



# **Laverda 3D and Vincent M1 4D Marine Seismic Survey Environment Plan Summary**

**Geotechnical Operations**

Date: May 2010

Status: FINAL

[Confidential]

# 1 BACKGROUND

Woodside Energy Limited (Woodside) proposes to conduct two marine seismic surveys, the Laverda three-dimensional (3D) Marine Seismic Survey (MSS) and the Vincent Monitor 1 (M1) four-dimensional (4D) MSS both located in Commonwealth waters, approximately 30 km offshore from the Northwest Cape in Western Australia (WA) (nearest town Exmouth) (Figure 2-1). The surveys will be undertaken over a six week period during the second quarter of 2010.

This document provides a summary of the Laverda 3D MSS and Vincent M1 4D MSS Environment Plan which was accepted by Department of Mines and Petroleum (DMP) (on 7 May 2010) as meeting the requirements for an EP under Regulation 11(1) of the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009*. In addition the EP also describes how the survey is being planned and conducted in line with Woodside's Corporate Environment Policy and the Woodside Environmental Management System.

The EP presents the findings and conclusions of the Environmental Risk Assessment (ERA) completed by Woodside for the key environmental risks associated with the Laverda 3D and Vincent M1 4D MSS (routine and non-routine operations). The EP then presents the preventative and management measures that will be implemented to ensure that any adverse impacts are managed to be as low as is reasonably practicable (ALARP).

While the ERA process identified no significant impacts to matters of national environmental significance (NES), Woodside made the decision to refer the Laverda 3D and Vincent M1 4D MSS to the Department of the Environment, Water, Heritage and the Arts (DEWHA) under the Environmental Protection and Biodiversity Conservation (EPBC) Act to mitigate any stakeholder perception issues relating to the survey. The Referral was approved as a "not controlled action if undertaken in a particular manner" by DEWHA on 28 April 2010.

## 2 DESCRIPTION OF THE ACTIVITY

### 2.1 Location

#### 2.1.1 Laverda 3D MSS

The proposed Laverda 3D MSS will be conducted entirely in Commonwealth waters over an acquisition area of ~ 150 km<sup>2</sup> within Production Permit Areas WA-28-L, WA-32-L, WA-36-R and WA-271-P(1)R2 (Figure 2-1). The survey acquisition area is located ~ 15 km from the northernmost boundary of the Ningaloo Marine Park (NMP) (Commonwealth) and ~ 35 km from the coast. The water depth across the acquisition area ranges from ~ 600 to 1000m. An operational area in excess of the acquisition area is required to allow for vessel turning and soft starts (Figure 2-1) and covers an area of ~ 560 km<sup>2</sup>. The closest point of the operational area is ~ 10 km from the NMP (Commonwealth) and ~ 30 km from the coast. Boundary coordinates of the acquisition and operational areas are provided in Table 2-1 and Table 2-2.

#### 2.1.2 Vincent M1 4D MSS

The proposed Vincent M1 4D MSS will be conducted entirely in Commonwealth waters over an area of 79 km<sup>2</sup> within Production Permit Areas WA-28-L, WA-43-L, and WA-35-L (Figure 2-1). The survey acquisition area is located ~ 21 km from the northernmost boundary of the NMP (Commonwealth) and ~ 38 km from the nearest stretch of coastline. The water depth across the Vincent M1 4D MSS acquisition area ranges from ~ 200 to 800 m. An operational area in excess of the acquisition area is required to allow for vessel turning and soft starts (Figure 2-1) and covers an area of ~ 398 km<sup>2</sup>. The closest point of the operational area is ~ 18 km from the boundary of the NMP (Commonwealth) and ~38 km from the coast. Boundary coordinates of the acquisition and operational areas are provided in Table 2-13 and Table 2-24.

