Pyrenees Expansion Installation

Environmental Plan Summary

15 January 2016

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1 INTRODUCTION

BHP Billiton Petroleum Pty Ltd (BHP Billiton) acting as operator of the 'Pyrenees Facilities', on behalf of a joint venture comprising BHP Billiton Petroleum (Australia) Pty Ltd, Quadrant PVG Pty Ltd and Inpex Ltd, is proposing to conduct tie-back and installation work within Permit Areas WA-42-L and WA-43-L. The proposed activity is within the Pyrenees Operational area, which has been active since 2009.

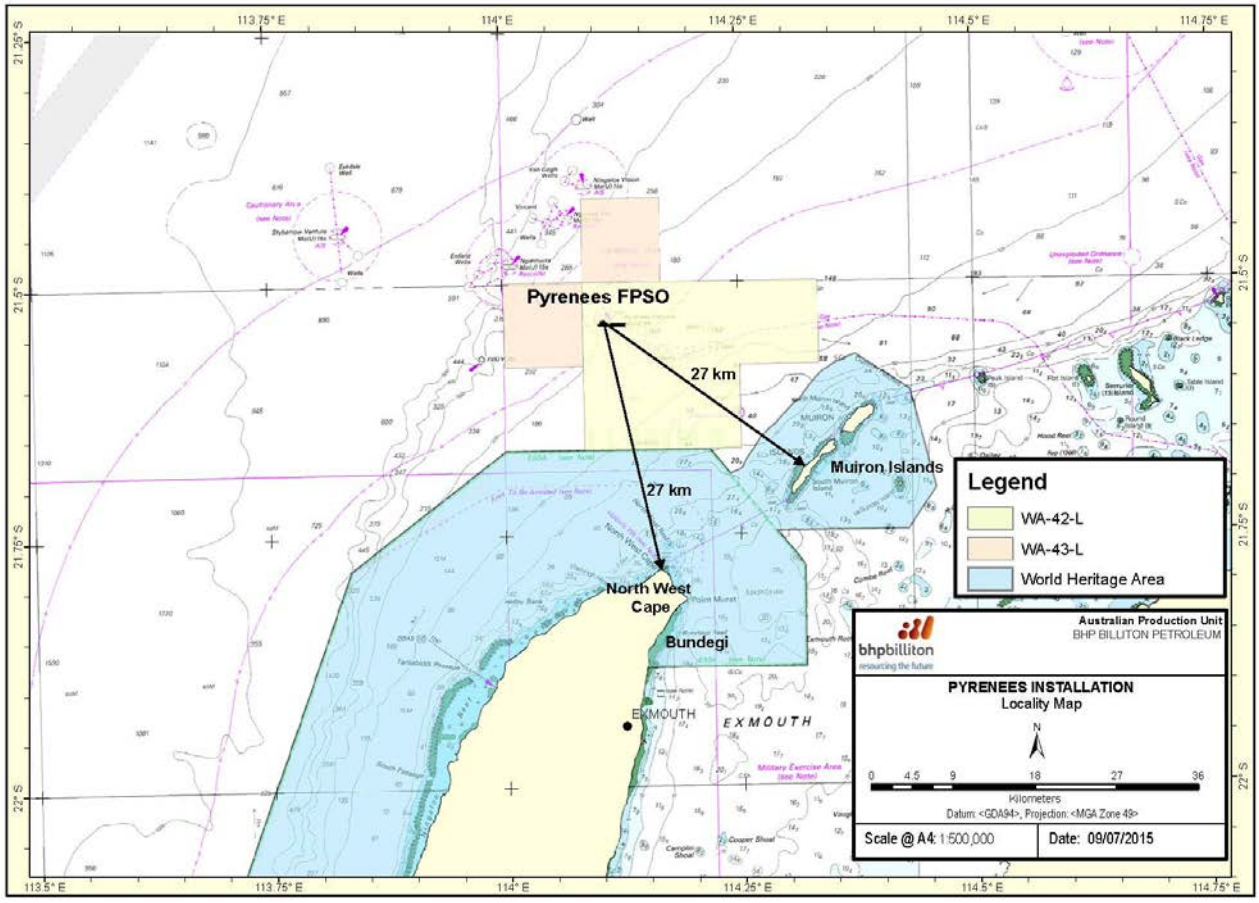
This activity summary addresses the installation, connection and commissioning of additional wells and related subsea infrastructure associated with the Pyrenees facility as the field is fully developed. The drilling of wells is covered under the Pyrenees Phase 3 Drilling Environmental Plan (EP) which was accepted the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) in March 2015.

This activity summary contains a comprehensive overview of the installation activity. Installation activities require a full environment plan which has been assessed and accepted by NOPSEMA, the regulator of petroleum activities in Commonwealth waters.

2 LOCATION OF ACTIVITY

The Pyrenees Development is located approximately 27 kilometres northwest of North West Cape and 46 kilometres northwest of Exmouth, Western Australia, in water depths of between 190 and 260 metres (refer Figure 2-1). The Pyrenees Expansion Installation activity will be conducted entirely within Petroleum Permit Areas WA-42-L and WA-43-L.

Figure 2-1: Location of Pyrenees development



3 DESCRIPTION OF RECEIVING ENVIRONMENT

Permit Areas WA-42-L and WA-43-L are located in the North West Marine Region (North West Province bioregion), as defined in the Marine Bioregional Plan for the North West Marine Region (link) (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 south.

Seabed communities in the Pyrenees 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. They 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 intersect the Area that May Be Affected (AMBA) are provided in Table 3-1 below which includes the key ecological features, values and descriptions from the Bioregion Plan.

