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Environment Plan for Drilling of Exploration Wells in WA-371-P: Public Summary

This summary of the Environment Plan (EP) for Drilling of Exploration Wells in WA-371-P has been submitted to the Western Australia Department of Mines and Petroleum (DMP) to comply with Regulations 11(1) and 11(7) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009.

1. Introduction

Shell Development (Australia) Pty Ltd (Shell) is midway through exploratory drilling in Permit Area WA-371-P off northern Western Australia (WA). The *Ocean Epoch* drilled the first eight wells between November 2006 and February 2008. The ninth well in the programme (Concerto-1ST1) was spudded with the *Ocean Epoch* and suspended in January 2009. Concerto-1ST1 was continued with the *Songa Venus* in March 2009 and a further 3 wells were drilled.

The current proposal is to continue the WA-371-P exploration drilling programme and additional wells with the *Songa Venus*, which is expected to commence in early April 2010.

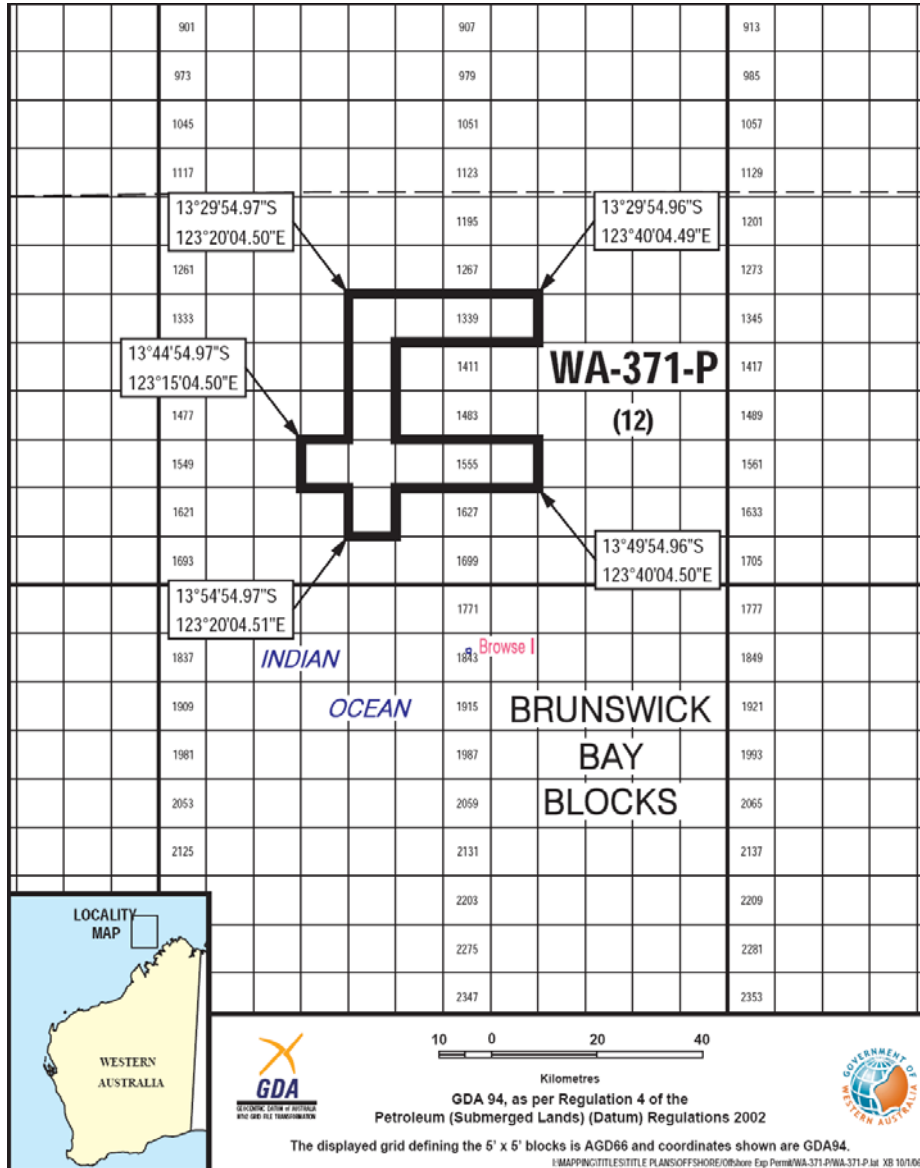
2. Coordinates of the Proposed Activity

The exploration drilling will take place in Commonwealth waters within Exploration Permit WA-371-P (Figure 2.1). The Permit area is bound by the coordinates listed in Table 2.1.

