



TRIDENT ENERGY LIMITED

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ABN 81 113 536 182

# ENVIRONMENT PLAN EXECUTIVE SUMMARY

OTE10 2D Seismic Survey

VIC/P62, Offshore Otway Basin

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# **1. EXECUTIVE SUMMARY**

## **1.1 The Proponent**

Trident Energy Limited (Trident) is the proponent for the OTE10 2D Seismic Survey - Otway Basin, VIC/P62.

Trident is an unlisted public company formed in March 2005. The Company has interests in petroleum exploration permits in the Amadeus Basin (onshore NT), Canning Basin (onshore WA) and Otway Basin (offshore VIC).

Trident's commercial office is located at:

Suite 3, Level 15  
Fawkner Centre  
499 St Kilda Road  
Melbourne  
Victoria, Australia 3004.

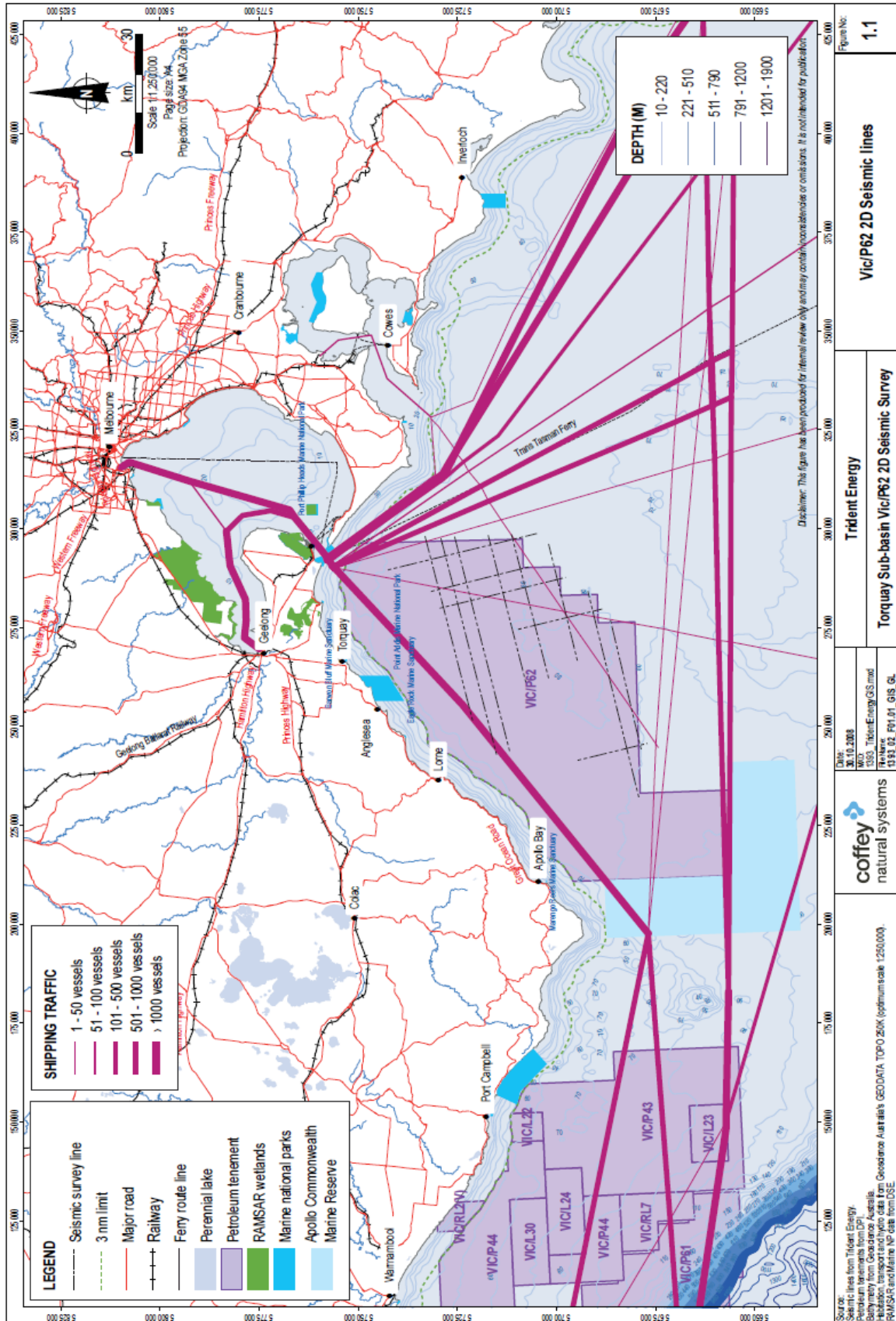
## **1.2 The Proposal**

Trident proposes to acquire approximately 491 km of two-dimensional (2D) marine seismic data within Victorian Petroleum Exploration Permit VIC/P62. The survey will be undertaken entirely within Commonwealth waters in the offshore Otway Basin of southern Victoria, in water depths ranging from 60 to 80 m (Figure 1.1)

The seismic survey is scheduled to occur over approximately 6 days (including 2 days standby for weather and other delays) commencing early-mid February 2010. This Environmental Plan covers the activities undertaken as part of the seismic survey.

The survey will be conducted using SeaBird Exploration's 'Aquila Explorer' seismic survey vessel. The vessel will travel along the seismic lines at an average speed of 5 knots (approximately 9.3 km /hour) and the sound source will be triggered at regular 18.75 m intervals. The acoustic source will be towed immediately behind the vessel at a depth of 5m. A single streamer, 3 km in length and towed at an average depth of 7m, will carry hydrophones to record the reflected sound.

Figure 1.1 Location of OTE10 2D Seismic Survey – Otway Basin, VIC/P62



## 1.3 The Receiving Environment

Coordinates for the survey area are shown in Table 1.1 below:

**Table 1.1 OTE10 2D seismic survey coordinates**

Location Point	Latitude (S)	Longitude (E)
1	38° 26' 24.80" S	144° 35' 19.69" E
2	38° 46' 50.63" S	144° 41' 0.07" E
3	38° 31' 36.56" S	144° 40' 59.20" E
4	38° 40' 29.68" S	144° 2' 38.77" E
5	38° 59' 39.39" S	143° 54' 24.54" E
6	39° 0' 11.40" S	144° 2' 46.29" E
7	38° 56' 24.44" S	144° 25' 52.27" E