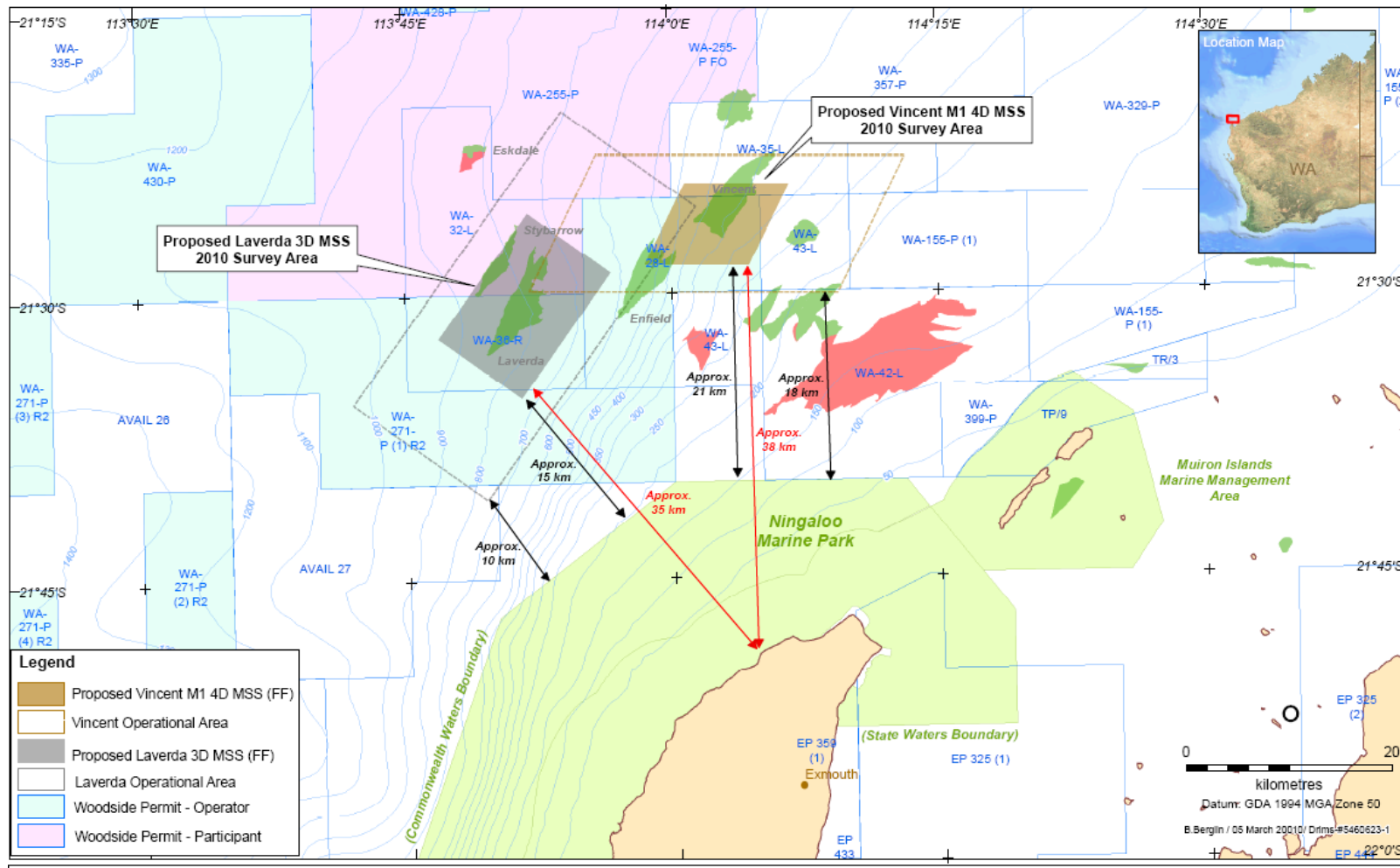


Figure 2-1: Proposed Laverda 3D MSS and Vincent M1 4D MSS Data Acquisition and Operational Areas

**Table 2-1: Boundary coordinates for the Laverda 3D MSS acquisition area (GDA94)**

Location Point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
1	21°	25'	38.89"S	113°	51'	57.72"E
2	21°	28'	50.45"S	113°	56'	37.99"E
3	21°	35'	23.96"S	113°	51'	30.85"E
4	21°	32'	12.26"S	113°	46'	50.53"E

**Table 2-2: Boundary coordinates for the Laverda 3D MSS operational area (GDA94)**

Location Point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
1	21°	21'	19.86"S	113°	55'	22.33"E
2	21°	24'	27.98"S	114°	00'	02.48"E
3	21°	25'	25.39"S	114°	01'	26.59"E
4	21°	40'	43.71"S	113°	49'	29.97"E
5	21°	35'	36.82"S	113°	42'	01.40"E
6	21°	20'	19.07"S	113°	53'	58.23"E
7	21°	21'	16.53"S	113°	55'	22.26"E

**Table 2-3: Boundary coordinates for the Vincent M1 4D MSS acquisition area (GDA94)**

Location Point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
1	21°	28'	25.63"S	113°	58'	35.36"E
2	21°	24'	11.91"S	114°	00'	52.76"E
3	21°	24'	17.99"S	114°	06'	39.63"E
4	21°	28'	31.81"S	114°	04'	22.39"E

**Table 2-4: Boundary coordinates for the Vincent M1 4D MSS operational area (GDA94)**

Location Point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
1	21°	28'	19.25"S	113°	52'	48.36"E
2	21°	24'	05.63"S	113°	55'	05.92"E
3	21°	22'	38.72"S	113°	55'	53.01"E
4	21°	22'	56.87"S	114°	13'	13.48"E
5	21°	28'	37.79"S	114°	10'	09.46"E
6	21°	30'	04.77"S	114°	09'	22.45"E
7	21°	29'	46.13"S	113°	52'	01.20"E

## 2.2 Proposed operations

The Laverda 3D and Vincent M1 4D MSS will be undertaken by the *M/V Geo Natuna* a specialised 64.17 m seismic vessel towing an acoustic source array (up to 3000 in<sup>3</sup> capacity) at a depth up to 6 m generating sound pulses every 12.5 m directed at the seabed. The vessel will also tow six hydrophone cables (solid streamer) each 3750 m long at depths up to 8 m which will record the reflected sound from the seabed. The vessel will operate up to 24 hours a day, travelling at a speed of 8 km/hr along preset lines within the survey areas. The data collected will be analysed and used to develop a map of the geological structures of the survey area. The *OMS Discovery* a 48 m support vessel will provide support to the seismic vessel during the surveys.

The Laverda 3D and Vincent M1 4D MSS will be conducted in accordance with all relevant Commonwealth Acts and regulations, with procedures in place to govern the survey activities that involve potential environmental impacts, including cetacean interaction, refuelling operations, streamer handling and maintenance, and vessel encounters.

