Koolama 2D Marine Seismic Survey
Environment Plan Summary

Geotechnical Operations

Date: May 2010

Status: FINAL

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1 BACKGROUND

Woodside Energy Limited (Woodside) proposes to conduct a marine seismic survey, the Koolama two-dimensional (2D) Marine Seismic Survey (MSS) offshore from the Kimberley coastline, Western Australia. The survey will be undertaken over a four week period between late May and 30 June 2010. The 2D MSS forms part of the continued exploration for additional oil and gas reserves in this region and will also be used as a first step in assessing potential Greenhouse Gas Storage Formations.

This document provides a summary of the Koolama 2D MSS Environment Plan (EP) which was accepted by Department of Mines and Petroleum (DMP) (on 29 April 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 Koolama 2D 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 Koolama 2D 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 29 April 2010.

2 DESCRIPTION OF THE ACTIVITY

2.1 Location

The proposed Koolama 2D MSS will be conducted entirely in Commonwealth waters and collect data within Permit Areas WA-415-P, WA-416-P and WA-417-P (Figure 2-1). The survey acquisition area is located ~ 35 km at closest approach from the nearest stretch of coastline and approximately 45km from Broome. The water depth across the acquisition area ranges from approximately 50 to 300 m. An operational area in excess of the survey acquisition area is required in order to allow for vessel turning and soft starts (Figure 2-1). The operational area will cover an area of 18470 km^2. Total 2D data acquisition will be approximately 2500 + line kms full fold. Boundary coordinates of the Koolama 2D MSS acquisition and operational area are provided in Table 2-1.

2.2 Proposed operations

The Koolama 2D MSS will be undertaken by the *M/V Beaufort Explorer* a specialised 84.7m seismic vessel towing an acoustic source array (up to 3090 in^3 capacity) at a depth up to 6 m generating sound pulses every 25m directed at the seabed. The vessel will also tow a single 6km long hydrophone cable (solid streamer) at depths up to 25m 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 area (1,8470 km^2). The data collected will be analysed and used to develop a map of the geological structures of the survey area. The *M/V Pacific Crest* a 32.2m support vessel will provide support to the seismic vessel throughout the survey.

The Koolama 2D 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.

