PYRENEES EXPANSION

ENVIRONMENT PLAN SUMMARY

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1 INTRODUCTION

BHP Billiton Petroleum Pty Ltd (BHP Billiton) acting as operator of the 'Pyrenees Facilities', on behalf of a joint venture comprising BHP Billiton Petroleum (Australia) Pty Ltd and Apache Northwest Pty Ltd, is proposing to drill six wells (five production wells and one appraisal / water injection well) within Permit Area WA-42-L. The proposed activity is within the Pyrenees Operational area which has been active since 2009. The area is located approximately 27km northwest of the tip of North West Cape and 46km northwest of Exmouth, Western Australia.

The project specific Environment Plan (EP) has been accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) and ensures that all operations are planned and conducted in line with BHPBP's environmental standards and comply with statutory requirements.

The Pyrenees Development was approved under the *Environmental Protection and Biodiversity Act 1999* (EPBC 2005/2034) subject to conditions including submitting plans for managing the impacts of drilling operations. This Environment Plan was submitted to the Department of Sustainability, Environment, Water, Population and Community and has received acceptance from the Ministers delegate..

The EP will serve as a practicable environmental management tool to be used throughout the activity by operators to implement targeted environmental control measures.

This summary EP contains the findings and conclusions of the environmental impact assessment undertaken for the proposed activity. This process ensures any potential environmental impacts associated with the activity, during both routine and non-routine (abnormal) operations, have been identified and appropriately assessed. Relevant preventative and mitigation measures have been developed and implemented to ensure any adverse impacts are eliminated where possible or managed to be as low as reasonably possible.

2 LOCATION OF THE ACTIVITY

The Pyrenees Development is located on the shelf break, the transition from continental shelf to slope, with water depths sloping seaward from 190 m at the shelf edge, to depths of 260 m. The coordinates for each of the wells are provided in Table 2.1 and the locations illustrated by Figure 2.1. The closest wells, Moondyne 1, 2 and 3 are approximately 34 km north-west of Exmouth, 15 km north of the closest point of the Ningaloo Marine Park (Cth waters), approximately 27 km from the North West Cape and approximately 23 km from the Muiron Islands.

Table 2-1. Pyrenees Expansion well locations (GDA94)

Well Name	Well Type	Latitude	Longitude	Depth (m)
Wildbull 1H1	Hydrocarbon production	21° 31' 12.51596"	114° 5' 5.52662"	212
Tanglehead 1H1	Hydrocarbon production	21° 31' 21.39754"	114° 7' 26.48749"	194
Tanglehead 2H2	Hydrocarbon production	21° 31' 21.61401"	114° 7' 27.73348"	194
Moondyne 1H1	Hydrocarbon production	21° 32' 5.45830"	114° 9' 17.97923"	191
Moondyne 2H2	Hydrocarbon production	21° 32' 5.48793"	114° 9' 19.71530"	191
Moondyne 3WI	Water injection/ Harrison reservoir appraisal sidetrack	21° 32′ 3.834″	114° 9' 18.011"	191
Ravensworth 8H6	Well intervention (gas valve change out)	21° 31′ 46.283″	114° 5' 6.999"	209

