Use of innovative technology to manage impacts in a sensitive environment

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Overview

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2. **Appraisal objective**
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Browse background

Location: ~ 425km north of Broome, Western Australia

3 gas fields in water depths up to 600m:

- Torosa (1971)
- Brecknock (1979)
- Calliance (2000)

Gas fields contain:

- Gas ~ 14 Tcf of gas (resource est. 1 Feb 2009)
- Condensate ~ 370 million barrels

The proposed development is a joint venture involving Woodside (operator) with BHP Billiton, BP, Chevron and Shell.

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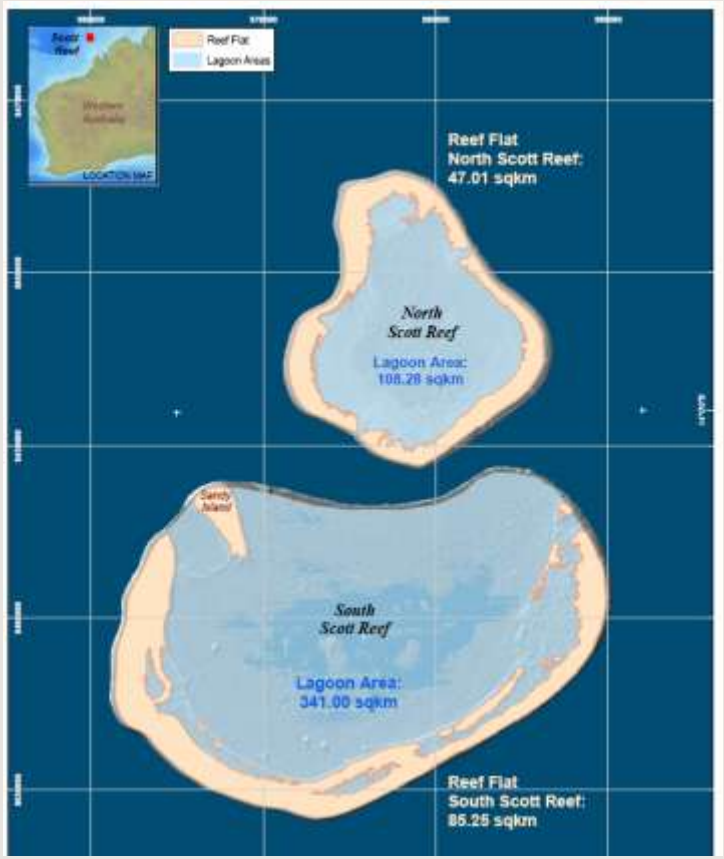
Scott Reef

- Scott Reef is a large emergent coral reef on the outer edge of the continental shelf.
- High biodiversity values.
- Listed place on the Commonwealth Heritage List.
- Sandy Islet is a turtle nesting site.
- Dolphin and whales travel through area.
- Traditional Indonesian fishing for trepang and trochus permitted.



