



Ananke-1 Exploration Well

Environment Plan Summary

Drilling and Completions

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1. INTRODUCTION

Woodside Energy Ltd (Woodside) as operator proposes to drill the Ananke-1 exploration well located in the Carnarvon Basin in Commonwealth waters in Exploration Permit Area WA-269-P.

The Ananke-1 Exploration Well Environment Plan (EP) has been prepared in accordance with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Environment Regulations). The EP has been reviewed and accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

This EP summary has been prepared as per the requirements of Regulations 11(7) and (8) of the Environment Regulations.

2. LOCATION OF THE ACTIVITY

The Ananke-1 exploration well location is in Commonwealth waters in Exploration Permit Area WA-269-P (Figure 2-1) in approximately 936 m (Lowest Astronomical Tide) water depth, approximately 196 km from Karratha. Table 2-1 summarises the well details including surface coordinates, water depth and permit area.

Table 2-1: Ananke-1 Exploration Well Coordinates and Water Depth

Well	Water Depth (m LAT)	Longitude	Latitude	Permit Area
Ananke-1	936 m	115° 21' 09.24"E	19° 38' 30.72"S	WA-269-P

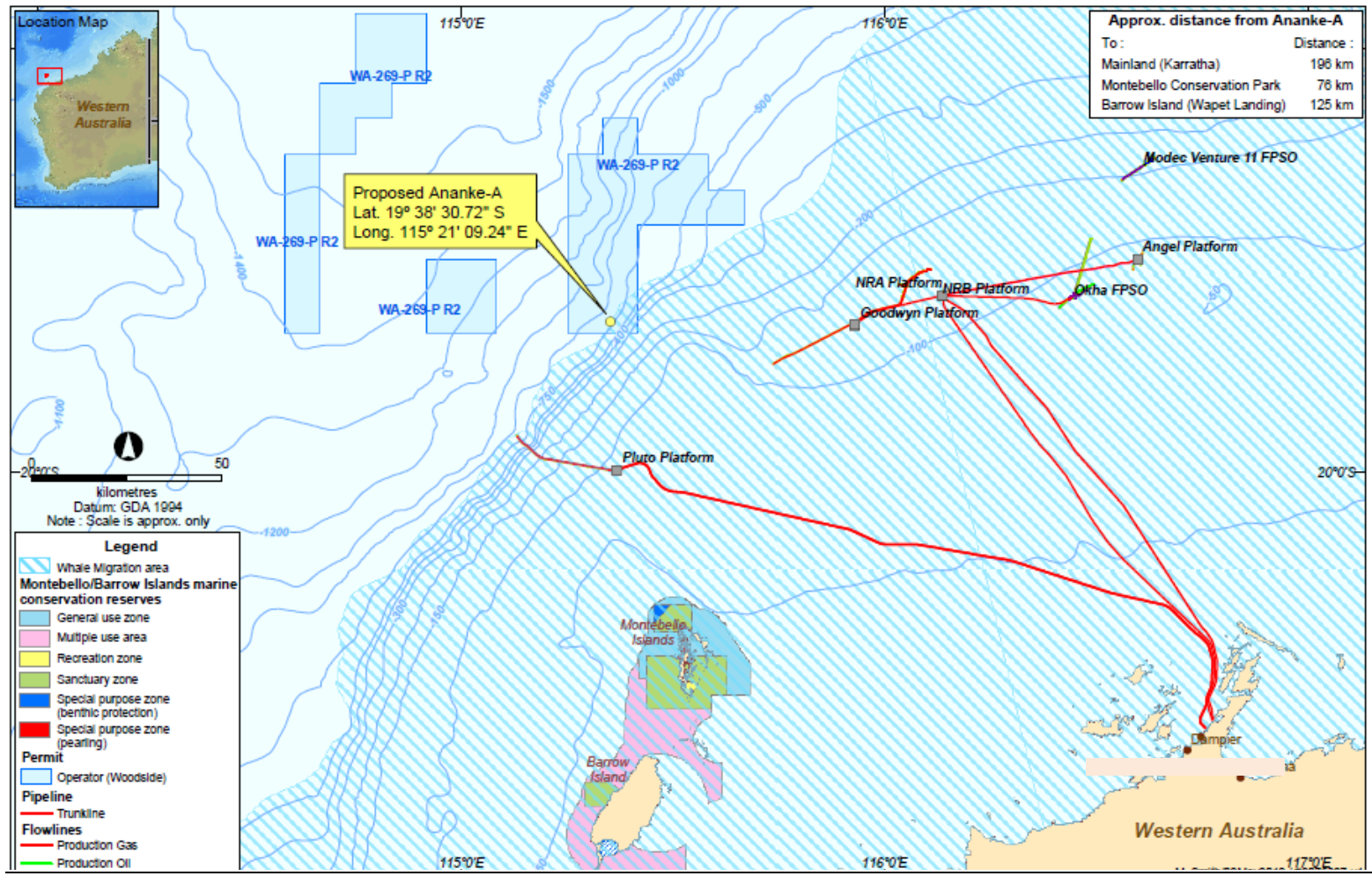


Figure 2-1: Drilling Location Map for Ananke-1 Exploration Well

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3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Physical Environment

The Ananke-1 exploration well is located within the North West Marine Bioregion (NWMR) on the outer continental slope region in 936 m water depth. The Indonesian Throughflow is the dominant current through the majority of the NWMR, while the Leeuwin Current is dominant in the south.

