept this EP, NOPSEMA took into account:

- the Environment Regulations;
- NOPSEMA Assessment Policy (PL0050), Environment Plan Assessment Policy (PL1347) and Environment Plan Decision Making Guidelines (GL1721);
- the Sauropod 3D Marine Seismic Survey Environment Plan;
- the information raised by relevant persons, government departments and agencies that is relevant to making a decision;
- relevant plans of management and threatened species recovery plans developed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and relevant guidance published by the Department of Agriculture, Water and the Environment;

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<sup>1</sup> Environment Regulations, Regulation 10A Criteria for acceptance of environment plan

## 2. Next steps

Responsibility for the ongoing environmental performance of the Sauropod 3D Marine Seismic Survey activity remains, at all times, with CGG Services (Australia) Pty Ltd.

NOPSEMA has legislated responsibilities to inspect and investigate offshore petroleum and greenhouse gas storage activities, and to enforce compliance with environmental law. These functions will be applied to this activity in accordance with NOPSEMA's policies.

## 3. Sensitive Information

Sensitive information received during the public comment period, such as the names and contact details of commenters and specific information identified by the commenter or relevant person as 'sensitive', is not published in this report. Sensitive information is contained in a sensitive information part of the EP which has been considered by NOPSEMA during its assessment process.

## 4. Further information

If you would like further information about the activity, please contact the titleholder's nominated liaison person specified in the EP and on NOPSEMA's webpage for the Sauropod 3D Marine Seismic Survey.

If you would like to be notified of regulatory information on the activity, such as start and end dates and enforcement actions (if any), please subscribe to updates from the [Underway Offshore page](#) on NOPSEMA's website.

## How NOPSEMA has taken into account key matters raised during relevant persons consultation, the assessment and decision-making process for the Sauropod 3D Marine Seismic Survey

#	Matter	Titleholder response	NOPSEMA's assessment and decision
1	<b><i>There was concern from relevant persons that the Sauropod 3D Marine Seismic Survey (MSS) may result in unacceptable impacts to the sustainability of commercial fisheries as a result of cumulative impacts to fish stocks, including spawning activity.</i></b>	<p>In preparing the EP, CGG engaged with commercial fishing representatives including the Western Australian Fishing Industry Council (WAFIC). CGG evaluated the objections and claims raised by relevant persons and provided a response to the relevant persons addressing the objections and claims raised.</p> <p>CGG provided a comprehensive evaluation of the potential impacts of the activity to spawning success of commercially important fish species. The evaluation was informed by relevant peer reviewed scientific literature and took into account the level of overlap between the proposed survey and the spawning range and timing of key species. The maximum spatial-temporal overlap of the Sauropod 3D MSS with the spawning areas and periods of commercial fish species is approximately 1.26%. CGG concluded that impacts would be limited to short-term behavioural disturbance of some adult fish with behaviour, and spawning, predicted to return to normal within days to weeks. The survey is not predicted to have a measurable effect on spawning or recruitment success, as key fish species are known to be highly fecund broadcast spawners that spawn frequently throughout their respective spawning seasons.</p> <p>CGG conducted a detailed assessment of potential cumulative and additive impacts to commercial fish stocks to address concerns from commercial fishing</p>	<p>NOPSEMA recognises that there was concern from commercial fishing stakeholders that the survey could adversely affect the sustainability of commercial fisheries as a result of cumulative impacts to fish stocks, including spawning activity.</p> <p>In making a decision regarding this matter, NOPSEMA took into account EP content, NOPSEMA's Decision Making Guidelines (GL1721) and relevant peer reviewed scientific literature. In addition, NOPSEMA reviewed the full text correspondence with relevant persons contained in the sensitive information part of the EP and considered the extent of the consultation effort by CGG and how CGG addressed the merits of objections and claims made in relation to potential commercial fisheries impacts.</p> <p>NOPSEMA is reasonably satisfied, after considering the nature and scale of the activity, that the consultation effort by CGG was consistent with the requirements of Division 2.2A because appropriate authorities and relevant persons were engaged in consultation, with sufficient time and information provided, and the responses by CGG to objections and claims were reasonable.</p>