### 1.3.1 Physical Environment

The seabed in the VIC/P62 area ranges from -40m to -90 m ASL, with various contours and depressions across the seabed. The survey will be conducted in water depths ranging from approximately 60 to 80 m (see Figure 1.1).

Bass Strait is a high energy environment exposed to frequent storms and significant wave heights, with highest wave conditions generally associated with strong west to southwest winds caused by the eastward passage of low pressure systems across Bass Strait. Storms may occur several times a month resulting in wave heights of 3 to 4 m or more. In severe cases, southwest storms can result in significant wave heights of greater than 6 m.

### 1.3.2 Biological Environment

Marine fauna and flora in the survey area are typical of cool temperate areas.

Fauna of national significance that may be encountered within the survey area include certain species of cetaceans, sharks, birds, ray-finned fishes and other marine species. Several of these species are discussed briefly below on the basis that they may occur in, or near the survey areas at various times of the year for feeding, breeding or migrating.

#### Cetaceans

There are seven species of whales and other cetaceans that may occur in the survey area at various times of the year for feeding, breeding or migratory purposes. These include three threatened whale species that may be present: blue, southern right and humpback whales. The management and mitigation measures described for these three species (see Table 1.2), are also applicable and adequate to ensure no adverse effects to any other cetacean species that may be encountered during the survey.

Blue whales (*Balaenoptera musculus*) (listed as endangered under the EPBC Act) have widespread migratory paths and although they can occur relatively close to the coast, they are not known to follow coastlines or oceanographic features. Observations suggest that western Victoria and southeast South Australia are used for feeding grounds due to their aggregations of the krill species along the Bonney Coast upwelling region. Historically, sightings of blue whales in the offshore Otway Basin have been recorded from November through to May, with more whales being sighted in March/April than other months. The location of the survey does not correspond

with areas where blue whales have been sighted. The timing of the proposed survey coincides with the migratory period of the blue whale and small numbers of blue whales may be sighted during the survey.