Table 3-1 – Key Ecological Features (KEF), Values and Description (sourced from the Bioregion Plan)

KEF	Values	Description
Exmouth Plateau	Unique seafloor feature with ecological properties of regional significance.	The Exmouth Plateau is a regionally and nationally unique deep-sea plateau in tropical waters. The plateau is a very large topographic obstacle that may modify the flow of deep waters, generating internal tides and may contribute to upwelling of deeper water nutrients closer to the surface, thus serving an important ecological role.
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 up onto the slope. This nutrient-rich water interacts with the Leeuwin Current at the canyon heads. Aggregations of whale sharks, manta rays, sea snakes, sharks, large predatory fish and seabirds occur in this area.
Ancient coastline at 125 m depth contour	Unique seafloor feature with ecological properties of regional significance.	Parts of the ancient coastline, particularly where it exists as a rocky escarpment, are thought to provide biologically important habitats in areas otherwise dominated by soft sediments. The topographic complexity of these escarpments may also facilitate vertical mixing of the water column, providing relatively nutrient-rich local environments.
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.
Commonwealth waters adjacent to Ningaloo Reef	High productivity and aggregations of marine life.	The Leeuwin and Ningaloo currents interact, leading to areas of enhanced productivity in the Commonwealth waters adjacent to Ningaloo Reef. Aggregations of whale sharks, manta rays, humpback whales, sea snakes, sharks, large predatory fish and seabirds are known to occur in this area.

The North West Conservation Values Atlas (link) (the Atlas) has been reviewed to identify any Biologically Important Area(s) (BIA) 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;
- Green turtle – nesting and foraging North West Cape area, the Dampier Archipelago (islands to the west of Burrup Peninsula) and Scott Reef;
- Hawksbill turtle – nesting Ningaloo coastline and inter-nesting North West Cape and Ningaloo coastline; and foraging, nesting and inter-nesting habitat on Varanus Island, the Barrow-Lowendal-Montebello Island Group and the Dampier Archipelago with a very important rookery on Rosemary Island;
- Loggerhead turtle – nesting Ningaloo coastline and Muiron Islands, inter-nesting North West Cape and Ningaloo coastline; nesting and inter-nesting Montebello and Lowendal Islands; and nesting and inter-nesting Rosemary Island Dampier Archipelago;
- Flatback turtle – inter-nesting North West Cape area and the Exmouth Gulf; nesting and inter-nesting Thevenard Island; foraging, nesting and inter-nesting Barrow-Lowendal-Montebello Island group; and the Dampier Archipelago (islands to the west of Burrup Peninsula); and
- Whale sharks – waters adjacent to Ningaloo coastline for intensive foraging; and offshore Commonwealth waters along the North West Shelf.

Table 3-2 – Threatened or migratory species that may occur or have habitat within the AMBA

Threatened Species (*also migratory)	Migratory Species
Australian Fairy Tern *Sternula nereis nereis*	Antarctic Minke whale, Dark-shoulder Minke whale *Balaenoptera bonaerensis*
Black-flanked Rock-wallaby *Petrogale lateralis lateralis*	Barn swallow *Hirundo rustica*
Blue whale *Balaenoptera musculus* *	Bar-tailed Godwit *Limosa lapponica*
Dwarf sawfish, Queensland sawfish *Pristis clavata**	Bryde's whale *Balaenoptera edeni*
Flatback turtle *Natator depressus* *	Cattle egret *Ardea ibis*
Great White shark *Carcharodon carcharias**	Dugong *Dugong dugon*
Green sawfish, Dindagubba, Narrowsnout sawfish *Pristis zijsron**	Flesh-footed shearwater, Fleshy-footed shearwater *Puffinus carneipes*
Green turtle *Chelonia mydas**	Fork-tailed swift *Apus pacificus*
Grey Nurse shark *Carcharias taurus*	Giant Manta ray, Chevron Manta ray, Pacific Manta
Hawksbill turtle *Eretmochelys imbricata**	Great egret, White egret *Ardea alba*
Humpback whale *Megaptera novaeangliae**	Grey wagtail *Motacilla cinerea*
Leatherback turtle, Leathery turtle, Luth *Dermochelys coriacea**	Indo-Pacific Humpback dolphin *Sousa chinensis*
Loggerhead turtle *Caretta caretta**	Killer whale, Orca *Orcinus orca*
Night parrot *Pezoporus occidentalis*	Longfin Mako *Isurus paucus*
Northern Quoll *Dasyurus hallucatus*	Oriental Plover, Oriental Dotterel *Charadrius veredus*
Short-nosed sea snake *Aipysurus apraefrontalis*	Oriental Pratincole *Glareola maldivarum*
Soft-plumaged petrel *Pterodroma mollis*	Osprey *Pandion haliaetus*
Southern Giant petrel *Macronectes giganteus**	Rainbow Bee-eater *Merops ornatus*
Southern Right whale *Eubalaena australis**	Ray, Pelagic Manta ray, Oceanic Manta ray *Manta birostris*
Whale shark *Rhincodon typus**	Ray, Prince Alfred's ray, Resident Manta ray *Manta alfredi*
	Reef Manta ray, Coastal Manta ray, Inshore Manta
	Shortfin Mako, Mako shark *Isurus oxyrinchus*

Threatened Species (*also migratory)	Migratory Species
	Sperm whale *Physeter macrocephalus*
	Spotted Bottlenose dolphin *Tursiops aduncus (Arafura/Timor Sea populations)*
	Wedge-tailed shearwater *Puffinus pacificus*
	Yellow wagtail *Motacilla flava*

The Pyrenees field is located in Commonwealth waters, offshore from the WA mainland. The marine parks or management areas and reserves which intersect the AMBA are:

- Ningaloo World Heritage Area
- Ningaloo Marine Park
- Muiron Islands Marine Management Area Boundary
- Gascoyne Marine Reserve
- North West Cape Peninsula

The ecological and social values of the Wold Heritage area recognised by UNESCO can be found in the World Heritage listing (link).

3.1 Socio-Economic Environment

The nearest population centre to the Pyrenees Development 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.

Popular tourist locations of interest include the many Sanctuary Zones along the Ningaloo Coastline, such as Mangrove Bay, Jurabi Point, Turquoise Bay and Oyster Stacks, where visitors can enjoy bird watching opportunities at Mangrove Bay. The Turtle Centre at Jurabi is a popular tourist attraction and snorkelling is a popular activity for visitors in the numerous embayment's such as at Turquoise Bay, and further south at the popular coastal town of Coral Bay. The most popular offshore tourism activities are fishing, diving and whale shark spotting.

The activities within Petroleum Permit Area WA-432-L and WA-43-L lie outside of declared and charted shipping fairways. The nearest shipping route is approximately 28 kilometres from the nearest edge of the AMBA.

There are five Commonwealth and five State commercial fisheries that have boundaries that overlie or are in close proximity to the activity area and / or the AMBA associated with an unplanned event (Table 3-4).