## 3 EXISTING ENVIRONMENT

The Laverda 3D MSS is located on the continental slope in water depths ranging from approximately 600 to 1,000 m. The Vincent M1 4D MSS is located on the continental slope in water depths ranging from approximately 200 to 800 m.

### 3.1 Benthic habitat

The seabed in the vicinity of the survey areas is comprised of extensive areas of loose, sandy sediments, with a small proportion of hard rocky areas. The main rocky feature is the surface or subsurface ridge of cemented rock associated with the north-south trending scarp feature that runs along the Rowley shelf break in approximately 450m water depth. The scarp has a height of approximately 50m, while at its base a channel of 20m depth is present. Minor ridges and channels of 5m depths are present in the areas. There are also a number of canyon-like features that run at right angles from the shelf break into deeper waters, including one major channel, with a depth of 90m.

The seafloor benthic environment in the vicinity of the survey areas typically comprises a sparsely distributed, mainly burrowing fauna of worms and crustaceans, with occasional larger fauna (echinoderms, sponges and crustaceans). These soft sediment offshore areas are of relatively low environmental sensitivity. Hard or rocky areas, particularly along the north-south trending scarp feature, tend to support a richer benthic fauna of soft corals, gorgonians and sponges and various fish and invertebrate species. Given the large water depths seagrass, coral reef and macroalgal communities are absent.

### 3.2 Threatened, migratory and listed species

The Laverda 3D and Vincent M1 4D MSS are not likely to have significant impacts on threatened, migratory or listed species under the EPBC Act. A search of the DEWHA protected matters search tool (conducted 18/03/2010) indicated that a total of 13 'threatened' and 19 'migratory' marine species under the EPBC Act may occur within, adjacent to or migrate through the surveys areas (see Table 3-1).

**Table 3-1: EPBC Protected Matters Report for the Laverda 3D MSS and Vincent M1 4D MSS area**

Type	Common Name	Scientific Name	Threatened Species Status	Migratory Species
Cetaceans	Blue Whale	<i>Balaenoptera musculus</i>	Endangered	Migratory
	Southern Right Whale	<i>Eubalaena australis</i>	Endangered	Migratory
	Humpback Whale	<i>Megaptera novaeangliae</i>	Vulnerable	Migratory
	Antarctic Minke Whale	<i>Balaenoptera bonaerensis</i>		Migratory
	Bryde's Whale	<i>Balaenoptera edenis</i>		Migratory
	Killer Whale	<i>Orcinus orca</i>		Migratory
	Sperm Whale	<i>Physeter macrocephalus</i>		Migratory
	Spotted Bottlenose Dolphin	<i>Tursiops aduncus</i> (Arafura/Timor Sea populations)		Migratory
Mammals	Dugong	<i>Dugong dugon</i>		Migratory
Marine Reptiles	Green Turtle	<i>Chelonia mydas</i>	Vulnerable	Migratory
	Leatherback Turtle	<i>Dermochelys coriacea</i>	Endangered	Migratory
	Flatback Turtle	<i>Natator depressus</i>	Vulnerable	Migratory
	Hawksbill Turtle	<i>Eretmochelys imbricata</i>	Vulnerable	Migratory
	Loggerhead Turtle	<i>Caretta caretta</i>	Endangered	Migratory
Fish	Grey Nurse Shark	<i>Caracharias taurus</i> (west coast population)	Vulnerable	
	Great White Shark	<i>Carcharodon carcharias</i>	Vulnerable	Migratory
	Whale shark	<i>Rhincodon typus</i>	Vulnerable	Migratory
	Mako Shark (Shortfin)	<i>Isurus oxyrinchus</i>		Migratory
	Mako Shark (Longfin)	<i>Isurus paucus</i>		Migratory
Birds	Southern Giant-Petrel	<i>Macronectes giganteus</i>	Endangered	Migratory
	Soft-plumaged Petrel	<i>Pterodroma mollis</i>	Vulnerable	

### 3.2.1 Cetaceans

The DEWHA Protected Matters search (DEWHA, 2010) identified three baleen whale species listed as 'threatened', the blue (*Balaenoptera musculus*), southern right (*Eubalaena australis*), and humpback (*Megaptera novaeangliae*) whales and five other migratory cetacean species that may occur within, adjacent to or migrate through the survey area.

There are two recognised subspecies of blue whale in Australia, the 'true' blue and 'pygmy' blue. In WA 'pygmy' blue whales are known to feed during summer/autumn in temperate waters off the WA coast, with one well documented feeding area being in the Perth Canyon (Jan-Apr), before migrating north along the WA coast to tropical breeding grounds during winter. 'Pygmy' blue whales are known to migrate along the Northwest Shelf. In contrast 'true' blue whales feed during the summer/autumn in predominately in Antarctic waters and are also known to migrate north off the WA coast but typically not as far north as 'pygmy' blue whales. Studies indicate that 'true' blues may also overwinter in the Perth Canyon. The apparent preference of blue whales for deeper waters means that there is the potential for blue whales to occur in the deeper western portions of the survey areas, however abundance is likely to be low based on the records of previous surveys conducted in the region.

Southern Right whales undertake annual migrations between summer feeding grounds in sub-Antarctic waters and winter breeding grounds in Australian waters. Southern Right whales are found in Australian waters during seven months of the year (approximately May to November)

with the main aggregation and calving/feeding grounds located along the southern coasts of Australia with only occasional animals being recorded as far north as the Northwest Cape.

