

Torosa-4 Appraisal Well Drilling Environment Plan Summary

This summary of the Torosa-4 Appraisal Well Environment Plan has been submitted to comply with Regulation 11(7)(8) of the *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999*. It may not be used for any other purpose without Woodside's prior approval.

1. Project Description

Woodside Energy Ltd (Woodside) proposes to undertake drilling of the Torosa-4 appraisal well in two parts within. The proposal is to use the Chikyu drill ship, operated by Seadrill, and the Sedco 703 semi-submersible drill rig, operated by Transocean. The well location is within Permit Area WA-30-R in approximately 472 m water, 291 km north of Cape Leveque and 9 km north-east of North Scott Reef.

The well will be drilled using water based muds and will be profiled using vertical seismic profiling. A well test may be conducted at the Torosa-4 site, incorporating up to 3 days of flow and up to 3 days shut-in. The practical objective of the test is to conduct operations without release of hydrocarbons to the marine environment and to minimise production of black smoke.

2. Coordinates of Activity

Well	GDA 1994 MGA Zone 51	
	Easting E	Northing N
Torosa-4	393 708 mE	8 459 635 mN

3. Description of the Receiving Environment

The most sensitive environment in the area is Scott Reef. Scott Reef is not a World Heritage Property, Marine Park or listed as a Ramsar Wetland. The reef flat of South Scott Reef is managed by the Western Australian Department of Environment. Scott Reef is listed on the Australian Heritage Register.

The diversity of habitats within the Scott Reef complex, together with its size and location in a coral rich province, is reflected in the diversity of corals reported from the area. A total of 258 species of scleractinian corals have been identified, which is similar to that reported for Ashmore Reef (255 species). Benthic habitats at Scott Reef were extensively mapped and described in 2006 by the Australian institute of Marine Science. Ten distinct benthic habitats were described from the lagoon at South Scott Reef and eight from north Scott Reef.

The following species, which may occur at the Torosa-4 well location and within surrounding waters, are considered to be rare, vulnerable or in need of special protection, and have been listed as being in need of protection under State and/or Commonwealth legislation:

- *Megaptera novaeangliae* (Humpback Whale)
- *Sula dactylatra bedouti* (Masked Booby - eastern Indian Ocean)
- *Chelonia mydas* (Green Turtle)
- *Caretta caretta* (Loggerhead Turtle)

Socio-economic Environment

Commercial fisheries currently operating in the offshore waters of the Browse Basin where the Torosa-4 well is located are:

- Northern Demersal Scalefish Fishery;
- North West Slope Trawl Fishery;
- North Coast Shark Fishery; and
- Western Tuna and Billfish Fishery.

Traditional Indonesian fishing activities are permitted within an area covered by a Memorandum of Understanding (MOU) between the Government of Australia and the Government of Indonesia. The MOU area includes Scott Reef.

Scott Reef may receive occasional visits from vessels, but little tourism or recreational activities are expected to occur in the vicinity of the offshore survey locations.

There are no known Australian indigenous sites at Scott Reef. The Yarra, a 482 tonne iron barque lost at Scott Reef in 1884, is listed on the DEW historical shipwreck database.

The Torosa-4 well location is in one of the most remote areas of Australia and is far from the main commercial shipping routes off the Australian coastline. The nearest shipping lane is the Port Hedland to Kupang/Banda shipping lane 74 km to the west.

4. Major Environmental Hazards

An environmental risk assessment undertaken identified environmental risks and potential environmental effects of drilling activities associated with rig deployment, well drilling and operation of standby vessels.

The main environmental aspects of the above activities are:

- Physical disturbance associated with positioning the rig, ship and drilling operations;
- Sound impacts if undertaking vertical seismic profiling;
- Discharge of drilling fluid, drill cuttings and cementing fluids;
- Discharge of deck drainage;
- Discharge of sewage and putrescible domestic wastes;
- Emissions to atmosphere from operating equipment and well testing;
- Accidental hydrocarbon and/or hazardous material spills during routine drilling activities and testing;
- Accidental hydrocarbon spills from failure of mechanical/physical barriers e.g. blowout preventers or casing strings;
- Accidental hydrocarbon and/or hazardous material spills during transfer from standby vessels; and
- Accidental diesel spill to marine environment from Chikyu losing position and foundering.