Southern right whales (*Eubalaena australis*) (listed as endangered under the EPBC Act) are found along the entire coast of Victoria. Logan's Beach, Warrnambool, approximately 125 km to the west of the survey area, is an important calving nursery area. Inshore waters around Port Fairy and Portland have also been used intermittently as calving areas or by small numbers of mothers with very young calves. A peak in southern right whale abundance occurs in winter and spring along the southern coast of Australia. As the survey is planned to occur in February 2010 there should be no overlap with the expected presence of this species.

A discrete population of humpback whales (*Megaptera novaeangliae*) (listed as vulnerable under the EPBC Act) migrate annually along the east coast of Australia between summer feeding grounds in the Antarctic, and winter breeding and calving grounds in the tropics. Humpbacks observed along the western coast of Victoria are likely to be travelling north to the east coast of Australia via Tasmania's west coast and Bass Strait. Sightings are frequently made along the Victorian coastline from June to August and also September to December. As the survey is planned to occur in February 2010, there will be no overlap with the expected presence of humpback whales in the region.

### **Sharks**

The great white shark (*Carcharodon carcharias*) may occur in the project area and is listed as threatened under the EPBC Act

### **Fish (Pipefishes, Seahorses, Seadragons, Pipehorse)**

Generally pipefishes, seahorses and seadragons are associated with kelp forests in sheltered to moderately exposed reef areas at a depth range of 0-50 m (depending on the species), being shallower depths than the proposed survey. However, the spiny pipehorse can be found in temperate marine water depths of up to 230 m, and therefore may occur in the survey area.

### **Seabirds and Migratory Waders**

The Victorian coast and neighbouring islands provide feeding, breeding and nesting habitats for many important coastal and migratory bird species. Among the frequent visitors to these coastal regions are a number of threatened species, including albatross, skua and petrel. Among these are 13 species of albatross (all migratory, three endangered and nine vulnerable). There are also four species of petrel that are threatened, three are migratory (one endangered and two vulnerable) and one is vulnerable.

These bird species may fly over the survey area since many of the birds undertake large annual migrations across the south Pacific. Such species are considered highly unlikely to be impacted by the survey due to the low impact and marine nature of the survey-related activities, relatively small spatial and temporal footprint of the activities and lack of roosting sites.

## **1.3.3 Heritage, Conservation and Areas of Cultural Significance**

### **Conservation**

The survey will be undertaken within Commonwealth waters, as extending from three to 200 nautical miles from the Australian coast.

The closest marine area to the seismic survey is the Apollo Commonwealth Marine Area, located 20 km west of the survey area.

The Victorian Government has reserved a series of Marine National Parks and Marine Sanctuaries in State waters to conserve representative samples of the marine environment, including important marine habitats and species, significant natural features, cultural heritage and aesthetic values.

The survey area will not impact any marine national park or marine sanctuary along the Victorian coast.

### **Heritage**

The OTE10 2D seismic survey is located offshore and is not an area known to be of high significance in terms of Aboriginal heritage.

There are 8 protected zones around shipwrecks in Victorian waters, six are in Port Phillip Bay one off Cape Schanck and one near Port Albert ([www.heritage.vic.gov.au/Maritime](http://www.heritage.vic.gov.au/Maritime)). The SS Alert Protected Zone, off Cape Schanck, lies near to, but outside of, the expected area of operations.

### **1.3.4 Socio-Economic Environment**

The main uses for the project area include oil and gas production, commercial shipping and commercial fishing.

#### **Oil and Gas Production**

The onshore and offshore Otway Basin is a highly prospective petroleum region, with a long history of petroleum exploration and drilling and more recently petroleum production development projects. Since the 1960s, extensive onshore and offshore seismic exploration has been undertaken within the region

Three petroleum exploration wells have been drilled within the VIC/P62 permit, Nerita-1 (1967), Snail-1 (1972) and Wild Dog-1 (1992-93).

Petroleum exploration and production has regional benefits for southwest Victoria and southeast South Australia. Not only have the numerous onshore and offshore projects resulted in a boost to the regional economy through the provision of services to project personnel and through the creation of employment in construction and project support, but studies undertaken for these developments led to a greater understanding of the region's terrestrial, coastal and marine environments.