Humpback whales undertake annual migrations between summer feeding grounds in Antarctic waters and mating and calving grounds in tropical waters. The west coast humpback migratory population migrates north along the WA coast to calving areas located in inshore northern WA waters between Lacedpede Islands and Camden Sound. The northern migration route is predominantly within the 500m depth contour and peaks in late July to early August off the NW Cape. The southern migration route is predominantly with the 200m depth contour and peaks in mid September off the NW Cape with cows and calves two to three weeks later.

The northern migration route passes through the eastern portion of the Laverda 3D and Vincent M1 4D MSS areas. As the surveys will end by the end of June they will avoid the peak northern migration that occurs in late July to early August.

The other five migratory species including two baleen whale species, the Antarctic minke (*Balaenoptera bonaerensis*) and Bryde's whales (*B. edeni*) and three toothed whale species, the killer whale (*Orcinus orca*), sperm whale (*Physeter macrocephalus*) and Spotted bottlenose dolphin (*Tursiops aduncas*) are unlikely to present in significant numbers as the survey area is not known to include significant habitat.

Any potential impacts to the species will be limited to localised/temporary displacement of animals within the immediate vicinity of the acquiring seismic vessel and is not considered as significant.

### 3.2.2 Migratory marine mammals

Dugongs (*Dugong dugon*) are classified as a migratory species under the EPBC Act. Dugongs occur throughout northern coastal waters of Australia from Shark Bay in the west to Moreton Bay in the east. Significant dugong populations occur in Shark Bay and Exmouth Gulf and animals are known to migrate between these areas. Dugongs are generally restricted to coastal and/or shallow water habitats where sufficient seagrass habitat, their primary food source exist. Dugongs are unlikely to be present in the survey area given the water depths ~ 200 – 1000 m and absence of feeding habitat.

### 3.2.3 Threatened migratory turtles

The DEWHA Protected Matters search identified five marine turtle species listed as migratory, with four species listed as "Vulnerable" including the green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), flatback (*Natator depressus*), and hawksbill (*Eretmochelys imbricata*) turtles and one species listed as "Endangered" the loggerhead turtle (*Caretta caretta*) which may occur within, adjacent to or migrate through the survey area.

The survey areas do not include any significant turtle habitat (migratory, feeding and breeding) but are adjacent to significant nesting areas of green, flatback, hawksbill and loggerhead turtles along the coast and offshore islands (including the North West Cape and Murion Islands). The Laverda 2D and Vincent M1 4D MSS will be undertaken outside of the main turtle nesting and hatching periods (October and April). The abundance of turtles in the survey areas is therefore expected to be low. Given the relatively small survey area and duration any potential localised/temporary displacement of animals present is unlikely to significantly impact the three turtle species.

### 3.2.4 Threatened and migratory fish

The DEWHA Protected Matters search identified five species of shark listed as migratory, with three species listed as "Vulnerable" including the grey nurse (*Caracharias Taurus*), Great White Shark (*Carcharodon carcharias*) and Whale Shark (*Rhincodon typus*). The other two shark species are listed as migratory and include the Mako Shark (Shortfin) (*Isurus oxyrinchus*) and Mako Shark (*I. paucus*) (Longfin).

Whale sharks are a migratory species found in tropical waters around the world. Significant feeding aggregations of whale sharks occur off the Ningaloo Reef between March and July each

year. Research at Ningaloo indicates that animals travel to and from Ningaloo Reef along a north east direction along the continental shelf moving offshore into the north-eastern Indian Ocean. It is possible that some individuals may travel through the survey area on route to and from Ningaloo Reef.

The great white shark is a pelagic species with a wide distribution throughout temperate and sub tropical regions of the world. In WA great white sharks have been recorded as far north as the NW shelf. Great white shark distribution/migrations are likely to be associated with the movement and availability of prey. In WA great white sharks are known to prey on humpback whales and have been recorded off the NW Cape during humpback migrations. It is unlikely that great white sharks will be present during the survey due to low prey abundance (i.e. humpback whales).

The grey nurse shark is generally associated with inshore sand/reef habitats in water depths of 15-40 m. It is unlikely that grey nurse sharks will occur within the survey area which is located over deep waters (200 – 1000 m) along the continental slope

The longfin mako and shortfin mako shark are considered widely distributed predominately located in deep offshore waters, occasionally frequenting coastal areas, as such they may occur within the survey areas.

### **3.2.5 Threatened listed seabirds**

The DEWHA protected matters search tool (DEWHA, 2010a) identified two seabird species, the endangered Southern Giant Petrel (*Macronectes giganteus*) and the vulnerable Soft-Plumaged Petrel (*Pterodroma mollis*), that may occur within or adjacent to the survey areas. Given the global dispersion, of both species their abundance/density at any given location is likely to be low. There is no emergent land to support nesting seabirds or migratory shorebirds within the survey areas, therefore the activities of birds in the areas will be restricted to foraging and the use of these areas as a migratory corridor. The proposed surveys are unlikely to impact on either petrel species or their prey.

## **3.3 Conservation reserves**

The Laverda 3D MSS and Vincent M1 4D MSS areas are located 15 km and 21 km from the boundary of the Ningaloo Marine Park (Commonwealth) (including the Murion Islands Marine Management Area) (Figure 2-1).

