STYBARROW OPERATION CESSATION ENVIRONMENT PLAN SUMMARY

Contents

1 INTRODUCTION

BHP Billiton Petroleum Pty Ltd (BHP Billiton) is the designated operator on behalf of a joint venture comprising BHP Billiton Petroleum (Australia) Pty Ltd and Woodside Petroleum, which are the holders of Petroleum Exploration Permit WA-32-L, approximately 51 kilometres northwest of the North West Cape of Western Australia.

Production commenced from the Stybarrow Facility in November 2007. Production ceased in Q2 2015 and the vessel sailed away in August 2015. At the cessation of production, all wells were bull-headed and valves pressure tested and closed. Flowlines were flushed with treated seawater until the oil in water content was < 30 ppm. These activities were carried out under the Stybarrow Operations Environment Plan (STHSE-E-0001). This Environment Plan covers the activities during the cessation phase.

This Environment Plan summary contains an overview of the cessation activity. Cessation activities require a full environment plan which has been assessed and accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), the regulator of petroleum activities in Commonwealth waters.

2 LOCATION OF ACTIVITY AND DESCRIPTION OF RECEIVING ENVIRONMENT

The Stybarrow Development area (Permit WA-32-L) is located in offshore Commonwealth waters between 700–1,000 metre water depth in the Exmouth Sub-basin, 30 kilometres northwest of the northern boundary of the Ningaloo Marine Park (Commonwealth Waters), 57 kilometres northwest of the Muiron Islands Marine Management Area, and 51 kilometres to the northwest of the North West Cape of Western Australia (refer Figure 2-1).

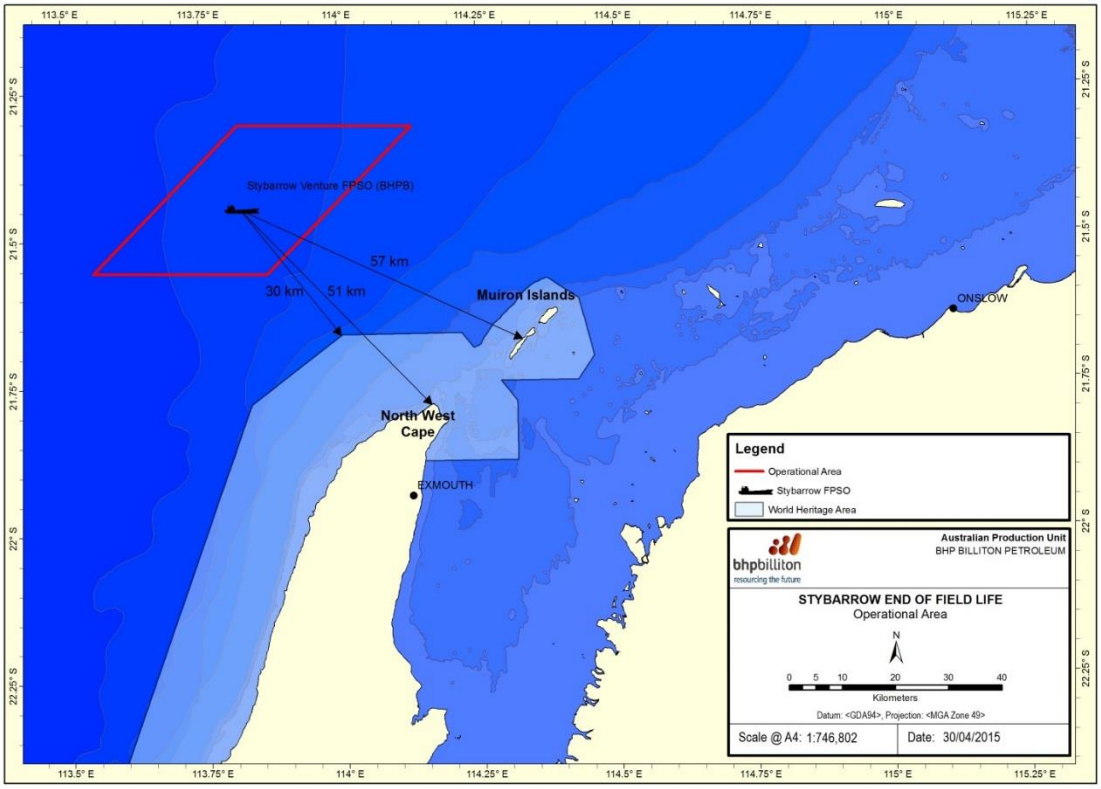

Figure 2-1: Location of Stybarrow development

2.1 Physical Environment

WA-32-L is located in the North West Marine Region (North West Province bioregion), as defined in the Marine Bioregional Plan for the North West Marine Region (the Bioregion Plan).

The region experiences an arid sub-tropical climate and a distinct summer monsoonal "wet" season from November to February followed by a typically cooler winter "dry" season. The climate is controlled by two major atmospheric pressure systems: Indian Tropical Maritime air moving in from the west or north-west, and the tropical continental air from the inland. The northwest coast between Broome and Exmouth experiences on average about five tropical cyclones between November to April each year. Cyclones can bring vast amounts of rain to the area, with strong swell and rough seas common during these meteorological events. Most cyclones approach the region from the east-northeast and then veer to the south.

2.2 Biological Environment

Seabed communities in the Stybarrow Development area are sparse, with diversity and abundance declining at increased depths, 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. Exposed or outcropping rocky areas are dominated by sponges, soft corals and gorgonians, with various finfish, ascidians, crustaceans, echinoderms, polychaetes and molluscs also occurring.

Pelagic fish species occur in the deeper offshore waters of the region, including billfish, sailfish, marlin and swordfish. Pelagic fish species are seasonally abundant and may pass through the area during annual migrations.

Five species of sea turtle are likely to be present in the region. These are Green turtles, Loggerhead turtles, Hawksbill turtles, Flatback turtles and Leatherback turtles.

The Humpback whale is the most common whale species in the North West Shelf region, traversing the region during their migration along the Western Australian coast. Blue whales, Minke whales and several other toothed whales may also be sighted in the region. The abundance of whales varies seasonally, with numbers lower during December to May and higher during June to November.

The region supports numerous shark and ray species. Whale sharks and dolphins are also common in the region, with their occurrence dependant on seasons and water depth.

A large number of seabird species migrate across the region.

The relevant values and sensitivities which intersects the Area that May Be Affected (AMBA) are provided in Table 2-1 below which includes the key ecological features, values and descriptions from the Bioregion Plan.

