Prion 3D Marine Seismic Survey

1. Purpose of this report

NOPSEMA has accepted the Prion 3D Marine Seismic Survey Environment Plan (the EP) submitted by Beach Energy (Operations) Limited (the titleholder, hereafter 'Beach') for a seismic survey activity in the Bass basin. The Prion 3D MSS is scheduled to commence at any time between September 2021 and August 2023, with no acquisition over the January to April (inclusive) period to account for the foraging blue whale season and a total duration of 40 days (including 25 days of acquisition).

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. After this period, Beach took into account public comments and prepared a Report on Public Comment which is published on NOPSEMA's website (https://info.nopsema.gov.au/home/approved_projects_and_activities).

Following the public comment period, Beach submitted the EP for assessment by NOPSEMA on 22 February 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[1] on 9 September 2021.

This report explains how NOPSEMA took into account comments received from the public during the public comment period in making its decision[2]. In this report comments have been grouped into 'matters' and 'claims' that capture the key issues, concerns or new information provided during the public comment process. This report also contains other 'key matters' that may be of interest to the public identified by NOPSEMA during the assessment process.

This report accompanies the accepted Prion 3D Marine Seismic Survey EP, Revision 3 submitted by Beach, 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 Prion 3D Marine Seismic Survey EP;
- the information raised by relevant persons, government departments and agencies that is relevant to making a decision;
- the information raised through public comment that is relevant to making a decision;
- There were 20 public comment submissions received during the public comment period with issues raised predominantly in relation to the key matters outlined in the below report;

[1] Environment Regulations, Regulation 10A Criteria for acceptance of environment plan
[2] Environment Regulations, Regulation 11(3) Publication of notice, etc.

- 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.

2. Next steps

Responsibility for the ongoing environmental performance of the seismic survey activity remains, at all times, with Beach.

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 Prion 3D MSS.

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 public comments, the assessment and decision making process for the Prion 3D Marine Seismic Survey EP

Issues raised	Titleholder response after public comment	NOPSEMA's assessment and decision
(1) Whales and dolphins **Matter:** The seismic survey will result in injury or death to whales and dolphins. Recent strandings of pilot whales in Tasmania may have been related to a seismic survey. **Claims:** • The seismic survey will result in injury or death to whales and dolphins. • Sound pulses interrupt the navigation of marine mammals and increase the potential for whale beaching.	Beach is cognisant of the concerns regarding potential impacts to whales and dolphins from marine seismic surveys (MSS). The Australian oil and gas exploration industry has operated within well-defined guidelines for minimising such impacts for many years, and there have been no reported cases of injury or death to cetaceans from MSS in Australian waters. The stranding of 470 pilot whales in Macquarie Harbour in western Tasmania in late September 2020 was not related to MSS. There were no MSS occurring in western Bass Strait or the Southern Ocean at this time, and the nearest MSS (which occurred in eastern Bass Strait) occurred from January to July 2020. The underwater sound modelling results included in Section 7.1 of the EP outline the distances to effect for temporary threshold shift (TTS), permanent threshold shift (PTS) and behavioural effects based on Prion-specific survey parameters. The controls in place are designed to avoid or minimise impacts to cetaceans. Beach has undertaken a thorough assessment of the known migration, foraging, breeding and calving areas for cetaceans in the survey area and surrounding regions, and mapped these biologically important areas (BIA) in the EP. The evaluation of impacts to cetaceans has been supported by acoustic modelling using inputs from the Prion 3DMSS design and using the latest research results regarding acoustic thresholds for	NOPSEMA recognises the concern raised that there is potential for the noise generated from the seismic source to have an unacceptable impact to whales and dolphins if not managed appropriately. In making a decision regarding this matter, NOPSEMA took into account the content of the EP, NOPSEMA's Decision Making Guidelines (GL1721), the requirements of Policy Statement 2.1, the full text of relevant persons consultation in the sensitive information report relevant to whales and dolphins, and relevant scientific literature. NOPSEMA required Beach to revise their process for identifying species that may be impacted by the MSS to ensure that the impact evaluation considered the potential occurrence of all cetacean species that may occur within the operational area. This resulted in Beach undertaking a comprehensive risk assessment that evaluated the impacts and risks of underwater noise on marine mammal species that may occur within the operational area including humpback whales and minke whales. In relation to dolphins, NOPSEMA considered the results of acoustic propagation modelling and thresholds for auditory injury in dolphins (a mid-frequency cetacean)

• Recent mass stranding of pilot whales in Tasmania may have been related to a seismic survey. • Impacts to Humpback whales have not been appropriately evaluated. • There is no acknowledgment of the dwarf minke whale migration through Bass Strait and possible use as a feeding ground. • The EP does not adequately assess the risks of the survey to the dwarf minke whale.	cetaceans (divided into low frequency, mid-frequency and high frequency cetaceans). These acoustic modelling results are included in Section 7.1 of the EP and outline the distances to effect for temporary threshold shift (TTS), permanent threshold shift (PTS) and behavioural effects. Features of the survey design that avoid or minimise impacts to threatened cetaceans include: • The acquisition area has a very small overlap (0.61%) with the 'possible foraging area' BIA for pygmy blue whales (PBW) but is outside of the 'known' and 'high use' foraging BIAs. Applying the 9.1 km buffer to the acquisition area for the distance to behavioural effects increases this overlap to 1.56%. • The acquisition area has a very small overlap (0.4%) with the 'known core range' BIA for southern right whales (SRW), but there is little data to indicate this area is important for migration or foraging. Applying the 9.1 km buffer to the acquisition area for the distance to behavioural effects increases this overlap to 1.03%. • For SRW, the acquisition area is located: o 90 km southwest of a 'known migration area' BIA. o 40 km north of the 'connecting habitat' BIA along the northern Tasmanian coast and 76 km east of the same BIA along the King Island coastline. o 280 km southeast of the 'aggregation' BIA (calving and nursery ground) in southwest Victoria.	and concluded that injury thresholds are unlikely to be reached given their highly mobile nature and low likelihood of remaining within close proximity to the seismic source for extended periods. In relation to whales, NOPSEMA required Beach to provide a robust demonstration that impacts to whales would be reduced to acceptable levels and as low as reasonably practicable (ALARP) through the application of control measures including EPBC Policy Statement 2.1, a 2 km power down zone, the use of qualified and experienced MMOs and additional vessel-based observation platforms to improve the efficacy of visual observations. After taking into account the likely presence and behaviours of cetacean species within the operational area and all the environmental management commitments in the EP, NOPSEMA is reasonably satisfied that impacts to whales and dolphins will be limited to short term behavioural disturbance of a small number of transient individuals and that the activity will not cause unacceptable impacts. Conclusions in relation to the impacts on blue whales and southern right whale are provided in item 2 of this report.