Table 3-4 – State and Commonwealth commercial fisheries in the AMBA

State and Commonwealth Commercial Fisheries	
Pearl Oyster (State)	Marine Aquarium (State)
Pilbara Trap, Trawl and Line (State)	West Coast Deep Sea Crustacean (State)
Exmouth Gulf Prawn (State)	Specimen Shell (State)
West Coast Rock Lobster (State)	Western Skipjack Tuna (Commonwealth)
Abalone (State)	Western Tuna and Billfish (Commonwealth)
Mackerel (State)	Southern Bluefin Tuna (Commonwealth)
Beche-de-mer (State)	Western Deepwater Trawl (Commonwealth)
Octopus (State)	North West Slope Trawl (Commonwealth)

There are no national heritage places, known shipwrecks, sites indigenous or non-indigenous heritage or archaeological significance within the vicinity of the Pyrenees Development.

4 DESCRIPTION OF THE ACTIVITY

BHP Billiton plans to increase the production from the Pyrenees Development Area with workovers of existing wells, and the installation of additional production wells.

This EP covers all tie back activities, including the installation of new manifolds, flowlines, umbilicals, flying leads and risers required to route production to the Pyrenees Venture FPSO and provide control to the wells. Control system software will be updated to account for the changes.

Where required, existing wells may be suspended, disconnected and isolated from the production system. Associated infrastructure will be disconnected and stored subsea. Residual well fluids will be displaced from the flowlines using either gas or water. The Pyrenees Development comprises of: the Pyrenees Venture FPSO and its moorings; subsea facilities including subsea wells (production and water/gas injectors), associated trees, manifolds, flowlines, and umbilicals; and the spider buoy which connects the FPSO to the subsea infrastructure. As the field is progressively developed additional wells will be drilled, and tied back to the Pyrenees Venture FPSO. The amount of new infrastructure which will be installed in the Pyrenees field is dependent on how many wells are eventually drilled under the Pyrenees Phase 3 Drilling EP.

Timing for the installation activities is planned to occur, subject to drilling and completions campaigns and Construction Support Vessel availability, between 2016 and 2021. During this period there may be down time where no installations or commission activities will be undertaken and the field will host normal production, maintenance and offtake operations. Normal operations comprise of: the movement of supply vessels and offtake tankers through the field; the offtake of hydrocarbons to tankers; crew change helicopter flights between the FPSO and shore; and ongoing inspection and maintenance work on the FPSO and subsea infrastructure as required.

The program of works for the installation campaign includes:

- The use of Installation Support Vessels (ISV) within the field;
- Heavy lift transportation to bring subsea infrastructure (manifolds, flow lines, jumpers, umbilicals, risers etc.) the field;
- Installation of new subsea wells and associated subsea infrastructure, to tie the wells back to the Pyrenees FPSO;
- The engineering, procurement, manufacture, assembly and testing of all equipment necessary for the successful installation;
- Pre-commissioning and commissioning of subsea systems; and
- Suspension and isolation of existing wells and associated infrastructure.

5 DETAILS OF ENVIRONMENTAL IMPACTS AND RISKS

5.1 Risk and Impact identification, evaluation and assessment

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 environmental impacts were based on the environmental receptors identified in the Activity Area and the broader AMBA. Impact descriptions are 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 the severity of the risk and impact was correctly assigned during the evaluation process. The process is illustrated in Figure 5-1.

5.2 Demonstration of ALARP and Acceptability

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 determine if 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 5-1.

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

Figure 5-1: Environment plan integrated impact and risk assessment.