3.2 Biological Environment

Regional studies in the North West Shelf indicate that the seabed material is likely to be predominantly flat and featureless and comprised of thick, unconsolidated fine grained sands. The sediments support soft sediment benthic communities dominated by infauna (mobile burrowing species including molluscs, crustaceans and worms) and isolated larger fauna (free swimming cnidarian, demersal fish and benthic crustaceans). The large water depths at the site mean that benthic communities including seagrass, algae and scleractinian (reef building) corals are not present.

The Commonwealth Protected Matters database lists eight marine species as 'threatened' and 14 species as 'migratory' under Commonwealth legislation that may occur in low abundance within, or pass through the Ananke-1 exploration well area. The area does not provide critical habitat for feeding, breeding or resting, or have constricted migratory pathways, for these species.

The Ananke-1 exploration well (see **Section 4** of this summary) is located north of the main humpback migration route, which occurs predominately inshore of the 500 m isobath. The timing of the Ananke-1 exploration well does overlap with known pygmy blue whale migration between April and July; however, the well site lies within a broad migratory pathway (>100 km wide).

The abundance of threatened and migratory animals is expected to be low and the presence of the operating drill rig may result in localised behavioural avoidance but this is not considered significant and will not impact the population of these whales or other species.

3.3 Socio-economic Environment

The Ananke-1 exploration well is located within two Commonwealth fisheries management areas that cover large areas between the 200 m isobath out to the outer limit of the Australian Fishing Zone which are the North West Slope Trawl Fishery and the Western Tuna and Billfish Fishery. Status reports on the fisheries indicate that both fisheries are small (< 5 vessels in each fishery) and total fishing effort is low (in decline over recent years). Fisheries data indicates that the Western Tuna Billfish Fishery operates south of North West Cape and not in the vicinity of the proposed Ananke-1 exploration well. Consultation undertaken with the North West Slope Trawl Fishery indicates that the Ananke-1 exploration well will not preclude fishing operators from undertaking normal business activities.

There are no major commercial shipping routes in the vicinity of the Ananke-1 exploration well location.

The Ananke-1 exploration well is located approximately 196 km off Karratha in deep offshore waters (approximately 936 m depth) and is not accessed for tourism activities (recreational fishing and boating and charter boats operations) which tend to be centred around nearshore waters, islands and coastal areas.

There are a number of operational oil and gas fields in the North West Shelf region, with facilities including the Goodwyn, North Rankin and Angel Platforms, and the Okha Floating Production Storage and Offloading facility. These facilities are accessed regularly by tankers and support vessels that may be anchored or moving through the fields.

The Ananke-1 exploration well area is located 76 km from the outer boundary of Montebello Islands Marine Park (State Waters) and approximately 125 km from Barrow Island Marine Park. There are no known areas of cultural heritage significance in this area.

4. DESCRIPTION OF THE ACTION

The Ananke-1 exploration well will be drilled using the Ocean America semi-submersible drill rig, operated by Diamond Offshore Drilling and supported by two support vessels.

The Ananke-1 exploration well drilling program will take approximately 30 days and will be undertaken in July and August 2012.

This activity includes:

1. Installation and cementing of the well conductor pipe
2. Drilling of the top-hole sections using seawater and pre-hydrated bentonite sweeps
3. Installation and cementing of the drill casing string
4. Testing and installation of the blow out protector on the conductor pipe
5. Installation of the marine riser
6. Displacement of the top-hole section with water based mud.
7. Drilling of the bottom hole section until new formation is reached
8. Drilling to reach target depth of well
9. Undertaking logging activities
10. Plugging and abandoning the well.

5. MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

Woodside undertook an environmental risk assessment to understand the potential environmental risks associated with the Ananke-1 exploration well (routine and non-routine operations) to ensure they are reduced to As Low As Reasonably Practicable (ALARP) and will be of an acceptable level using a method consistent with Woodside standards.

The key environmental hazards and control measures to be applied to the Ananke-1 exploration well activities are shown in **Appendix A**. These are consistent with Woodside corporate and project-specific objectives, standards and criteria. All control measures associated with the hazards will be used to reduce environmental risk to ALARP and will be of an acceptable level.