#### **Commercial Shipping**

The South-east Marine Region is one of the busiest areas for shipping in Australia, with freight and passengers carried between the mainland and Tasmania and between Australian ports and New Zealand (see Figure 1.1). The seismic survey area is within the main shipping lane in the region west out of Port Phillip Bay. Shipping within the region comprises cargo shipping, passenger shipping and ship/boat building and repair activities.

#### **Commercial Fishing**

Commercial fishing in southern Victoria includes inshore coastal waters (mainly State administered fisheries) and areas along the continental slope (mainly Commonwealth fisheries). The majority of the commercial fishing occurs within Commonwealth waters along the continental shelf and the upper continental slope.

Of the commercial fisheries within Bass Strait, Danish seiners, shark fishers and squid fishers are most likely to be encountered within the proposed survey area.

## Recreation and Tourism

Recreation and tourism activities are valuable foundations for the local and regional economy, and include:

- Sight-seeing.
- Surfing.
- Fishing (rock, beach and boat).
- Scuba diving and snorkelling.

The survey is located offshore from the Surf Coast and Mornington Peninsula, popular holiday destinations for Victorians especially in the summer. The survey is scheduled to commence in early-mid February after the peak summer holiday season. As the seismic vessel is not expected to approach closer than 5nm from the coast, recreational activity by the general public is expected to be minimal.

### 1.4 Stakeholder Consultation

In the course of planning the seismic program and developing the EP, Trident has to date undertaken consultation with relevant stakeholders to identify regulatory processes, potential environmental issues and management requirements. Trident will undertake ongoing consultation to ensure the seismic survey management arrangements and communications are in place.

Stakeholders of relevance to the OTE10 2D Seismic Survey include:

Commonwealth Government:

- Department of the Environment, Water, Heritage and the Arts (DEWHA).
- Australian Fisheries Management Authority (AFMA).
- Australian Maritime Safety Authority (AMSA)

Victorian State Government:

- Department of Primary Industries (Minerals and Petroleum Regulation Branch).
- Department of Primary Industries (DPI) Fisheries.
- Department of Sustainability and Environment.
- Marine Safety Victoria (MSV)

Commercial fishing and other groups:

- Seafood Industry Victoria
- Tasmanian Seafood Industry Council
- South East Trawl Fishing Industry Association (SETFIA)
- Lakes Entrance Fishermen's Co-operative Society Ltd (LEFCOL)
- VRFish (Victorian Recreational Fishing organisation)
- Blue Whale Study Inc
- Scuba Divers Federation of Victoria Inc
- Game Fishing Association of Victoria
- Dive boat operators
- Game fishing boat operators



Consultation and information dissemination has been, and will continue to be, undertaken through a range of media including:

- Meetings with regulators
- Briefings with individual fishers
- Meetings and correspondence with key stakeholders.
- Invitation for public comment on the EPBC referrals via the DEWHA website.
- Provision of detailed survey maps.
- Daily schedule communications to fishing operators.
- Vessel communication systems with maritime traffic.

Consultation with commercial fishing groups will follow APPEA Guidelines where applicable. Trident has engaged the services of a Victorian fisheries consultant who has undertaken consultation with relevant fishers, and will continue to do so until the survey is completed.

## **1.5 Environmental Impact Assessment, Management and Mitigation**

The main environmental hazards presented by seismic survey include:

- High intensity sound discharge.
- Physical presence of the vessel.
- Waste discharge.
- Ballast water discharge.
- Hydrocarbon and/or chemical spills.

The Environmental Plan provides a detailed assessment of potential impacts. The key points of the assessment, and management and mitigation measures are summarised in Table 1.2 below. The summary risk ranking is shown in Table 1.2. There are a total of 11 environmental risk assessments, 9 of these were assessed as having low risk and 2 assessed as having a moderate risk.