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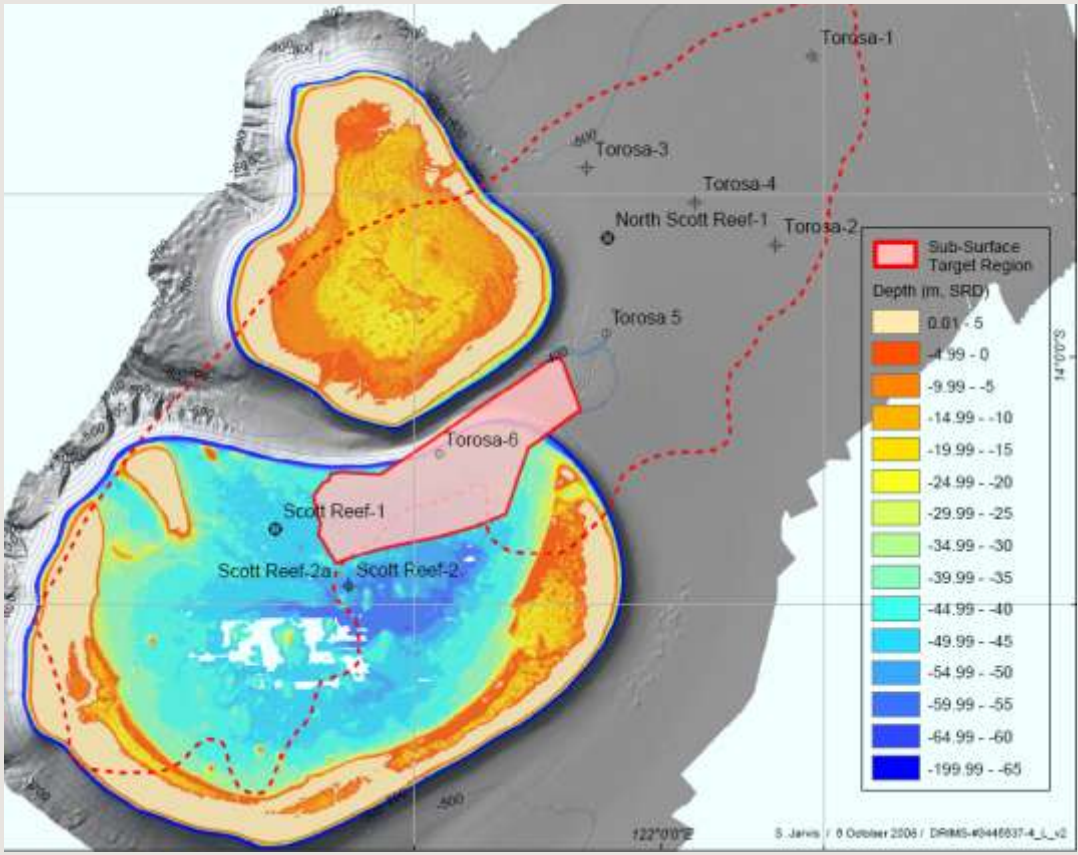
Appraisal objectives

- Approximately half the area of the Torosa gas field is beneath Scott Reef.
- Torosa North has been extensively appraised.
- Based on previous appraisal information a sub-surface target region was identified.



Impact assessment & regulatory approvals

- Approval required via under the EPBC Act and Offshore Petroleum Act.
- Significant stakeholder involvement via two stakeholder roundtables.
- Comprehensive impact assessment submitted with referral detailing predicted impacts and mitigations.
- Resulted in not controlled action.

Feasible rig options

1. Dynamically positioned rig

- Lagoon and channel water depths too shallow for rig to maintain position.

2. Moored semi-submersible

- Anchor spread would not fit within channel.
- Anchor footprint in lagoon relatively large.

3. Jack-up

- Anchor footprint in lagoon minimal footprint.

Environmental mitigations

The objective for the Torosa-6 well was to drill the well with the smallest possible environmental footprint.

The key environmental mitigations undertaken were:

- Undertaking a seabed survey to identify a well location away from coral habitats.
- Containing all cuttings, muds, cement returns and pit cleaning fluids.
- Management of invasive marine species.
- Monitoring waste water discharges while drilling.

Torosa-6 documentary

Torosa-6 Video

Invasive marine species (IMS)

- Comprehensive risk assessment process to identify vessels/rigs with potential for introduction of IMS.
- Risk assessment identified the rig and three support vessels as high risk.
- For high risk vessels/rig an inspection by an experienced IMS specialist was required to identify if IMS present.
- Pre-inspection of rig undertaken while in transit with legs and top of spud cans accessible.
- Final inspections, rig and two vessels had no IMS, one vessel had IMS and had to be replace with another vessel.

Monitoring program

- A comprehensive monitoring program was designed and implemented.
- The aim of the program was to compare actual impacts to predicted and modeled impacts.
- Post seabed survey results being analysed but initial results show no impacts outside of the rig footprint area.
- Monitoring of waste water discharges detected no impact at 50 m from the discharge point.
- Light monitoring showed no light recorded from the rig at Sandy Islet.
- Monitoring results are applicable to other wells and to the full field development.

Conclusions

The Torosa-6 well was successfully drilled with the following significant achievements:

- Appraisal objectives met.
- World first application of riser less mud recovery from a jack-up rig.
- Woodside first application of cuttings collection and containment system.
- No impact to water quality at the location.
- Minimal footprint of less than 500 m^2.

Acknowledgements

Premium Drilling: Wilcraft rig operator

Baker Hughes Drilling Fluids: Supplier and operator of cuttings containment, slurrification and transport system

AGR Group: Supplier and operator of riserless mud recovery system

Marine Operations Contractors:

Go Offshore

Tidewater Marine

Offshore Marine Services

SKM/ERM: Woodside environmental alliance contracting partner