## **3.4 Cultural environment**

### **3.4.1 Shipwreck and heritage**

The WA Maritime Museum database identifies five shipwrecks in the general area including the *Lady Anne*, *Gem*, *Beatrice*, *Mildura* and *Occator*, with only the last two wreck site locations known. No wrecks are known to occur in the Laverda 3D MSS and Vincent M1 4D MSS areas.

A search of the Australian Heritage Database did not reveal any sites listed as National Heritage Places, within the proposed operational areas (Australian Heritage Council, 2009).

### **3.4.2 Indigenous issues**

A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register did not identify any indigenous heritage values within the proposed the Laverda 3D MSS and Vincent M1 4D MSS areas (DIA, 2008).

## **3.5 Socio-economic environment**

### **3.5.1 Commercial fisheries**

There are several commercial fisheries operating within the region surrounding the Laverda 3D MSS and Vincent M1 4D MSS area including:

- Abalone Fishery;



- Exmouth Gulf Beach Seine Fishery;
- Exmouth Gulf Prawn Managed Fishery;
- Pearl Oyster Fishery;
- Wetline Fishery (Commonwealth);
- Tropical Rock Lobster Fishery;
- Western Deepwater Fishery (Commonwealth);
- Western Tuna and Billfish Fishery (Commonwealth);
- Marine Aquarium Managed Fishery; and
- North West Slope Trawl.

Only the Wetline, Western Deepwater, North West Slope Trawl and Western Tuna and Billfish fisheries overlap the Laverda 3D MSS and Vincent M1 4D MSS areas. The Wetline Fishery operates year round in the region. The North West Slope Trawl Fishery has periodic activity throughout the year and is historically most active during the periods that Northern Prawn Fishery was not operational. The Northern Prawn Fishery seasons are generally mid March to the end of May and mid August to December. Tuna long-lining is a developing fishery in the Exmouth region, with boats operating in offshore and shelf waters generally from March to October, with the main activity between November to February.

### **3.5.2 Recreational fisheries**

The Laverda 3D MSS and Vincent M1 4D MSS areas are located greater than 30 km off the NW Cape in water depths of ~ 200 – 1000 m in an area of ongoing petroleum activities. The survey areas lie west of the main recreational fishing areas which occur in waters within and adjacent to Ningaloo Reef and Exmouth Gulf. A high portion of fishing in the region is conducted from the shore or from small power boats operating within lagoonal areas or immediately outside of the reef. Offshore fishing is conducted from large powerboats and charter vessels and comprises bottom fishing for reef fish and trolling for mackerel, trevally and tuna. Recreational activities such as game fishing tend to focus on the main tourist season starting from April through to September. Spear-fishing and collecting rock lobster occurs around reefs and offshore islands mainly in water depths less than 20m.

### **3.5.3 Petroleum and gas**

Oil and gas activities in the area consist of vessels supporting the operations of the in-situ Floating Production Storage and Offtake (FPSO) facilities that are located over the Enfield, Vincent, Van Gogh (operated by Apache) and nearby Stybarrow (operated by BHP) fields. Drilling rigs may also be located in the area with their concomitant support vessels for operations.

### **3.5.4 Tourism**

The proposed Laverda 3D MSS and Vincent M1 4D MSS are located greater than 30 km off the NW Cape in water depths of ~ 200 – 1000 m in an area of ongoing petroleum activities. The survey areas lie well west of the main marine tourism areas which occur in waters within and adjacent to Ningaloo Reef and Exmouth Gulf. Marine tourism includes both recreational and commercial vessels undertaking a range of activities including wildlife viewing/interaction, scuba diving, snorkelling and fishing. One the most significant commercial tourism activities is whale shark viewing/interactions which targets whale shark aggregation areas immediately adjacent to Ningaloo Reef between March and July.

### **3.5.5 Shipping**

Deep offshore areas are subject to regular coastal shipping traffic which would be expected to pass through and near the Laverda 3D MSS and Vincent M1 4D MSS areas.

## 4 POTENTIAL ENVIRONMENTAL EFFECTS

The environmental risks and potential environmental impacts of the proposed Laverda 3D and Vincent M1 4D MSS have been determined on the basis of Woodside's previous seismic experience in the region and the outcomes of an environmental risk assessment (ERA). The ERA indicates that the potential impacts arising for the surveys can be categorised as having low to medium risks with no high or severe risks identified.

A summary of the key sources of environmental risk (aspects) for the proposed activity include:

- discharge of underwater seismic pulses;
- light generation from vessels;
- interactions of vessels with marine fauna;
- anchoring or grounding of vessels used for the activity;
- dragging or loss of streamers, streamer fluid and associated equipment;
- emissions to atmosphere from vessels;
- discharge of ballast water and vessel biological fouling;
- routine discharge of wastewater and waste to ocean from survey and support vessels;
- accidental discharge of hydrocarbons and chemicals to ocean from survey and support vessels; and
- interactions with shipping and commercial and recreational fishing activities.

A summary of the potential environmental impacts associated with the above sources of environmental risk include:

- disturbance to marine fauna including marine mammals, marine turtles and fish;
- disturbance to marine habitats including seabed and benthic habitats;
- reduced air quality from atmospheric emissions as a result of operation of machinery and use of internal combustion engines;
- introduction of invasive marine species as a result of ballast water discharge and vessel biological fouling;
- marine pollution from routine discharges including sewage water, bilge water and other solid wastes;
- marine pollution from accidental discharges including hydrocarbon spills and hazardous materials;
- disturbance to social and community values due to interactions with commercial, recreational and Indonesian fisheries and shipping vessels; and
- disturbance to heritage and conservation values due to operation of vessels within protected areas.