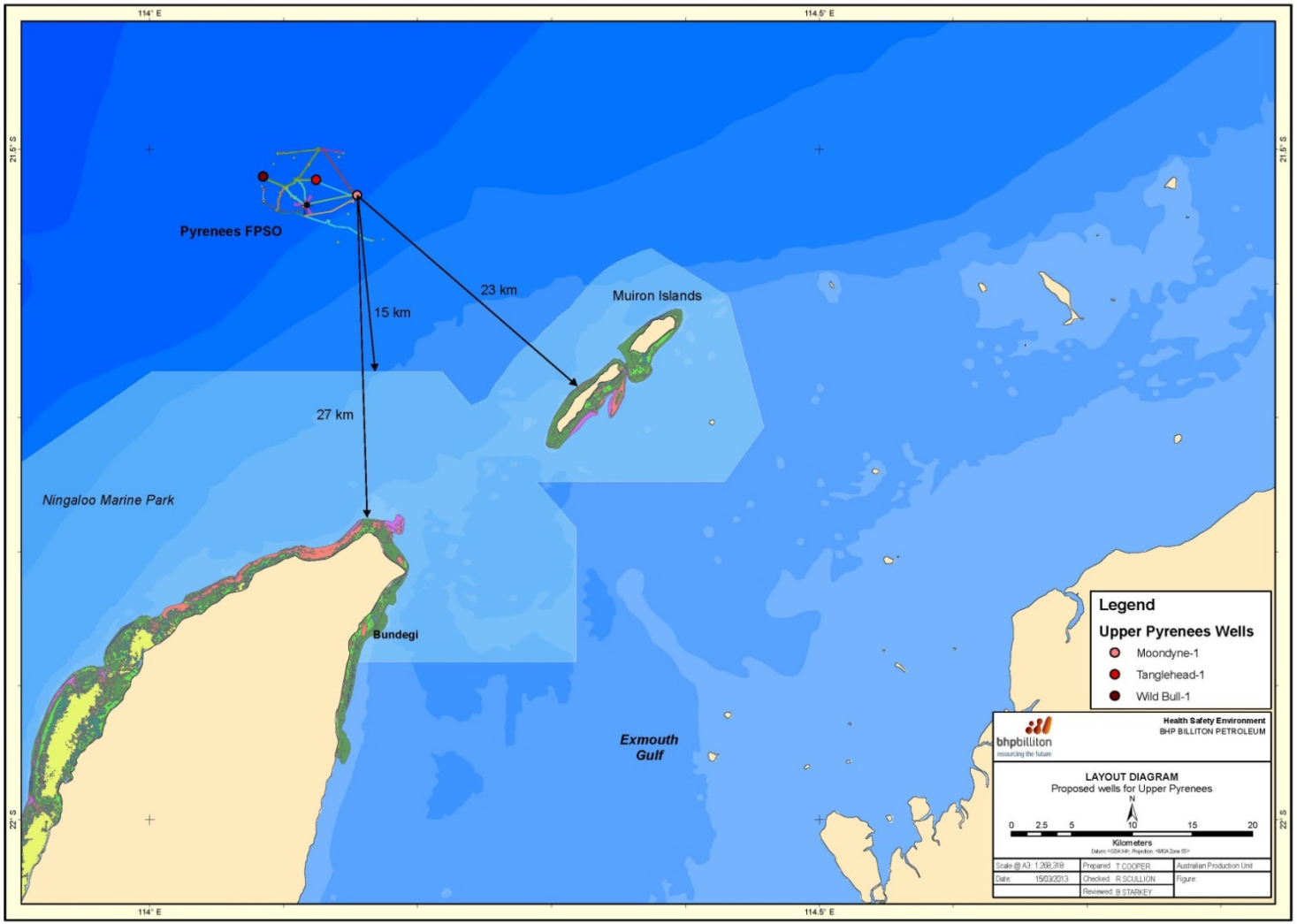

Figure 2-1. Location diagram showing well centres; coloured lines represent subsea infrastructure associated with the field development

3 DESCRIPTION OF THE ACTION

A semi-submersible drilling rig, the Nan Hai VI, will be used for the Pyrenees Expansion drilling campaign. The *Nan Hai VI* has previously been used by BHP Billiton to drill production wells in the region. The *Nan Hai VI* normally has a complement of up to 100 personnel and will be supported by a minimum of two Anchor Handling and Supply Vessels (AHSVs).

The *Nan Hai VI* will be held on location by eight drag embedment anchors connected to the rig by mooring lines. The anchors will likely be positioned approximately 1,400 m from the rig and approximately 900 m of anchor chain will be in contact with the seafloor between the anchor embedment point and the point where the chain rises from the seabed. The anchors will be carried by the AHSVs to the pre-identified deployment spot and lowered to the seabed at site. The rig will then winch in the slack from the mooring lines to a pre-determined optimal tension. Removal of anchors is reverse of the deployment procedures described above.