	There is a low probability of overlap with humpback whale migration given their preference for migrating along the edge of the continental shelf in water depths of about 200 m. The acquisition area has a very small overlap (0.58%) of the humpback whale 'core range' BIA in southeast Australia. Applying the 9.1 km buffer to the acquisition area for the distance to behavioural effects increases this overlap to 1.48%. The controls adopted by Beach to avoid or minimise impacts to cetaceans include: • Implementing the EPBC Act Policy Statement 2.1 (Part A) – pre-start visual observations, soft start, start-up delay, stop work and night-time and low visibility procedures). • Implementing the EPBC Act Policy Statement 2.1 (Part B.1) – use of Marine Mammal Observers (MMOs). • Adaptive management for controls relating to whales depending on the time of year that the survey proceeds, involving increasing the precaution/observation zones and increasing soft start duration and using spotter vessels with MMOs if the survey takes place during February or March. Beach is confident that adopting these controls will reduce the impacts to cetaceans (e.g., death, injury or disruption to migration, foraging and feeding) to ALARP and an acceptable level. There is limited knowledge of minke whale (*Balaenoptera acutorostrata*) presence in Bass Strait, though it is listed as having the potential to occur in the survey area and EMBA in the EPBC Act PMST results (Section 5.4.5 of the EP). There is even less	

	knowledge of the dwarf minke whale (*Balaenoptera acutorostrata* unnamed subsp.) Beach was unaware of the Minke Whale Project, and thanks the submitter for bringing this to Beach's attention. Beach has since included information about this species, and its activities in Bass Strait, in the EP, as noted below. The dwarf minke whale is the smallest of the baleen whales and is an unnamed subspecies of the minke whale. Dwarf minke whales may grow to around 6-8 m in length and appear to primarily occupy costal habitats within tropical and warm temperate waters. This species has been poorly studied and limited life history data exists. They are considered generalist feeders and though little is known about their preferred prey species, it is assumed that krill are a potential food source. Dwarf pygmy whales are known to congregate on the Great Barrier Reef (GBR) during June and July with sightings recorded from March to September each year (though 90% of these occur during June and July). In these tropical locations, the species displays inherently inquisitive behaviour, which has led to the site becoming a tourist attraction with divers regularly encountering these whales underwater. During 2013 and 2014, satellite tracking of 14 dwarf minke whales was undertaken at the GBR aggregation site to further study and understand the movements of the group. All of the satellite tags successfully transmitted for periods of 15 to 72 days and demonstrated that all but one whale travelled generally southward through the GBR and down the east coast of Australia. Three of the tags transmitted long enough to leave Tasmania and continue on to the sub-Antarctic. In the 2013 study, two of the tagged whales transmitted from Bass Strait for more than 1.5 weeks while others	

	continued to the east coast of Tasmania. The 'residence' behaviour observed in the satellite tracking could indicate foraging behaviour in the areas east and south of King Island while on migration to southern Tasmania and the sub-Antarctic region. These satellite studies indicate that dwarf minke whales may be present (either foraging or migrating) in central Bass Strait some time in spring and summer. Minke whales are a low frequency cetacean and impacts to these species are already assessed in Section 7.1 of the EP. Beach is confident that the controls adopted for managing impacts to whales mean that there will be no injury or death to dwarf minke whales if they occur in or near the acquisition area at the time of the survey.	
(2) Blue whales and southern right whales **Key matter:** Without adequate management, there is potential for unacceptable impacts from underwater noise on blue whales and southern right whales in their respective biologically important areas (BIA).	Beach has undertaken a thorough assessment of the known migration areas, foraging, breeding and calving areas for cetaceans in the survey area and surrounding regions, and mapped these biologically important areas (BIA) in the EP. The evaluation of impacts to blue whales and southern right whales has been supported by acoustic modelling using inputs from the Prion 3DMSS design and using the latest research results regarding acoustic thresholds for low frequency cetaceans These acoustic modelling results are included in Section 7.1 of the EP and outline the distances to effect for temporary threshold shift (TTS), permanent threshold shift (PTS) and behavioural effects. Beach has committed to a seasonal exclusion of the survey between the months of January and April inclusive to minimise overlap with the blue whale foraging season. In addition, Beach has committed to a range of whale monitoring and management	NOPSEMA recognises that there is the potential for the activity, if not appropriately managed, to have an unacceptable impact to pygmy blue whales utilising the possible foraging biologically important area (BIA) and southern right whales migrating out of coastal calving and aggregation areas. In making a decision regarding this matter, NOPSEMA took into account the content of the EP, NOPSEMA's Decision Making Guidelines (GL1721), the Conservation Management Plan for the Blue Whale (DoE 2015), Conservation Management Plan for the Southern Right Whale (DSEWPC 2012), the full text of relevant persons consultation in the sensitive information report, and relevant scientific literature.