The impacts of sound generated by the acoustic source and vessel operation will be minimal given the expected low abundance/density of marine fauna in the survey area, low sound propagation due to water depth, survey duration and compliance with *EPBC Act Policy Statement 2.1 Interaction between offshore seismic exploration and whales* (DEWHA, 2008).

The Laverda 3D and Vincent M1 4D MSS involve the use of two vessels travelling at slow speed (around 4 knots) along defined paths over a relatively short period (4 weeks). The timing and location of the survey does not coincide with any major/peak fauna migrations or critical habitat.

The density of marine fauna is therefore likely to be low and as such the probability of adverse fauna interactions also low.

The routine discharge of sewage and putrescibles wastes from survey vessels will comply with MARPOL requirements and the additional condition of no discharges within 12 nautical miles of the Ningaloo Marine Park (Commonwealth). The rates and volumes of discharge will be low and any increase in nutrients will be localised and short term. Discharges will not impact water quality and benthic habitats. Vessel management procedures, equipment and personnel are in place to prevent and mitigate against any potential accidental discharge of pollutants.

## **5 SUMMARY OF MANAGEMENT APPROACH**

Woodside's environmental management strategies and procedures to be used for the Laverda 3D MSS and Vincent M1 4D MSS include responsibilities, training, reporting frameworks, mitigation and response activities and monitoring and auditing procedures. Commitments associated with these (Table 5-1) will be used to reduce environmental risk to As Low As Reasonably Practicable (ALARP).

## **6 STAKEHOLDER CONSULTATION**

Woodside has an ongoing community consultation programme in relation to its operations in the Vincent and Enfield fields offshore from the North West Cape (Exmouth). The consultation programme utilises a Community Reference Group (CRG) representing stakeholders and community and is supported by a corporate affairs manager. In addition a 1800 information line has been set up to make it easier for the community to seek additional information outside of regular CRG meetings. The CRG has been in existence since 2001 and meets with Woodside on a quarterly basis.

Woodside has an ongoing commitment with the CRG to engage them in regards to seismic surveys in the region and provided to the CRG a copy of the EP for the proposed seismic survey programme for comment. The CRG did make a submission on the Referral of proposed action to the Department of the Environment, Water, Heritage and the Arts and copied this to Woodside. Woodside will address the comments provided in this submission with the CRG as part of the ongoing consultation programme.

Woodside will contact all relevant stakeholders prior to the commencement of the Laverda 3D MSS and Vincent M1 4D MSS and issue a 'Fact Sheet' providing relevant information on the surveys.

## **7 CONTACT DETAILS**

For further information on this proposal please contact:

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**Table 7-1: Laverda 3D and Vincent M1 4D MSS– Summary of Proponents Commitments**

No	Objective	Commitments/Criteria
1.	No significant impact to marine fauna	<ul style="list-style-type: none"> <li>• Adherence to <i>EPBC Act Policy Statement 2.1</i> –(DEWHA 2008) and the following additional mitigation measures:               <ul style="list-style-type: none"> <li>• Precaution zones (Observation zone: 3km+; Low power zone: 2km; and Shutdown zone: 500m)</li> <li>• Dedicated Marine Fauna Observer on seismic vessel;</li> <li>• Survey personnel (marine and seismic) provided with pre-survey induction on Policy 2.1; and</li> <li>• Woodside MSS Guidelines on the implementation of EPBC Act Policy Statement 2.1</li> <li>• Detailed reports of all cetacean sightings will be recorded using the DEWHA Cetacean Sightings Application (database) (<a href="http://data.aad.gov.au/aadc/ammc/index.cfm">http://data.aad.gov.au/aadc/ammc/index.cfm</a> )</li> </ul> </li> <li>• Adherence to the DEWHA Whale Interaction/Watching Guidelines 2005;</li> <li>• In conjunction with the cetacean mitigation measures the MFO will:               <ul style="list-style-type: none"> <li>• maintain continuous visual observations for turtles &amp; whale sharks within a 500m horizontal radius of the source vessel;</li> <li>• If turtles or whale sharks are sighted within 500m horizontal radius of source vessel, the acoustic source will be shut down; and</li> <li>• undertake visual observations for turtles &amp; whale sharks for at least 10 minutes prior to the commencement of soft start, focusing on a 500m horizontal radius of the source vessel.</li> <li>• Detailed reports of all turtle and whale shark sightings will be recorded and reported.</li> </ul> </li> <li>• External lighting of vessels will be minimized to that required for navigation, vessel safety and safety of deck operations, except in the case of emergency.</li> </ul>
2.	No significant impact to marine habitats	<ul style="list-style-type: none"> <li>• Anchoring within the Laverda 3D and Vincent M1 4D MSS areas will not be undertaken due to the 24 hour operations and water depths.</li> <li>• Anchoring in nearshore waters will only occur in the event of an emergency if required. All measures will be taken to avoid areas of sensitive habitats such as corals.</li> <li>• Vessels will not enter marine conservation reserves during normal operations and will aim to avoid entering them during emergencies.</li> <li>• Vessels will use approved navigation systems and depth sounders.</li> <li>• Adherence to standard maritime safety/navigation procedures.</li> <li>• Strict adherence to equipment handling and acquisition procedures.</li> </ul>