stakeholders regarding multiple seismic surveys occurring within the same fishery or fish stock distribution. This evaluation was informed by historical fishing catch and effort data, the spatial extent of past and current seismic surveys, and relevant scientific literature. Based on the evaluation, the maximum predicted spatial-temporal overlap of seismic surveys is for the goldband snapper with an 8.73% overlap of spawning area and period. Based on the status of the fisheries reports, that indicate increasing stock levels from 2014-15, the relatively small spatial-temporal overlap with spawning area and period, and the historically high level of seismic surveys within the region, CGG concluded that cumulative impacts would be of an acceptable level.

CGG has committed to undertake seismic acquisition in a manner that prevents serious or irreversible impacts to key indicator commercial fish populations, such that sufficient spawning fish biomass and recruitment of the stocks may be maintained, and the stocks continue to be assessed by Department of Primary Industries and Regional Development as sustainable (EPO 1.5).

To achieve the level of performance committed to by CGG, control measures have been adopted to ensure potential impacts of the activity to spawning success of key fish species are managed to levels that are as low as reasonably practical (ALARP) and acceptable including developing and implementing a concurrent operations plan for any concurrent seismic surveys within 40 km of the area of seismic acquisition (PS 1.5).

NOPSEMA is reasonably satisfied, after taking into consideration CGG's evaluation of the potential for cumulative impacts on the sustainability of commercial fish stocks, recently published scientific literature and the control measures adopted by CGG to manage the activity, that the potential impacts to spawning fish will not result in serious or long-term effects to populations of key commercial species.

Given the above, NOPSEMA has concluded that the activity will be conducted in a manner that does not result in unacceptable impacts to the sustainability of commercial fisheries, including spawning activity.

**2** ***There was concern from relevant persons that the seismic survey may result in unacceptable impacts to commercial fishers as a result of reduced catchability of target species.***

In preparing the EP, CGG engaged with commercial fishing representatives including WAFIC. CGG evaluated the objections and claims raised by relevant persons and provided a response to the relevant persons addressing the objections and claims raised.

CGG identified that the seismic survey operational area overlaps with areas where commercial fishers have applied historical fishing effort including the Pilbara Trap Managed Fishery, Pilbara Fish Trawl (Interim) Managed Fishery, Northern Demersal Scalefish Managed Fishery and Mackerel managed Fishery. CGG undertook a comprehensive evaluation of the potential impacts of the activity to commercial fishers including the potential for reduced catchability of target species due to displacement by anthropogenic noise generated by the seismic source.

The evaluation was informed by underwater acoustic modelling which determined effect ranges for fish and relevant peer reviewed scientific literature. In addition, CGG took into consideration feedback from WAFIC and commercial fishers as well as the best available fishing catch and effort data to understand when and where fishing effort has occurred relative to the activity location and timing. The evaluation concluded that the potential impact of reduced catchability of target species would be limited to short-term behavioural disturbance of some adult fish at a small proportion of historical fishing grounds with behaviour predicted to return to normal within days to weeks.

NOPSEMA recognises that there was concern from commercial fishing stakeholders that the survey could impact on their functions, activities and interests through impacts to the catchability of target species as a consequence of noise emissions from the seismic source. In addition, NOPSEMA recognises that there is potential for the activity, if not appropriately managed, to result in unacceptable impacts to commercial fishers as a result of reduced catchability of target species.

In making a decision regarding this matter, NOPSEMA took into account EP content, NOPSEMA's Decision Making Guidelines (GL1721) and relevant peer reviewed scientific literature. In addition, NOPSEMA reviewed the full text correspondence with relevant persons contained in the sensitive information part of the EP and considered the extent of the consultation effort by CGG and how CGG addressed the merits of objections and claims made in relation to potential commercial fisheries impacts.