Table 2-1 – Key Ecological Features, Values and Description (sourced from the Bioregion Plan)

Key Ecological Feature	Values	Description
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	Unique seafloor features with ecological properties of regional significance.	The canyons are associated with upwelling as they channel deep water from the Cuvier Abyssal Plain onto the slope. This nutrient-rich water interacts with the Leeuwin Current at the canyon heads. Aggregations of whale sharks, manta rays, fish and seabirds are known to occur in the area.
Continental Slope Demersal Fish Communities	High levels of endemism.	The diversity of demersal fish assemblages on the continental slope in the Timor Province, the Northwest Transition and the Northwest Province is high compared to elsewhere along the continental slope.

The North West Conservation Values Atlas (the Atlas) has been reviewed to identify areas of Biologically Important Areas (BIAs) for protected species that will or may occur within the AMBA. The identified protected species and the relevant BIAs are:

- Humpback whales – Exmouth Gulf for resting area and waters out to about 50 km offshore as part of the migratory corridor;

- Wedgetail shearwater – breeding North West Cape area;
- Pygmy blue whale – part of migratory corridor.

A search of the EPBC Act Protected Matters database was undertaken to identify threatened and migratory species with a potential to occur within the area that may be affected by the activities in the EP. The search identified 13 listed threatened species and 19 listed migratory species that may occur or have habitat within the AMBA (Table 2-2). Of the 13 threated species, 10 are also listed as migratory species (denoted as *).

Table 2-2 – Threatened or migratory species that may occur or have habitat within the AMBA

Threatened Species	Migratory Species
Southern giant petrel (*Macronectes giganteus*)*	Flesh-footed shearwater (*Puffinus carneipes*)
Soft-plumaged petrel (*Pterodroma mollis*)	Antarctic minke whale (*Balaenoptera bonaerensis*)
Australian fairy tern (*Sternula nereis nereis*)	Bryde's whale (*Balaenoptera edeni*)
Eastern curlew (*Numenius madagascariensis*)	Shortfin mako shark (*Isurus oxyrinchus*)
Curlew sandpiper (*Calidris ferruginea*)	Longfin mako (*Isurus paucus*)
Flesh-footed shearwater (*Puffinus carneipes*)	Giant manta ray (*Manta birostris*)
Wedge-tailed shearwater (*Puffinus pacificus*)	Killer whale (*Orcinus orca*)
Blue whale (*Balaenoptera musculus*)*	Sperm whale (*Physeter macrocephalus*)
Southern right whale (*Eubalaena australis*)*	Osprey (*Pandion haliaetus*)
Humpback whale (*Megaptera novaeangliae*)*	
Loggerhead turtle (*Caretta caretta*)*	
Green turtle (*Chelonia mydas*)*	
Leatherback turtle (*Dermochelys coriacea*)*	
Hawksbill turtle (*Eretmochelys imbricata*)*	
Flatback turtle (*Natator depressus*)*	
Great white shark (*Carcharodon carcharias*)*	
Dwarf sawfish (*Pristis clavata*)	
Green Sawfish (Pristis Zijsron)	
Sei Whale (*Balaenoptera borealis*)	
Fin Whale (*Balaenoptera physalus*)	
Whale Shark (*Rhincodon typus*)	
Short-nosed sea snake (*Aipysurus apraefrontalis*)	

2.3 Marine Parks, Reserves and World Heritage Areas

The Stybarrow field is located in Commonwealth waters, offshore from the WA mainland. Key regional features and their proximities to the cessation activities are provided in Table 2-3.

Table 2-3: Distance of Relevant Key Regional Features from the Stybarrow Activity Area

Regional Feature	Approximate Distance from Stybarrow Activity Area
Ningaloo Marine Park and World Heritage Area Boundary	17 km
Muiron Islands Marine Management Area Boundary	37 km
Gascoyne Marine Reserve Boundary	0 km
North West Cape Peninsula	39 km

There are four Western Australian places on the World Heritage List. Based on the AMBA, none of the World Heritage Areas are intersected and therefore would not be impacted by planned or unplanned events from the cessation activities. The nearest World Heritage Area to the AMBA is the Ningaloo Coast and Marine Park and World Heritage Area (including the Murion Islands Marine Management Area), the ecological and social values recognised by UNESCO can be found in the World Heritage listing (link).

2.4 Socio-Economic Environment

The nearest population centre to the Stybarrow field 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 AMBA does not intersect popular tourist sites.

The Stybarrow Development is outside the main shipping fairways in the area and fishing vessels will remain subject to a 500 metre petroleum safety zone which will stay in place over the site of the spider buoy (the former location of the FPSO).

There are five Commonwealth and five State commercial fisheries that have boundaries that overlie or are in close proximity to the Stybarrow cessation area and/ or the AMBA associated with an unplanned event (Table 2-4).

Table 2-4 – State and Commonwealth commercial fisheries in the AMBA

State Fisheries	Commonwealth Fisheries
Pilbara Line Fishery	North West Slope Trawl Fishery
Mackerel Managed Fishery	Western Skipjack Tuna Fishery
Beche-de-mer Fishery	Western Tuna and Billfish Fishery
West Coast Deep Sea Crustacean (Interim) Managed Fishery	Southern Bluefin Tuna Fishery
Octopus	Western Deepwater Trawl Fishery

Due to the water depths of approximately 825 metres and a distance to shore of approximately 46 kilometres, recreational fishing is unlikely to occur in the Stybarrow Development operational area. There are no national heritage places or shipwrecks within the Stybarrow Development operational area, and there are no other known sites of non-indigenous heritage or archaeological significance within the vicinity of the Stybarrow Development.

3 DESCRIPTION OF THE ACTIVITY

During the operational phase, the Stybarrow Development infrastructure comprised the Stybarrow Floating Production Storage Offtake (FPSO vessel) and its moorings; subsea facilities including ten subsea wells (production and water/gas injectors), the associated trees, manifolds, flowlines, and umbilicals; and the spider buoy which connects the FPSO to the subsea infrastructure. Water depth in the operational area varies from approximately 700 metres in the east to 1,000 metres in the west, with the spider buoy located in approximately of 850 metres water depth

End of field life occurred in the third quarter CY 2015 and the FPSO vessel has departed the field. The cessation phase is expected to continue for the acceptability period of the EP (5 years) during which time BHP Billiton will commence planning for the final decommissioning and abandonment of the field.