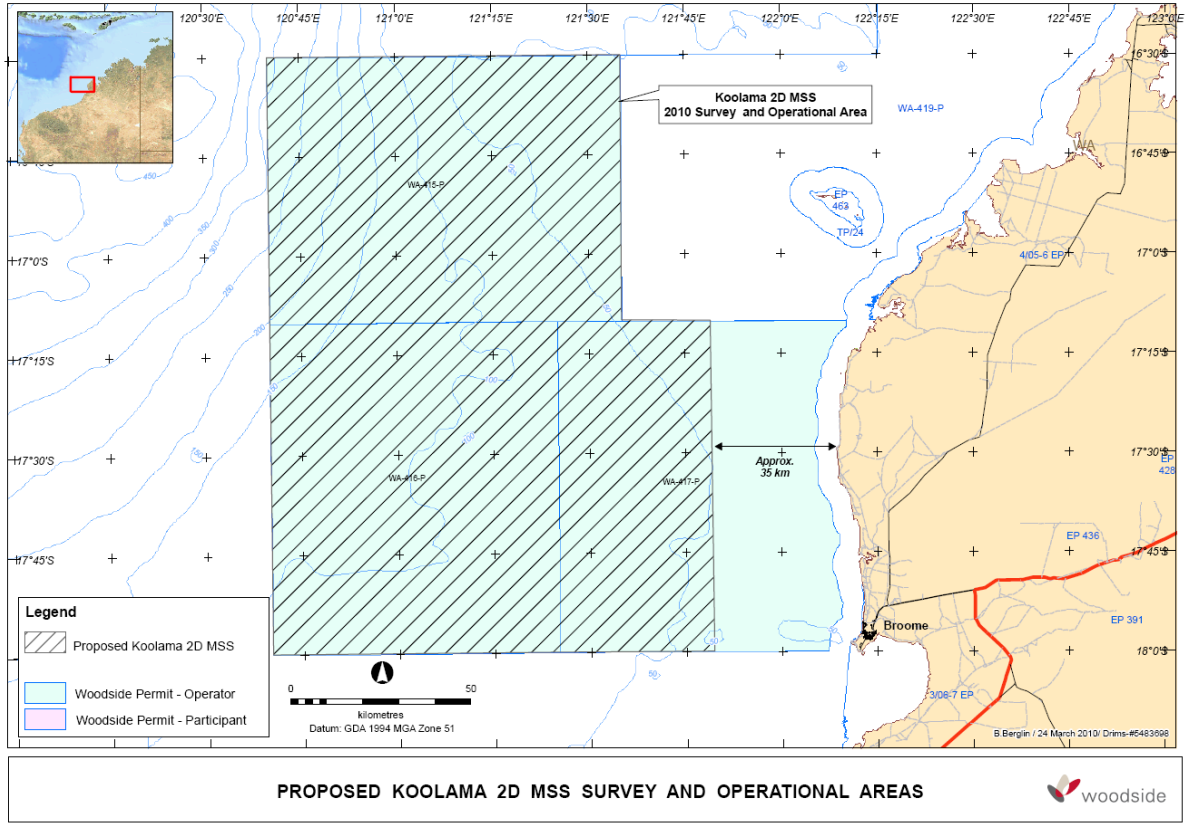

Figure 2-1: Proposed Koolama 2D MSS Survey and Operational Areas

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

	Latitude			Longitude		
Location Point	Degrees	Minutes	Seconds	Degrees	nutes	Seconds
1	17°	09’	55.05”	121°	35’	04.62”
2	17°	10’	01.91”	121°	48’	56.08”
3	17°	59’	56.17”	121°	49’	20.72”
4	17°	59’	55.06”	121°	25’	04.63”
5	17°	59’	55.08”	120°	40’	04.64”
6	17°	09’	55.07”	120°	40’	04.61”
7	16°	29’	55.06”	120°	40’	04.59”
8	16°	29’	55.03”	121°	35’	04.60”

3 EXISTING ENVIRONMENT

The survey area lies in the Northwest Marine region with water depths ranging from 20 to 300 m with the majority of the survey in waters less than 200m. The offshore marine environment of the Northwest Marine Region is very dynamic being subject to large tidal ranges and strong currents. Offshore swells in the region are consistently from the south-west with a height of 1 to 2 m, rising to 3 m during the winter. The seabed topography across the region is highly variable, from areas of flat seabed to areas with large calcarenite ridges and sand waves.

3.1 Benthic habitat

The Northwest Marine Region is dominated by soft sediment seabed (sandy and muddy substrata with occasional patches of coarser sediment). Regional oceanographic and coastal processes such as high turbidity, low light penetration and high sedimentation, effectively limit the widespread occurrence of significant marine flora and fauna within the nearshore zone, such as hard coral communities.

Benthic habitat surveys conducted in the vicinity of survey area indicate that communities living on the surface of the sediment (epifauna) were generally sparse and scattered. The predominant species consisting of a variety of common taxa including isolated sea fans and whips (Gorgonacaea), featherstars (crinoids), bryozoans, sea pens (Pennatulidae), hydroids, isolated small hard coral colonies and sea urchins. Growth of larger sessile epifauna is generally associated with patchy coarser sediment which serves as hard substrate for attachment. Beyond 50 m depth, observed areas of the seabed were found to be largely devoid of epifauna.

Infaunal communities (burrowing into the top few centimetres of the substrate) were dominated by polychaete worms, arthropods and molluscs. Overall, the abundance and diversity of infauna was low.

3.2 Threatened and Migratory species

The Koolama 2D MSS is **not likely** to have a significant impact on threatened, migratory or listed species. A search of the DEWHA protected matters search tool (DEWHA 2010) (conducted on 08/03/2010) indicated that ten 'threatened' and twenty 'migratory' marine species under the *EPBC Act* may occur within, adjacent to or migrate through the survey area (Table 3-1).

