

## LOCATION

BHP Billiton Petroleum Pty Ltd (BHPB) is the Operator of a number of permits in the Carnarvon Basin, including WA-255-P, WA-155-P, WA-12-R, WA-322-P, WA-354-P, WA-10-L, WA-12-L, WA-264-P, WA-346-P and WA-1-R. BHPB proposes to drill several exploration and appraisal wells within these permits as part of ongoing exploration and appraisal of the Carnarvon Basin.

A number of exploration drilling targets within these permits are scheduled to be drilled using the Sedco 703 semi-submersible drilling rig. The first well, Helvellyn-1, is located in permit area WA-155-P(1) and is scheduled to be drilled in mid-late March 2007. The approximate surface location of Helvellyn-1 is 21°27'12.65" S and 114°15'07.40" E. The second well, Crosby West-1, is scheduled to be drilled after Helvellyn-1. Crosby West-1 is located in WA-12-R, with an approximate surface location of 21°30'22" S and 114°06'27" E.

These wells will be drilled using low toxicity water based mud, which will be discharged to the ocean at the completion of drilling. Testing of these wells is not proposed.

## RECEIVING ENVIRONMENT

The water depth at the proposed drill sites is 175m for Helvellyn-1 and 203m for Crosby West-1. The seabed in the vicinity of the well sites is expected to comprise of very soft sand/silt and carbonate clays of 10 to 20m thickness. Seabed surveys of adjacent permits have identified a relatively low abundance of invertebrate fauna, with occasional deepwater sponges, echinoderms and transient crustaceans and bottom dwelling fish.

The closest population centre to the drilling sites is the town of Exmouth. Exmouth has become a significant tourist centre based in large part on the natural resources contained in the Cape Range National Park, Ningaloo Marine Park and adjacent inshore waters. The most popular offshore tourism activities are fishing, diving and whale shark spotting. These activities are unlikely to be adversely affected by drilling operations given the relatively small exclusion area and temporary time frame associated with this drilling.

BHPB has consulted with the Exmouth Community over a number of years, as BHPB has been active in the region for some time. The consultation has predominantly centred around BHPB's projects in the region, however has also included other activities such as drilling and seismic surveys.

The consultation programme has included:

- Face-to-face briefings and discussions;
- Periodic written newsletter updates posted to stakeholders;
- A 1800 toll-free telephone number; and
- Community Reference Groups (CRG) established in Exmouth and Perth.

Ongoing consultation activities include:

- Continued use of CRGs established in Exmouth and Perth;
- Periodic written newsletter updates posted to stakeholders; and
- A 1800 toll-free telephone number.

## **ENVIRONMENTAL RISK ASSESSMENT AND MANAGEMENT**

Drilling will be undertaken as per BHPB's Drilling HSE Management System (WWD Drilling HSE-MS), which is compliant with ISO 14001 Environmental Management System and OHSAS 18001 Safety Management System requirements. A systematic approach is taken to the management of hazards and risk through the identification and assessment of hazards and risk, the establishment of objectives, plans and performance standards, and the development of adequate documentation.

A number of actual and potential environmental impacts have been identified for the Carnarvon Basin Drilling Program. The risk of these potential impacts has been assessed, and this risk assessment is summarised in Table 1 below. Management measures to minimise these impacts and risks have been identified, and these are also summarised below (Table 2).

Objectives, standards and performance criteria for environmental management have been established based on consideration of:

- Sustainable Development Policy requirements;
- BHPB HSEC management Standards;
- Legal requirements;
- Community comments received from consultation; and
- Technology options and feasibility.

Table 3 provides a summary of these for each identified activity/event.

All staff and contractors taking part in the Carnarvon Basin drilling program will be advised of their responsibilities prior to commencement of activities. This will occur through meetings with key contractor personnel and an induction and awareness presentation that will be given to all crew.

Further information may be obtained from BHPB's external affairs 1800 036 247 or by writing to:

The External Affairs Advisor  
BHP Billiton Petroleum Pty Ltd  
Central Park 152-158 St Georges Terrace  
PERTH WA 6000.