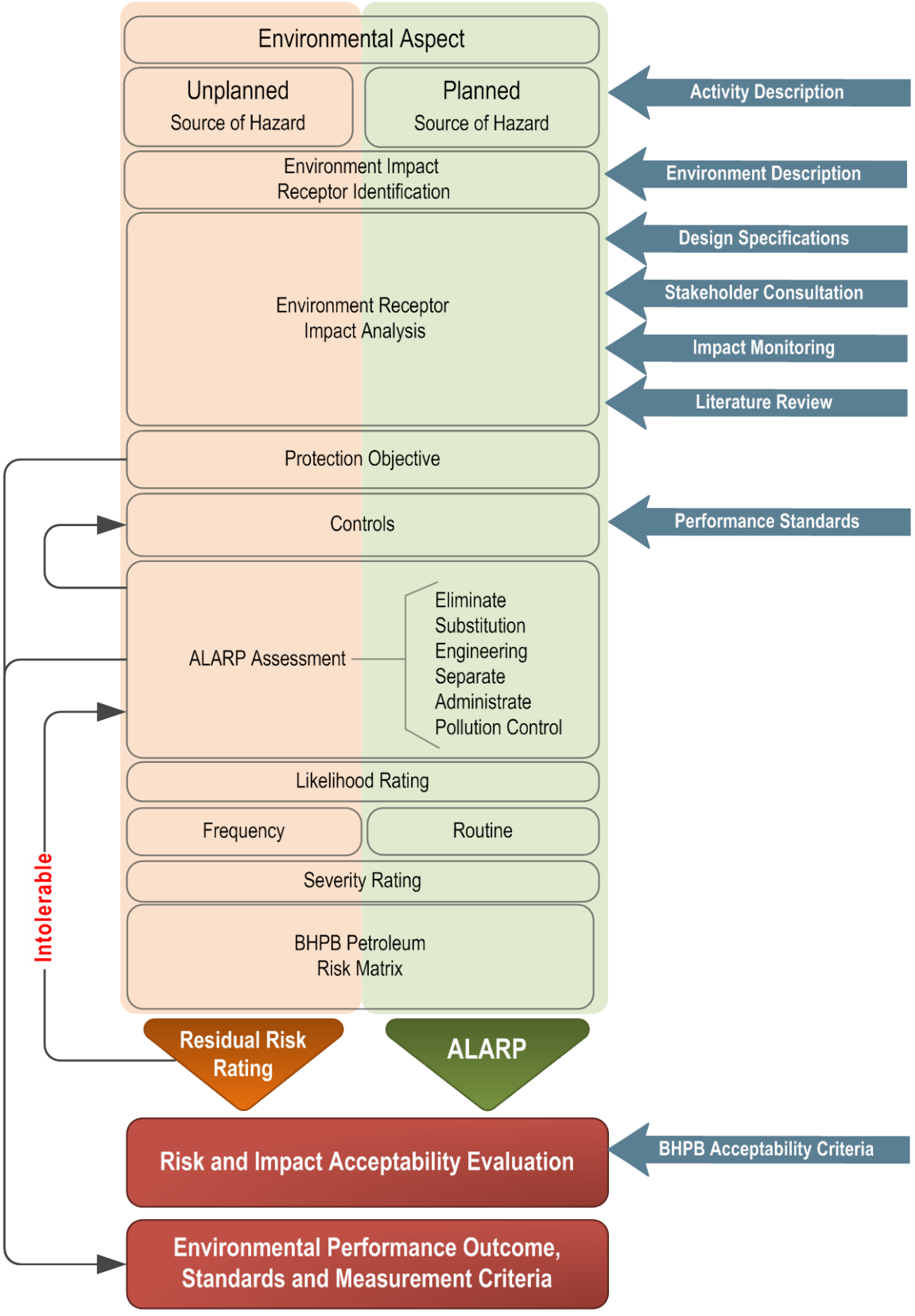


Table 5-1: Summary of risk ratings, decision-making tools and decision-making protocols

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 as 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 of impact; and

Separate – Separate the source from the receptor preventing impact.

Tier 2: *Administrate* – Procedures, competency and training to minimise the source of 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 with each of the risks for planned and unplanned events, 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 was 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.

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; and
- 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 5-2 (below) lists the risk identified for this activity and their controls. All residual risks have been assessed as tolerable as per Table 5-1.

Table 5-2 – Summary of Risk Assessment and Environmental Performance Outcomes, Performance Standards and Measurement Criteria

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
Physical Presence	Timing and location of vessels	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.	No collisions / incidents with other marine users.	**Navigation Act 2012; International Convention of the Safety of Life at Sea (SOLAS) 1974; Marine Order - Part 30: Prevention of Collisions, Issue 8; Marine Order 21, Issue 8 (Safety of Navigation and Emergency Procedures); AMSA Marine Order 70: Seafarer Certifications; and International Convention of Standards of Training, Certification and Watch-keeping for Seafarers (STCW95):** Navigation (including lighting, compass/radar), bridge and communication equipment will be compliant with appropriate marine navigation and vessel safety requirements. Automatic Identification System (AIS) is fitted and maintained in accordance with Regulation 19-1 of Chapter V of SOLAS. Crew undertaking vessel bridge-watch will be qualified in accordance with International Convention of STCW95, AMSA Marine Order 70: Seafarer Certifications or certified training equivalent. Notification of location and timing of installation activities to AMSA RCC, which triggers RCC to issue an AusCoast Warning, and to the Australian Hydrographic Service (AHS) who will issue a 'Notice to Mariners'. **BHP Billiton Stakeholder Engagement Management Plan (WA) - Community Engagement Program:** The Community Reference Group (CRG) will be consulted / advised of relevant installation activities. **APU Community Concerns, Inquiries and Complaints Procedure (WA):** Third-party (community) concerns, inquiries and complaints associated with Health, Safety, Environment and Community (HSEC) issues are directed to the appropriate contact for Exmouth Sub-basin based activities and dealt with appropriately and consistently.	Tolerable
	Presence of 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.			

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
Disturbance to Seabed	Installation of flowlines and subsea infrastructure through installation activities Dropped objects	Damage to seabed habitat 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. Small area of direct damage to seabed and associated communities. Impact mitigated by widespread distribution of similar habitat in the region.	No disturbance to sensitive benthic habitats within the Pyrenees Expansion Installation area.	Pre-installation survey to avoid seabed obstacles and associated environmental sensitivities Recovery of dropped objects where practicable to do so and where recovery will provide a net environmental benefit.	Tolerable
Noise emissions associated with vessel operations	Vessel operations	Noise to marine environment causing interference to marine mammals.	Noise radiated underwater can cause whales and cetaceans to take avoidance measures thereby causing disruption to migratory pathway.	No adverse interactions between vessels underway (i.e. not involved in installation activities) and cetaceans, whale sharks and sea turtles.	**OPGGS Act 2006 – (s. 280 (2) (c)) - EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans (modified to include whale sharks and turtles):** Vessels will not knowingly travel greater than 6 knots within 300 m of a cetacean, whale shark or turtle (caution zone) and minimise noise. Vessels will not knowingly approach closer than 100 m for a large whale or whale shark, or 50 m of a dolphin or turtle (with the exception of bow riding). If the cetacean / whale shark show signs of being disturbed, vessels will immediately withdraw from the caution zone at a constant speed of less than 6 knots. Vessels must move at a constant slow speed and with	Tolerable

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
					minimal noise away from a cetacean that is approaching so that the vessel remains at least 300 m from the cetacean. **EPBC Act 1999 – Ministerial Approval Decision April 2006 (EPBC 2005/2034) Conditions:** 1 (a) iv: Cetacean interaction procedures for supply vessels and aircraft that is consistent with Part 8 of the EPBC Regulations 2000. 1 (a) v: Cetacean and whale shark sightings reporting. Environmental awareness induction provided to vessel crew prior to activities to advise marine fauna interaction requirements. Injury or death of any marine fauna species listed as threatened or migratory under the EPBC Act reported to NOPSEMA. **APU Community Concerns, Inquiries and Complaints Procedure (WA):** Third-party (community) concerns, inquiries and complaints associated with Health, Safety, Environment and Community (HSEC) issues will be directed to the appropriate contact for Exmouth Sub-basin based activities and dealt with appropriately and consistently.	
Atmospheric emissions	Vessel engines, generators and mobile/ fixed plant and equipment.	Greenhouse gas (GHG) emissions	Increase in GHG	Atmospheric emissions will be managed to meet legislative emission standards.	**BHP Billiton GLD.012 HSEC Reporting:** Identify and document all data sources (for example invoice, instrument); measurement methods (including calculations and estimations); calibration and maintenance requirements for measurement equipment (including location details of the associated records); and data source exclusions. **Protection of the Sea (Prevention of Pollution from Ships) Act 1983 – Part IIID:** Only low sulphur diesel will be used. **AMSA Marine Order – Part 97: Marine Pollution Prevention - Air Pollution:** Vessels will hold a current International Air Pollution Prevention (IAPP) Certificate. **MARPOL Annex VI:** Equipment containing ozone-depleting substances (ODS) shall be maintained, along with an ODS Record Book, for vessels with rechargeable systems	Tolerable