**Table 1.2 Summary of environmental impact assessment results**

Impact Assessment	Management and Mitigation	Risk Ranking
<p><b>Acoustic discharge: High intensity sound discharge</b></p> <p>Pathological damage to hearing systems or other organs of marine fauna.</p>	<p>The timing of the OTE10 seismic survey coincides with the presence of blue whales and is distant from known feeding locations.</p> <p>Department of Environment, Water, Heritage and the Arts (DEWHA) management guidelines for seismic vessels (DEWHA, 2008) will be implemented.</p> <p>Soft start procedures will be implemented; highly unlikely that cetaceans will get to within 2km of active acoustic source.</p>	<p>Low</p>
<p><b>Acoustic discharge: High intensity sound discharge</b></p> <p>Behavioural / lifecycle changes to cetaceans. Avoidance measures.</p>	<p>Department of Environment, Water, Heritage and the Arts (DEWHA) management guidelines for seismic vessels (DEWHA, 2008) will be implemented.</p> <p>Stand off or avoidance measures not expected to cause gross changes in behaviour or normal activities.</p>	<p>Low</p>
<p><b>Acoustic discharge: High intensity sound discharge</b></p> <p>Behavioural changes to pinnipeds.</p>	<p>The survey will remain distant from known breeding or nesting areas.</p> <p>Soft Start requirements to minimise impacts to cetaceans will also minimise potential impacts on any transient seals in the survey area.</p> <p>It is considered unlikely that a seal will be affected whilst in an important habitat area.</p>	<p>Low</p>
<p><b>Acoustic discharge: High intensity sound discharge</b></p> <p>Behavioural / Lifecycle change to fish species. Possible pathological effects.</p> <p>Behavioural changes and startle response.</p>	<p>Behavioural changes likely to be localised and temporary (alarm, avoidance, tighter schooling).</p> <p>Any 'flight' response is likely to be localised and short term.</p> <p>Larvae and other planktonic organisms are likely to be significantly affected (i.e., suffer pathological damage) within a few metres (five) of an acoustic source, however effects of seismic on larval fish and invertebrate populations are negligible when compared to total population sizes and natural mortality rate for eggs and larvae. Impacts will be limited to the duration of the survey (approximately 6 days including weather standby days).</p> <p>Soft-start procedures will prevent sudden exposure.</p>	<p>Low</p>

**Table 1.2 Summary of environmental impact assessment results (cont)**

Impact Assessment	Management and Mitigation	Risk Ranking
<p><b>Vessel travelling through permit area:</b>  <b>Physical presence of the vessel</b>                      Behavioural change to marine animals</p>	<p>Possible behavioural changes in response to the physical presence of the vessel are considered to be similar, although less intense, than those associated with sound discharges.</p> <p>Department of Environment, Water, Heritage and the Arts (DEWHA) management guidelines for seismic vessels (DEWHA, 2008) will be implemented.</p>	<p>Low</p>
<p><b>Vessel travelling through permit area:</b>  <b>Physical presence of the vessel</b>                      Collision with marine mammals causing death or injury.</p>	<p>Due to the size and speed of the vessel, the noise generated by engines and the acoustic array, it is considered that animals would be able to easily avoid the vessel</p> <p>Department of Environment, Water, Heritage and the Arts (DEWHA) management guidelines for seismic vessels (DEWHA, 2008) will be implemented</p>	<p>Low</p>
<p><b>Vessel travelling through permit area:</b>  <b>Physical presence of the vessel</b>                      Collision with birds causing death or injury</p>	<p>Artificial lighting used during night time operations may attract birds, resulting in collisions that are potentially fatal to the birds. To minimise this risk deck lighting will be maintained at the minimum required for safety and navigational requirements.</p>	<p>Low</p>
<p><b>Vessel travelling through permit area:</b>  <b>Physical presence of the vessel</b>                      Interference to fishing or third party activities.                      May require minor modification to the course of third party vessels during the survey.                      Adverse impacts will be localised and short term</p>	<p>It is possible that commercial fishing vessels may be operating in the survey area during the time of survey.</p> <p>It is possible that shipping operators may wish to travel through the survey area during the time of survey, as the survey crosses a major shipping lane in the region.</p> <p>The Seismic Contractor and chase boat shall remain vigilant for fishing and other commercial vessels during the survey utilising radars and satellite navigation systems to ensure sufficient warning of other vessels approaching the survey area and establish communications to avoid conflict.</p> <p>A record of consultation with commercial fisheries groups shall be kept and made available to regulatory authorities upon request.</p> <p>During the course of the survey a log of all communication between the Aquila Explorer and any other vessels will be maintained.</p> <p>During the course of the survey a log of all communication between the Lady Roula and any other vessels will be maintained.</p> <p>The Master of the Aquila Explorer will advise RCC Australia when commencing the survey, and on completion of the survey.</p>	<p>Moderate</p>