Table 2.1: Coordinates of the Permit Areas

Latitude	Longitude
13 29' 54.97	123 20' 04.50
13 44' 54.97	123 15' 04.50
13 54' 54.97	123 20' 04.51
13 29' 54.96	123 40' 04.49
13 49' 54.96	123 40' 04.50

Figure 2.1: Location of the WA-371-P Permit Area



3. Description of the Activity

The forthcoming works involve a series of drilling programmes within a known gas and condensate field in Permit Area WA-371-P (Figure 2.2). The *Ocean Epoch* drilled the first eight wells. These include wells named Prelude (1 and 1A), Gigue-1, Bouree (1 and 1A), Rigaudon-1, Tocatta-1, Rondo-1, Trio-1 and Fortissimo-1. The ninth well, Concerto-1ST1, was drilled initially by the *Ocean Epoch* before suspension and was re-entered and drilled to total depth by the *Songa Venus*. The remaining three wells (Minuet-1, Intermezzo-1 and Crescendo-1) were all drilled using the *Songa Venus* in 2009.

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Table 3.1 presents the proposed drilling well sequence for the drilling programme in WA-371-P permit area.

Table 3.1 Details of the Survey

Name of Well	Permit Area	Timing	Duration	Total Depth (m)
Songa Venus				
Concerto-1ST1 Deepening	WA-371-P	Q2 2010	53 days	4446 – 4700
Concerto-2	WA-371-P	Q2 2010	73 days	4400 - 4700

4. Description of the Receiving Environment

4.1. Physical Environment

The Permit Area is located on the Australian continental shelf 200 km offshore from the Australian mainland or 300 km from islands of the Indonesian archipelago. The water depth within the Permit Area is approximately 280 m.

4.2. Biological Environment

Six species of marine organisms listed as Threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and are known to occur in offshore areas of northern Western Australia and may pass through the Permit Area. Of these 6 species, 1 is endangered with the other 5 listed as Vulnerable (Table 4.1).

Table 4.1 Endangered and Vulnerable Marine Species Reported to Occur in WA-371-P permit area.

Common Name	Scientific Name	Status
Blue Whale	<i>Balaenoptera musculus</i>	Endangered
Whale Shark	<i>Rhincodon typus</i>	Vulnerable
Green Turtle	<i>Chelonia mydas</i>	Vulnerable
Leatherback Turtle	<i>Dermochelys coriacea</i>	Vulnerable
Humpback Whale	<i>Megaptera novaeangliae</i>	Vulnerable
Flatback Turtle	<i>Natator depressus</i>	Vulnerable

It is reasonable to consider that some of these organisms may pass through the Permit Area or utilise these waters for foraging. However, it is unlikely that species are dependent on the habitat and resources immediately adjacent to the proposed well sites at the time the wells are to be drilled.

4.2.1. Benthic Communities

The seafloor in WA-371-P is expected to comprise predominantly of sand-sized marine carbonate sediments. This bottom type is the primary habitat that will be affected by the proposed project.

The general region of the WA-371-P area, at a little over 250 m depth, shows little evidence of epibenthic communities. Species found in these areas include sponges, gorgonians,

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ascidians, echinoderms, crustaceans, bryozoans, and soft corals. Absence of hard substrate is considered a limiting factor for the recruitment of epibenthic organisms.

4.2.2. Cetaceans

The region of the Permit area supports a variety of migratory whales and dolphins, including:

- Striped and Spinner dolphins (*Stenella coeruleoalba* and *S. longirostris*);
- Common dolphins (*Delphinus delphis*);
- Bottle-nose dolphins (*Tursiops truncatus*);
- Blue Whale (*Balaenoptera musculus*);
- Sperm Whale (*Physeter macrocephalus*);
- Tropical Bryde's whales (*Balaenoptera edeni*);
- Short-finned pilot whales (*Globicephala macrorhynchus*);
- Humpback whales (*Megaptera novaeangliae*);
- Southern minke whales (*Balaenoptera acutorostrata*)
- Antarctic Minke Whale, Dark-shoulder Minke Whale (*Balaenoptera bonaerensis*); and
- Killer Whale (*Orcinus orca*).

The humpback and southern minke whales are known to be present over winter in the region during their migratory cycle. Calving grounds for humpback whales have been identified in Camden Sound, near the Kimberley coast more than 100 km distant from the Permit Area.