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
					containing ODS. No discharge of ODS.	
Liquid Discharges	Sewage	Localised nutrient increase.	Localised increase in marine productivity surrounding discharge point.	Routine liquid waste discharges are managed in accordance with legislation and will comply with requirements of relevant Marine Orders. Prevent environmental impact of flowline discharges by the selection of chemicals with the best environmental profiles.	**MARPOL Annex IV: Sewage (as implemented in Commonwealth Waters by the Protection of the Sea (Prevention of Pollution from Ships) Act 1983); AMSA Marine Order – Part 96: Marine Pollution Prevention – Sewage:** Current International Sewage Prevention Pollution (ISPP) Certificate. **AMSA Marine Orders - Part 91: Marine Pollution Prevention – Oil, as appropriate to vessel class:** Vessels to have a current International Oil Pollution Prevention (IOPP) certificate for oily water filtering equipment. ***Protection of the Sea (Prevention of Pollution from Ships) Act 1983 – Part IIIB:*** No discharge of untreated sewage within 12 nm of the territorial sea baseline. No discharge of treated sewage within 3 nm of the territorial sea baseline. No discharge of sewage to cause discoloration or visible solids. ***Protection of the Sea (Prevention of Pollution from Ships) Act 1983 – Part IIIC:*** Putrescible and other food waste discharge from vessels (when inside the 500 m safety exclusion zone) must be ground or comminuted to <25 mm and discharged only when >12 nm from the territorial sea baseline. ***Protection of the Sea (Prevention of Pollution from Ships) Act 1983 – Part II (Section 9), as appropriate to vessel class:*** Liquids with oil in water content exceeding 15 ppm must be contained and disposed of at a licensed onshore reception facility or to a carrier licensed to	Tolerable
	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 plankton in 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 and temporary elevated water temperature adjacent to discharge point. Potential toxic effect from residual biocide chemicals to plankton in discharge plume.			
Liquid Discharge - Deck Drainage	Rainfall/ washdown water	Detergent, oil and grease discharge to marine environment during rainfall or wash-down activities.	Potential water quality impacts leading to bioaccumulation and toxicity to biota immediately adjacent to vessels.			

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
Liquid Discharge - Nutrient Addition	Food waste	Localised nutrient increase from food waste discharge.	Localised increase in marine productivity surrounding discharge point.		receive waste. Liquid 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. Fuels, oils and hazardous chemicals must be stored with secondary containment. Scupper plugs or equivalent deck drainage control measures available where chemicals and hydrocarbons are stored and frequently handled. **BHP Billiton APU Hazardous Materials Management:** Where Offshore Chemical Notification Scheme (OCNS) rating of D or E or a CHARM rating of Silver or Gold rated chemicals intended for liquid discharge are used, no further control required. If other non-rated chemicals intended for liquid discharge are used, chemical selection procedures described in APU Hazardous Materials Management will be followed.	
Solid Waste	Waste generated by miscellaneous vessel activities.	Generation of waste materials.	Additional usage of onshore waste reception facilities.	No unplanned release of hazardous and non-hazardous solid waste to the marine environment. Waste is managed in accordance legislative requirements and BHP Billiton Waste Management Plan.	**Protection of the Sea (Prevention of Pollution from Ships) Act, 1983 - Parts IIIA & IIIC:** All solid, liquid and hazardous waste (other than sewage, grey water and putrescible wastes) will be sent ashore for recycling, disposal or treatment. **Marine Orders - Part 94/Order 95: Marine Pollution Prevention - Packaged Harmful Substances:** Any loss or discharge to sea of harmful materials is to be reported to the AMSA Rescue Coordination Centre (RCC). **BHP Billiton HSEC Controls: Environment Control 7 – Waste Management:** Waste management plan will be implemented, including preventative and mitigating controls. Records of waste type, source and quantities will be maintained.	Tolerable
	Hazardous waste generated by miscellaneous vessel activities.	Generation of hazardous waste materials.	Additional usage of onshore waste reception facilities.			

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
Unplanned interference to marine fauna	Presence of installation vessels	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.	No injury or mortality to marine fauna as a result of vessel collision.	**OPGGS Act 2006 – (s. 280 (2) (c)) - EPBC Regulations 2000 – Part 8 Division 8.1 (r. 8.05) Interacting with cetaceans (modified to include turtles and whale sharks):** Vessels will not knowingly travel greater than 6 knots within 300 m of a whale shark and 150 m for a dolphin (50 m of a turtle) (caution zone). Vessels will not knowingly approach closer than 100 m for a whale, 50 m for a dolphin (and 25 m of a turtle). If the cetacean/whale shark shows signs of being disturbed, the Vessels will immediately withdraw from the caution zone at a constant speed of less than 6 knots. ***EPBC Act 1999* – Ministerial Approval Decision April 2006 (EPBC 2005/2034) Conditions:** 1 (a) iv: 'Cetacean interaction procedures for supply vessels and aircraft that are consistent with Part 8 of the EPBC Regulations 2000; and 1 (a) v: 'Cetacean and whale shark sightings reporting'. Environmental awareness induction provided to marine crew prior to activities to advise marine fauna interaction requirements. Cetacean and whale shark sightings are recorded and reported secondary to the primary responsibilities of crew, and cetacean and whale shark sightings annually reported to DoE. Injury or death of any marine fauna species listed as threatened or migratory under the EPBC Act reported to NOPSEMA. Maximise the likelihood that all vessel strike incidents are reported in the National Ship Strike Database. Vessel collisions also submitted to the National Ship Strike Database at https://data.marinemammals.gov.au/report/shipstrike Installation vessels will not enter Exmouth Gulf during the period 15 September to 31 October in any year except in emergency situations.	Tolerable
	Vessel collision with marine fauna	Potential lethal impact or harm to protected species.	Potential mortality or injury of protected marine species.			