3.2.1 Cetaceans

The DEWHA protected matters search tool (DEWHA 2010) identified two threatened and migratory baleen whale species, the blue whale (*Balaenoptera musculus*) and humpback whale (*Megaptera novaeangliae)* and seven other migratory cetacean species that may occur within, adjacent to or migrate through the survey area.

It is unlikely that significant numbers of humpback whales will be present during the Koolama 2D MSS given that that survey is of a short duration and timed to occur prior to the peak humpback whale migration in July/August, and covers a relatively small area on the western edge of the main humpback migratory route. It is also unlikely that significant numbers of blue whales will be present due to the generally low density and lack of known significant feeding areas (variable based on localised up-welling) in the area.

The other seven migratory species including two baleen whale species, the Antarctic minke (*Balaenoptera bonaerensis*) and Bryde's whales (*B. edeni*) and five toothed whale species, the killer whale (*Orcinus orca*), sperm whale (*Physeter macrocephalus*), Irrawaddy dolphin / Australian snubfin dolphin (*Orcaella brevirostris/Orcaella heinsohni*), Indo-Pacific humpback dolphin (*Sousa chinensis*), 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.

Table 3-1: *EPBC Act* threatened, migratory and listed marine fauna that may occur within, adjacent to or migrating through the Koolama 2D MSS area

Type	Common Name	Scientific Name	Threatened Species Status	Migratory Species
Cetaceans	Blue whale	*Balaenoptera musculus*	Endangered	Migratory
	Humpback whale	*Megaptera novaeangliae*	Vulnerable	Migratory
	Antarctic Minke whale, Dark-shoulder Minke whale	*Balaenoptera bonaerensis*		Migratory
	Bryde's whale	*Balaenoptera. edeni*		Migratory
	Killer whale	*Orcinus orca*		Migratory
	Sperm whale	*Physeter macrocephalus*		Migratory
	Irrawaddy Dolphin	*Orcaella brevirostris*		Migratory
	Indo-Pacific Humpback Dolphin/ Australian snubfin	*Sousa chinensis*		Migratory
	Spotted Bottle Nose Dolphin	*Tursiops aduncas*		Migratory
Mammals	Dugong	*Dugong Dugon*		Migratory
Reptiles	Green Turtle	*Chelonia mydas*	Vulnerable	Migratory
	Leatherback Turtle,	*Dermochelys coriacea*	Vulnerable	Migratory
	Flatback Turtle	*Natator depressus*	Vulnerable	Migratory
	Loggerhead Turtle	*Caretta caretta*	Endangered	Migratory
	Hawksbill Turtle	*Eretmochelys coriacea*	Vulnerable	Migratory
Fish	Dwarf Sawfish	*Pristis clevata*	Vulnerable	
	Green Sawfish	*Pristis zijsron*	Vulnerable	
	Whale Shark	*Rhincodon typus*	Vulnerable	Migratory
	Shortfin Mako Shark	*Isurus oxyrinchus*		Migratory
	Longfin Mako Shark	*Isurus paucus*		Migratory
Birds	Streaked Shearwater	*Calonectris leaucomelas*		Migratory
	White Bellied Sea Eagle	*Haliaeetus leucogaster*		Migratory

3.2.2 Migratory Marine Mammals

Dugongs (*Dugong dugon*) are classified as a migratory species under the EPBC Act and are widely distributed across nearshore waters in the Kimberley where they are associated with seagrass habitat their food source. It is unlikely that dugongs will be present in the survey area due to large water depth and lack of suitable feeding habitat.

3.2.3 Threatened Migratory Turtles

The DEWHA protected matters search tool (DEWHA 2010) identified five threatened, migratory and listed marine turtle species, the green (*Chelonia mydas*), flatback (*Dermochelys coriacea*), leatherback (*Natator depressus*), Loggerhead (*Caretta caretta*) and Hawksbill (*Eretmochelys imbricate*) that may occur within, adjacent to or migrate through the survey area.