No	Objective	Commitments/Criteria
		<ul style="list-style-type: none"> <li>• Vessel with experienced operators and crew will be used to minimise the risk of equipment dragging or loss.</li> <li>• Where possible equipment lost will be recovered.</li> <li>• Detailed records of equipment lost overboard will be maintained.</li> </ul>
3.	Minimise emissions to atmosphere from operation of vessels	<ul style="list-style-type: none"> <li>• Compliance with MARPOL 73 / 78 Annex VI (as implemented in Commonwealth waters by the Commonwealth <i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i>). In particular: <ul style="list-style-type: none"> <li>• Use of low sulphur fuel when it is available to minimise emissions from combustible sources.</li> <li>• Emissions managed by the implementation of a preventive maintenance system. Records kept of inspections and preventative maintenance.</li> </ul> </li> </ul>
4.	No introduction of marine introduced marine species or spread of existing introduced marine species	<ul style="list-style-type: none"> <li>• Adherence the AQIS Australian Ballast Water Management Requirements.</li> <li>• IMS risk assessment will be undertaken for all vessels and immersible equipment planning to enter and operate within nearshore waters around Australia (i.e. nearshore areas include all waters within 12nm of land and in all waters less than 50m deep (at Lowest Astronomical Tide).</li> <li>• Based on the outcomes of each IMS risk assessment, management measures commensurate with the risk will be implemented to minimise the likelihood of IMS being introduced and establishing.</li> </ul>
5.	No significant impact on marine environment from routine operational discharges e.g. sewage and putrescible wastes	<ul style="list-style-type: none"> <li>• All sewage and putrescible wastes will be managed and disposed of in accordance with MARPOL 73/78 (as implemented in Commonwealth waters by the <i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i>): <ul style="list-style-type: none"> <li>• discharge of sewage and putrescibles waste will be of short duration with high dispersion and biodegradability;</li> <li>• All sewage and putrescible waste treatment systems and holding tanks are to be fully operational prior to survey commencement;</li> <li>• Onboard sewage treatment plant approved by the International Maritime Organisation (IMO)</li> </ul> </li> <li>• Discharge of sewage and putrescible wastes only at a distance of more than 12 nautical miles from the nearest land or NMP boundary;</li> <li>• Sewage and putrescible wastes macerated where possible prior to disposal;</li> <li>• Vessels unable to treat/store grey water (i.e. wastewater from sinks and showers will where possible use biodegradable soaps and detergents.</li> <li>• A Vessel Waste Log will be maintained to record waste management practices;</li> </ul>
6.	No significant environmental impact from routine storage, handling and disposal of solid and hazardous wastes	<ul style="list-style-type: none"> <li>• No discharge of plastics or plastic products of any kind from vessels in accordance with MARPOL and P (SL) requirements.</li> <li>• No discharge of domestic wastes (i.e. cans, glass, paper or other wastes from living areas) and no maintenance wastes (i.e. paint sweepings, rags,</li> </ul>

No	Objective	Commitments/Criteria
		<p>deck sweepings, oil soaks, machinery deposits, will be disposed of overboard) from vessels.</p> <ul style="list-style-type: none"> <li>• All solid, liquid and hazardous wastes (other than sewage, grey water and putrescible wastes) will be incinerated or compacted (if possible) and stored in designated areas and sent ashore for recycling, disposal or treatment.</li> <li>• Incinerators used are compliant with MARPOL and IMO requirements.</li> <li>• Incinerators will be operated in accordance with established operating procedures that align with manufacturers specifications by trained personnel.</li> <li>• Vessel Waste Management Plan in place detailing wastes generated and disposal requirements.</li> <li>• All storage facilities and handling equipment will be in good working order and designed in such a way as to prevent and contain any spillage as far as practicable.</li> <li>• A Vessel Waste Log will be created and maintained to record quantities of wastes transported to shore.</li> <li>• Detailed records of equipment lost overboard will be maintained.</li> <li>• Bilge water will be treated and disposed in accordance with MARPOL 73/78 (as implemented in Commonwealth waters by the Protection of the Sea (Prevention of Pollution from Ships) Act 1983).</li> <li>• Bilge water contaminated with hydrocarbons must be contained and disposed of onshore, except if the oil content of the effluent without dilution does not exceed 15 ppm or an IMO approved oil/water separator is used to treat the bilge water.</li> <li>• Bilge water contaminated with chemicals must be contained and disposed of onshore, except if the chemical is demonstrated to have a low toxicity (as determined by the relevant Material Safety Data Sheet (MSDS)).</li> </ul>
7.	No accidental hydrocarbon or chemical spills to the marine environment.	<ul style="list-style-type: none"> <li>• The survey vessels will comply with MARPOL 73/78 Annex I requirements to prevent oil pollution, including: <ul style="list-style-type: none"> <li>• Vessel holds a valid IOPP Certificate.</li> <li>• Oil Record Book maintained which details how, when and where any waste oils/oily effluents are disposed of.</li> <li>• Oily slops storage tank is provided.</li> <li>• Oily effluents from bilges and machinery spaces are treated in an IMO oil/water separator to a 15 parts per million oil content specification prior to overboard discharge.</li> </ul> </li> <li>• Oil spills will be managed according to Woodside's Western Australia and Carnarvon Basin Oil Spill Contingency Plan (ERP-3250).</li> <li>• Shipboard Oil Pollution Emergency Plans (SOPEP) will be prepared and kept onboard the vessels;</li> <li>• Operational procedures will be in-place on board the survey vessels for all operations that involve handling environmentally hazardous materials, oil</li> </ul>