4.2.3. Turtles

Three species of marine turtles listed as threatened or endangered and migratory under the EPBC Act may occur within the permit area:

- Green turtle (*Chelonia mydas*);
- Leatherback turtle (*Dermochelys coriacea*); and
- Flatback turtle (*Natator depressus*).

Sea turtles, especially green turtles, undertake extensive migrations and low numbers of individuals may transit the area.

Ashmore Reef and Browse Island are recognised as two offshore breeding locations for marine turtles along the north-western Australian coastline.

4.2.4. Birds

Seabird feeding grounds, roosting and nesting areas are found on the offshore atolls, particularly Ashmore Reef (DEWHA 2008a). Of the 102 species of birds recorded in the Ashmore reserve, 49 are listed in the Japan-Australia or China-Australia Migratory Bird Agreements, which require habitat protection for migratory and endangered bird species. Ashmore Reef is one of the most important areas for seabirds in Australian waters, with up to 95,000 pairs of breeding birds nesting at the reef.

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4.3. Socio-Economic Environment

The Browse Basin region is subject to existing petroleum exploration and production activities, shipping, low levels of commercial fishing, and tourism activities centred around the Scott Reef, Browse and Adele Islands.

There are four Commonwealth commercial fisheries that overlap with the permit area, namely the Southern Blue Fin Tuna Fishery (SBFTF), Western Tuna and Billfish Fishery (WTBF), Western Skipjack Fishery (WSF) and North West Slope Trawl Fishery (NWSTF). Due to the low level of fishing effort in the permit area, it is unlikely that the proposed programme will conflict with these activities.

None of the major commercial shipping routes through the Timor Sea passes through the permit area. Vessel movements in closer proximity to the permit area are likely to include tankers servicing the Jabiru and Skua oilfields, and Dinichthys gas field and smaller refined product carriers and coastal ships servicing Western Australian and Northern Territory ports.

5. Major Environmental Hazards and Controls

Risk analysis has been used to characterise risk likelihood and severity and to evaluate the environmental risks and effects, as summarised for key aspects in Table 5.1 below.

Table 5.1: Summary of Environmental Risks and the Management Approach for the Key Aspects of the Survey

Potential Impact	Risk Rating	Management Approach
Minimise adverse impacts of disposal of WBM and SBM drilling fluids	Med	SBM will be recovered for subsequent re-use on other drilling programmes. Optimise the solids control equipment including regular washing down of shaker screens to maximise the opportunity for separation.
Vessel collision and large fuel spill (500 T)	Med	Notice to Mariners advising of the presence of the drill ship will be issued through the Australian Maritime Safety Authority (AMSA). Supply vessels to maintain 24 hour watch. Establish a 500 m exclusion zone around drill ship
Disturbance to seabed and benthic communities during anchoring	Low	Anchors are placed in identified suitable areas in accordance with Mooring Plan, minimise anchor movement.
Pollution of sea water with hydrocarbons deck drainage resulting from oily machinery areas	Low	Accumulations of oil, grease and other contaminants will be collected and removed from decks prior to any wash down. Ensure that water discharged from the separator contains no more than 15 ppm oil in water.
Introduction of invasive marine species or spread of existing invasive species	Low	Strict adherence to AQIS Australian Ballast Water Management Requirements. Inspection of hull for marine growth prior to departure, and if significant, conduct underwater cleaning.

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6. Management Approach

The survey will be conducted in accordance with all legislative and regulatory requirements and commitments in the DoIR approved Environment Plan. Shell's environmental management strategies and procedures include responsibilities, training, reporting framework, mitigation and response activities, monitoring and auditing procedures which are intended to reduce environmental risk to as low as reasonably practicable (ALARP) and to ensure that environmental performance objectives are met.

7. Consultations

Consultations regarding the proposed activity have been undertaken with the relevant stakeholders, including:

- Department of Mines and Petroleum (DMP);
- Australian Maritime Safety Authority;
- Australian Fisheries Management Authority (AFMA);
- Kimberly Professional Fishermans Association;
- Shire of Broome;
- Department of Environment and Conservation;
- Department of Lands and Planning;
- WA Fishing Industry Council;
- Australian Hydrographic Office;
- Broome Port Authority.

Shell has communicated with these and other stakeholders during the period leading up to the proposed survey, using a range of communication methods. Shell is committed to a process of ongoing engagement as appropriate with key stakeholders and will continue to respond directly to stakeholders where issues have been raised throughout the campaign.

8. Further Details

For further information about the WA-371-P Exploration Drilling programme please contact:

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