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
Marine spills of Stored Chemicals or Refined Oil.	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.	No accidental release of environmentally hazardous chemicals or refined oil to the marine environment.	***Protection of the Sea (Prevention of Pollution from Ships) Act 1983* – Part II (Section 9)**, as appropriate to vessel class: 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 discharge if the oil-in-water content does not exceed 15 ppm after treatment in a MARPOL-compliant oily water filter system. **AMSA Marine Orders - Part 91: Marine Pollution Prevention – Oil**, as appropriate to vessel class: Vessels to have a current International Oil Pollution Prevention (IOPP) certificate for oily water filtering equipment. **AMSA Marine Orders - Part 94: Marine Pollution Prevention - Packaged Harmful Substances:** Any loss or discharge to sea of harmful materials to be reported to the AMSA Rescue Coordination Centre (RCC). **MARPOL Annex I (Prevention of Pollution by Oil) and MARPOL Annex III (Prevention of Pollution by Harmful Substances Carried at Sea in Packaged Form):** Vessels will have current MARPOL-compliant Shipboard Oil Pollution Emergency Plan (SOPEP) and Shipboard Marine Pollution Emergency Plan (SMPEP - for noxious liquid) – the latter may be combined with a SOPEP. All shipboard hazardous liquid, chemical and hydrocarbon spills and leaks will be managed in accordance with the SOPEP/ SMPEP. Continuous bunding or drip trays are used around machinery or equipment with the potential to leak chemicals / fuel. Scupper plugs or equivalent deck drainage control measures available where hazardous chemicals and hydrocarbons are stored and frequently handled. **Environmental Protection (Controlled Waste) Regulations 2004:** Hazardous waste materials (including empty packaging previously containing hazardous substances and contaminated material from spill response activities) are contained on-board for onshore disposal at a licensed reception facility or to a	Tolerable

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
					carrier licensed to receive waste. 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 and replaced as part of the Preventative Maintenance System.	
Introduced Marine Species	Movement of vessels from known high IMS risk areas	Introduction of invasive marine species to area leading to major impact to native species.	Colonisation of invasive species affecting native marine organisms	No introduction of invasive marine species as a result of Pyrenees Expansion Installation activities.	***AQIS Australian Ballast Water Management Requirements (as defined under the Quarantine Act (1908) r. B-4 Ballast Water Exchange (aligned with the International Convention for the Control and Management of Ships' Ballast Water and Sediments)*** Ballast water exchange to occur in accordance with the Australian Ballast Water Management Requirements. **BHP Billiton Introduced Marine Species Management Procedure:** Vessels sourced from outside the North West Bioregion will complete an IMS risk assessment, before mobilisation to permit area, as described in Introduced Marine Species Management Procedure. The IMS risk assessment assigns a final risk category of low, moderate or high) to vessels based on a range of information including last port of call, age of antifouling coating etc. If a risk category of moderate or high is scored, a range of management options are available including inspections, cleaning or treatment of internal seawater systems.	Tolerable
Hydrocarbon release	Release of residual hydrocarbons / natural gas from subsea infrastructure	Release of hydrocarbons / natural gas leading to localised small scale changes in water quality.	Localised and temporary changes in water quality	No accidental release of hydrocarbon / natural gas from subsea infrastructure Prevent environmental impact of flowline discharges by the selection of chemicals with the	**OPGGS Act (2006) – (s. 280):** A 500 m Petroleum Safety Zone and a cautionary zone will be maintained around the Facility at all times; and Permanent infrastructure is marked on marine charts by the Australian Hydrographic Office.	Tolerable

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
	Dropped object	Release of hydrocarbons from perforated flowline leading to localised small scale changes in water quality.	Localised and temporary changes in water quality	best environmental profiles. No accidental release of hydrocarbon / natural gas from subsea infrastructure	Pyrenees wells are managed in accordance with the Pyrenees Well Operations Management Plan (WOMP) (PYAIMS-PS-0005) in accordance with the OPGGS (Resource Management and Administration) Regulations, 2011, which includes the Pyrenees Well Integrity Management System (PYAIMS-PS-0005-0002) to prevent loss of containment from the wells. **Billiton Petroleum Pyrenees Expansion Installation Oil Pollution Emergency Plan (OPEP) (BHPB-00PY-N950-0019):** Pyrenees Expansion Installation OPEP developed and maintained for the activity. Oil spill response executed in accordance with the OPEP. Following disconnection, to aid stability and preservation, residual natural gas will be displaced to the environment in a controlled manner using treated fresh water. **BHP Billiton APU Hazardous Materials Management:** Where Offshore Chemical Notification Scheme (OCNS) rating of D or E or a CHARM rating of Silver or Gold rated chemicals intended for liquid discharge are used, no further control required. If other non-rated chemicals intended for liquid discharge are used, chemical selection procedures described in APU Hazardous Materials Management will be followed. Structures will not be over-boarded from the vessel closer than 50 horizontal metres from existing seabed infrastructure.	
	Discharge of treated water / preservation fluid from flexibles during installation	Localised exposure of marine biota and	Localised and temporary changes in water quality			

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
Diesel spill to the environment during bunkering operations.	Bunkering hose failure. Leak from piping, flanges, valves, hose connections.	Contamination / pollution of water column. Contamination / pollution of water column.	Visual pollution (i.e. slicks and sheens) potential localised acute toxic response. Visual pollution (i.e. slicks and sheens) potential localised acute toxic response.	No accidental release of hydrocarbons to the marine environment during bunkering operations.	**BHP Billiton Petroleum HSEC Controls (PHSE-00-C01):** Diesel bunker transfer checklist will be completed prior to each bunkering activity, detailing load, communications, and alarm criteria. Direct line of sight between vessels maintained during transfer. Diesel bunkering transfer hose will remain buoyant at all times during the bunkering activity. Dry break couplings will be used on hoses used for bulk transfer of diesel. A weak link breakaway coupling (e.g. a KLAW coupling) will be in place within the transfer hose string. **MARPOL Annex I, Prevention of Pollution by Oil:** In line with MARPOL Annex I, all vessels involved in the vessel-based activities over 400 gross tonnage will have a current Shipboard Oil Pollution Emergency Plan (SOPEP) in place. Spill clean-up equipment is available on the vessels. Scupper plugs or equivalent deck drainage control measures available where hazardous chemicals and hydrocarbons are stored and frequently handled. **BHP Billiton Pyrenees Expansion Installation *Oil Pollution Emergency Plan (OPEP) (BHPB-00PY-N950-0019)*:** Pyrenees Expansion Installation OPEP will be developed and maintained for the duration of the activities. Oil spill response executed in accordance with the OPEP. **EPBC Act 1999 – Ministerial Approval Decision April 2006 (EPBC 2005/2034) Conditions** 1 (a) iii: The plan (or plans) must include measures for fuel and chemical handling and transfer procedures.	Tolerable