The drilling programme is summarised as:

- Drill 914 mm (36”) hole riserless
- Install 762 mm (30”) conductor and cement annular space back to the surface
- Drill 444 mm (17 ½”) hole riserless
- Install 340 mm (13 3/8”) casing and cement annular space back to the surface
- Install, latch and pressure test Xmas Tree and BOP
- Drill 311 mm (12 ¼”) hole to top reservoir depth.
- For water injector, plug and abandon 12 ¼” sidetrack (appraisal of Harrison)
- Install 244 mm (9 5/8”) casing and cement annular space approximately 500 m back from the shoe
- Drill 216 mm (8 ½”) horizontal hole in reservoir
- Install Lower completion, including sand screens
- Install Upper completion
- Suspend well for initial cleanup and production operations direct to FPSO

Drilling will be conducted using water based muds (WBM) for all hole sections. The basic formulation of WBM has seawater as the base fluid with additives for controlling formation pressure, borehole stability improving drilling performance and reliability. Where the circulation system is open, the drilling mud (seawater and seawater based mud sweeps) is discharged directly to the seabed. Where a closed system is used and the drilling mud is recirculated, drilling mud from one section can be recovered for use in subsequent sections. At the end of a well, the surplus WBM volume is discharged to the ocean..

Cementing operations are undertaken to ensure well integrity. Cement is transported as dry bulk to the rig by the support vessels and is mixed with water in the cementing unit onboard the rig to form wet grout/concrete slurry immediately prior to use. The grout/concrete slurry is then injected down to the well by high pressure pumps.

3.1 Timing

Drilling operations for each well are expected to take 30 to 40 days to complete. The drilling rig may be on location for a longer period if there are periods of non-drilling such as during a weather stand-down. The drilling campaign will be conducted entirely within Petroleum Permit Area WA-42-L over an approximate 9 month period between April 2013 and April 2014 inclusive.

4 DESCRIPTION OF RECEIVING ENVIRONMENT

4.1 Natural Environment

The Pyrenees expansion wells lie on the shelf slope within the Central Western Shelf Transition Bioregion. This bioregion covers approximately 7,340 km^2 on the continental shelf from north of Carnarvon to the tip of the North West Cape.

The western half of the development area (190 to 260 m depth) is characterised by gravely fine to coarse carbonate sands, while the seabed sediments in the eastern part of the area (190 to 200 m depth) are soft, fine sediments, mainly carbonate silts and clays.

4.2 Biological Environment

Seabed communities in the Pyrenees area are relatively sparse, with diversity and abundance tending to decrease with increasing depth, except where occasional areas of exposed or outcropping rock occur, resulting in localised increases of abundance and diversity. Soft sediment communities are dominated by invertebrate infauna, including polychaetes, crustaceans, molluscs, echinoderms and sponges. Exposed or outcropping rocky areas are dominated by sponges, soft corals and gorgonians, with various finfish, ascidians, crustaceans, echinoderms (urchins and brittle stars), polychaetes and molluscs also occurring.

A number of different pelagic fish occur in the deeper offshore waters of the region. Pelagic fish species are seasonally abundant and may pass through the area during annual migrations. The most notable species of deep water pelagic fishes in the area are the billfish, which include sailfish, marlin and swordfish.

Five species of sea turtle are known to possibly occur in the region, including green turtles, loggerhead turtles, hawksbill turtles, flatback turtles and leatherback turtles.

The most common whale species in the North West Shelf region is the humpback whale, which migrates through the region, during their movement along the Western Australian coast. In addition to the humpback whale, the blue whale, the minke whale and several other toothed whales may be sighted in the vicinity of the proposed wells. The abundance of the whales present in the Pyrenees area is likely to vary seasonally from low numbers during December to May and low to moderate abundance from June to November.

The region also supports diverse and abundant shark and ray populations. Whaler sharks are the most numerous and diverse, occurring in a wide range of habitats such as intertidal (black-tip reef shark), offshore reef drop-offs (grey reef shark) and deep ocean areas (oceanic white-tip). The whale shark is also known to frequent the region.

Dolphins are common inhabitants of the offshore waters of the region. Spinner dolphins and striped dolphins are expected in deeper waters while bottle-nosed dolphins are common in shallow water areas of the North West Shelf.

A large number of seabird species migrate across the region, and may pass through the permit areas, including ten species of migratory seabirds protected under international agreements. The southern giant petrel and the soft plumaged petrel, which are listed Threatened species, may be sighted in the vicinity of the Pyrenees development.