6. MANAGEMENT APPROACH

The Ananke-1 exploration well drilling activity will be managed in compliance with the *Ananke-1 Exploration Well Environment Plan* accepted by NOPSEMA under the Environment Regulations, other relevant environmental legislation and Woodside's Management System (e.g. Woodside Environment Policy).

The objective of the EP is to ensure that potential adverse impacts on the environment associated with the Ananke-1 exploration well drilling activities, during both routine and non-routine operations, are identified, and will be reduced to ALARP and will be of an acceptable level.

The EP details specific objectives and standards for each environmental aspect that was identified and assessed in the Environmental Risk Assessment (**Section 5 of the EP**). For each environmental aspect the range of controls to be implemented (consistent with the standards) to achieve the performance objectives are detailed. The EP then establishes the specific measurement criteria that will be used to demonstrate that the performance objectives are achieved.

The implementation strategy detailed in the EP identifies the roles/responsibilities and training/competency requirements for all personnel (Woodside and its contractors) in relation to implementing controls, managing non-compliance, emergency response (oil spills) and meeting monitoring, auditing, and reporting requirements during the activity. The EP details the types of monitoring and auditing that will be undertaken and the reporting requirements for environmental incidents and reporting on overall compliance of the activity with the EP.

7. CONSULTATION

Woodside conducted a stakeholder assessment to identify potentially affected and interested stakeholders based on the well location, proposed activities and timing.

A consultation fact sheet was sent electronically to all identified stakeholders prior to lodgement of the EP to NOPSEMA for assessment and approval. This was supported by engagement with potentially affected stakeholders, relevant regulators and industry associations.

The stakeholder group identified to be potentially most affected was the North West Slope Trawl Fishery, given the proximity of the well to previous fishing effort. A representative from the fishery confirmed that there would be no fishing operators in the location at the proposed time of drilling.

Woodside did not receive any material concerns from stakeholders prior to or after lodgement of the Environment Plan for assessment and approval. Woodside will continue to accept feedback from stakeholders during the drilling program.

8. CONTACT DETAILS

Further information about the Ananke-1 Exploration Well activity can be obtained from:

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APPENDIX A: Summary of Key Environmental Hazards and Control Measures to be applied to the Ananke-1 Exploration Well Drilling and Completion Activities

Source of Risk (Hazard)	Potential Environmental Impact	Control/Mitigation Measures
Timing and location of drilling activity	Disturbance to marine fauna in critical habitat	<ul style="list-style-type: none"> • Planning/location of activity to avoid/minimise disturbance to marine fauna
	Displacement of fishing activities in the area	<ul style="list-style-type: none"> • Maintain a 500 m radius petroleum safety zone around the drill rig as required under the <i>Offshore Petroleum Greenhouse Gas Storage Act 2006 (OPGGSA)</i>
	Interference with other sea users	<ul style="list-style-type: none"> • Compliance with Australian Maritime Safety Authority administered marine safety regulations and marine notification requirements • Pre-drilling notification/consultation with stakeholders
Vessel/rig movement and noise	Acoustic disturbance to whales - behavioural	<ul style="list-style-type: none"> • The interaction of the support vessels and helicopters with cetaceans will be consistent with Part 8 of the Environment Protection and Biodiversity Conservation Regulations 2000
	Injury/mortality of whales	
Well site	Damage to benthic habitat	<ul style="list-style-type: none"> • Pre-spud survey undertaken to ensure areas of hard substrate and high structural complexity will be avoided
Rig anchoring	Damage to benthic habitat	<ul style="list-style-type: none"> • Anchoring analysis undertaken and implemented to minimise the potential for accidental anchor drag or the rig dragging off location
Transport/introduction of invasive marine species (IMS) on hull, internal niches and in-water equipment	Introduction and establishment of invasive marine species and displacement of native marine species	<ul style="list-style-type: none"> • An IMS risk assessment will be undertaken for all vessels, rigs and immersible equipment planning to enter and operate within nearshore waters around Australia (i.e. nearshore areas include all waters within 12 nautical miles of land and in all waters less than 50 metres 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 • The Ocean America will not enter nearshore waters around Australia
Generation of acoustic signals – Vertical seismic profiling	Acoustic disturbance to whales and whale sharks	<ul style="list-style-type: none"> • Management procedures for vertical seismic profiling will be consistent with the <i>Environment Protection and Biodiversity Conservation Act Policy Statement 2.1</i> –