The Kimberley area is thought to be regionally significant for turtles, supporting large feeding and nesting populations of green, flatback, hawksbill and loggerhead turtles. Owing to their migratory habits, all five species of turtle have the potential to be present in open ocean habitats across the region including the survey area. Although given the relatively small survey area and duration any potential localised/temporary displacement of animals present is unlikely to significantly impact the turtle species. The survey will also be undertaken outside of known flatback and green turtle nesting periods to further reduce potential for interaction.

3.2.4 Threatened and Migratory Fish

The Northwest Marine Region contains a diverse range of fish of tropical Indo-West Pacific affinity (approximately 1,400 species). A search of the EPBC Act protected matters database identified that three threatened (vulnerable) fish species may occur within the permit areas: the whale shark (*Rhincodon typus*), the green sawfish (*Pristis zijsron*) and the dwarf sawfish (*Pristis clavata*). A further two listed migratory marine fish species may occur in the permit areas: the longfin mako shark (*Isurus paucus*) and the shortfin mako (*Isurus oxyrinchus*).

It is considered quite unlikely that whale sharks will be encountered in the survey areas. It has been suggested that a small number of the WA population migrate through the Browse region although few sighting of animals has occurred to date.

Green sawfish have a preference for muddy, soft bottom habitats such as the upper reaches of estuaries and turbid river systems. Green sawfish have historically been recorded in the coastal waters off Broome and in offshore waters (50-100 m depth) by commercial trawlers operating in the Pilbara Trawl Fishery.

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 permit areas.

3.2.5 Migratory Seabird Species

The DEWHA protected matters search tool (DEWHA 2010) identified and two migratory species, the streaked shearwater (*Calonectris leucomelas* or *Puffinus leucomelas*) and the white-bellied sea eagle (*Haliaeetus leucogaster*) that may occur within or adjacent to the survey area. Due to the large geographical ranges of both seabirds and migratory shorebirds, many of the birds in the Northwest Marine Region have the potential to occur in the survey area. There is no emergent land to support nesting seabirds or migratory shorebirds within the permit area, therefore the activities of birds in the areas will be restricted to foraging and the use of these areas as a migratory corridor.

3.3 Conservation Reserves

The proposed Koolama 2D MSS area is not located in or adjacent to any marine parks or reserves.

3.4 Cultural Environment

3.4.1 Shipwreck and heritage

A search of the Australian Heritage Database did not reveal any sites listed as National Heritage Places, within the Koolama 2D MSS area (Australian Heritage Council, 2009).

3.4.2 Natural, Historic and Indigenous issues

The Koolama 2D MSS area is not located in or immediately adjacent to any areas of natural, historic and indigenous significance.

3.5 Socio-economic environment

3.5.1 Commercial fisheries

The Koolama 2D MSS area overlaps the operating areas of one Commonwealth managed fishery and five state managed fisheries. The major fisheries in the Northwest Marine Region include prawn trawl fisheries and a variety of tropical finfish fisheries using trawl, trap, line and net methods. The fishing industry has been notified of the survey and has no issues were raised.

3.5.2 Recreational fisheries

Recreational fishing is concentrated around key population centres (e.g. Broome), with peak activity during the winter months (dry season) when the local population is increased considerably by tourists travelling to or through the area. Most recreational fishing occurs around the coastal waters and inshore islands, given the distance to the offshore islands. Fishing safaris, coastal cruises and charters are also popular, in terms of tourist activities on the coast. Much of the fishing activity in the area is boat-based due to high tidal ranges.

The Koolama 2 MSS area is adjacent to a popular bill fish fishing location which is centred around to two key bathymetric features referred to as the “Peanut” and the “Puddle” where bill fish and baitfish school aggregate. The “Peanut” is a ridge of about three miles length, located about 11 nautical miles west of JPP and about two miles south. The “Puddle” is an oval

depression of about 3.5 miles length, about five miles west of Quondong. Both features are located in the far-eastern portion of the WA-417-P permit area outside of the survey area. The areas are heavily fished during an annual bill fish fishing tournament held out of Broome. It is unlikely that survey will impact on bill fish due to the distance between the survey area and known aggregation point, the low sensitivity of billfish and baitfish to seismic noise and survey ending prior to the billfish tournament.