Aspect	Source of Risk	Potential Impact	Consequence	Performance Outcome	Performance Standard	Residual Risk Rating
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.	No accidental release of hydrocarbons to the marine environment from vessel collision.	**Navigation Act 2012; International Convention of the Safety of Life at Sea (SOLAS) 1974; Marine Order - Part 30: Prevention of Collisions, Issue 8; Marine Order 21, Issue 8 (Safety of Navigation and Emergency Procedures); and International Convention of Standards of Training, Certification and Watch-keeping for Seafarers STCW95:** Navigation (including lighting, compass/radar), bridge and communication equipment will be compliant with appropriate marine navigation and vessel safety requirements. Automatic Identification System (AIS) is fitted and maintained in accordance with Regulation 19-1 of Chapter V of SOLAS. Crew undertaking vessel bridge-watch will be qualified in accordance with International Convention of STCW95, AMSA Marine Order - Part 3: Seagoing Qualifications or certified training equivalent. Bridge-watch on all vessels to be maintained 24-hours per day.	Tolerable
					Notification of significant installation activities, duration of activities, etc. to AMSA RCC, which triggers AMSA RCC to issue an AusCoast Warning, and to the Australian Hydrographic Service (AHO) who will issue a 'Notice to Mariners'.	
					BHP Billiton Petroleum Stakeholder Engagement Management Plan (WA) – Community Engagement Program: The Community Reference Group (CRG) will be consulted / advised of relevant activities associated with significant vessel-based activities.	
					For construction vessels with unprotected main fuel tanks (i.e. not protected by water ballast tanks), tank volumes to be maintained at $\leq$100 m^3	
					BHP Billiton Petroleum Pyrenees Expansion Installation *(OPEP) (BHPB-00PY-N950-0019)*: Pyrenees Expansion Installation OPEP developed and maintained for the duration of the vessel-based activities. Oil spill response executed in accordance with the OPEP.	

6 MONITORING ENVIRONMENTAL PERFORMANCE

EPs establish the environmental performance outcomes and standards an activity must maintain. To determine these for the Pyrenees Expansion Installation 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 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; Incident reported to NOPSEMA; Monthly incident report and Environmental performance report. .	As required Monthly
Waste	Sewage and grey water.	Vessel log.	Monthly
		Maintenance records for sewage / grey water equipment.	Monthly
	Putrescible waste.	Garbage Record Book.	Weekly
		Maintenance records demonstrate functioning macerator on-board Vessel.	Monthly
	Oily water – Bilges and machinery spaces.	Oil Record Book.	Monthly
	Fuels and oils.	Containment and inspections, maintenance records, PMS records, checklists.	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

7 SUMMARY OF OIL POLLUTION EMERGENCY PLAN

BHP Billiton has prepared the Pyrenees Expansion Installation 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. All active BHP Billiton OPEPs have been developed to comply with the *OPGGS (Environment) Regulations* and are accepted by NOPSEMA.

The OPEP provides oil spill response strategies based on the identified credible and worst-case spill scenarios that could occur during the activity. Spill response relating to other activities undertaken in the

Pyrenees field activities (i.e. operations or drilling) are covered by the activity specific EPs and OPEPs, accepted by NOPSEMA. 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 or capping stack, is deployed;
- Noise or air emissions causing a temporary increases in ambient noise or reduction in air quality;
- 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 – 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.
- Shoreline Protection – the deployment of vessels, equipment and personnel to use protection and deflection booms which assist in minimising the amount of oil contacting shorelines. To be effective, the oil is required to be of a certain thickness. This response strategy will be considered, and activated if appropriate, in accordance with the operational NEBA process described in s3.2 of the OPEP.

- Shoreline Clean-up will be considered, and activated if appropriate, in accordance with the operational NEBA process described in s3.2 of the OPEP.
- 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 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.
- Oiled Wildlife Response – includes pre-oiling activities such as the installation of onshore exclusion barriers (e.g. fencing) to stop shorebirds and terrestrial fauna gaining access to shoreline areas affected by the hydrocarbon spill; hazing techniques, either on the water or on shorelines and may involve a combination of visual and auditory devices to shepherd fauna away from oil slicks or oiled shorelines; and pre-emptive capture and removal of fauna that may otherwise come into contact with oil if they were to stay in the area. Post-oiling activities will include the collection and rehabilitation to treat oiled fauna at dedicated Oiled Wildlife Response Centres and once treated, to return them to similar suitable habitat. This response strategy will be considered, and activated if appropriate, in accordance with the operational NEBA process described in s3.2 of the OPEP.

BHP Billiton has established arrangements with defined performance standards/criteria for the provision of resources, services or equipment in support of emergency response activities. These resources will be activated, dispatched and deactivated prior to and during an emergency. BHP Billiton maintains arrangements with a number of Oil Spill Response Agencies (OSRAs) including The Australian Marine Oil Spill Centre (AMOSC), Oil Spill Response Limited (OSRL), environmental consultants and recruitment agencies. The services of the National Response Team will be obtained through AMSA, which has made arrangements with the respective government and industry agencies, for the release of designated personnel for oil spill response activities. These services will be activated when it is assessed that an oil spill incident exceeds the resource availability at the state level.

8 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 67 stakeholders whose functions, interests or activities may be affected by the Pyrenees Installation campaign and/or any of the project's potential associated activities. Consultation has included 15 Government stakeholders (Commonwealth departments, State departments and local government) as well as fisheries, local residents and business stakeholders.

No objections or significant concerns were raised by stakeholders during consultation in the preparation of the environment plan (EP).

Since the application of the Stybarrow Development Environmental Impact Statement (EIS) in 2004, BHP Billiton has held regular open community reference group (CRG) meetings in Exmouth. The CRGs are not member based or exclusive and any interested community member may attend.