	response measures that will be implemented for the duration of the survey (EP, Appendix 10).	During the assessment, NOPSEMA required Beach to evaluate: the potential presence of blue whales within the foraging BIA, the potential for southern right whale cows and calves to be encountered migrating out of coastal aggregation areas, and cumulative exposure of whales to underwater noise from the activity. To adequately address underwater noise impacts, NOPSEMA required Beach to adopt a seasonal exclusion of the blue whale foraging period and to adopt substantial mitigation measures in addition to EPBC PS2.1 standard controls including: • Additional observation platforms (both aerial and vessel based) to detect whales and undertake noise management responses at greater distances from the seismic vessel. • The use of experienced and qualified marine mammal observers (MMOs) to effectively implement management measures. • A pre-survey aerial survey of the ensonified zone prior to commencing the survey to inform management. • Conservative pre-start watch and soft start commencement procedures. • Prohibition of seismic acquisition at night or low visibility conditions if there has been one or more

		blue or southern right whale observed in the preceding four hours of good visibility. • Air gun shutdowns for a minimum of four hours upon sighting of a blue or southern right whale regardless of distance from the vessel. • Adaptive mitigation to detect early arrival of blue whales including temporarily ceasing the survey until such as time as aerial surveys can confirm there are no blue whales in the area upon sighting two or more blue (or unidentified) whales (Appendix 10). However, NOPSEMA noted that the EP required two or more positive blue whale identifications before triggering the deployment of spotter aircraft to inform ongoing management of the activity and considered that this did not provide a suitably precautionary approach because: • There is a risk that reliance on a confirmation of species identification may delay or preclude an appropriate management response for unidentified baleen whales; and • To obtain a positive identification of a blue whale, the EP allowed for the support and/or chase vessel to be deployed to confirm whale identification thereby presenting the risk that underwater noise from support/chase vessels may cause additional disturbance and displacement of foraging blue whale(s).

		To address this matter NOPSEMA decided to accept the EP subject to conditions to ensure that: • During implementation of the whale management procedures, if two or more whales (blue or unidentified) are sighted: - airguns will be immediately shutdown and - spotter aircraft with suitably qualified marine mammal observers will be deployed to undertake observations to inform a timely and effective adaptive management response. • Any support or chase vessel that is operating in connection with the Prion 3D MSS activity is not permitted to intentionally approach a whale for any purpose, including species identification. Taking into account the mitigation measures described in the EP and the conditions imposed on the acceptance of the EP, NOPSEMA is reasonably satisfied that the activity will not be inconsistent with relevant recovery plans and will not result in unacceptable impacts to blue whales or southern right whales.
(3) Ongoing consultation with relevant persons **Key Matter:** The EP does not provide for appropriate ongoing consultation with relevant	The EP sets out the titleholder's provisions for ongoing consultation in Section 4.8. This section of the EP explains that, subject to COVID-19 initiated travel restrictions, Beach will also endeavour to consult in further face-to-face meetings with key stakeholders in Tasmania once the EP is accepted and timing for the Prion 3DMSS is confirmed. If face-to-face meetings are not	NOPSEMA was of the view that it was not clear from the content of the EP that relevant persons who may undertake concurrent activities on the water, within the area that may be affected by the activity, will be engaged and notified prior to and during the activity so that appropriate arrangements can be put in place for simultaneous operations (e.g., recreational and

persons including those utilising the waters of the survey area and may be yet to be identified.	possible due to border closures, these meetings will be conducted remotely. The EP also states that Beach has established an arrangement with SETFIA for them to issue SMS messages to their members before, during and after the survey completion. Beach has also established effective and routine engagement with IMAS, Curtin University, FRDC, BSSIA, AFMA and DPIPWE in relation to the Prion 3DMSS.	commercial activities). It was also not evident in the EP that remote methods of engagement would be employed to conduct consultation with all relevant persons (e.g. those already on the stakeholder register located outside Tasmania, or new relevant persons who continue to be identified) that need to be directly engaged, if Covid-19 restrictions prevent face to face engagement. To address this matter NOPSEMA has decided that acceptance of the EP is subject to a condition requires an ongoing consultation process to be in place and applies prior to, during and, where appropriate, following the activity so that: • all relevant persons, particularly those undertaking marine use activities continue to be identified, included on the relevant stakeholder registers and are provided sufficient information; and • impacts and risks to other marine users continue to be identified and managed to as low as reasonably practicable (ALARP) and acceptable levels.
(4) Commercial scallops **Matter:** Underwater sound impacts on commercial scallops	Beach has undertaken detailed consultation with the commercial fisheries associations that have raised this issue with Beach prior to the public exhibition of the EP, and this consultation continues. A detailed assessment of the known impact of seismic sound on commercial scallops (using Australian research) is presented in Section 7.1 ('Impacts to Molluscs') of the EP. In summary, it indicates that impacts to scallops are minor because:	NOPSEMA recognises the concern from commercial scallop fishing stakeholders that the Prion 3DMSS could impact on their functions, activities and interests through impacts to scallops, if not managed appropriately. In making a decision regarding this matter, NOPSEMA took into account the content of the EP (including activity-specific acoustic modelling undertaken for