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		<p>Interaction Between Offshore Seismic Exploration and Whales</p> <ul style="list-style-type: none"> Records of sightings of marine mammals and whale sharks during vertical seismic profiling operations will be maintained
Routine operational discharge of waste to marine environment	Toxic effects to marine biota	<ul style="list-style-type: none"> All sewage and putrescible wastes will be handled and disposed of in accordance with MARPOL 73/78 Annex IV (as implemented in Commonwealth waters by the Protection of the Sea (Prevention of Pollution from Ships) Act 1983; and Marine Orders - Part 96: Marine Pollution Prevention - Sewage)
Loss of waste to marine environment	Toxic effects to marine biota	<ul style="list-style-type: none"> All wastes (oil, packaged harmful substances and garbage (other wastes)) will be handled and disposed of in accordance with MARPOL 73/78 Annex IV (as implemented in Commonwealth waters by the Protection of the Sea (Prevention of Pollution from Ships) Act 1983; and Marine Orders – Part 91: Marine Pollution Prevention – Oil; Part 94: Marine Pollution Prevention – Packaged Harmful Substances and Part 95: Marine Pollution Prevention – Garbage) Woodside will have a plan in place for management of wastes
Routine operational discharges to marine environment	Toxic effect on marine biota	<ul style="list-style-type: none"> The management of drilling fluids, drill cuttings, cementing fluids and subsea control fluids will be consistent with applicable Woodside engineering and operating standards and procedures Water based mud will be used while drilling the Ananke-1 exploration well All hazardous substances (as defined in NOHSC:1008 (2004) – Approved Criteria for Classifying Hazardous Substances) will have a Material Safety Data Sheet available on board All potentially hazardous materials and chemicals will be reviewed and approved through relevant Woodside procedures Check for marine mammals within the vicinity of the rig undertaken before bulk discharge of water based mud or cement Operational discharges are managed under the rig and vessel/s permit to work system
	Localised burial and smothering of benthic habitats from cuttings pile	
	Localised reduction in water quality (turbidity increase)	
Routine discharges from deck drainage to marine environment	Toxic effect on marine biota	<ul style="list-style-type: none"> Compliance with MARPOL 73/78 Annex I (as implemented in Commonwealth waters by the <i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i>) Management of deck drainage will be consistent with applicable Woodside engineering standards

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<p>Loss of hydrocarbons/chemicals to marine environment – Deck spill</p>	<p>Toxic effect on marine biota</p>	<ul style="list-style-type: none"> • All hazardous substances (as defined in NOHSC:1008 (2004) – Approved Criteria for Classifying Hazardous Substances) will have a Material Safety Data Sheet available on board • All potentially hazardous materials and chemicals will be reviewed and approved through relevant Woodside procedures • Fuels, oils and chemicals will be stored with secondary containment • Spill response bins/kits will be well stocked, readily available and personnel trained in their use
<p>Loss of hydrocarbons/chemicals to marine environment – Refuelling/breach of vessel tanks (vessel collision/grounding)</p>	<p>Toxic effect and oiling on marine biota</p>	<ul style="list-style-type: none"> • Bulk transfers will commence during daylight hours and when sea conditions are appropriate as determined by the master of the supply vessel • Bulk transfer hoses for diesel will have adequate floatation and dry-break couplings • Bulk transfers of diesel will be undertaken in accordance with procedures which include constant visual monitoring of gauges, hoses, fittings and sea surface, and radio communication between rig and support vessel • Internal transfers of diesel will be undertaken in accordance with procedures, which include constant visual monitoring of gauges, hoses and fittings • Preventative maintenance system is in place and effective to ensure the integrity of hoses, dry break couplings and other equipment used for fluid transfers <p>In the event of a loss of containment:</p> <ul style="list-style-type: none"> • The rig and vessels will have a Shipboard Oil Pollution Emergency Plan (as per MARPOL 73/78 Annex 1) for managing spills aboard • Spill kits will be well stocked and readily available with personnel trained in their use • Spills to sea will be managed as per Woodside’s Corporate Oil Spill Response Plan and the Ananke-1 Exploration Well Oil Spill Action Plan • Maintain a 500 m radius petroleum safety zone around the drill rig as required under the OPGGSA • Supply vessels to transit along pre-planned routes between the Ananke-1 exploration well site and port where possible to avoid navigation hazards • Vessels will use approved navigations systems and depth sounders • Adherence to standard maritime safety/navigation procedures

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Loss of well integrity resulting in loss of gas and condensate	Toxic effect and oiling on marine biota and coastlines/islands/coral reefs	<p>Preventative</p> <ul style="list-style-type: none">• Use of a range of industry standard well barrier equipment, materials and procedures as part of the well design, construction and abandonment• Barriers and testing requirements will be consistent with applicable Woodside engineering standards and procedures <p>Spill Response</p> <ul style="list-style-type: none">• Spills to sea will be managed as per Woodside's Corporate Oil Spill Response Plan and the Ananke-1 Exploration Well Oil Spill Action Plan• Monitoring/observation of the spill to guide the spill response• Recovery and containment undertaken to minimise potential environmental impact
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