



**STYBARROW EAST-1, STYBARROW EAST-2 AND
STANTON-1**

ENVIRONMENT PLAN SUMMARY

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1 INTRODUCTION

BHP Billiton Petroleum Pty Ltd (BHPB) acting as operator, on behalf of a joint venture comprising BHP Billiton Petroleum (Australia) Pty Ltd and Woodside Energy Limited, is proposing to drill the Stainton-1 and Stybarrow East-1 exploration wells and, depending on results of Stybarrow East-1, drill the nearby Stybarrow East-2 exploration well. The wells will be drilled in Production Licence Area WA-32-L using a semi-submersible drilling rig.

The wells are located in the BHP Billiton operated Production Licence Area WA-32-L and WA-255-P R1 approximately 55 km 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 BHPB's environmental standards and comply with statutory requirements.

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 proposed well locations are in deep water, about 675 m to 700 m deep, on the outer edge of the continental slope. Stybarrow East-1, which is the closest to land, is located approximately 55 km North West of Exmouth, 27 km North West of the closest point of the Ningaloo Marine Park and approximately 46km from the closest reef or coastline of Ningaloo Marine Park or Muiron Island Marine Management Area. Stainton-1 is the closest well to the Gascoyne Marine Reserve ~10 km. The Stainton-1 and Stybarrow East-1 well coordinates and the bounding coordinates for the Stybarrow East-2 Area of Interest are provided in Table 2-1. The Stainton-1 location is given as centre point of an area of interest with 500 m radius. The location is shown in Figure 2-1.

Table 2-1. Stybarrow East-1 well location and Stybarrow East-2 Area of Interest Coordinates

Well Name	Latitude	Longitude	Depth (m)
Stainton-1	21° 24' 18.11"	113° 51' 46.10"	720 to 740
Stybarrow East-1	21° 26' 14.68"	113° 53' 29.60"	675
Stybarrow East-2	21° 24' 25.70"	113° 51' 55.38"	675 to 700
	21° 24' 28.74"	113° 54' 38.88"	
	21° 27' 51.50"	113° 54' 34.61"	
	21° 27' 48.46"	113° 51' 51.05"	