3.5.3 Petroleum and gas

No other petroleum or gas operations are known to be occurring within the immediate vicinity of or during the Koolama 2D MSS.

3.5.4 Tourism

Various recreational vessels, including charter vessels operate within the nearshore areas of the Kimberley and out to the offshore reefs and shoals. However, the survey area are not expected to be of any particular significance for these activities.

3.5.5 Shipping

The main concentration of shipping within and around the survey area primarily include small tugs, support and supply vessels but do include small numbers of other larger vessels such as bulk carriers transiting to/from the Port of Broome.

4 POTENTIAL ENVIRONMENTAL EFFECTS

The environmental risks and potential environmental impacts of the Koolama 2D MSS have been determined on the basis of Woodside's previous seismic survey experience in the region and the outcomes of an environmental risk assessment (ERA). The ERA indicates that the potential impacts arising for the Koolama 2D MSS can be categorised as having Low risk to Medium risk levels. No risks were assessed as High or Severe.

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;
- 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;
- 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 Koolama 2D MSS involves 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 MSS does not coincide with any major 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 putrescible wastes from survey vessels will comply with MARPOL requirements. 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 Koolama 2D 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

Significant consultation has been carried out in the course of progressing the broader Browse LNG Development. A wider programme of engagement with stakeholders is in place to ensure adequate consultation with:

- Government regulators and other decision-making authorities;
- Government and non-government scientific institutions;
- Relevant commercial enterprises;
- Community; and
- Non-government organisations/environmental or conservation groups.

A range of stakeholder consultations have also been carried out regarding the Koolama 2D MSS during the preparation of the Environment Plan including:

- Department of Mines and Petroleum (DMP);
- Department of Environment and Conservation (DEC); and
- Department of the Environment, Water, Heritage and the Arts (DEWHA).

A range of stakeholder consultations have also been carried out regarding the Koolama 2D MSS prior to the commencement of the activity including:

- DEC (Broome);
- Department of Fisheries (Broome and Research Division);
- DEWHA – Australian Antarctic Division – Australian Marine Mammal Centre;
- Shire of Broome;
- Broome Port Authority;
- Pearling Industry (Clipper Pearls, Paspaley Pearls, Pearl Producers Association);
- Kimberley Marine Tourism Association;
- Commercial fishing (Northern Demersal Scale Fishery, Kimberley Professional Fisherman's Association, Broome Prawn Managed Fishery, WA Fishing Industry Council)
- Woodside Marine Expert Advisory Panel (Dr Robert Harcourt – cetacean expert)
- Centre for Whale Research; and
- Broome Fishing Club (organisers of the Broome Bill Fish Classic).

Where issues/questions were raised by Stakeholders, these have/will be addressed by Woodside as required.

Woodside will contact all relevant stakeholders prior to the commencement of the Koolama 2D MSS and issue a 'Fact Sheet' providing relevant information on the survey.

7 CONTACT DETAILS

For further information on this proposal please contact:

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Table 7-1: Koolama 2D Marine Seismic Survey – Summary of Proponents Commitments