The subsea production system, which is deactivated and shut in, includes production, gas injection and water injection wells (which were connected to the FPSO via flexible flowlines and risers). The subsea equipment remaining in place consists of:

- Ten subsea production and injection trees (6 x production, 1 x gas Injection and 3 x water injection) located within four drill centres;

- Five subsea distribution units;
- Eight dynamic risers and a system of static flexible flowlines variously connecting the subsea trees to distribution units and the spider buoy; and
- A single electro-hydraulic umbilical distributed through the field via a series of subsea distribution units (SDU), one per drill centre. Electric and hydraulic flying leads connect each tree to a local SDU.

Vessel Operations during the cessation phase may be used for the following activities:

- Vessel-based activities including subsea flowline disconnection and plugging;
- Vessel-based activities including subsea inspections/ interventions; and

During the cessation phase a small campaign will be conducted to facilitate acceptable isolation of the wells from the flowlines and risers in preparation for the removal of the spider buoy. A vessel with ROV capability will disconnect flowlines and plugs will be inserted into production flowlines.

The cessation activities will involve a Construction Support Vessel(s) entering the field to remove buoyancy sections from the risers. The spider buoy is now sitting on the seabed within the Stybarrow Field and recovery of the buoy will be considered as part of a future decommissioning project.

The final disposal of the spider buoy, sections of risers and mooring system, will be part of a future abandonment EP.

A number of inspection type activities may also be undertaken during the cessation phase. These inspections are generally undertaken by ROV to inspect the current state of infrastructure and can involve visual inspection, side scan surveys, probing of marine growth and ultrasonic wall measurements.

4 DETAILS OF ENVIRONMENTAL IMPACTS AND RISKS

4.1 Risk and Impact identification and evaluation process

A risk analysis was done to identify the potential environmental impacts and risks associated with the activity and the control measures required to manage these impacts and risks to as low as reasonably practicable (ALARP) and an acceptable level. This risk assessment and evaluation process was 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 Risk Management Framework and Policies.

An Environmental Hazard Identification (ENVID) process was undertaken to identify the impacts and risks of each environmental aspect and source of hazard for the activity. The objective of the assessment was to develop an understanding of the impacts and risks, to identify appropriate controls and to demonstrate that risks had been reduced to ALARP and that this was acceptable to BHP Billiton. The ENVID process included a detailed impact assessment for the sources of hazard, the controls chosen to reduce or prevent the impact or risk and why some controls were not chosen. This also involved consideration of the sources of risk, their positive and negative consequences and the likelihood that those consequences may occur.

The ENVID considered both planned and unplanned impacts with variation on how each of these impacts or risks was assessed through to ALARP and acceptability.

The ENVID assessment was conducted as a workshop with a range of personnel from different disciplines including Operations, HSE, and Surface and Subsea Engineering. Decisions made within the ENVID included:

- Confirmation of the sources of hazard identified;
- A protection outcome developed based on the source of hazard and potential impact (later used for the Performance Outcome);
- Identification of all potential controls and their acceptance through an ALARP process;

- Allocation of likelihood rating for an unplanned source of hazard;
- Severity rating for all sources of hazard; and
- Final acceptability of the impact or risk to BHP Billiton using the acceptability criteria.

The outcome of the assessment process illustrated in Figure 4-1 is summarised in Section 4.1.

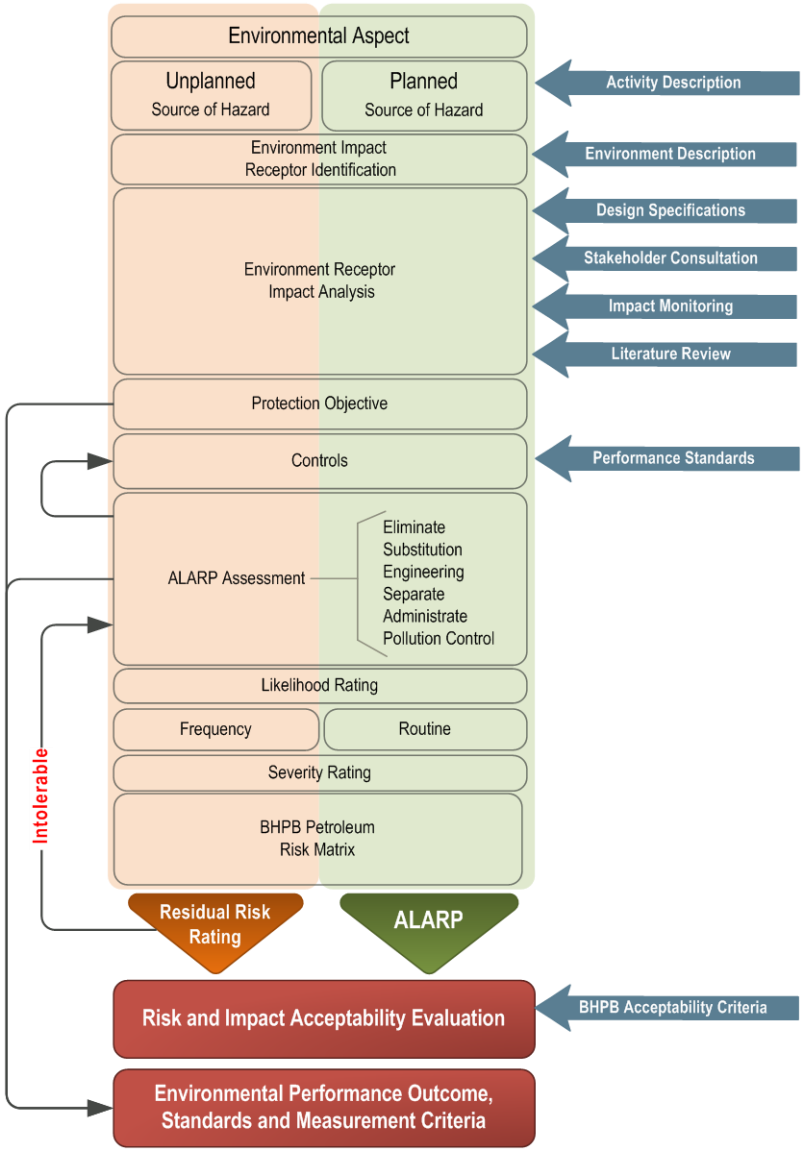

Figure 4-1: Environment plan integrated impact and risk assessment

4.2 Environmental Impact Assessment

The environmental impacts were based on the environmental receptors identified in the Activity Area and the broader area that might be affected with the impact descriptions developed in an initial screening process that identified the specific receptor that may be impacted. Further quantitative or qualitative definition of the impact was then completed to ensure an understanding of the impact (routine or unplanned) to confirm that the severity of the risk and impact was correctly assigned during the evaluation process.