No	Objective	Commitments/Criteria
		<p>and oily effluents/ waste during routine/ maintenance activities;</p> <ul style="list-style-type: none"> <li>• All hazardous substances (as defined in <i>NOHSC:1008(2004) – Approved Criteria for Classifying hazardous substances</i>) will have an Material Safety Data Sheet (MSDS) in place that is readily available on board;</li> <li>• Discharge of treated bilge water (&lt; 15 ppm oil) only at a distance of more than 12 nautical miles from the nearest boundary of the NMP (Commonwealth boundary);</li> <li>• All storage facilities in good working order and designed in such a way as to prevent and contain any spillage as far as practicable;</li> <li>• Spill response bins/kits located in close proximity to hydrocarbon storage areas and replenished if required. Identified personnel trained in the use of the equipment;</li> <li>• Personal Protective Equipment (PPE) appropriate to the nature and volume of spilled material;</li> <li>• Hydrocarbons located above deck will be stored with some form of secondary containment to contain leaks or spills e.g. bund, containment pallet, transport packs etc;</li> <li>• Refuelling at sea is unlikely to be required during the surveys and will be avoided if at all possible. If refuelling does take place the vessels will transit to at least 12 nautical miles from the NMP (Commonwealth boundary) and will be subject to the following <ul style="list-style-type: none"> <li>• refuelling of vessels will be undertaken under favourable wind and sea conditions as determined by the Master of the Vessels;</li> <li>• refuelling will take place during day light hours only;</li> <li>• JHA in place and reviewed before each fuel transfer;</li> <li>• refuelling procedure approved by Woodside.</li> <li>• All valves and flexible transfer hoses checked for integrity prior to use.</li> <li>• Dry break couplings (or similar) in place for all flexible hydrocarbon transfer hoses.</li> </ul> </li> </ul>
8.	Minimise interference with commercial and recreational fishing.	<ul style="list-style-type: none"> <li>• Adherence to standard maritime safety and navigation procedures (e.g. Auscoast Warnings via AMSA, radio contact, display of appropriate navigational beacons and lights).</li> <li>• Notification of activity details to relevant commercial fisheries organisations prior to commencement of each survey (e.g. Fact Sheet).</li> </ul>
9.	Minimise disruption to commercial fishing, shipping and recreational vessels	<ul style="list-style-type: none"> <li>• Adherence to standard maritime safety and navigation procedures (e.g. Auscoast Warnings via AMSA, radio contact, display of appropriate navigational beacons and lights).</li> <li>• Use of support vessels</li> </ul>

No	Objective	Commitments/Criteria
10.	Minimise disruption to oil and gas activities.	<ul style="list-style-type: none"> <li>Adherence to standard maritime safety and navigation procedures (e.g. Auscoast Warnings via AMSA, radio contact, display of appropriate navigational beacons and lights).</li> </ul>
11.	Minimise impacts to heritage and conservation values	<ul style="list-style-type: none"> <li>Ensure all contractor personnel are aware of and comply with the approved Environment Plan.</li> <li>Vessels will not during normal operations enter marine conservation reserves and during emergencies will aim to avoid entering marine conservation reserves</li> </ul>
12.	Project personnel understand and comply with the scope contained in the EP and understand the procedure to be followed if a change in scope is required.	<ul style="list-style-type: none"> <li>All relevant Woodside and contractor personnel receive an induction that outlines the approved activity scope.</li> <li>All relevant Woodside and contractor personnel understand the 'management of change procedure' contained in this EP</li> </ul>
13.	Woodside and contractor personnel understand and comply with the environmental objectives, standards and commitments within this EP.	<ul style="list-style-type: none"> <li>All Woodside and contractor personnel undertake an HSE induction that will include an overview of environmental sensitivities of the project area, management procedures and standards and commitments detailed in this EP.</li> </ul>
14.	Vessel HSE Management system covers applicable requirements of this EP	<ul style="list-style-type: none"> <li>Review of Vessel HSE Management System to ensure it covers applicable requirements of this EP.</li> </ul>
15.	Environmental inspections to be carried out according to the requirements of the EP.	<ul style="list-style-type: none"> <li>Environmental inspection of the vessel(s) carried out prior to the start of the activity.</li> <li>Project Environmental Commitments Checklist distributed and monitored onboard the vessel(s) on a regular basis by the Onboard Woodside Representative.</li> </ul>
16.	All environmental incidents are reported in accordance with the requirements of this EP, WEL procedures and legislative requirements.	<ul style="list-style-type: none"> <li>All relevant project personnel undertake an HSE induction that includes an overview of the incident reporting and notification procedures detailed in this EP.</li> <li>Environmental incidents recorded and reported according to the requirements of the EP.</li> </ul>
17.	A review of the operation conducted at the end of the programme to ensure all environmental commitments within the EP were met.	<ul style="list-style-type: none"> <li>Review of the environmental performance of the operation conducted at the end of the programme. This review will involve an assessment of compliance with the objectives, standards and commitments outlined in the EP, based on the results of the monitoring, records and audit processes described in this EP.</li> </ul>