Claims: • Prion 3DMSS will result in long-term, unknown and un-quantifiable impacts on commercial scallops (*Pecten fumatus*) populations in the region, with evidence indicating increased mortality. • The thresholds used to assess impacts to scallops are misleading and that fishing stocks will be lost.	• The scientific literature (e.g., Harrington *et al*., 2010; Przeslawski *et al*., 2016a;b; Day *et al*., 2016) indicates that MSS does not result in immediate mass mortality, and that there are no short- or long-term changes in measured responses to sound, but that low levels of mortality may occur, along with impaired reflexes. Measured mortality rates in some experiments are within the ranges of natural mortality rates. • In the context of the wide availability of suitable habitat for scallops in Bass Strait (sandy sediments) and the bioregion in general, the potential impacts of the MSS are considered insignificant. • Using the particle motion threshold (the most relevant metric given that scallops are attached to the seabed), physiological impacts to commercial scallops (in the form of increased stress levels and therefore a low risk of mortality in the long-term, but no mass mortality) are restricted to a distance of no greater than 8 m from each seismic impulse location at the seabed. This represents 8% of the acquisition area. • Only the southern half of the acquisition area contains sediments suitable for commercial scallops. As such, impacts are restricted to this area. With regards to the commercial scallop fishery, impacts are considered minor because: • The northern part of the survey area is not important to the fishery as it comprises mostly muddy sediments that are not suitable for scallop settlement.	assessing marine fauna sound exposures), NOPSEMA's Decision Making Guidelines (GL1721), the full text of relevant persons consultation in the sensitive information report, and relevant scientific literature. During the course of the assessment, NOPSEMA required Beach to define appropriate acceptable levels of impact to commercial fisheries using measurable and clearly defined terminology. To ensure that any impacts to scallops would be at or below these acceptable levels of impact, NOPSEMA required that Beach conduct a robust assessment of the potential impacts to the sustainability of commercial scallop stocks from the proposed Prion 3DMSS. In response, Beach revised both the defined acceptable levels of impact and the associated environmental performance outcomes for scallops and the scallop fishery. Beach considered and incorporated new information that became available during the assessment period, including the identification of a new scallop bed (KI-10) during the 2021 BSCZSF survey (Koopman et al. 2021). Although there is 0.038 km^2 overlap between KI-10 and the acquisition area, the location of the proposed sail lines means there will be no seismic acquisition directly over KI-10, and the adopted 8 m particle motion potential impact threshold for scallops will not overlap with the bed. Beach has made a management commitment to ensure the KI-10 bed is excised from the survey.

	• There is likely to be negligible impact to current scallop fishing grounds because there is little overlap between fished scallop beds and the acquisition area. Where scallops occur, physiological effects may be experienced at the individual level, but research indicates that mass mortality at the population level will not occur. • Based on the 8 m distance to no effect for commercial scallops (based on survey-specific acoustic modelling) and mapped fishing intensity of commercial scallops for recent years, there will be no impacts to known beds of commercial scallops or historically fished areas. - The proposed acquisition area overlaps a very small proportion of the Bass Strait Central Zone Scallop Fishery (BSCZSF) (0.59%). - Using SETFIA's catch figures of an average of 9.3 t of scallops caught from the survey area for each of the last 10 years (2009-2018) represents 0.31% of the BSCZSF catch of 2,931 t in 2019 and 0.28% of the catch of 3,253 t in 2018. Assuming there was complete mortality of scallops in the acquisition area (which the literature does not support), this does not place the sustainability of the fishery at risk. - The 8 m distance to no effect is calculated to cover 8% of the acquisition area. - The 8 m distance to no effect is based on assuming the scallops are 50 cm off the seabed (rather than in/on the seabed). This modelling methodology is conservative because when the receiver (i.e., the scallop) is closer to the	In addition, Beach is committed to the principle that a fisher should not incur an economic loss as a direct result of a Beach project and make their Fair Ocean Access procedure available to any fisher so that they are able to make a claim for losses. The information sheet provided in Appendix 11 of the EP provides a summary describing features of the full Fair Ocean Access procedure and includes a process for affected fishers to claim compensation for any proven economic loss caused by the Prion 3DMSS. The Fair Ocean Access procedure includes steps for appointing an independent expert to resolve matters if a fisher and Beach cannot agree on a claim. Taking into consideration the relatively short acquisition period (~25 days), limited overlap with scallop fishing effort and recognised scallop beds, available peer-reviewed literature, the excision of potential scallop beds in the 50–55 m depth range and KI-10 bed, and compensation commitments, NOPSEMA is satisfied that the potential impacts to scallops will be limited to a small portion of the greater population and will not constitute an unacceptable impact to the sustainability of commercial scallop stocks.

	seafloor, the expected waterborne particle acceleration would be lower. - Based on the 8 m distance to no effect, the areas of most intense scallop fishing in recent years will not be affected by particle motion. Using the most recent 2019 scallop fishing intensity mapping (which are the closest fishing grounds to the acquisition area compared to previous years), the acquisition area is located: • 1.1 km (0.7 nm) from the 'low' level fishing intensity; • 5.5 km (3.0 nm) from the 'medium' level fishing intensity; and • 9 km (4.9 nm) from the 'high' level fishing intensity. • One of the scallop fishers working in the area requested that Beach avoids undertaking the survey over the 'KI-BDSE' (King Island-Blue Dot South East) and 'blue dot' juvenile scallop beds and that adequate buffer is maintained around them. The distances between these nominated scallop beds and the acquisition area means there will be no effects to scallops. The acquisition area is located: - 4.3 km east of 'KI-BDSE'; and - 20 km southeast of 'Blue dot.' • The scallop fisheries representatives advised Beach that the key area for scallop fishing is the 50-55 m depth range. In response to this information, Beach revised the acquisition area to completely excise this water depth range to minimise impacts. The 3.7 nm distance of ramp-up sound required to	

	take place within the operational area (to meet EPBC Policy Statement 2.1 with regard to minimising impacts to whales) also does not intersect this depth range. The former shape of the acquisition area overlapped 1% of this depth range. • There may be some impact to scallop spawning if the survey proceeds during the preferred window of October to December (with peak scallop spawning occurring in November and December according to one fishery stakeholder). However, as per the impact assessment for plankton (scallop spawn belong in this category), mortality or injury is only likely within several meters of the sound source. If the survey timing does overlap with scallop spawning and the six-week period in which the larvae drift in the planktonic phase, the larvae may be subject to mortal injury or mortality if they are present close to the seismic source. Mass mortality of scallop larvae is not credible given the very low likelihood of all of a given scallop population's larvae being concentrated in the survey area and specifically within 223 m of the seismic pulse (the modelled distance to mortality/potential mortality). In order to address uncertainties about the effects of the survey on scallops and the fishery, Beach is proposing to undertake the following studies: • A pre-MSS scallop dredge (with the dredge designed by Fishwell Consulting) to determine the abundance and condition of scallops in the proposed acquisition area. This will determine whether the southern part of the acquisition area represents a stock recruitment area for the fishing grounds to the west or future productive fishing grounds.	