4.3 Demonstration of ALARP

The OPGGS (Environment) Regulations 2009 require a demonstration that the environmental impacts and risks of the activity will be reduced to as low as reasonably practicable (ALARP). To determining whether risks have been reduced to ALARP an understanding of the risk and the sacrifice (in terms of safety, time, effort and cost) involved in avoiding it are needed. The hierarchy of decision tools (from lowest risk to highest risk) has been adapted from the UKOOA *Framework for Risk Related Decision Support* is below and a summary of the application of these decision tools and protocols in relation to the different categories of risk is presented in Table 4-1.

- Codes and Standards;
- Good Oilfield Practice;
- Professional Judgement;
- Risk-based Analysis;
- BHP Billiton Values; and
- Societal Values.

Table 4-1: Summary of risk ratings, decision-making tools and decision-making protocols

Risk Rating	Decision-Making Tool	Decision-Making Protocol
Tolerable	Comparison to codes and standards, good oilfield practice and professional judgement are used to determine risk acceptability.	If the environmental risk was found to fall within the "Tolerable" zone and the control measures are consistent with applicable standards and 'good oilfield practice' then no further action is required to reduce the risk further. However, if a control measure that would further reduce the impact or risk is readily available, and the cost of implementation is not disproportionate to the benefit gained, then it is considered 'reasonably practicable" and should be implemented.
ALARP Zone	In addition to comparisons with codes and standards, good oilfield practice and professional judgement, risk-based analyses are used to determine risk acceptability.	If the environmental risk of the hazard has been found to fall within the "ALARP Zone" then an iterative process to identify alternative/additional control mechanisms will be conducted to reduce the risk to the "Tolerable" zone. However, if the risk associated with a hazard cannot be reasonably reduced to the "Tolerable" zone without grossly disproportionate sacrifice (e.g. cost, time, resources and safety); then the mitigated environmental risk is considered to be ALARP.
Intolerable	All of these decision making tools apply combined with consideration of BHP Billiton and societal values.	If the environmental risk of the hazard has been found to fall within the "Intolerable Zone" then the source of hazard will need additional barriers and is not acceptable to BHP Billiton in the current condition.

The ALARP assessment process primarily considers good engineering plus industry practice and legal requirements as key factors affecting the acceptability of a risk. Other factors such as physical constraints, stakeholder perceptions, asset protection and the interaction between environmental and safety risk is also considered as part of the overall decision-making process. The approach also implies a level of proportionality where the decision-making applied to each particular hazard are proportionate to the acceptability of its risk. The decision-making principles for each level risk are based on the precautionary principle (as defined in the EPBC Act) and provide assurance that the environmental impacts and risks are reduced to ALARP and of an acceptable level.

All environmental risks and associated sources of hazard in the EP have been assessed through a tailored ALARP assessment that presents all identified controls in a hierarchal framework. All of the risks associated with the Stybarrow Cessation activity correspond to Type A Decisions according to the UKOOA Guidance (UKOOA, 2014), which indicates they do not represent anything new or unusual, the risks are well understood,

the adopted control measures represent established good oilfield practice and there are no conflict with BHP Billiton corporate values or major stakeholder implications.

This ALARP process considers all possible controls for planned and unplanned impacts and risks, analyses their risk reduction (prevent or mitigate) proportional to the benefit gained and their final acceptance as a control or rejection and reasoning as to why.

The general preference is to accept controls that are ranked as Tier 1 categories as these controls provide a preventive means of reducing the likelihood of the hazard occurring. Tier 2 categories reduce the potential consequence of the impact or risk. This ranking of controls was considered during the determination of ALARP and the impact and risk acceptance process.

The hierarchy of controls applied in the EP are defined below and are in order of preference:

- Tier 1:
  - Eliminate – Remove the source preventing the impact, i.e. eliminate the hazard;
  - Substitution – Replace the source preventing the impact;
  - Engineering – Introduce engineering controls to prevent or control the source having an impact;
  - Separate – Separate the source from the receptor preventing impact;
- Tier 2:
  - Administrate – Procedures, competency and training to minimise the source causing an impact;
  - Pollution Control – Implement a pollution control system to reduce the impact;
  - Contingency Planning – Mitigate control reducing the impact; and
  - Monitoring – Program or system used to monitor the impact over time.

The controls associated each of the risks for planned and unplanned events of the activity, along with those for the response strategies proposed in the unlikely event of an oil spill, were assessed taking into consideration the potential environmental benefit gained if the control was implemented compared with the practicability of its implementation. If the control had high effectiveness (Availability, Functionality, Reliability, Survivability, Independence/Compatibility) and were practicable to implement, i.e. there was no disproportionate cost/time/safety/effort sacrifice, then the control was adopted. Similarly, if the controls were not practicable, i.e. the cost, time and effort to implement the control was grossly disproportionate to the benefit gained, then the control was rejected.

4.4 Demonstration of Acceptability

The OPGGS (Environment) Regulations 2009 require a demonstration that the environmental impacts and risks of the activity will be of an acceptable level. The process to determine acceptability is as follows:

- Tolerable residual risks are 'Acceptable', if they meet legislative requirements, codes and standards, good industry practice and professional judgement;
- ALARP residual risks are ‘Acceptable’ if demonstrated using risk based analysis in addition to legislative requirements, codes and standards, good industry practice and professional judgement;

In addition, BHP Billiton evaluates the following criteria for all Tolerable and ALARP residual risks:

- Principles of Ecological Sustainable Development as defined under the EPBC Act;
- Internal context - the proposed controls and residual risk is consistent with BHP Billiton Policies
- External context – consideration of the environmental best practice and stakeholder views.

Only risks which have been assessed to be tolerable or ALARP are acceptable. Intolerable residual risks are not acceptable. Table 4-2 (below) lists the risk identified for this activity and their controls. All residual risks have been assessed as tolerable as per Table 4-1.