5. Summary of Management Approach

The following table identifies the general key management objectives, standard and criteria to achieve these objectives.

Objectives	Standards	Criteria
No introduction of exotic marine species	<ul style="list-style-type: none"> • AQIS Australian Ballast Water Management Requirements • Quarantine Act 1980 	<ul style="list-style-type: none"> • Chikyu, Sedco 703 and support vessels adhere to AQIS Australian Ballast Water Management Requirements and quarantine requirements.

Objectives	Standards	Criteria
No significant impact to marine fauna	<ul style="list-style-type: none"> Woodside Environmental Standards and Aspirations EBPC Amendment Regulations 2006 DEW Guidelines for Minimising Disturbances to Whales 	<ul style="list-style-type: none"> Guidelines to minimise whale disturbance followed. Required safe distance of 300 m from cetaceans maintained by standby vessels. VSP Survey Procedures followed.
No significant impact on marine environment from drilling fluids and cuttings	<ul style="list-style-type: none"> Woodside Environmental Standards and Aspirations Woodside's Well Engineering Drilling Fluid Selection Procedure (TP03) 	<ul style="list-style-type: none"> Use of approved, low toxicity WBM. Fluid and cuttings control equipment inspected and operating correctly prior to commencement of operations.
No significant impact on marine environment from routine discharges	<ul style="list-style-type: none"> Woodside Environmental Standards and Aspirations MARPOL 73/78 Annex IV 	<ul style="list-style-type: none"> Sewage and putrescible waste systems are fully operational prior to commencement of drilling operations and includes maceration to less than 25 mm diameter. Check for marine mammals within the vicinity of the drill unit undertaken before discharge of residual water based mud or cement. Deck drainage contaminated by hydrocarbons or chemicals is contained and disposed onshore unless monitored and oil in water content below 15 mg/L.
No significant environmental impact from solid and hazardous wastes	<ul style="list-style-type: none"> Woodside Environmental Standards and Aspirations Waste Management Plan - Dampier MARPOL 73/78 Annex IV 	<ul style="list-style-type: none"> Waste Management Plan is in place and adhered to. Hazardous wastes documented and tracked according to requirements. MSDS sheets readily available. Waste log maintained and quantities of wastes transported ashore recorded. Recording and reporting of all items lost overboard.
Minimise interference with recreational vessels, commercial fishing, and shipping.	<ul style="list-style-type: none"> Woodside Environmental Standards and Aspirations Emergency Response Plans AMSA requirements. 	<ul style="list-style-type: none"> Functional navigational lighting in place and in use. Consultation with local fishermen, fishing industry groups and management agencies as needed. Operations carried out in a manner that does not interfere with navigation and fishing to a greater extent than is necessary. Marine notices broadcast according to Standard Maritime Safety Procedures (AMSA), via the Rescue Co-ordination Centre (RCC).

The following table identifies the Chikyu specific key management objectives, standard and criteria to achieve these objectives.

Objectives	Standards	Criteria
No significant disturbance to seabed and benthic habitats	<ul style="list-style-type: none"> • Woodside Environmental Standards and Aspirations • Supply Vessel Marine Operations Procedures 	<ul style="list-style-type: none"> • Use of dynamically position drill ship. • Use of ROV to position transponders. • Recording and reporting of all items lost overboard.
No hydrocarbon or chemical spills to the marine environment.	<ul style="list-style-type: none"> • Woodside Environmental Standards and Aspirations • Chikyu SOPEP • Chikyu Emergency Response Plan • Western Australia and Dampier Sub-Basin Oil Spill Contingency Plan (ERP-3210). 	<ul style="list-style-type: none"> • Approved OSCP in place. • Chikyu crew induction covers spill response procedures and spill response exercise conducted. • Re-fuelling procedures are in place and followed for Chikyu and standby vessels. • JHA for bulk transfer of diesel and drilling fluids reviewed before each transfer. • Dry break couplings used on transfer hoses. • At sea refuelling supervised by Vessel Master or nominated Officer. • DP Operator in the control room at all times. • Records kept of inspections and preventative maintenance. • All valves, couplings and the transfer hose checked for integrity prior to use. • Approval is sought and provided prior to all dispersant applications.
Minimise emissions to atmosphere from incineration of wastes.	<ul style="list-style-type: none"> • Woodside Environmental Standards and Aspirations • MARPOL 73/78 Annex IV • MEPC.76(40) Standard Specification for Shipboard Incinerators • Incinerator Operating Manual 	<ul style="list-style-type: none"> • Incinerator certified to meet MARPOL requirements. • Incinerator operated as per Incinerator Operating Manual. • Only combustible non-hazardous waste, with the exception of oil and oily material, to be incinerated. • Ash to be contained and transported onshore for disposal. • Flue gas outlet temperature monitored together with fed / start up controls.