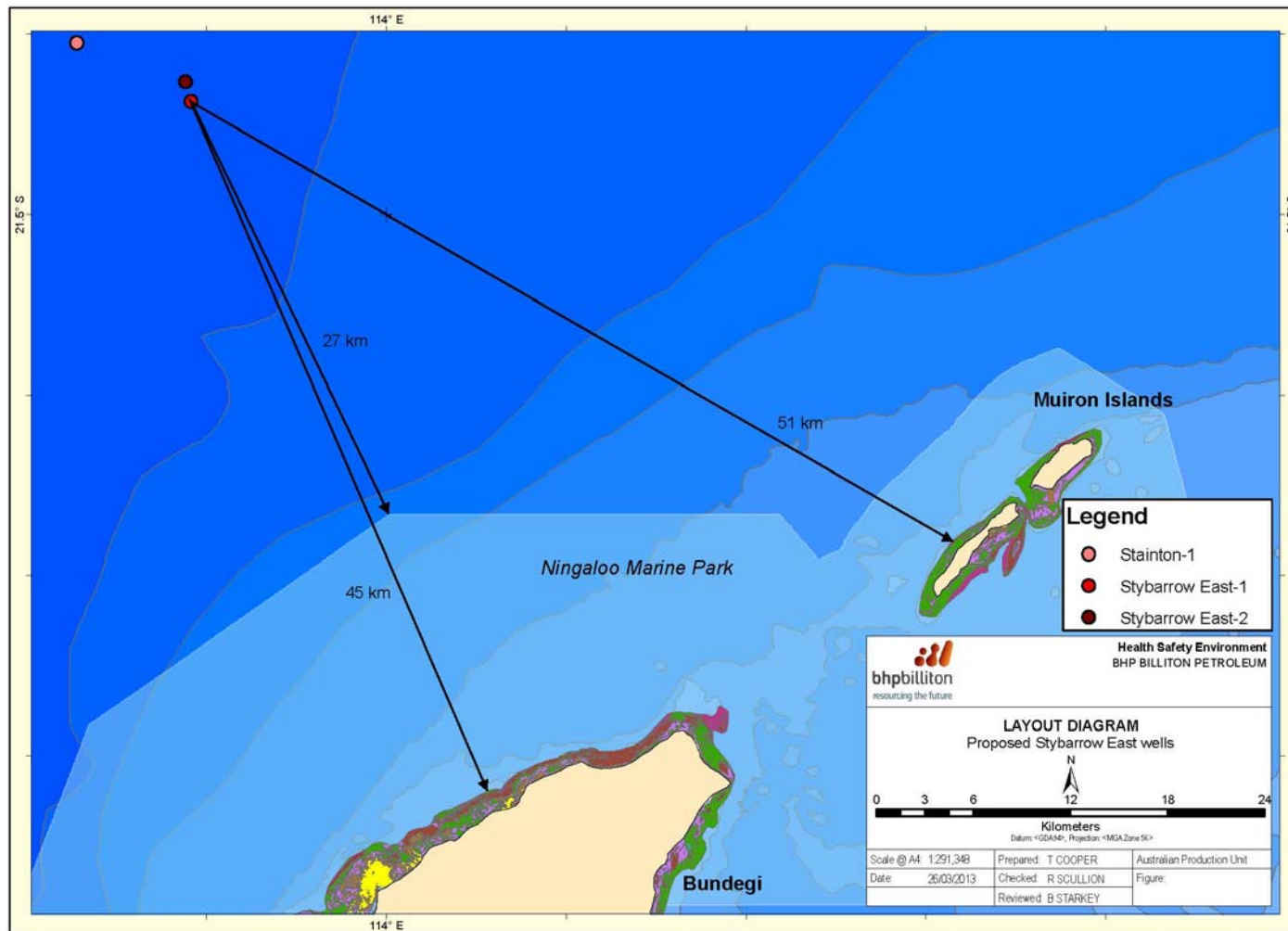


Figure 2-1: Location diagram showing well centres

3 DESCRIPTION OF THE ACTIVITY

A semi-submersible drilling rig, will be used to drill the Stybarrow East-1, Stybarrow East-2 and Stainton-1 wells. A semi-submersible drilling rig of this size normally has accommodation for about 110 personnel and will be supported by two Anchor Handling and Supply Vessels (AHSVs). A summary of activities to be undertaken for the wells are detailed below:

- Stybarrow East-1: expected to take 20 – 50 days to complete
 - Run anchors
 - Drill 914 mm (36") hole riserless
 - Install 762 mm (30") conductor and cement annular space back to the seabed
 - Drill 444 mm (17 ½") hole riserless
 - Install 340 mm (13 3/8") casing and cement annular space back to the seabed
 - Install, latch and pressure test BOP
 - Drill 311 mm (12 ¼") hole to target depth, undertake formation evaluation that may comprise of:
 - FEWD
 - Wireline logging
 - Plug back 12.25" section
 - 1 or 2 contingent geological sidetracks in 12.25" hole
 - Plug and abandon
 - Pull anchors
- Stybarrow East-2: expected to take 20 – 40 days to complete
 - Drill 914 mm (36") hole riserless
 - Install 762 mm (30") conductor and cement annular space back to the seabed
 - Drill 444 mm (17 ½") hole riserless
 - Install 340 mm (13 3/8") casing and cement annular space back to the seabed
 - Install, latch and pressure test BOP
 - Drill 311 mm (12 ¼") appraisal hole to target depth
 - Plug and abandon 12 ¼" sidetrack appraisal well
 - Dependent on results of the sidetrack well, install 244 mm (9 5/8") casing and cement annular space approximately 500 m back from the shoe, or plug and abandon
 - Pull anchors
- Stainton-1: expected to take 30 – 40 days to complete
 - Run anchors
 - Drill 914 mm (36") hole riserless
 - Install 762 mm (30") conductor and cement annular space back to the seabed
 - Drill 444 mm (17 ½") hole riserless
 - Install 340 mm (13 3/8") casing and cement annular space back to the seabed
 - Install, latch and pressure test BOP
 - Drill 311 mm (12 ¼") hole to target depth, undertake formation evaluation that may comprise of:
 - FEWD
 - Wireline logging
 - Plug back 12.25" section
 - 1 or 2 contingent geological sidetracks in 12.25" hole
 - Plug and abandon
 - Pull anchors

The base case for drilling is to use water based muds (WBM) for all hole sections. Based on experience and information from other exploration and appraisal offset wells in the area, the riser-less sections will be drilled using seawater and highly viscous sweeps (bentonite, guar gum). The basic formulation of WBM likely to be

used has seawater brine as the base fluid with additives for controlling formation pressure, borehole stability improving drilling performance and reliability.

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

Timing for the drilling operations is subject to rig availability and will occur in the period between July 2013 to July 2014 inclusive. Drilling will take place 24 hours a day and is expected to take up to 100 days depending on whether or not the contingent side-track wells and Stybarrow East-2 are drilled and depending on operational efficiencies and weather conditions.

4 DESCRIPTION OF RECEIVING ENVIRONMENT

4.1 Natural Environment

The bathymetry of the region is characterised by shallow water depths on the continental shelf, rapidly increasing water depths on the continental slope, gradually lowering into deep sub-sea basins with distance offshore. The Stybarrow East-1, Stybarrow East-2 and Stainton-1 wells are located on outer edge of the Continental Slope geomorphic feature, in water ranging from 675 m to 740 m deep approximately.

4.2 Biological Environment

Seabed communities in the Stybarrow East-1, Stybarrow East-2 and Stainton-1 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.

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.

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.

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 at the Stybarrow East-1, Stybarrow East-2 and Stainton-1 locations is likely to vary seasonally from low numbers (comprised of minke and blue whales and occasional humpback whales) during December to May and low to moderate abundance (comprised overwhelmingly of humpback whales) from June to November.