**Table 1.2 Summary of environmental impact assessment results (cont)**

Impact Assessment	Management and Mitigation	Risk Ranking
<p><b>Vessel travelling through permit area:</b>  <b>Routine waste discharges to sea</b></p> <p>Minor changes to water quality and nutrient level that are short term and localised.</p> <p>Minor changes to feeding patterns of fish species.</p> <p>Low level contamination or toxic effects to fish species and plankton.</p>	<p>Dilution, decomposition and uptake by marine animals will reduce nutrient levels over time.</p> <p>No sewage or food waste discharge will be undertaken within 3 nm of land</p> <p>Sewage discharged between 3 and 12nm from shore only if the sewage is macerated (&lt;25mm) and disinfected.</p> <p>Sewage discharged at a distance of more than 12 nm from shore only when the ship is en route and proceeding at not less than 4 knots</p> <p>Food wastes discharged between 3 and 12nm from shore if macerated (&lt;25mm)</p> <p>Hazardous wastes will be segregated and stored in sealed storage areas and transferred to onshore licensed hazardous material handlers for disposal to a licensed depot. Other non-hazardous garbage will be disposed of in compliance with the requirements of Annex V of MARPOL 73/78 for disposal of garbage. The disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets and plastic garbage bags, is prohibited.</p>	<p>Low</p>
<p><b>Vessel travelling through permit area:</b>  <b>Ballast water discharge.</b></p> <p>Introduction of foreign organisms.</p> <p>Foreign organisms may compete with native species, introduce disease or modify local ecological processes.</p>	<p>Ballast water will be managed in strict accordance with the SeaBird Ballast Water Management Plan and AQIS guidelines</p>	<p>Low</p>
<p><b>Vessel travelling through permit area:</b>  <b>Accidental fuel and oil spills</b></p> <p>Contamination of marine environment.</p> <p>Pathological effects to fish larvae and ingestion by marine organisms.</p> <p>Smothering of marine flora and fauna.</p> <p>Contamination of landforms.</p>	<p>Oil spill response procedures are detailed in the contractor Shipboard Oil Pollution Emergency Plan (SOPEP).</p> <p>All necessary oil spill contingency equipment will be maintained to ensure it is functional and accessible.</p> <p>Risk of spill due to streamer loss is low. Streamers are segmented and each segment contains a synthetic urethane polymer (gel-solid), designed not to leak if streamer is holed, cut or severed.</p> <p>A spill of fluid &gt; 80 litres from a ruptured stretch section is a reportable incident under the PSLME Regulations 1999, requiring DA notification within 2 hours.</p> <p>No refuelling of the survey vessel will be carried out at sea.</p> <p>Waste oil or any inseparable bilge water will not be discharged offshore.</p>	<p>Moderate</p>

In summary, the offshore seismic survey is located in Commonwealth waters of Bass Strait. The transient nature and short duration of the survey (6 days) means that the activity has a low to moderate impact on the marine environment.

Stakeholders have been consulted, especially fishing groups, and mitigation measures have been put in place to manage interaction with whales that may be present at the time of the survey.

Detailed management and mitigation measures that will be followed during the project are provided in the Environmental Plan. The implementation strategy for the Environment Plan specifically details the measures needed to ensure that the environmental performance objectives and standards are met, and identifies:

Systems practices and procedures

Specific roles and responsibilities

Employee training

Monitoring, auditing and recording requirements

Emergency response planning

Consultation with government and stakeholders

## **1.6 Contact Details**

Please direct all queries, comments or request for a copy of the approved OTE10 2D Seismic Survey Environment Plan to:

Ms Sandy Menpes  
Exploration Asset Manager  
Trident Energy Limited  
Suite 3 Level 15  
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