	• Underwater sound and particle motion validation to determine the accuracy of the acoustic modelling predictions (to allay concerns expressed by scallop fishers about the acoustic modelling results. • A physiological scallop impact research study to be carried out by Institute of Marine and Antarctic Science (IMAS) in accordance with an approved research application to FRDC, co-founded by Beach, (for which the application is currently under development). More information about this process is discussed in Section 8.11.1 of the EP. Beach continues to discuss plans for these studies with the Tasmanian fishing industry associations and keep them involved in survey designs. Results from these studies will be shared with these stakeholders.	
(5) Commercial octopus **Matter:** Mortal effects of seismic surveys on octopus **Claim:** The loss of octopus as a result of the survey would affect 20 people who rely on this fishery for their livelihood.	Beach is cognisant of the one family-owned octopus fishery that fishes in and around the proposed Prion 3DMSS area and has consulted extensively with this family. Beach's analysis of the commercial octopus fishery indicates that the survey area overlaps 1.23% of the fishery and that catch from the survey area in 2018/19 was between 3–12 tonnes in the northern two-thirds of the acquisition area and >20 tonnes in the southern third (noting that the reporting grids extend beyond the acquisition area). Consultation with the fishery indicates that water depths of 30–50 m are the most prolific and occur in the southern third of the survey area where there is shelly-gravelly substrate preferred by octopus. Beach has met with this stakeholder to develop a	NOPSEMA recognises the importance of productive octopus fishing grounds that overlap with the Prion 3DMSS acquisition area. In making a decision regarding this matter, NOPSEMA took into account the content of the EP (including activity-specific acoustic modelling undertaken for assessing marine fauna sound exposures), NOPSEMA's Decision Making Guidelines (GL1721), the full text of relevant person consultation in the sensitive information report, and relevant scientific literature. During the course of the assessment, NOPSEMA required Beach to define appropriate acceptable levels of impact

	mitigation plan to ensure no economic loss due to the Prion 3DMSS.	to commercial fisheries using measurable and clearly defined terminology. To ensure that any impacts to octopus would be at or below these acceptable levels of impact, NOPSEMA required that Beach conduct a robust assessment of the potential impacts from the Prion 3DMSS to all life stages of octopus using appropriate literature-supported sound thresholds. In response, Beach revised both the defined acceptable levels of impact and the associated environmental performance outcomes for octopus and the octopus fishery, and provided a suitable evaluation that includes a commitment to apply the Fair Ocean Access procedure for affected fishers to claim compensation for any proven economic loss caused by the Prion 3DMSS (also refer to Item 4). In addition, Beach is aware of research currently underway on the effect of MSS on octopus in eastern Gippsland (FRDC Project Number 2019-051) and is committed to reviewing the study results once they are publicly released and will revise the EP to take account of these results as necessary. Taking into consideration the relatively short acquisition period (~25 days), the extensive suitable octopus habitat and high catch rates outside of the acquisition area, the evidence based predictions that impacts to cephalopods will be behavioural only and the commercial fisheries compensation plan (Fair Ocean Access procedure), NOPSEMA is satisfied that the potential impact to

		octopus and the octopus fishery will be of an acceptable level.
(6) Principles of ESD **Matter:** Mitigation measures need to be assessed in the context of the principles of ecological sustainable development (ESD) particularly the precautionary principle **Claim:** The EP will not meet the acceptance criteria if the EP fails to mitigate impacts and risks in accordance with the precautionary principle.	The process for evaluating each impact and risk considered the activity in the context of the principles of ESD (section 7).	In making a decision, NOPSEMA took into account the content of the EP, the principles of ESD, NOPSEMA's Decision Making Guidelines (GL1721), the full text of relevant person consultation including correspondence from relevant persons (contained in the sensitive information part of the EP). NOPSEMA considered that the activity can be managed consistent with the principles of ESD because: • Beach's consideration and response to public comments, consultation with relevant persons and the evaluation of the socio-economic, cultural and ecological features of the environment that may be affected by the activity provide confidence that the impacts of the activity will be managed to ALARP and acceptable levels. • To address scientific uncertainty a precautionary approach to the management of impacts on commercial fisheries and cetaceans has been undertaken. This includes a study into the impacts of scallops to inform the application of the Fair Ocean Access procedure (refer to Items 4 & 5) • Management controls and conditions imposed by NOPSEMA on the activity provide appropriate levels of protection to biodiversity and socio-economic

		values consistent with biodiversity and intergenerational equity principles of ESD.
(7) Oil spills **Matter:** Impacts from an oil spills will risk livelihoods, coastal lifestyles, and fishing industries. **Claims:** • An oil spill during the survey will put livelihoods and coastal lifestyles and fishing industries at risk in a far-reaching area of southeast Australia • There is a high risk of a diesel spill during the survey and that this would pollute large parts of Bass Strait and be detrimental to marine life.	Marine seismic surveys occur regularly around Australia, including Bass Strait. There have been no known large-scale diesel spills resulting from these surveys. The risk of a diesel spill during the survey is extremely low. Section 3.5.1 of the EP describes Beach's vessel selection procedure, which aims to ensure only vessel contractors with the highest operating standards are chosen (thereby minimising the risk of a diesel spill). Beach commissioned diesel spill modelling to understand the risks associated with a diesel spill that may originate within the survey area. These results (based on the most credible but worst-case spill scenario), and the associated risk assessment, are included in Section 7.13 of the EP. In brief, these results indicate that the: • Maximum probability of shoreline contact is 3%. • The maximum probability of shoreline contact to islands within Bass Strait is 1% (at the 10 g/m2 threshold), 1% (at the 100 g/m2 threshold) and 0% (at the 1,000 g/m2 threshold). • Minimum time to shore is 25 hours (1 day). • Maximum volume of hydrocarbons ashore of 3.5 m^3. The Environmental that May Be Affected (EMBA) by the spill scenario is the amalgamation of 200 randomly timed spills (to take into account various wind and water currents), not a single spill. Maps showing the extent of a single worst-case spill for diesel on	NOPSEMA recognises that, like all commercial shipping activity, vessel-based seismic surveys present an oil spill risk. In making a decision regarding this matter, NOPSEMA took into account the content of the EP relevant to oil pollution risk assessment and management for the activity, NOPSEMA's Decision Making Guidelines (GL1721) and Oil Pollution risk management guidance note (GN1488). During the course of the assessment, NOPSEMA required Beach to clarify its testing of oil spill response arrangements and oil spill environmental monitoring. With Beach having responded to NOPSEMA's requests for clarification, the EP includes an oil spill risk assessment and an Oil Pollution Emergency Plan (OPEP) tailored to the risk presented by the activity, as well as other measures including for vessel selection. When considered together, these measures provide a basis for NOPSEMA to be reasonably satisfied that oil spill risk will be appropriately managed.