**Table 1 - Summary of Environmental Risk Assessment – 2007-2009 Carnarvon Basin Drilling Program**

Likelihood  (Likelihood of the realisation of the potential consequences)	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophe
	CDEU 1.0 - 1.5	CDEU 1.5 - 2.5	CDEU 2.5 - 3.5	CDEU 3.5 - 4.5	CDEU 4.5 - 5.0
	<ul style="list-style-type: none"> <li>No measurable damage</li> <li>Damage area not detectable</li> <li>Damage to ecosystem not detectable</li> </ul>	<ul style="list-style-type: none"> <li>Minor Damage</li> <li>Damage area &lt;200,000m<sup>2</sup></li> <li>0-25% of ecosystem damaged</li> <li>Natural recovery &lt;1yrs acute, &lt;5yrs planned</li> <li>Artificial recovery possible</li> </ul>	<ul style="list-style-type: none"> <li>Localised Damage, sustainability unaffected</li> <li>Damage area &lt;785,000m<sup>2</sup></li> <li>25-50% of ecosystem damaged</li> <li>Natural recovery &lt;5yrs acute, &lt;10yrs planned</li> <li>Artificial recovery difficult</li> </ul>	<ul style="list-style-type: none"> <li>Major Damage sustainability affected</li> <li>Damage area &lt;3,140,00m<sup>2</sup></li> <li>50-75% of ecosystem damaged</li> <li>Potential transmission to other ecosystem components or new generations</li> <li>Natural recovery &lt;10yrs acute, &lt;20yrs planned</li> <li>Artificial recovery very difficult</li> </ul>	<ul style="list-style-type: none"> <li>Massive Damage, sustainability affected</li> <li>Damage area &gt;3,140,00m<sup>2</sup></li> <li>75-100% of ecosystem damaged</li> <li>Transmission to other ecosystem components or new generations</li> <li>Natural recovery &gt;10yrs acute, &gt;20yrs planned</li> <li>Artificial recovery not yet possible</li> </ul>
Almost certain					
Likely					
Moderate	9.3 WBM Drilled Cuttings Discharge 9.4 WBM Drilling Fluid Dumping 9.5 SBM Drilled Cuttings Discharge 9.7 Diatomaceous Earth Discharge 9.15 Well testing – Loss of Combustion	9.8 Chemical Spills			
Unlikely	9.1 Physical Presence 9.2 Support Vessel 9.6 Completion Fluid Discharge 9.12 Solid/Special Waste Disposal 9.13 Well testing – Flaring to Atmosphere 9.14 Well testing – Partial Combustion	9.16 Spills of Diesel (2.5m <sup>3</sup> )			
Rare	9.9 Deck Washdown 9.10 Stormwater Run off 9.11 Sewage/Food Scrap Discharge		9.17 Spills of Diesel (80 m <sup>3</sup> ) 9.18 Spills of Oil (600m <sup>3</sup> ) 9.19 Introduction of Exotic Species		

Risk Level	ALARP Region	Action required	Risk Level	ALARP Region	Action required
High	Unacceptable Risk	Risks cannot be justified under any circumstances	Moderate	Lower ALARP	Cost effective measures for risk reduction should be implemented and hazard analysis considered/
Significant	Upper ALARP	Risk reduction measures are strongly recommended or where effective hazard control and emergency preparedness measures are necessary	Low	Negligible Risk	Further risk reduction measures are not generally required in favour of long term risk reduction programs