Table 4-2 – Stybarrow End of Field Life – Environmental Risks, Impacts, and Summary of Controls

Aspect	Source of Risk	Impact	Consequence	Controls – Mitigation Measures
Planned Activities				
Physical Presence	Presence of vessel during buoy removal or inspection vessel, ROV survey or other inspection/maintenance activities; or Presence of wells, flowlines and subsea infrastructure	Interference with shipping, fishing and/ or other third party vessels	Potential disruption to commercial & recreational fishing and shipping activities. Temporary loss of small part of fishing area.	Bridge-watch crew to be appropriately qualified. Navigation (including lighting, compass/radar), bridge and communication equipment will be compliant with appropriate marine navigation and vessel safety requirements, and Navigational aids (AIS) will alert marine vessels to avoid collision. Notification of location and timing of significant vessel-based activities (i.e. spider buoy removal), etc. to AMSA who will issue an AusCoast Warning, and to the Australian Hydrographic Office (AHO) who will issue a 'Notice to Mariners'. Establish and maintain a Community Engagement Program by regularly meeting with the Community Reference Group (CRG). Record and review stakeholder complaints.
Disturbance to Seabed	Presence of wells and/or flowlines; Cessation activities including stabilisation, sampling, removal of spider buoy and disconnection and plugging of flowlines; or dropped objects	Damage to seabed habitat	Small area of direct damage to seabed and associated communities. Impact mitigated by widespread distribution of similar habitat in the region.	Recovery of dropped objects where practical to do so and when recovery will provide a net environmental benefit.
Noise	Noise from vessel operations	Noise to marine environment causing interference to marine mammals.	Noise radiated underwater can cause marine fauna to take avoidance measures thereby causing disruption to migratory pathway.	Vessels to operate in accordance with the EPBC Regulations 2000 to avoid interactions with cetaceans and whale sharks. Vessels will not knowingly travel greater than 6 knots within 300 m of a cetacean, whale shark or turtle (caution zone) or approach closer than: 100 m of a large whale or whale shark, or 50 m of a dolphin or turtle (except if bow riding). Implement EPBC Act 1999 – Ministerial Approval Decision April 2006 (EPBC 2005/2034) Conditions in relation to cetacean and whale shark interactions and sightings reporting. Environmental awareness induction provided to vessel crew to advise marine fauna interaction requirements and the injury or death of any marine fauna species listed as threatened or migratory under the EPBC Act reported to NOPSEMA. Record complaints from stakeholders, review of complaints register done annually.
Atmospheric emissions	Vessel engines, generators and mobile/ fixed plant and equipment.	Greenhouse gas (GHG) emissions	Increase in GHG	Air emissions will be measured or estimated (using accepted industry estimation methodology), recorded and internally reported and emissions to be MARPOL compliant. Vessels will use marine-grade low sulphur diesel (rather than heavy fuel oil).

Aspect	Source of Risk	Impact	Consequence	Controls – Mitigation Measures
Liquid and Nutrient Discharges	Sewage and Food waste	Localised nutrient increase from food and sewage waste discharge.	Localised increase in marine productivity near discharge point.	All production flowlines will be plugged. Current International Sewage Prevention Pollution Certificate on-board vessel. Current International Oil Prevention Certificate (IOPP) on-board vessel. Where Offshore Chemical Notification Scheme (OCNS) rating of D or E or a CHARM rating of Silver or Gold rated chemicals are used, no further control required. No discharge of untreated sewage within 12 nm of the territorial baseline, and no discharge of treated sewage within 3 nm of the territorial sea baseline; and no discharge of sewage to cause discoloration or visible solids. Utilise sewage treatment and discharge equipment to treat sewage and reduce impact to the environment. Macerate food waste to less than 25 mm prior to discharge when >3 nm and <12 nm from the territorial sea baseline. Oily water discharge after treatment to 15 ppm in a MARPOL-compliant oily water system. Fuels, oils and hazardous chemicals stored with secondary containment at least 110% of largest single waste container.
	Grey water	Minor localised nutrient increase, addition of surfactants (soaps and detergents) and chemicals to water column.	Localised and temporary reduction in water quality adjacent to discharge point. Potential toxic effect to planktonic species entrained with discharge plume.	
	RO brine reject	Minor increase in salinity.	No observable effect on flora or fauna.	
	Cooling water	Potential for contamination with residual biocide chemicals. Minor increase in water temperature.	Localised temporary elevated water temperature adjacent to discharge point. Potential toxic effect from residual biocide chemicals to planktonic species entrained with discharge plume.	
	Discharges from wells and flowlines (seawater & preservation chemicals)	Residual hydrocarbon and chemical discharge to sea.	Potential for toxic effect to fauna close to release point.	
Deck Drainage	Rainfall/ wash-down water	Detergent, oil and grease discharge to sea during rainfall or wash-down activities.	Potential water quality impacts causing bioaccumulation and toxicity to biota adjacent to vessels.	
Residual NORM in flowlines	Presence of NORM in flowlines and subsea equipment	Discharge of gamma radiation from NORM scale.	Localised exposure of marine biota to gamma radiation.	