	the sea surface (Figure 7.13) and diesel on the shoreline (Figure 7.15) clearly indicate that very small areas are at risk and not all of southeast Australia. Table 7.70 of the EP presents the residual risk ratings (after controls are applied) for each of the key receptors at risk during a diesel spill, noting that these risks are 'low' for each receptor.	
(8) Southern rock lobster and fish larvae **Matter:** The seismic survey will result in unacceptable impacts to southern rock lobster larvae. **Claim:** The Prion 3DMSS should not be allowed to proceed until more scientific evidence is available regarding the impacts of seismic surveys on southern rock lobster and fish larvae.	Beach assessed the potential impacts of the Prion 3DMSS on crustacean larvae (including southern rock lobster). The EP also includes results from the only known study on the impacts of seismic surveys on early-stage embryonic (entirely soft tissue) southern rock lobsters. This assessment was supported by a comprehensive review of scientific literature and informed with the outputs of underwater acoustic modelling. Acoustic modelling applied the seafloor PK-PK threshold of 202 dB as the level of particle motion from sound that could cause an impact to crustaceans. Particle motion is considered to be the most appropriate metric to use as opposed to sound pressure level as it is this element of sound that crustaceans are most sensitive to. The distance from the source to this level varied between 650 m and 761 m depending on water depth. Beach's assessment concludes that impacts to the larvae of southern rock lobster are localised, temporary and managed to a level that does not create an unacceptable impact on future recruitment and catch rates productivity because: • Of the small overlap with the southern rock lobster fishery (0.90%) and the absence of suitable rock lobster habitat (rocky reef) in the survey area;	NOPSEMA recognises the matter raised in relation to the potential for unacceptable impacts on southern rock lobster and fish larvae from the Prion seismic survey if it's not managed appropriately. In making a decision regarding this matter, NOPSEMA took into account the content of the EP, NOPSEMA's Decision Making Guidelines (GL1721) and relevant scientific literature. The EP includes an evaluation of the impacts to zooplankton (including fish larvae and eggs) using available peer-reviewed literature and concludes that impacts to plankton, fish eggs and larvae will be minor when compared to natural mortality rates given the hydrodynamics of Bass Strait are conducive to continual mixing and replenishment. In relation to southern rock lobster, the EP concludes that larval release occurs over wide spatial scales, and larval release across the continental shelf allows for mixing and dispersal due to the high currents of southern Australian waters. This wide dispersal means very little of a given cohort's larval phase is likely to occur within the

	• Research conducted to date does not indicate mortality of exposed adult crustaceans (meaning that breeding success may not be affected); and The acoustic modelling undertaken for plankton indicates that crustacean in the drifting planktonic phase are not likely to be impacted by the seismic pulses unless within 210 m of the sound source.	zone of effect around the airguns and therefore is likely to constitute a minor proportion of the widely dispersed crustacean larvae. Given the above, NOPSEMA is reasonably satisfied that the impacts underwater noise to larval stages of fish and southern rock lobster will not be unacceptable
(9) Australian marine parks **Matter:** Seismic surveys in Australian Marine Parks **Claims:** • The survey occurs in the Boags Australian Marine Park (AMP), which is designed to protect and preserve significant marine environments and should not be open to resource exploration or extraction. • The Prion 3DMSS should not be	Figure 3.1 in the EP illustrates that only the operational area overlaps a small portion of the Boags AMP (15 km2 of the park's 537 km2, a 2.8% overlap). No seismic acquisition occurs in the operational area – it allows for vessel turns and soft-starts. As noted in the South-east Commonwealth Marine Reserves Network – Management Plan 2013-2013 (Director of National Parks, 2013), the Boags AMP is classed entirely as a Multiple Use Zone. This classification means that activities that do not significantly impact on benthic habitats are permitted. 'Mining' (under which petroleum exploration falls) is a permitted activity in the Boags AMP Multiple Use Zone. An assessment of underwater sound impacts to the Boags AMP was undertaken and is presented in the EP and concludes that seismic sound will not reach the behavioural, TTS or PTS thresholds within the park for any of the fauna groups examined in the EP. The primary objective of IUCN Category VI (being the category of relevance to the multiple use zone of the Boags AMP) is: To protect natural ecosystems and use natural resources sustainably when conservation and sustainable use can be mutually beneficial.	NOPSEMA recognises the matter raised in relation to seismic surveys in Australian marine parks. In making a decision regarding this matter, NOPSEMA took into account relevant content of the EP, NOPSEMA's Decision Making Guidelines (GL1721), NOPSEMA's Petroleum activities and Australian marine parks guidance note (GN1785), the South-East Commonwealth Marine Reserves Network Management Plan (2013-23), the relevant Director of National Parks Class Approval – Mining and relevant person consultation in the sensitive information report. There will be no seismic data acquisition in the Boags Marine Park (Multiple Use, IUCN Category VI) and although the operational area overlaps a small area of the park, there are no planned vessel operations in the park. Considering this in the context of the Director of National Parks Mining Class Approval, it is considered that the EP is not inconsistent with the South-East Commonwealth Marine Reserves Network Management Plan (2013-23).