4.3 Socio-Economic Environment

There are no conservation reserves or parks located within the WA-42-L permit area. The closest marine conservation areas to the Pyrenees area are the Muiron Islands Marine Management Area and the Ningaloo Marine Park (Commonwealth boundary) located 18 km and 15 km respectively from the nearest well centre.

No state-managed fisheries overlap with the drilling area. There are three Commonwealth commercial fisheries operating in the drilling area and area of potential effect, these being:

- Western Deepwater Fishery - the fishery is mainly focused on the continental slope along the western coast of Australia. It is therefore unlikely that this fishery will be actively operating in the drilling area.
- Western Tuna and Billfish Fishery - the fishing season is currently open all year (from February–January), but most activity occurs during November to February. Due to the timing of the drilling, it is possible that vessels operating in this fishery will occur in the area, albeit in low numbers.
- North West Slope Trawl Fishery - given the drilling activity occurs within the boundaries of this fishery, it is possible that vessels operating in the fishery may occur in the drilling area in low numbers

There are not any shipwrecks in the area of the Pyrenees drilling.

5 MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

Risk analysis has been undertaken for all environmental aspects of the activity, consistent with the procedures outlined in the Australian and New Zealand Standards AS/NZS ISO 31000:2009 (Risk Management – Principles and Guidelines) and BHP Billiton's Drilling Worldwide Management Policies (WWD000).

These aspects, potential impacts and preventative and mitigative controls are indicated below. All mitigation measures associated with hazards will be used to reduce environmental risk to ALARP and will be of an acceptable level.

Environmental/Other Aspect	Potential Impact	Management and Mitigation Methods
Timing and location of drilling activity/ physical presence	Interference with fishing, shipping and/or other users	Maintaining 500m safety zone; Maritime Safety Information Notice; Notice to Mariners; Consultation Plan
Anchoring and seabed contact	Damage to seabed habitat Displacement of benthic biota	Anchors carried by support vessels directly to deployment location; Anchor Analysis Plan; AHSVs not to anchor near well site; Rig Move and Positioning Plan identify areas of potential highly sensitive habitat to be avoided.
Interference to fauna	Interference with fauna migratory patterns Displacement or attraction of fauna Physical impact from collisions	Adherence to EPBC Regulations; Briefing/induction for AHSV and helicopter personnel on cetacean/turtle interaction guidelines; Trained Marine Fauna Observer onboard
Noise	Acoustic disturbance to marine fauna Noise annoyance to residents/ tourists	Adherence to EPBC Regulations ; Briefing/ induction of personnel on cetacean, whale sharks and turtle interaction regulations/ guidelines; Trained Marine Fauna Observer onboard
Light	Disorientation of marine fauna	Illumination of working areas on the MODU and support vessels for safe working practices only.
Atmospheric emissions	Emission of greenhouse gases	Low sulphur diesel; preventative maintenance system; compliance with Marine Orders 97 (Marine Pollution Prevention, Air Pollution); Rig and support vessels have current International Air Pollution Prevention Certificates; annual inspection of machinery
Drilling fluids and cuttings	Localised reduction in water quality (turbidity); potential toxicity to marine fauna; localised displacement and smothering of seafloor biota	Whole fluids and components are 'non-toxic' or 'almost non-toxic'. Use of fluids and additives ranked "D" or better. Barite, bentonite and guar gum are "E" Category fluids on OCNS list and considered to (pose little or no risk to the environment (PLONOR).
Liquid wastes	Localised nutrient increase; minor increase in salinity; introduction of potential contaminants in water column from sewage, grey water, food waste, RO brine rejects, cooling water Oil and grease contamination to marine environment from deck drainage Toxicity to marine biota from BOP control fluid	Certificate of STP compliance with either MEPC.159(55) [post 2010 installation] or MEPC.2(VI) [installed pre 2010]; food wastes macerated to less than 25 mm prior to discharge Current IOPP certificate (International Oil Pollution Prevention); bunding; plugging or closing drains; current SOPEP; clean up equipment on board; operation and maintenance procedures; chemical selection process for least environmental harm BOP control fluid is ranked "D" or better on OCNS ranked list; MSDS on board
Cementing fluids	Localised reduction in water quality, deposition of cement on seabed	Cement products ranked "D" or better on OCNS ranked list; MSDS's on board
Solid wastes	Impact on the marine environment from waste disposal	Waste stored on board in appropriate containers; inductions of personnel in waste management procedures; no solid wastes to be disposed overboard