Aspect	Source of Risk	Impact	Consequence	Controls – Mitigation Measures
General (non-hazardous & hazardous) Waste	Waste generated by miscellaneous vessel activities.	Generation of waste materials.	Additional usage of onshore waste reception facilities.	Waste management plan for managing waste generation, transport and disposal, and a waste management hierarchy to eliminate, reduce, recycle or reuse in lieu of disposal in the management plan. Records are maintained of waste type, source and quantities sent onshore. Loss or discharge of hazardous waste materials to sea will be reported to AMSA.
Unplanned Activities				
Physical Presence	Presence of vessel during buoy removal or inspection vessel, ROV survey or other inspection/maintenance activities	Interference of vessel with migratory or resident populations	Potential for migratory species to be diverted or, in extreme case, blocked from following normal migratory route.	Vessel Masters to operate vessel in accordance with the OPGGS Act 2006 – and EPBC Regulations 2000 on interacting with cetaceans (modified to include turtles and whale sharks). Implement EPBC Act 1999 – Ministerial Approval Decision April 2006 (EPBC 2005/2034) Conditions in relation to cetacean and whale shark interactions and sightings reporting. Cetacean and whale shark sightings are recorded, secondary to the primary responsibilities to the crew, and reported to DoE annually and marine crew to be briefed on marine fauna interaction requirements. Injury or death of any threatened or migratory marine fauna species (as per EPBC Act) reported to NOPSEMA and vessel collisions to the National Ship Strike Database. Installation vessels will not enter Exmouth Gulf during the period 15 September to 31 October in any year except in emergency situations.
Physical Presence – Accident	Vessel collision with marine fauna	Potential lethal impact or harm to protected species.	Potential mortality or injury of protected marine species.	
Introduced Marine Species	Vessels from high IMS risk areas entering Australian Waters with IMS attached to vessel, equipment, or within ballast tanks/water.	Introduction of invasive marine species to area leading to major impact to native species.	Colonisation of invasive species affecting native marine organisms	Tributyl tin (TBT) free anti-fouling systems applied to vessels entering operational area. Implement management measures commensurate with the IMS risk to minimise the likelihood of IMS being introduced and established (i.e. manage biofouling and ensure ballast water exchange in accordance with legal requirements). Ballast water exchange upon entering Australian waters in accordance with standards.
Hydrocarbon spills (refined oil and lube oil) / hazardous chemicals or liquid waste.	Accidental leaks from storage and equipment, including ROV's	Contamination / pollution of water column.	Localised decrease in water quality causing toxicity/ oiling of marine receptors at sea surface.	All oily water exceeding 15 ppm must be contained and disposed of at a licensed onshore reception facility or to a carrier licensed to receive waste. Liquids from drains may only be discharged if the oil-in-water content does not exceed 15 ppm after treatment in a MARPOL-compliant oily water filter system. Vessels to have a current IOPP certificate for oily water filtering equipment. Loss or discharge to sea of harmful materials to be report to AMSA. Vessels will have current MARPOL-compliant Shipboard Oil Pollution Emergency Plan (SOPEP) and Shipboard Marine Pollution Emergency Plan to manage any spills or leaks. Continuous bunding or drip trays are used around machinery or equipment with the potential to leak chemicals/ fuel. Spill clean-up equipment and deck drainage control measures to be located where hydrocarbons and hazardous chemicals are frequently handled. Hazardous waste materials are contained on-board for onshore disposal at a licensed reception facility or to a carrier licensed to receive waste.

Aspect	Source of Risk	Impact	Consequence	Controls – Mitigation Measures
				Fuels, oils and hazardous chemicals must be stored with secondary containment at least 110% of largest single waste container. Critical hoses outside bunded areas are identified and regularly inspected/maintained/replaced as part of the Preventative Maintenance System.
Diesel spill to the environment during bunkering operations.	Bunkering hose failure.	Contamination / pollution of water column.	Visual pollution (i.e. slicks and sheens) potential localised acute toxic response.	Diesel bunker transfer checklist will be completed prior to each bunkering activity, detailing load, communications, and alarm criteria. Diesel bunkering activities to commence during day time and only if sea conditions are such that it is safe to do so. Bunkering area drain points will be plugged prior to commencement of bunkering activities. Diesel bunkering transfer hose will remain buoyant at all times during the bunkering activity. Bunkering hoses will be drained at cessation of bunkering activities. Direct line of sight between vessels maintained during transfer. No concurrent transfer operations shall take place while undertaking fuel bunkering from the same vessel. Hose register will be maintained that contains details of date of manufacture, date of pressure test and test pressure and preventative maintenance and inspection. Dry break couplings will be used on hoses used for bulk transfer of diesel and a weak link breakaway coupling (e.g. a KLAW coupling) will be in place with the transfer hose string. ESD, bunkering valves and relief valves are in place and included on bunkering pumps. Spill clean-up equipment is located where hydrocarbons and hazardous chemicals are frequently handled. All vessels involved activities over 400 gross tons will have a current SOPEP. Scupper plugs or equivalent deck drainage control measures available where hazardous chemicals and hydrocarbons are stored and frequently handled. Compliance with EPBC Act 1999 – Ministerial Approval Decision April 2006 (EPBC 2005/2034) Conditions. Implement and maintain BHP Billiton Stybarrow Cessation OPEP and MARPOL-compliant SOPEP and equipment.
	Leak from piping, flanges, valves, hose connections.	Contamination / pollution of water column.	Visual pollution (i.e. slicks and sheens) potential localised acute toxic response.	
Diesel spill from ruptured fuel tank due to vessel collision.	Tank rupture	Contamination / pollution of water column.	Visual pollution (i.e. slicks and sheens) potential acute toxic response over localised area.	Bridge-watch crew to be appropriately qualified. Navigation (including lighting, compass/radar), bridge and communication equipment will be compliant with appropriate marine navigation and vessel safety requirements, and Navigational aids (AIS) will alert marine vessels to avoid collision. Notification of vessel-based activities, duration of activities, etc. to AMSA Rescue Coordination Centre (RCC), which triggers RCC to issue an AusCoast Warning, and to the Australian Hydrographic Service (AHS) who will issue a 'Notice to Mariners'. Maintain a Community Engagement Program by regularly meeting with the Community Reference Group (CRG). For construction vessels with main fuel tanks located as wing tanks (i.e. not protected by water ballast tanks), tank volumes to be maintained at <100 m^3

Aspect	Source of Risk	Impact	Consequence	Controls – Mitigation Measures
				Implement and maintain BHP Billiton Stybarrow Cessation OPEP and MARPOL-compliant SOPEP and equipment.
Loss of containment from wells and subsea infrastructure or a release of residual hydrocarbons from flowlines	Release of crude oil leading to direct impact of marine biota at within water column and indirect impact to biota due to water quality impact			Establish and maintain Petroleum Safety Zones (500 m) and Cautionary Areas surrounding the fixed structures (wells, FPSO). Develop and maintain a Stybarrow Cessation OPEP indicating potential nature of spills, likely response and resourcing.

5 MONITORING ENVIRONMENTAL PERFORMANCE

EPs establish the environmental performance outcomes and standards an activity must maintain. To determine these for Stybarrow Cessation activities applicable legal requirements, international standards, BHP Billiton Policies, environmental risks, available controls, and the views of interested parties were considered. In addition, performance outcomes and standards must be measurable where practicable.

Environmental Performance Outcomes were developed during the ENVID process to ensure protection of the environment from the impact or risk and to ensure ongoing performance and measurability of the controls. All environmental risks are required to have at least one associated environmental performance outcome which are developed using the below criteria:

- Specific to the source of hazard;
- Indicate how the environmental impact will be managed (e.g. minimise or prevent);
- Contain a statement of measurable performance (where applicable);
- Contain a timeframe for action (where applicable); and
- Consistent with legislative and HSEC policy requirements.