NOPSEMA is reasonably satisfied, after considering the nature and scale of the activity, that the consultation effort by CGG was consistent with the requirements of Division 2.2A because appropriate authorities and relevant persons were engaged in consultation, with sufficient time and information provided, and the responses by CGG to objections and claims were reasonable.

		<p>To demonstrate that the activity can be conducted in a manner that does not result in unacceptable impacts to commercial fishers, CGG has committed to ensuring that seismic acquisition is undertaken in a manner that does not result in financial loss to commercial fishers due to reduced catchability of target species, decreased catch or catch per unit effort, loss or damage to fishing equipment, or decreased ability to fish within the area impacted by seismic noise emissions (EPO 1.5).</p> <p>To achieve the level of performance committed to by CGG, control measures have been adopted to ensure potential impacts of the activity to commercial fishers are managed to levels that are ALARP and acceptable including implementing an evidence-based adjustment protocol to formally manage claims by commercial fishers for loss of catch, displacement and lost or damaged fishing gear as a consequence of the activity (PS 1.11).</p>	<p>NOPSEMA is reasonably satisfied, after taking into consideration CGG's evaluation of the potential for impacts to commercial fishers from reduced catchability of target species and recently published scientific literature, that impacts will be limited to short-term behavioural disturbance of some adult fish at a small proportion of historical fishing grounds with behaviour predicted to return to normal within days to weeks following completion of the activity. In addition, NOPSEMA is reasonably satisfied, after taking into consideration the control measures adopted by CGG to manage the activity, including a commitment to implement an evidence-based adjustment protocol for commercial fishers, that commercial fishers will be fairly compensated for any demonstrable loss of catch should behavioural disturbance result in a reduction in catchability.</p> <p>Given the above, NOPSEMA has concluded that the activity will be conducted in a manner that does not result in unacceptable impacts to commercial fishers as a result of reduced catchability of target species.</p>
3	<p><b><i>There would be unacceptable impacts to whale sharks due to the overlap of the seismic survey operational area with the whale shark foraging biologically important area (BIA).</i></b></p>	<p>CGG identified that the seismic survey operational area overlaps with the whale shark foraging BIA. CGG undertook a comprehensive evaluation of the potential impacts of the activity to whale sharks, particularly the potential impacts of underwater noise. The evaluation was informed by underwater acoustic modelling which determined effect ranges for whale sharks, relevant conservation actions that apply to the activity in the</p>	<p>NOPSEMA recognises that there is the potential for the activity, if not appropriately managed, to have an unacceptable impact on whale sharks should they be migrating through the region during the activity.</p> <p>In making a decision regarding this matter NOPSEMA took into account EP content,</p>

conservation advice for the whale shark (TSSC 2015) and relevant peer reviewed scientific literature. The evaluation also took into account the proposed timing of the activity, which does not coincide with the peak whale shark migratory period.

To demonstrate that the activity can be conducted in a manner that does not result in unacceptable impacts to whale sharks and not inconsistent with relevant conservation actions that apply to the activity in the Conservation Advice for the Whale Shark (TSSC 2015), CGG has committed to ensuring that:

- seismic acquisition is undertaken in a manner that prevents injury or mortality to an individual listed marine fauna species protected under the EPBC Act from underwater noise emissions from the seismic source (EPO 1.1); and
- seismic acquisition is undertaken in a manner that does not compromise the objectives of relevant recovery plans or wildlife conservation plans/advice that are in force for a marine fauna species (EPO 1.3).

To achieve the level of performance committed to by CGG, control measures have been adopted to ensure potential impacts of the activity to whale sharks are managed to levels that are ALARP and acceptable including:

- implementing EPBC Act Policy Statement 2.1 Part A – Standard Management Measures such as pre-start-up visual observations, start-up delay procedures, soft-start procedures and operational shut-down procedures (PS 1.1);

NOPSEMA's Decision Making Guidelines (GL1721), the Conservation Advice for the Whale Shark (TSSC 2015), EPBC Act Policy Statement 2.1 (DEWHA 2008) and EPBC Act Significant Impact Guidelines 1.1–Matters of National Environmental Significance (DEWHA 2013).