permitted to occur within the Boags AMP	• Because sound levels from the proposed Prion 3DMSS are not predicted to reach thresholds for behavioural effects, TTS or PTS for any marine species within the Boags AMP (either in the water column or at the seabed), the survey is not inconsistent with the primary objective and is therefore considered acceptable.	
(10) Seabirds **Matter:** Impacts of vessel lighting on seabirds **Claims:** • Some seabirds are vulnerable to the impacts from vessel lighting and indirect impacts of potential temporary loss of access to fish. • The description of some seabirds and conclusions regarding the impacts of lighting and indirect impacts regarding access to prey are inadequate.	Beach has reviewed the descriptions of seabirds and associated impact assessment with regard to underwater sound and vessel lighting. As a result of this review, additional information has been included in the EP for the shy albatross (*Thalassarcha cauta*) given that it breeds on Albatross Island, which is 56 km southwest of the acquisition area. With regards to artificial light, Beach has reviewed the existing controls and believes that they remain relevant given that lighting from the survey vessel will be minimal (it does not have a large open deck like construction and support vessels do), it will be a short-term activity, it will be constantly moving and is distant from seabird rookeries. The controls for lighting are: • Managing external lighting in accordance with AMSA Marine Orders Part 30 (Prevention of Collision) and Part 59 (Offshore Support Vessel Operations). • Lighting is directed to working areas (rather than overboard) to minimise light spill to the ocean. • Lighting directed overboard can be manually over-ridden such that it is only switched on as required. • Blinds will be lowered on all portholes and windows at night.	NOPSEMA recognises the potential for offshore lighting to impact seabirds. In making a decision regarding this matter, NOPSEMA took into account content of the EP, NOPSEMA's Decision Making Guidelines (GL1721), EP content, relevant plans of management for listed threatened and migratory species and resources published on the DAWE website and relevant person consultation in the sensitive information part of the EP. During the assessment, NOPSEMA required Beach to address claims and objections raised in relevant persons consultation regarding light impacts on marine birds, including how regard was given to National Light Pollution Guidelines and recovery plans for listed threatened birds in environmental impact assessment, and more compressively set out proposed control measures and their levels of performance. Beach evaluated potential impacts of activity lighting on fish and plankton, and seabirds in the context of relevant environmental and EPBC Act policy settings. It also evaluated a suite of control measures aimed at eliminating and reducing artificial lighting, taking into

	In response to the claim, Beach has added that helideck lights will be switched off unless anticipating the arrival of a helicopter. These control measures are aligned with seabird management actions listed in the National Light Pollution Guidelines for Wildlife (DoEE, 2020). Many of the measures listed in these guidelines for reducing impacts to seabirds are not considered necessary for the reasons listed above. The impacts of underwater sound on seabirds is addressed in Section 7.1 ('Impacts to Avifauna') of the EP and Beach considers that no changes are necessary in this section.	account the proposed 24-hour operations and maritime safety requirements. As a result of this evaluation Beach has committed to adopting a range of controls to minimise artificial lighting monitoring the survey vessel on a daily basis for grounded birds and taking steps in consultation with a relevant subject matter expert to address bird grounding should such an event occur. Taking into account the nature and scale and environmental setting for the activity, Beach's impact evaluation and control measures adopted, NOPSEMA is reasonably satisfied that the suite of control measures adopted when considered together will reduce impacts of artificial lighting to as low as reasonably practicable (ALARP) and an acceptable level.
(11) Opposition to oil and gas exploration **Matter:** Exploration for oil and gas should cease in preference for creating more renewable energy sources. **Claim:** That the Prion 3DMSS should not be allowed to proceed because it would result in unnecessary greenhouse gas emissions	In accordance with Section 4 of NOPSEMA's Guidance Note Responding to public comment on Environment Plans, because these comments do not specifically relate to the EP, they are not considered relevant and therefore are not considered further here or in the EP.	NOPSEMA notes that the Prion MSS is an exploration activity authorised by an access authority title issued by NOPTA. The concern presented relates primarily to the potential yet uncertain future exploitation of petroleum resources at the activity location which would require subsequent project proposals and development activities. NOPSEMA does not have a government policy role and does not advocate for exploitation of oil and gas resources or the development of renewable energy sources. These are policy matters for the Australian Government.

if discovered fields were developed.		NOPSEMA also notes that the title issued to Beach does not confer rights to produce petroleum. Issue of relevant titles to support further exploration and/or project development is subject to separate approvals. Evaluations of environmental impacts and risks associated with offshore projects are also considered separately through future approvals should Beach decide to progress future exploration and/or project development.
(12) Gas supply and export **Matter:** Opposition to gas supply and export **Claims:** • Australia doesn't need to boost gas supplies to lower gas prices to industry. It just needs to reserve a portion of gas already being produced for domestic use. • No company, or industry sector, has the right to unfettered	The EP is submitted with regard to a marine seismic survey. This is several steps before that required to reach a decision on whether to develop a gas field. In the event gas in a commercial quantity is found, it would be likely to tie into Beach's existing Yolla gas production platform or pipeline (22 km east of the Prion acquisition area), which connects to the Lang Lang Gas Plant that supplies gas to the domestic market.	NOPSEMA does not have a government policy role and does not advocate for exploration or production activity of the offshore petroleum industry, or Australia's energy or export needs. These are policy matters for the Australian Government. Decisions about whether petroleum exploration should be allowed to proceed on the basis of potential gas export is not a feature of the Environment Regulations, under which NOPSEMA is required to make decisions. NOPSEMA recognises that some parts of the community hold strong views about whether exploration for oil and gas should occur in certain areas and acknowledges that members of the community have a right to freely express and promote opinions regarding petroleum activities and have their views considered. The regulatory processes administered by NOPSEMA are expert and independent from other processes. NOPSEMA cannot take into account factors that are not relevant to assessing the specific activity proposed in an