No.	Objective	Commitment

1	No significant impact to marine fauna	• Adherence to E*PBC Act Policy Statement 2.1* and the following additional mitigation measures:
		  • Precaution zones (Observation zone: 3km+; Low power zone: 2km; and Shutdown zone: 500m)
		  • Dedicated Marine Fauna Observer on source vessel;
		  • Survey personnel (marine and seismic) provided with pre-survey induction on Policy 2.1
		  • Woodside MSS Guidelines on the implementation of EPBC Act Policy Statement 2.1
		• Adherence to the DEWHA Whale Interaction/Watching Guidelines 2005 located at: http://www.environment.gov.au/coasts/publications/pubs/whale-watching-guidelines-2005.pdf;
		• All vessel personnel will be supplied and familiarised with the Browse Cetacean Sighting Capacity Tool Kits to assist in cetacean sightings and identification. These kits are a pelican case with binoculars, cetacean reference books and posters.
		• Detailed reports of all marine fauna sightings will be recorded using the DEWHA Cetacean Sightings Application (database) (http://data.aad.gov.au/aadc/ammc/index.cfm) ,
		• Seismic survey programme will cease when humpback whale migration activity reaches a pre-determined trigger level of three (3) or more cetacean triggered shutdowns per day for a period of seven (7) consecutive days
		• In conjunction with the cetacean mitigation measures the MFO will:
		  • Maintain continuous visual observations for turtles & whale sharks within a 500m horizontal radius of the source vessel;
		  • If turtles or whale sharks are sighted within 500m horizontal radius of source vessel, the acoustic source will be shut down; and
		  • Undertake visual observations for turtles & whale sharks for at least 10 minutes prior to the commencement of soft start, focusing on a 500m horizontal radius of the source vessel.
		  • 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.

2	No significant impact to marine habitats	• Anchoring will only occur in the event of an emergency. • Vessels will use approved navigation systems and depth sounders. • Adherence to standard maritime safety/navigation procedures. • Strict adherence to equipment handling and acquisition procedures. • Vessels with experienced operators and crew will be used to minimise the risk of equipment dragging or loss. • Where possible equipment lost will be recovered. • Detailed records of equipment lost overboard will be maintained.

No.	Objective	Commitment

3	Minimise emissions to atmosphere from operation of vessels	• Compliance with MARPOL 73 / 78 Annex VI (as implemented in Commonwealth waters by the Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983). In particular:
		  • Use of low sulphur fuel when it is available to minimise emissions from combustible sources.
		  • Emissions managed by the implementation of a preventive maintenance system.

4	No introduction of marine introduced marine species or spread of existing introduced marine species	• Adherence the AQIS Australian Ballast Water Management Requirements. • 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). • 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.

•	No significant impact on marine environment from routine operational discharges e.g. putrescible wastes	• All sewage and putrescible wastes will be managed and disposed of in accordance with MARPOL 73/78 (as implemented in Commonwealth waters by the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983):*
		  • discharge of sewage and putrescibles waste will be of short duration with high dispersion and biodegradability;
		  • All sewage and putrescible waste treatment systems and holding tanks are to be fully operational prior to survey commencement;
		  • Onboard sewage treatment plant approved by the International Maritime Organisation (IMO)
		• Discharge of sewage and putrescible wastes only at a distance of more than 12 nautical miles from the nearest land or NMP boundary;
		• Sewage and putrescible wastes macerated where possible prior to disposal;
		• Vessels unable to treat/store grey water (i.e. wastewater from sinks and showers will where possible use biodegradable soaps and detergents.
		• A Vessel Waste Log will be maintained to record waste management practices;

5	No significant environmental impact from routine storage, handling and disposal of solid, liquid and hazardous wastes	• No discharge of plastics or plastic products of any kind from vessels in accordance with MARPOL and P (SL) requirements. • 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, deck sweepings, oil soaks, machinery deposits, will be disposed of overboard) from vessels. • 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.

No.	Objective	Commitment
		• Incinerators used are compliant with MARPOL and IMO requirements. • Incinerators will be operated in accordance with established operating procedures that align with manufacturers specifications by trained personnel. • Vessel Waste Management Plan in place detailing wastes generated and disposal requirements. • 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. • A Vessel Waste Log will be created and maintained to record quantities of wastes transported to shore. • Detailed records of equipment lost overboard will be maintained. • 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). • 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. • 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).