Environmental performance standards set the performance benchmark of systems, equipment, procedures or functional responsibility, which are used for managing environmental risks for the duration of the activity. Each outcome has one or more standards which must be met, and the risk control measures (identified by the risk assessment) which are used to reduce risks to ALARP also have performance standards. Performance Standards can be broad ranging and can be taken from many sources however, they must be specific, measurable and achievable. Performance Standards include:

- BHP Billiton internal policies, controls, frameworks and standards;
- Legislation and Regulations (e.g. OPGGS Act and Regulations); and
- Industry Guidelines and Standards (e.g. ISO 14001).

Measurement criteria have been developed for each environmental performance outcome and to measure that the performance outcome and standard will be met during the activity. The measurement criteria are focused on providing evidence of meeting environmental performance outcomes and providing assurance of compliance with standards, processes or required to reduce risks to be ALARP and acceptable.

For the duration of the activities covered in this EP, BHP Billiton will ensure environmental performance is managed through an inspection, monitoring, auditing and review regime.

Monitoring of environmental performance of Stybarrow Cessation activities will be undertaken in a number of ways. The following tools and systems are used to monitor environmental performance:

- Scheduled environmental inspections of vessels when undertaking activities;
- Regular review of waste management and recycling records;
- Monitoring of progress against key environmental performance indicators; and
- Auditing and assurance program of the activities

On-going environmental performance of contractors is the responsibility of the Contract Sponsors and Operations Managers.

Key data that will be monitored and recorded during the cessation activities are summarised in Table 5-1.

Table 5-1: Monitoring and record keeping summary

Parameter	Monitoring	Record Keeping	Frequency
Seabed Disturbance	Recovery of dropped objects where practicable to do so and where recovery will provide a net environmental benefit.	Documentation of dropped object retrieval.	As required.
Marine Fauna Interactions	Cetacean and whale shark sightings and interactions (secondary to primary work activities/ responsibilities).	Fauna sighting datasheet; Incident report form; Monthly incident report and environmental performance report.	As required Monthly
	Injury or death of listed threatened or migratory marine fauna species.	Incident report form; Monthly incident report; Environmental performance report. Incident reported to NOPSEMA.	As required
Waste	Sewage and grey water.	Support vessel log.	Monthly
		Maintenance records for sewage/grey water equipment.	Monthly
	Putrescible waste.	Garbage Record Book.	Weekly
		Maintenance records demonstrate functioning macerator onboard Vessel.	Monthly
	Oily water – Bilges and machinery spaces.	Oil Record Book.	Monthly
	Oily water – Deck drainage	Drain inspections	Monthly
	Fuels and oils.	Containment and inspections, maintenance records, PMS records, checklists.	Monthly
	Hazardous chemicals.	Hazardous chemical locker inspection.	Monthly
	Hazardous and non-hazardous solid waste.	Garbage Record Book or manifests.	Monthly
	Loss or discharge to sea of harmful materials.	Record log of report to AMSA RCC.	As required
Training	Details of crew environmental inductions / drills.	Induction record sheets / drill reports.	As completed
Incident Reporting	Number and details of environmental incidents.	Incidents recorded in the BHP Billiton 1SAP system.	As required
Annual Environmental Performance Review	Review of Environmental commitments and implementation strategy	Annual review of controls, ALARP assessment, to allow continual improvement.	Annual
Compliance Reporting	Compliance with commitments in outcomes and standards.	Monthly recordable incident reports.	Monthly
		Annual Environmental Performance Report to NOPSEMA.	Annual

6 SUMMARY OF OIL POLLUTION EMERGENCY PLAN RESPONSE ARRANGEMENTS

BHP Billiton has prepared the Stybarrow Cessation Oil Pollution Emergency Plan (OPEP). The OPEP is the primary reference document and key control measure to be implemented in the event of an oil spill. It has been developed as a formal means of establishing the processes and procedures to ensure that BHP Billiton maintains a constant vigilance and readiness to prevent and, where required, respond to and effectively manage oil spill incidents that may occur during the activity. The OPEP has been developed to be compliant with the *OPGGS (Environment) Regulations*.

The OPEP provides oil spill response strategies based on the identified credible and worst-case spill scenarios that could occur during the activity. The following hydrocarbon spill response strategies were evaluated and selected for implementation in the very unlikely event of a loss of containment during the activity. The potential environmental risks and impacts associated with response strategies include:

- Physical presence of vessels and equipment causing disturbance to marine fauna including interference/temporary displacement of marine fauna;
- Seabed disturbance impacting any benthic habitats or species when equipment such as anchors for the relief well, capping stack, is deployed;
- Noise / air emissions causing a temporary increases in ambient noise and reduction in air quality, respectively;
- Increased routine liquid waste discharge and generation of solid waste from response vessels/personnel;
- Physical damage to shoreline habitats from protection and clean-up operations;
- Physical injury and stress to wildlife if captured for treatment;

  Pollution of the marine environment from unplanned chemical/hydrocarbon spills and waste generated during a spill response; and

- Exposure to entrained oil.

The environmental risks and impacts of these response strategies are identified and considered as part of the ALARP and acceptability assessment. Appropriate response strategies are those where the environmental benefit of implementing the response outweighs the potential risks and impacts of not undertaking the response. Implementation of these response strategies would be re-assessed during a spill event, on an ongoing basis, with continued use of the daily Operational Net Environmental Benefits Analysis (NEBA) and taking into consideration the size of the spill, weather conditions and other constraints.

The following response strategies will be applied as soon as possible in the event of a hydrocarbon spill:

- Source Control:
  - Vessel Control – is the primary response strategy for responding to single point spills, transfer hose/ pipe failure, spills during transfer/ bunkering, tank overflows, hull leakage and spills in the event of a vessel collision. Activities will be dependent on the type of incident but may include:
    - Closing valves, isolating pipework and shutting down pumps.
    - The use of temporary patches or bungs/ plugs to seal holes, until more permanent measures can be made.
    - The use of spill response equipment, including small booms, absorbent pads, spill absorbent litter, spill recovery containers, permissible cleaning agents and other materials.

  - The transfer of product between tanks on the vessel or between vessels - in the event of a leaking tank or tank rupture from a vessel collision.

- Monitor and Evaluate – conducted for all spills by the following methods (as required) to maintain situational awareness and inform response decision-making during a spill event:
  - Oil spill trajectory modelling;
  - Surveillance using boats;
  - Aircraft observation; and
  - Oil spill tracker buoys;
- Natural Recovery – the natural degradation and weathering processes will breakdown and remove surface oil and stranded hydrocarbons. This response strategy means that no direct action is taken other than to monitor and evaluate the oil spill trajectory, the rate of dispersion of the diesel or crude oil, and the rate of habitat/ community recovery.
- Operational and Scientific Monitoring – initiated for large spills to spills to support the oil spill response strategies and to understand any effects on sensitive receptors. BHP Billiton has developed Operational and Scientific Monitoring Guidelines for monitoring effects of oil spills on the marine environment that may occur during exploration, production and operational activities.