export of Australia's natural resources. • Prion 3DMSS should not proceed as it is likely to lead to gas exports.		environment plan such as whether particular areas are made available for exploration or whether a title is issued.
(13) Senate Inquiry **Matter:** Senate Inquiry regarding the Impact of seismic testing on fisheries and the marine environment. **Claims:** • Seismic surveys should not be allowed to proceed until the Senate Inquiry regarding the Impact of seismic testing on fisheries and the marine environment is complete and a report is released. • Prion 3DMSS should not be allowed to proceed until the	The Senate Inquiry on the Impact of seismic testing on fisheries and the marine environment is independent of the NOPSEMA assessment and approvals process for MSS EPs. For example, the Senate Inquiry commenced on 16 September 2019 and since that time, at least eight MSS EPs have been accepted by NOPSEMA (noting that some of those assessments began prior to the Senate Inquiry commencing). Beach is following the EP submission process specified in the OPGGS (Environment) Regulations 2009.	NOPSEMA is required to make decisions in accordance with the relevant legislation and notes that the Senate Inquiry on the Impact of seismic testing on fisheries is independent of the NOPSEMA's assessment and approvals process for EPs.

Senate Inquiry has reached its conclusion.		
(14) Public comment period **Matter:** Public comment period over the Christmas and new year holiday period. **Claims:** • The timing of public exhibition over the Christmas and new year holiday period was inappropriate. • One claim was made that timing of public exhibition should be extended beyond the 17th of January 2021.	Beach understands that the timing of EP exhibition was not ideal with regards to the holiday period. This timing was not a deliberate act to minimise the time in which the public were able to provide comments. The approvals process is a lengthy one that must allow for a number of steps, including: • Sufficient time for pre-submission stakeholder engagement; • EP preparation; • Public exhibition of the EP; • Addressing comments from public exhibition; • Formal submission to NOPSEMA and assessment; and • Likely re-submissions to address assessment comments from NOPSEMA. The length of the approvals process meant that the public exhibition period for the EP necessarily occurred over the holiday period. It is important to note that 'relevant persons' as defined under the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations (OPGGS(E)) has taken place since early 2020. Despite this, on the 8th of January 2021, Beach extended the exhibition period another four weeks (for a total exhibition period	Beach recognised that the timing of the EP public comment period coincided with the Christmas holiday period and responded to this by requesting a repeat public comment period to enable members of the public sufficient opportunity to make a submission. There were two public comment periods on request of Beach within which 20 public comment submissions were received. These were: • 18-12/20-18/01/2021; and • 08/01/2021-08/02/2021. Public comments have been considered by Beach and by NOPSEMA in making a decision on this EP and NOPSEMA notes that a number of public comment submissions were made by persons or organisations that are 'relevant persons' as defined by the Environment Regulations. During the course of the assessment process, NOPSEMA identified that a number of these relevant persons had not received sufficient information and/or the merits of their claims or objections were not appropriately assessed by Beach. NOPSEMA required Beach to more fully address claims, objections and other matters raised by relevant persons and /or members of the public. In response to this, Beach undertook further targeted consultation with relevant persons and provided a more

	of 7 weeks). This resulted in another five submissions (on top of the 13 received up until the 8th of January).	comprehensive assessment of the merits of claims and objections, including the practicability of committing to additional or more protective control measures in response to matters raised during the public comment period or relevant person consultation process. Given the above, NOPSEMA is satisfied that the public comment process was appropriately implemented and that appropriate relevant persons consultation was undertaken during the preparation of the Prion 3D MSS EP.
(15) King Island reputational risk **Matter:** Tasmania's and King Island's 'clean and green' reputation is at risk. **Claim:** • the Prion 3DMSS will damage King Island's 'clean and green' reputation and tourism credentials.	Beach is cognisant of the marketability of King Island's 'clean and green' image, given the low human population in the region and relative absence of polluting industries. Numerous 2D and 3D MSS have occurred around King Island, which have not damaged this image in the past. Beach believes that the design of the Prion 3DMSS and the controls that will be adopted for the survey will not result in any damage to King Island's 'clean and green' reputation. Without the supply of fuels for transit of goods and people from King Island, it would be difficult for the development of the iconic King Island brand renowned for its agricultural and fishing produce	NOPSEMA recognises that there was concern from relevant persons, particularly residents of King Island, that the activity could impact on their functions, activities and interests. In making a decision regarding this matter, NOPSEMA took into account EP content, including impact evaluation and maps showing the proximity of the activity to King Island, the Beach's consultation process, including records of relevant persons consultation in the sensitive information part of the EP. NOPSEMA noted that Beach met with the King Island Mayor and Councillors regarding the Prion Survey and that specific concerns about the potential impact of the Prion MSS on the King Island brand were not raised. As seismic surveys are exploratory activities, their results in terms of data about potential hydrocarbon-bearing geology are not certain before activities commence. Results of seismic surveys are among the factors

		considered by titleholders in deciding whether or not further petroleum activity in an area may be planned. Accordingly, there remains uncertainty as to whether the area of the Prion MSS may be the subject of future petroleum exploration drilling or development activity EPs.
(16) Phytoplankton **Key matter:** The effects of underwater noise on phytoplankton population will be unacceptable. **Claim:** That underwater noise from the survey will impact on phytoplankton and affect the entire ecosystem.	The EP has evaluated the impacts of underwater noise on zooplankton through has not specifically evaluated the effects of underwater noise on phytoplankton.	NOPSEMA notes the concern raised however has concluded that there is no credible impact pathway for underwater noise to affect the diversity or abundance of phytoplankton in the water column. Matters that relate to the potential impacts on zooplankton are addressed in Item 8.

5. Relevant references

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