6	No accidental hydrocarbon or chemical spills to the marine environment.	• Hydrocarbons (oils and fuels) and chemical spills will be managed accordance with Woodside's Browse Basin Oil and Other Noxious and Hazardous Substances Spill Contingency Plan (OSCP) (WEL Doc No. W0000RH3920923);
		• The survey vessels will comply with MARPOL 73/78 Annex I requirements to prevent oil pollution, including:
		  • Vessel holds a valid IOPP Certificate.
		  • Oil Record Book maintained which details how, when and where any waste oils/oily effluents are disposed of.
		  • Oily slops storage tank is provided.
		  • 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.
		• Shipboard Oil Pollution Emergency Plans (SOPEP) will be prepared and kept onboard the vessels;
		• Operational procedures will be in-place on board the survey vessels for all operations that involve handling environmentally hazardous materials, oil and oily effluents/ waste during routine/ maintenance activities;
		• All hazardous substances (as defined in NOHSC:1008(2004) – Approved Criteria for Classifying hazardous substances) will have an Material Safety Data Sheet (MSDS) in place that is readily available on board;
		• Discharge of treated bilge water (< 15 ppm oil) only at a distance of more than 12 nautical miles from the nearest boundary of the NMP (Commonwealth boundary);

No.	Objective	Commitment

		• All storage facilities in good working order and designed in such a way as to prevent and contain any spillage as far as practicable;
		• 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;
		• Personal Protective Equipment (PPE) appropriate to the nature and volume of spilled material;
		• 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;
		• Refuelling at sea is will be avoided if at all possible. If refuelling does take place its and will be subject to the following:
		  • refuelling of vessels will be undertaken under favourable wind and sea conditions as determined by the Master of the Vessels
		  • refuelling will take place during day light hours only;
		  • JHA in place and reviewed before each fuel transfer;
		  • refuelling procedure approved by Woodside
		  • All valves and flexible transfer hoses checked for integrity prior to use.
		  • Dry break couplings (or similar) in place for all flexible hydrocarbon transfer hoses.

7	Minimise interference with commercial and recreational fishing.	• Notification of activity details to relevant commercial fisheries organisations prior to commencement of each survey. • The use of standard maritime safety procedures (Auscoast Warnings via AMSA where appropriate, radio contact, display of appropriate navigational beacons and lights) • Strict adherence to equipment handling and acquisition procedures • Vessels with experienced operators and crew will be used to minimise the risk of equipment dragging or loss • Where possible in-water equipment lost will be recovered • Detailed records of equipment lost overboard will be maintained.
8	Minimise disruption to commercial fishing, shipping and recreational vessels	• Adherence to standard maritime safety and navigation procedures (e.g. Auscoast Warnings via AMSA, radio contact, display of appropriate navigational beacons and lights). • Use of support vessels • Strict adherence to equipment handling and acquisition procedures • Vessels with experienced operators and crew will be used to minimise the risk of equipment dragging or loss • Where possible in-water equipment lost will be recovered • Detailed records of equipment lost overboard will be maintained.
9	Minimise impacts to heritage and conservation values	• Ensure all contractor personnel are aware of and comply with the approved Environment Plan.

No.	Objective	Commitment
10	Project personnel understand and comply with the scope, objectives and commitments contained in the EP and understand the procedure to be followed if a change in scope is required.	• All relevant Woodside and contractor personnel receive an induction that outlines the approved activity scope, management procedures and standards and commitments detailed in this EP. • All relevant Woodside and contractor personnel understand the 'management of change procedure' contained in this EP.
11	Vessel HSE Management system covers applicable requirements of this EP	• Review of Vessel HSE Management System to ensure it covers applicable requirements of this EP.
12	Environmental inspections to be carried out according to the requirements of the EP.	• Environmental inspection of the vessel(s) carried out prior to the start of the activity. • Project Environmental Commitments Checklist distributed and monitored onboard the vessel(s) on a regular basis by the Onboard Woodside Representative.
13	All environmental incidents are reported in accordance with the requirements of this EP, WEL procedures and legislative requirements.	• All relevant project personnel undertake an HSE induction that includes an overview of the incident reporting and notification procedures detailed in this EP. • Environmental incidents recorded and reported according to the requirements of the EP.
14	A review of the operation conducted at the end of the programme to ensure all environmental commitments within the EP were met.	• 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.