Introduction of non-indigenous or invasive marine species	Displacement of native species by marine pests from ballast water and biofouling	Adherence to AQIS Australia Ballast Water Management Requirements; IMS risk assessment; MODU/vessels have current Certificate of Anti-Fouling Systems (IAFS)
Marine spills of stored chemicals or refined oil	Contamination or pollution of the water column; visual pollution and potential toxicity	Bunding; preventative maintenance system; compliant SOPEP; IOPP certificate; clean up equipment on board
Uncontrolled leak of diesel from bulk storage	Contamination or pollution of the water column; potential large area of acute and chronic toxicity; visual pollution; impact to other users; complaints	Navigation aids; competent crew; petroleum safety zone; support vessel on standby to maintain exclusion zone; SOPEP; spill kits on board and personnel trained; Pyrenees Expansion Oil Spill Contingency Plan; IOPP certificate; Maritime Safety Information Notice; Notice to Mariners
Spill of diesel during transfer operations	Contamination or pollution of the water column; visual pollution	Transfers only under acceptable sea state and daylight hours; Certified transfer hoses; dry breakaway couplings; oil recovery system in drainage; tank alarms; hoses replaced 6-monthly; clean up kit in proximity; SOPEP; IOPP certificate
Loss of well containment	Contamination or pollution of the water column, impact to fauna, interference with fishing, shipping and/or other users from well blow out or sinking of MODU	Drilling Management System in place; Well Operations Management Plan; Oil Spill Contingency Plan

6 MANAGEMENT APPROACH

The Pyrenees Expansion well drilling activities will be managed in compliance with the Pyrenees Expansion Environment Plan accepted by NOPSEMA under the regulations and BHP Billiton's risk management policy.

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

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

The implementation strategy identifies the roles and responsibilities and the training and competency requirements for all personnel (BHP Billiton and contractors) in relation to implementing controls, managing noncompliance, emergency response (oil spills) and meeting monitoring and auditing and reporting requirements during the activity. The Environment Plan details the types of monitoring and auditing that will be undertaken (including audits and monitoring during the activity) and reporting requirements for environmental incidents (recordable and reportable incidents) and reporting overall compliance of the activity.

7 CONSULTATION

BHP Billiton has been actively involved in stakeholder engagement in the region since a community reference group was first established in Exmouth during preparation of the Stybarrow Development Environmental Impact Statement (EIS) in 2004, meeting on a quarterly basis. These community reference group meetings were expanded in 2005 during preparation of the Pyrenees Development Draft EIS to encompass the Pyrenees Development.

An Exmouth Sub-basin Stakeholder Engagement Management Plan (SEMP) has been in place since the start-up of the Stybarrow FPSO in November 2010. The SEMP is reviewed and updated annually. The stakeholder list contained within the Exmouth Sub-basin SEMP is updated each time a new activity is planned within the region or an Environment Plan is to be submitted.

In support of the Pyrenees expansion well drilling operations, BHP Billiton undertook an assessment of the proposed activities and potential environmental, social and economic impacts. All relevant stakeholders were sent an Environment Plan Fact Sheet, containing: a map showing the location of the proposed activity; a description of the activity including timing and duration; a description of the socio-environmental risks and mitigation measures; and details on where to seek additional information if required.

In addition, stakeholders were provided with

- face to face meetings;
- a presentation of information on the activity via the Exmouth Community Reference Group meeting;
- follow-up telephone calls to solicit comments or questions relating to the proposed activities; and
- a toll-free 1800 number and email address for queries

BHP Billiton will continue to engage with stakeholders in the lead up to the commencement of activities through regular community reference group meetings. In addition, we will directly communicate any material change to the activity as described in the Fact Sheet to all relevant stakeholders. Prior to mobilisation of the drilling vessels BHP Billiton will issue a notice to mariners and distribute a vessel fact sheet to Exmouth and regional recreational and commercial marine users.

8 CONTACT DETAILS

For further information about this activity please contact BHPB Petroleum Government and External Affairs Team on 1800 110 258 or send an email to bhppetexternalaffairs@bhpbilliton.com.