**Table 2 - Summary of Mitigation and Control Practices**

<b>Mitigation and Control Practices</b>
<b>General</b>
Comply with all relevant legislation
Record sightings of whales and provide to HSE Team
Sea bed survey of the site will be conducted by the ROV, from the rig, at the end of the drilling activity
Notice to Mariners issued regarding exclusion zones
Ensure deck is maintained in a clean state
<b>Waste and hazardous substances</b>
All sewage/food scraps to be ground such that the material can pass through a screen with opening no greater than 25mm.
All wastes (except cuttings, water based drilling fluids, sewage and ground food scraps) will be removed from site for disposal
Wastes to be stored in suitable containers for return to shore for disposal in accordance with regulations and sound waste management practices.
Waste management procedures in place.
Hazardous and general waste is to be segregated and placed into labelled containers for onshore disposal.
Waste will be disposed of at approved sites onshore
MSDS are to accompany hazardous substance consignments. (M&L to rig, OIM from rig)
Personnel to be instructed on the safe handling of hazardous waste
Monitor waste substances that contain NPI listed substances
Use non toxic water based mud, as determined by LC50 96 hour test
Monitor mud to ensure %SBM on cuttings as per DoIR requirements
Use shale shakers/solids control equipment to separate drill fluid from cuttings (recirculate mud)
SBM will be recycled at the completion of drilling operations.
Double barrier on all SBM dump lines, with drain off for the dead space
All valves inspected prior to SBM use
Rig floor drains return to collection tank or flow line
All chemicals and hazardous material will be stored in bunded areas.
Completion fluids and diatomaceous earth tested to ensure hydrocarbon content is <10% by weight prior to discharge overboard
<b>Fuel, chemical and drilling fluid transfers</b>
Personnel involved in transfer operations are to be fully instructed on procedures to be adopted, including specific duties and responsibilities.
All fuel, chemical and drilling fluid transfer operations are to be supervised, controlled and monitored before and during operation
Bulk fuel, chemical and drilling fluid transfers take place only in calm weather and daylight conditions (where possible)
<b>Maintenance, inspection and testing</b>
Ensure sewage and foodscrap treatment systems are maintained and operating effectively
Approved procedures and equipment to prevent/control blowout
<b>Atmospheric emissions</b>
Record quantity of flared products
Use approved equipment/ procedures for flare
<b>Spill response</b>
Instigate incident investigation procedures in the event of a spill.
Personnel trained/ drilled in oil spill response
Notify regulator of reportable and recordable incidents
Spill kits available & maintained on the rig/vessels for clean up of minor spills. Rig/vessels to demonstrate they have kits that are fit for purpose
Spills are cleaned up ASAP to minimise contamination potential.
<b>Ballast water management</b>
Follow Australian Ballast Water Management Requirements (legislated under the Commonwealth Quarantine Act)

**Table 3: Summary of Environmental Objectives, Standards and Performance Criteria**

Activity/Event	Objectives	Standards	Performance Criteria
Physical Presence	<ul style="list-style-type: none"> <li>Minimise impact upon marine communities</li> <li>Minimise impact on fisheries, tourism and other users of the region</li> </ul>	<ul style="list-style-type: none"> <li>Section 124 of the Petroleum (Submerged Lands) Act 1967</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Approved Oil Spill Contingency Plan</li> <li>All personnel to complete induction</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Support Vessel	<ul style="list-style-type: none"> <li>Minimise impact upon marine communities</li> </ul>	<ul style="list-style-type: none"> <li>MARPOL 73/78 Annex IV and V</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>All personnel to complete induction</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
WBM Drilled Cuttings Discharge	<ul style="list-style-type: none"> <li>Dispose of cuttings to minimise the impact upon the environment</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by the DoIR</li> <li>Drilling contractor has documented procedures for use of shale shakers/solids control equipment to separate drill fluids from cuttings (recirculate mud)</li> <li>Conduct HSE audit to verify compliance with compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
WBM Drilling Fluid Dumping	<ul style="list-style-type: none"> <li>Minimise impact upon marine communities</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> <li>Clause 222 (3) issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Conduct HSE audit to verify compliance with compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
SBM Drill Cuttings Discharge	<ul style="list-style-type: none"> <li>Dispose of cuttings to minimise the impact upon the environment</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Drilling contractor has documented procedures for use of shale shakers / solids control equipment to separate drill fluids from cuttings (recirculate mud)</li> <li>Conduct HSE audit to verify compliance with compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Completion Fluid Discharge	<ul style="list-style-type: none"> <li>Minimise impact upon marine communities</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> <li>Clause 222 (3), issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Conduct HSE audit to verify compliance with compliance with mitigation and control measures.</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Diatomaceous Earth Discharge	<ul style="list-style-type: none"> <li>Minimise impact upon marine communities</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Conduct HSE audit to verify compliance with compliance with mitigation and control measures.</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>