7 CONSULTATION & CONTACT DETAILS

BHP Billiton has been actively engaging with residential and business stakeholders of the North West Cape since 1992. We have undertaken extensive stakeholder engagement with over 81 relevant stakeholders whose functions, interests or activities may be affected by the Stybarrow Cessation and/or any associated potential risks in the project. The relevant stakeholders / stakeholder groups are identified in Table 5 below.

Table 2: Relevant Stakeholders

Category	Stakeholder
Federal Government	Australian Customs and Border Protection Department of Defence Department of Environment Department of Industry Innovation and Science
Marine Safety / Emergency Response	AMOSC Australian Maritime Safety Authority (AMSA) Oil Spill Response Limited
State Government	Pilbara Port Authority Department of Parks and Wildlife (WA) Department of Fisheries Department of Mines and Petroleum Department of State Development Department of Transport Gascoyne Development Commission Main Roads WA

Industry	Quadrant Energy Woodside Energy APPEA Shell Australia
Local Government	Shire of Exmouth
Exmouth / Onslow Community	Exmouth CRG Cape Conservation Group Exmouth Chamber of Commerce & Industry Exmouth Businesses Exmouth Volunteer Marine Rescue
Fishing Industry	Austral Fisheries Australian Fisheries Management Authority Commonwealth Fisheries Association Exmouth Gulf Prawn Managed Fishery Fat Marine / Coral Park Seafoods Gascoyne Demersal Scalefish Fishery Marine Aquarium Fish Managed Fishery Nickol Bay Prawn Fishery Nickol Bay Prawn Fishery;Northern Prawn Fishery North West Slope Trawl Fishery Onslow Prawn Managed Fishery Pearl Producers Association Pilbara Demersal Scalefish Fishery (Trap and Trawl) Pilbara Line Fishery Recfishwest Shark Bay Prawn Fishery Shark Bay Scallop Limited Entry Fishery Skipjack Tuna Fisheries Southern Bluefin Tuna Fishery Specimen Shell Managed Fishery WAFIC - Western Australian Fishing Industry Council[1] West Coast Deep Sea Crustacean Managed Fishery

[1] WAFIC represents all fisheries identified in area including North West Slope Trawl Fishery; Western Skipjack Tuna Fishery; Western Tuna and Billfish Fishery; Southern Bluefin Tuna Fishery; Western Deepwater Trawl Fishery; North Coast Shark Fishery (closed); Onslow Prawn Managed Fishery; Nickol Bay Prawn Fishery; Pearl Oyster Managed Fishery; Pilbara Demersal Scalefish Fishery (Trap and Trawl); Exmouth Gulf Prawn Managed Fishery; Gascoyne Demersal Scalefish Fishery; Shark Bay Prawn Fishery; Shark Bay Scallop Limited Entry Fishery; Shark Bay Crab Interim Managed Fishery; Shark Bay Beach Seine and Mesh Net Fishery; West Coast Rock Lobster Fishery; Roe's Abalone Fishery; West Coast Demersal Gillnet / Demersal Longline (Interim) Managed Fishery; West Coast Demersal Scalefish (Interim) Managed Fishery Mackerel Managed Fishery; Beche-de-mer Fishery; Marine Aquarium Fish Managed Fishery; West Coast Deep Sea Crustacean (Interim) Managed Fishery; Octopus; and Specimen Shell Managed Fishery.

	West Coast Demersal Scalefish Fishery West Coast Rock Lobster Fishery Western Deepwater Trawl Fishery Western Skipjack Tuna Fishery Western Tuna and Billfish Fishery
Other	Australian Institute of Marine Science Conservation WA Ningaloo Coast World Heritage Advisory Committee Oceans Institute University of WA

No objections or concerns were raised by stakeholders during consultation in the preparation of the EP.

BHP Billiton has held regular open community reference group (CRG) meetings in Exmouth since 2004. The CRG meetings provide stakeholders with updates on petroleum activities including all Stybarrow field activities. Meetings are open to any interested stakeholder and participants are invited to raise any concerns or issues. Meeting agendas are prepared and circulated in advance of meetings and minutes are recorded The BHP Billiton Corporate Affairs toll-free 1800 number and email address is made available to stakeholders.

Consultation undertaken in support of the Stybarrow Cessation Activities has included:

- Provision of Activity Summary – April/May 2015
- Project updates at CRG meetings – Throughout 2015/2016

BHP Billiton's consultation includes: distribution of an activity fact sheet; direct mail; email; face to face meetings; and telephone conversations. The type of information provided includes: the timing and duration of the activity and the mitigation measures of relevant risks; BHP Billiton's policies and experience; and contact details for BHP Billiton.

Stakeholders who raise objections and claims during consultation in the preparation of an EP are responded to directly, and any concerns raised (if not already considered by BHP Billiton) are addressed in the EP in the same manner as all risks identified by BHP Billiton. BHP Billiton will continue to engage with stakeholders in the lead up to the commencement of activities through our various consultation mechanisms.

Table 7-3: Summary of stakeholder questions or comments and BHP Billiton responses

Topic	Stakeholder Question/Comment	BHP Billiton Response
Maritime Safety	Advised BHPB of maritime traffic in the vicinity of the activity area and requested to be kept informed of the departure date of the FPSO and future decommissioning activities.	Stakeholder's comments used to guide EP's management of communication with maritime traffic. Stakeholder had no further comment. Stakeholder was advised on departure of FPSO.
Commercial Fisheries	Stakeholder noted that BHP Billiton petroleum should consult with WAFIC and relevant Fisheries licence holders	Advised that BHP Billiton have consulted with WAFIC and relevant Fisheries licence holders. Stakeholder had no further comment.
	The Department of Fisheries provided BHP with advice regarding relevant fisheries and fish spawning times, information required in OPEP, and biosecurity controls and contact information in the event of the identification of marine pests.	BHP responded by acknowledging letter and noting that required information was present in the EP or OPEP as relevant. Stakeholder had no further issues.

8 NOMINATED LIASION PERSON

For further information about this activity please contact the BHP Billiton Corporate Affairs Team:

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