NOPSEMA recognises that the seismic operational area overlaps with the whale shark foraging BIA and that CGG has selected the timing of the activity to avoid overlap with the peak whale shark migratory period. During the assessment, NOPSEMA required CGG to consider the need for trained and experienced MFOs to be on duty during all daylight operations. In response, CGG committed to the use of dedicated, adequately trained MFOs, with at least one experienced MFO on duty during daylight hours when the seismic source is active, or during pre-start-up observations.

NOPSEMA is reasonably satisfied that the timing of the activity and the control measures adopted by CGG to manage the activity will ensure potential impacts to whale sharks will be limited to short-term behavioural responses in isolated individuals, with no injury or displacement in the foraging BIA.

Given the above, NOPSEMA has concluded that the activity will be conducted in a manner that does not result in unacceptable impacts to whale sharks and not inconsistent with relevant conservation actions that apply to the activity in

		<ul style="list-style-type: none"> <li>• use of dedicated, adequately trained marine fauna observers (MFOs), with at least one experienced MFO on duty during daylight hours when the seismic source is active, or during pre-start-up observations (PS 1.2);</li> <li>• no discharge of the seismic source outside of the seismic operational area (PS 1.4);</li> <li>• developing and implementing a concurrent operations plan for any concurrent seismic surveys within 40 km of the area of seismic acquisition (PS1.5)</li> <li>• seismic source volume will be equal to or less than the seismic source volume used for the underwater acoustic modelling (PS 1.6); and</li> <li>• implementing a 200 m shut-down zone for a whale shark sighting (PS 1.9).</li> </ul>	<p>the Conservation Advice for the Whale Shark (TSSC 2015).</p>
<p><b>4</b></p>	<p><b><i>There would be unacceptable impacts to blue whales due to the overlap of the seismic survey operational area with the pygmy blue whale distribution BIA.</i></b></p>	<p>CGG identified that the seismic survey operational area overlaps with the pygmy blue whale distribution BIA with potential for the seismic acquisition period to overlap with the commencement of the northbound migration of pygmy blue whales. CGG undertook an evaluation of the potential impact of anthropogenic noise from the seismic source on this species. The evaluation was informed by underwater acoustic modelling which determined effect ranges for low-frequency cetaceans such as the blue whale, relevant conservation actions that apply to the pressure of anthropogenic noise in the Conservation Management Plan (CMP) for the Blue Whale (CA 2015) and relevant peer reviewed scientific literature.</p>	<p>NOPSEMA recognises that there is the potential for the activity, if not appropriately managed, to have an unacceptable impact on pygmy blue whales should they be migrating through the region during the activity.</p> <p>In making a decision regarding this matter, NOPSEMA took into account EP content, NOPSEMA's Decision Making Guidelines (GL1721), the CMP for the Blue Whale (CA 2015) and relevant peer reviewed scientific literature.</p> <p>NOPSEMA recognises that the seismic survey operational area overlaps with the pygmy blue whale distribution BIA and that CGG has selected the timing of the activity to avoid overlap with the</p>



To demonstrate that the activity can be conducted in a manner that does not result in unacceptable impacts to pygmy blue whales and not inconsistent with relevant conservation actions that apply to the pressure of anthropogenic noise in the CMP for the Blue Whale (CA 2015), CGG has committed to ensuring that:

- seismic acquisition is undertaken in a manner that prevents injury or mortality to an individual listed marine fauna species protected under the EPBC Act from underwater noise emissions from the seismic source; and, allows any blue whale to utilise the area without injury and does not displace a blue whale from a foraging area (EPO 1.1); and
- seismic acquisition is undertaken in a manner that does not compromise the objectives of relevant recovery plans or wildlife conservation plans/advice that are in force for a marine fauna species (EPO 1.3).