The following table identifies the Sedco 703 specific key management objectives, standard and criteria to achieve these objectives.

Objectives	Standards	Criteria
No significant disturbance to seabed and benthic habitats	<ul style="list-style-type: none"> • Woodside Environmental Standards and Aspirations • Site specific mooring plan • Sedco 703 Specific Procedures • Support Vessel Marine Operations Procedures 	<ul style="list-style-type: none"> • Anchor deployment and retrieval is done according to anchoring procedures and anchoring plan. • Recording and reporting of all items lost overboard.
No hydrocarbon or chemical spills to the marine environment.	<ul style="list-style-type: none"> • Woodside Environmental Standards and Aspirations • Sedco 703 SOPEP • Sedco 703 Emergency Response Plan • Western Australia and Dampier Sub-Basin Oil Spill Contingency Plan (ERP-3210). 	<ul style="list-style-type: none"> • BOP in place. • Approved OSCP in place. • Sedco 703 crew induction covers spill response procedures and spill response exercise conducted. • Re-fuelling procedures are in place and followed for Sedco 703 and standby vessels. • JHA for bulk transfer of diesel and drilling fluids reviewed before each transfer. • Dry break couplings used on transfer hoses. • At sea refuelling supervised by Vessel Master or nominated Officer. • Records kept of inspections and preventative maintenance. • All valves, couplings and the transfer hose checked for integrity prior to use. • Approval is sought and provided prior to all dispersant applications.
Minimise occurrence and impacts of oil spills during well test.	<ul style="list-style-type: none"> • Woodside Environmental Policy. • Woodside Production Test Guidelines for Exploration and Appraisal Wells. • Torosa-4 Well Test Programme. • Western Australia and Dampier Sub-Basin Oil Spill Contingency Plan (ERP-3210). • Sedco 703 SOPEP. 	<ul style="list-style-type: none"> • Design features and management measures are in place to maximise operating efficiency and to reduce risk to environment and reputation. • Well test is undertaken in compliance with the Torosa-4 Well Test Programme. • Well Test Pre-Flow Checklist completed before well testing commences. • Incidents including spills are reported to the Designated Authority as per Section 7.7.2. • Briefing of all project personnel on environmental sensitivities, management procedures and commitments detailed in the EP.
Minimise emissions to atmosphere during well test.	<ul style="list-style-type: none"> • Woodside Environmental Policy. • Woodside Production Test Guidelines for Exploration and Appraisal Wells. • Torosa-4 Well Test Programme. 	<ul style="list-style-type: none"> • High efficiency burner booms are in place to maximise operating efficiency and to reduce environmental effects during flaring. • Well Test Pre-Flow Checklist completed before well testing commences.

6. Consultation

As part of general stakeholder engagement for the Browse Project, a Stakeholder Engagement Plan has been developed and consultation will be ongoing with government, NGOs and community members. Prior to the commencement of drilling the Torosa-4 well, a fact sheet will be distributed to the following stakeholder groups:

- Western Australian Fisheries Industry Council (WAFIC)
- Australian Fisheries Management Authority (AFMA)
- Commonwealth Fisheries Association
- Fisheries WA
- Shire of Broome
- Port of Broome
- Australian Customs Service
- Kimberley development Commission
- TunaWest
- Western Australian Northern Trawl Owners Association
- Northern Fishing Companies Association
- Northern Territory Trawl Owners Association

The fact sheet will detail information about the Chikyu drill ship, Sedco 703 drill rig, supply vessels to be used, well location and duration of drilling activities. Further information will be made available upon request.

7. Contact Details

For further information about the project, please contact:

Samantha Jarvis
Woodside Drilling and Completions Environmental Adviser
(08) 9348 3956
Samantha.jarvis@wooside.com.au