Activity/Event	Objectives	Standards	Performance Criteria
Chemical spills	<ul style="list-style-type: none"> <li>Prevent spills of SBM or chemicals to sea</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Conduct HSE audit to verify compliance with compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Deck Wash-down	<ul style="list-style-type: none"> <li>Prevent releases of oil or chemical contaminated water to sea</li> <li>Prevent spills of oil or chemicals to sea (eg. from drums, storage tanks, etc)</li> </ul>	<ul style="list-style-type: none"> <li>Clause 615, issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Develop spill KPI for the drilling program</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Stormwater run off (excluding dirty/bunded areas)	<ul style="list-style-type: none"> <li>Prevent releases of oil or chemical contaminated water to sea</li> </ul>	<ul style="list-style-type: none"> <li>Clause 615, issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Develop spill KPI for the drilling program</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Sewage / food scraps discharge	<ul style="list-style-type: none"> <li>Prevent releases of un-treated sewage/ food-scrap to sea</li> </ul>	<ul style="list-style-type: none"> <li>Protection of the Sea (Prevention of Pollution From Ships) Act 1993 Division 2</li> <li>MARPOL 73/78 Annexe IV</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> <li>Clause 222 (3) (4), issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Drilling contractor has a documented maintenance procedure for maintaining the sewage macerator</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Solid / Special Waste Disposal	<ul style="list-style-type: none"> <li>Prevent releases of waste products to sea</li> <li>Ensure proper disposal of waste</li> </ul>	<ul style="list-style-type: none"> <li>Clause 50 and 51 of Environmental Protection Act, 1986</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Drilling contractor has a documented waste management procedure</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Well testing - flaring to atmosphere	<ul style="list-style-type: none"> <li>Minimise the amount of hydrocarbons flared during well testing</li> </ul>	<ul style="list-style-type: none"> <li>Clause 615, issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Use of approved equipment and procedures for flaring</li> <li>Quantity of flared products recorded</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Well testing - partial combustion	<ul style="list-style-type: none"> <li>Minimise the amount of oil spilt to the sea</li> </ul>	<ul style="list-style-type: none"> <li>Clause 615, issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Develop spill KPI for the drilling program</li> <li>Use of approved equipment and procedures for flaring</li> <li>Quantity of flared products recorded</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>

Activity/Event	Objectives	Standards	Performance Criteria
Well testing - loss of combustion	<ul style="list-style-type: none"> <li>Minimise the amount of oil spilled to the sea</li> </ul>	<ul style="list-style-type: none"> <li>Clause 615, issued as a schedule to the Petroleum (Submerged Lands) Act, 2005 consolidation</li> <li>Regulations 13 &amp; 14 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Develop spill KPI for the drilling program</li> <li>Use of approved equipment and procedures for flaring</li> <li>Quantity of flared products recorded</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Spills of diesel (2.5m <sup>3</sup> )	<ul style="list-style-type: none"> <li>Prevent loss of fuel to sea</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13, 14 &amp; 26 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> <li>Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (MARPOL)</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Develop spill KPI for the drilling program</li> <li>Emergency Response Plan, which includes Oil Spill Contingency Plan, located on the rig</li> <li>Drilling contractor has documented procedures for transfer operations</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures.</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Spills of diesel (80m <sup>3</sup> )	<ul style="list-style-type: none"> <li>Prevent loss of fuels to sea</li> <li>Ensure appropriate preparedness in case of oil spill</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13, 14 &amp; 26 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> <li>Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (MARPOL)</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Develop spill KPI for the drilling program</li> <li>Emergency Response Plan, which includes Oil Spill Contingency Plan, located on the rig</li> <li>Drilling contractor has documented procedures for transfer operations</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Spills of oil (600m <sup>3</sup> )	<ul style="list-style-type: none"> <li>Reduce risk of blowout through use of effective procedures and safety equipment</li> <li>Ensure appropriate preparedness in case of oil spill</li> </ul>	<ul style="list-style-type: none"> <li>Regulations 13, 14 &amp; 26 of the Petroleum (Submerged Lands)(Management of Environment) Regulations 1999</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Develop spill KPI for the drilling program</li> <li>Oil Spill Response Plan and Emergency Response Plan located on the rig</li> <li>Drilling contractor has approved equipment and procedures to prevent/control blowouts</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>
Introduction of Exotic Species	<ul style="list-style-type: none"> <li>Prevent introduction of exotic species from ballast water</li> </ul>	<ul style="list-style-type: none"> <li>Quarantine Act 1908</li> </ul>	<ul style="list-style-type: none"> <li>Environment Plan accepted by DoIR</li> <li>Conduct HSE audit to verify compliance with mitigation and control measures</li> <li>No breaches in applicable Laws, Regulations or conditions of approval</li> </ul>