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 Stybarrow East wells.

4.3 Socio-Economic Environment

The Stybarrow East and Stainton drilling campaign will be conducted within Petroleum Permit Area WA-32-L and WA-255-P. A key feature of the environment in the vicinity of this permit area is the Ningaloo Marine Park (NMP), which is a multiple-use Marine Park that stretches approximately 300 km along the west coast of the Cape Range Peninsula near Exmouth. The NMP consists of both State and Commonwealth Waters, which are declared under Western Australian and Commonwealth legislation.

There are no conservation reserves or parks located within the WA-32-L or WA-255-P permit areas. The closest marine conservation areas to the well Stybarrow East 1 & 2, Stainton well locations are:

- Ningaloo Marine Park.
- Muiron Islands Marine Management Area
- Gascoyne Marine Reserve

The Muiron Islands Marine Management Area was established in 2004 and covers approximately 280 km². The area was designated to protect the waters surrounding South Muiron Island, North Muiron Island and Sunday Island. The Muiron Islands Marine management Area is also part of the Ningaloo Coast World Heritage Area.

The NMP (State and Commonwealth) was established in 1987 and stretches 300 km from the North West Cape to Red Bluff, and encompasses the state waters covering the Ningaloo Reef and a 40 m strip along the shore. The NMP (and Muiron Island Marine Management Area) is part of the Ningaloo Coast World Heritage Site.

There are a number of commercial fisheries in the area. The fisheries operating in the vicinity of the well locations include the Western Deep Water Trawl Fishery, Mackerel Managed Fishery, Western Tuna and Billfish Fishery and West Coast Deep Sea Crustacean (Interim) Managed Fishery. The Exmouth Gulf Prawn Managed Fishery also operates in the area.

The Western Australian Maritime Museum database identifies five shipwrecks in the general area off North West Cape, but none in the area of the Stybarrow East-1, Stybarrow East-2 and Stainton-1 wells location. There are 26 shipwrecks recorded off the western side of the Cape Range Peninsula, along Ningaloo Reef. Another 28 wrecks are recorded in Exmouth Gulf and eight wrecks recorded further north of the coast near Onslow.

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 mitigating 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 and/or shipping	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; 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 personnel on cetacean interaction guidelines
Noise	Acoustic disturbance to marine fauna Noise annoyance to residents/ tourists	Adherence to EPBC Regulations
Light	Disorientation or attraction 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); 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	Using CHARM and OCNS rating as a criteria in the selection of all WBM drilling fluids; use of shakers and centrifuges to ensure maximum fluid retention; no discharge of whole SBM drilling fluids (returned to shore for disposal)
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	Sewage and greywater treated by MARPOL certified sewage treatment plant; food wastes macerated to less than 25 mm prior to discharge 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 MSDS on board
Cementing fluids	Localised reduction in water quality, deposition of cement on seabed	Cementing operations will be continuously monitored; Hazardous substances will have MSDS’s on board
Solid wastes	Impact on the marine environment from waste disposal	No discharge of harmful substances; no disposal of garbage to sea; Waste stored on board in appropriate containers
Introduction of non-indigenous or invasive marine species	Displacement of native species by marine pests from ballast water and biofouling	Adherence to AQIS Australian Ballast Water Management Requirements; IMS risk assessment
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; clean up equipment on board

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Uncontrolled leak of diesel from bulk storage	Contamination or pollution of the water column; visual pollution;	500m Safety Zone; support vessel on standby; navigation aids; SOPEP; spill kits on board; Oil Spill Contingency Plan
Spill of diesel or SBM during transfer operations	Contamination or pollution of the water column; visual pollution	Transfers only under acceptable sea state and daylight hours; Certified transfer hoses; relief valves and dry breakaway couplings;
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 Stybarrow East-1, Stybarrow East-2 and Stainton-1 well drilling activities will be managed in compliance with the Stybarrow East-1, Stybarrow East-2 and Stainton-1 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 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. The Stybarrow Development Draft EIS was advertised nationally and made available in libraries and on the internet for public review and comment over a six week period in November-December 2004. Written submissions were received providing comment on the Draft EIS, which were responded to.

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.

Since August 2012 BHP Billiton has been engaged in a process to identify and consult all relevant stakeholders including Commonwealth and State regulatory agencies, and persons or organisations within the Exmouth and regional area who may have an interest or be affected by BHPs exploration activities in the Exmouth sub-basin. Consultation has included meetings with stakeholders and distribution of Environment Fact Sheets.

BHP Billiton undertook a stakeholder engagement program with 16 direct stakeholders in support of the Stybarrow East-1, Stybarrow East-2 and Stainton-1 exploration well EP submission. This included departments or agencies of the Commonwealth; departments or agencies of a State; the department of the responsible State Minister and/or persons or organisations whose functions, interests or activities may be affected by the Stybarrow East-1, Stybarrow East-2 and Stainton-1 exploration well drilling activity and/or any associated potential risks. Stakeholders were met face-to-face and provided with:

- 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.