To achieve the level of performance committed to by CGG, control measures have been adopted to ensure potential impacts of the activity to blue whales are managed to levels that are ALARP and acceptable including:

- implementing EPBC Act Policy Statement 2.1 Part A – Standard Management Measures such as pre-start-up visual observations, start-up delay procedures, soft-start procedures and operational shut-down procedures (PS 1.1);
- use of dedicated, adequately trained MFOs, with at least one experienced MFO on duty during daylight

southward migration period and reduce overlap with the northward migration period for pygmy blue whales. During the assessment, NOPSEMA required CGG to evaluate the need for additional and/or more effective control measures to account for uncertainties in the impact evaluation such as the predicted effect ranges for low-frequency cetaceans including the blue whale and the predicted presence of pygmy blue whales during the activity. In response, CGG committed to increasing the shut-down zone for pygmy blue whales from 500 m to 3 km and adopting adaptive management measures applicable to pygmy blue whales that include ceasing night time or low visibility seismic operations in the event of a pygmy blue whale (or potential pygmy blue whale) instigated shut-down until such time that there has been no pygmy blue whale (or potential pygmy blue whale) instigated shut-downs in the previous daylight period.

NOPSEMA is reasonably satisfied that with the proposed control measures in place, uncertainties in the impact and risk evaluation will be appropriately monitored and managed to ensure potential impacts to blue whales will be limited to short-term behavioural responses in isolated individuals, with no injury in the distribution BIA.

Given the above, NOPSEMA has concluded that the activity will be conducted in a manner that does not result in unacceptable impacts to pygmy blue whales and not inconsistent with relevant conservation actions that apply to the pressure of

	<p>hours when the seismic source is active, or during pre-start-up observations. (PS 1.2);</p> <ul style="list-style-type: none"> <li>• implementing EPBC Act Policy Statement 2.1 Part B.4 – Increased precaution zones and buffer zones including a 3 km shut-down zone for a pygmy blue whale (or potential pygmy blue whale) sighting (PS 1.3);</li> <li>• no discharge of the seismic source outside of the seismic operational area (PS 1.4);</li> <li>• developing and implementing a concurrent operations plan for any concurrent seismic surveys within 40 km of the area of seismic acquisition (PS 1.5);</li> <li>• seismic source volume will be equal to or less than the seismic source volume used for the underwater acoustic modelling (PS 1.6); and</li> <li>• implementing EPBC Act Policy Statement 2.1 Part B.6 – Adaptive Management Measures including ceasing night time or low visibility operations if there is a pygmy blue whale (or potential pygmy blue whale) instigated shut-down until such time that there has been no pygmy blue whale (or potential pygmy blue whale) instigated shut-downs in the previous daylight period (PS 1.8).</li> </ul>	<p>anthropogenic noise in the CMP for the Blue Whale (CA 2015).</p>
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## 5. References

CA. (2015). Conservation Management Plan for the Blue Whale. Commonwealth of Australia. Available at <https://www.awe.gov.au/sites/default/files/documents/blue-whale-conservation-management-plan.pdf>

DEWHA. (2008). EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales. Department of the Environment, Water, Heritage and the Arts. Available at <https://www.environment.gov.au/system/files/resources/8d928995-0694-414e-a082-0ea1fff62fc8/files/seismic-whales.pdf>

DEWHA. (2013). Matters of National Environmental Significance – Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment, Water, Heritage and the Arts. Available at [https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines\\_1.pdf](https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf)

Mark G. Meekan, Conrad W. Speed, Robert D. McCauley, Rebecca Fisher, Matthew J. Birt, Leanne M. Currey-Randall, Jayson M. Semmens, Stephen J. Newman, Katherine Cure, Marcus Stowar, Brigit Vaughan, Miles J. G. Parsons (2021). A large-scale experiment finds no evidence that a seismic survey impacts a demersal fish fauna. *Proceedings of the National Academy of Sciences* July 2021, 118 (30)

TSSC. (2015). Conservation Advice – *Rhincodon typus* (whale shark). Threatened Species Scientific Committee. Available at <http://www.environment.gov.au/biodiversity/threatened/species/pubs/66680-conservation-advice-01102015.pdf>