Beach Energy Ltd ('Beach') Prion 3D Marine Seismic Survey Environment Plan – titleholder response

This titleholder response has been prepared in accordance with NOPSEMA's Guidance Note *Responding to public comment on environment plans* (N-04750-GN1847, A662607, September 2020) using the template provided by NOPSEMA document N-04750-FM1846.

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1Exploration for oil and gas should cease in preference for creating more renewable energy sources.Three claims were made that the Prion 3DMSS should not be allowed to proceed because it would in unnecessary greenhouse gas emissions if discovered fields were developed.	In accordance with Section 4 of NOPSEMA's <i>Guidance Note Responding</i> <i>to public comment on Environment Plans</i> , 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.
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.Two claims were made that the Prion 3DMSS will injure or kill dolphins and whales.	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 is 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.

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	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 cetaceans has been supported by acoustic modelling using inputs from the Prion 3DMSS design and using the latest research results regarding acoustic thresholds for 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
	 Increases this overlap to 1.03%. For SRW, the acquisition area is located:
	 90 km southwest of a 'known migration area' BIA. 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.
	 280 km southeast of the 'aggregation' BIA (calving and nursery ground) in southwest Victoria.

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		• 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.
3	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. Two claims were made that there is a high risk of a diesel spill during the survey and that	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)

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Matte	this would pollute large parts of Bass Strait and be detrimental to marine life.	 Beach Energy Lid response 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 m³. 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 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.
4	The seismic survey will result in unacceptable impacts to southern rock lobster larvae. Two submissions claim that 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.

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		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; 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.
5	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. Two claims were raised that the Prion 3DMSS should not be permitted to occur within the Boags AMP.	 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.

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		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.
		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.
6	6 Underwater sound impacts on commercial scallops. Two claims have been made that the Prion 3DMSS will result in long-term, unknown and un-quantifiable impacts on commercial scallops (<i>Pecten fumatus</i>) populations in the region, with evidence indicating increased mortality. There are claims that the thresholds used to assess impacts to scallops are misleading and that fishing stocks will be lost.	 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: The scientific literature (e.g., Harrington <i>et al.</i>, 2010; Przeslawski <i>et</i>
		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 scall in Bass Strait (sandy sediments) and the bioregion in general, t potential impacts of the MSS are considered insignificant. Using the particle motion threshold (the most relevant metric gir that scallops are attached to the seabed), physiological impacts 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 	long
 Only the southern half of the acquisition area contains sedimen suitable for commercial scallops. As such, impacts are restricte this area. 	wen s to m % of nts ed to
With regards to the commercial scallop fishery, impacts are considere minor because:	d
 The northern part of the survey area is not important to the fisher as it comprises mostly muddy sediments that are not suitable for scallop settlement. There is likely to be negligible impact to current scallop fishing grounds because there is little overlap between fished scallop the 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 fish 	ery or oeds tur.

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Matter	 Beach Energy Ltd response 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 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 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:

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	 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. 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,

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	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.

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7	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 export of Australia's natural resources. One claim was raised that the Prion 3DMSS should not proceed as it is likely to lead to gas exports.	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.
8	Seismic surveys should not be allowed to proceed until the Senate Inquiry regarding the Impact of seismic testing on fisheries and the marine environment <i>is complete</i> <i>and a report is released.</i> One claim was made that the Prion 3DMSS should not be allowed to proceed until the Senate Inquiry has reached its conclusion.	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.
9	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 17 th 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;

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		 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 8 th of January 2021, Beach extended the exhibition period another four weeks (for a total exhibition period of 7 weeks). This resulted in another five submissions (on top of the 13 received up until the 8 th of January).
10	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.	There is limited knowledge of minke whale (<i>Balaenoptera acutorostrata</i>) 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 (<i>Balaenoptera acutorostrata</i> 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

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		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.
11	Some seabirds are vulnerable to the impacts from vessel lighting and indirect impacts of potential temporary loss of access to fish. One claim was made that the description of some seabirds and conclusions regarding the	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 (<i>Thalassarcha cauta</i>) given that it breeds on Albatross Island, which is 56 km southwest of the acquisition area.

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	impacts of lighting and indirect impacts regarding access to prey are inadequate.	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-riden such that it is only switched on as required.
		 Blinds will be lowered on all portholes and windows at night.
		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.
12	Seismic surveys kill octopus. One claim was made (twice by the one submitter) that 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 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-

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		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 30-55 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 mitigation plan to ensure no economic loss due to the Prion 3DMSS.
13	Tasmania's and King Island's 'clean and green' reputation is at risk.	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.
	One claim was made that the Prion 3DMSS will damage King Island's 'clean and green' reputation and tourism credentials.	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

Note: As per the NOPSEMA guidance note, *claims* are noted in this table. However, these *claims* are generally only implied or inferred in the submissions rather than expressly stated, so there may be some error in interpreting what the claims are.