The CRGs provide stakeholders with updates on petroleum activities including all Pyrenees field activities. Meeting participants are invited to raise any concerns or issues which are either addressed immediately in the meeting or responded to following the meeting. Meeting agendas are prepared and circulated in advance of meetings and minutes are recorded and shared with attendees (refer to Appendix D). The BHP Billiton Corporate Affairs toll-free 1800 number and email address is made available to stakeholders.

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; mitigation measures of relevant risks; BHP Billiton's policies and experience; and contact details for BHP Billiton. No stakeholders raised any objections or claims during consultation in the preparation of this EP. If such claims or objections were raised during ongoing consultation the merits will be assessed and they

will be responded to directly, and (if not already considered by BHP Billiton) considered and addressed in the same manner as risks identified in the EP.

Relevant stakeholders were identified as those whose functions, interests or activities are intersected by the area which may be affected. Our knowledge of stakeholders is drawn from our longstanding engagement with and ongoing presence in the Exmouth region.

Fisheries stakeholders were identified based on BHP Billiton's existing relationships with fisheries operators which are active in the North West Cape region and on advice from the Australian Fisheries Management Authority and the Western Australian Department of Fisheries. None of the licence holders from the Abalone or Mackerel State managed fisheries have accepted the invitation to be consulted on our activities and therefore have not identified themselves as relevant. The Abalone and Mackerel fisheries were therefore consulted through the Western Australian Fishing Industry Council (WAFIC).

Following initial engagement with fisheries stakeholders, BHP Billiton allowed a period of up to three weeks for stakeholders to respond before following up to confirm they had received the information and check if any additional information was required. Any request for additional time was accommodated.

BHP Billiton will continue to engage with stakeholders in the Exmouth region in the lead up to the commencement of activities and throughout the duration of the life of the Pyrenees field via our various consultation and stakeholder engagement mechanisms including social investment programs, community partnerships and events as well as our structured consultation activities for EPs. These activities enable regular contact with relevant stakeholders where they can be informed about the progress of activities, and we are able to identify new stakeholders should they emerge.

The Australian Maritime Safety Authority (AMSA) and the Australian Hydrographic Office (AHO) will be notified prior to mobilisation of the Installation vessels, so a 'Notice to Mariners' can be issued prior to the commencement of works.

Table **8-1** provides a summary of engagement and each response made by relevant stakeholders and a statement of BHP Billiton's response to each of the requests for further information. The full text responses from stakeholders and the minutes of the CRG meetings held during the preparation of the EP were provided to NOPSEMA in the assessment of the EP. Where full text was not provided, acknowledgement of receiving information was either verbal or via email read receipt.

Table 8-1: Summary of stakeholder consultation process and outcomes

Stakeholder	Stakeholder Response	BHP Billiton Comments	Contact method	Acknowledge receipt of information
Fisheries Operator: West Coast Deep Sea Crustacean Managed Fishery	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Industry Association	No issues	Not required	Email and Fact Sheet	Yes
Consultancy	No issues	Not required	Email and Fact Sheet	Yes
Fisheries Operator: North West Slope Trawl Fishery; Western Deepwater Trawl Fishery	No issues	Not required	Email and Fact Sheet	Yes
Regulator	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Research agency	No issues	Not required	Email and Fact Sheet	Yes
Regulator	No issues	Not required	Email and Fact Sheet	Yes
Tuna fishing industry association	Advised the proposal is outside of the area their members are concerned with.	Not required	Email and Fact Sheet	Yes
Business Partner /	No issues	Not required	Email and Fact Sheet	Yes

Stakeholder	Stakeholder Response	BHP Billiton Comments	Contact method	Acknowledge receipt of information
Contractor				
Local Business	No issues	Not required	Email and Fact Sheet	Yes
Business Partner / Contractor	No issues	Not required	Email and Fact Sheet	Yes
Environmental NGO	No issues	Not required	Email and Fact Sheet	Yes
Industry Association	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Commonwealth Fisheries Industry Association	Advised BHP Billiton to contact relevant fisheries stakeholders	Not required	Email, Fact Sheet and Phone Call	Yes
Environmental NGO	Stakeholder did not reply to emails or phone calls.	Not required	Email, Fact Sheet and Phone Call	Yes
Fisheries Operator: Specimen Shell Managed Fishery	No response to email and no alternate contact was provided by the licence holder		Email and Fact Sheet	Yes
Government Department	No issues	Not required	Email and Fact Sheet	Yes
Regulator	No issues	Not required	Email and Fact Sheet	Yes
Regulator	Provided BHP Billiton with: general advice; a list of fisheries in the region; the Department's contact details in the event of an oil spill; information relating to introduced marine pests; and the spawning times of the key fish species in the region.	Acknowledged the letter noting that BHP Billiton used the advice in the letter to inform the EP. Also advised that BHP Billiton had contacted commercial fisheries operators and the industry associations, and the BHP Billiton would be using WA sourced vessels to minimise introduced marine pest risk.	Email, Fact Sheet, Phone Call and Letter	Yes
Regulator	No issues	Not required	Email and Fact Sheet	Yes
Regulator	No issues	Not required	Email and Fact Sheet	Yes
Government Department	Requested a copy of the EP and OPEP prior to acceptance.	BHP Billiton advised that the OPEP would be provided on acceptance, however not prior to given the high potential for amendments to the plan during the assessment process.	Email, Fact Sheet and Phone Call	Yes
Local Business	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Fisheries Operator: Specimen Shell Managed Fishery	No issues	Not required	Email and Fact Sheet	Yes
Local Business	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Local business	No issues	Not required	Email and Fact Sheet	Yes
Industry Association	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Government/ Community Organisation	No issues	Not required	Email and Fact Sheet	Yes

Stakeholder	Stakeholder Response	BHP Billiton Comments	Contact method	Acknowledge receipt of information
Local Business	No issues	Not required	Email and Fact Sheet	Yes
Local Business	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Local Business	No issues	Not required	Email and Fact Sheet	Yes
Local business	No issues	Not required	Email and Fact Sheet	Yes
Local business	No issues	Not required	Email and Fact Sheet	Yes
Community Organisation	No response to email and no alternate contact available		Email and Fact Sheet	No
Emergency Services	No issues	Not required	Email and Fact Sheet	Yes
Local business	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Local business	No issues	Not required	Email and Fact Sheet	Yes
Community Organisation	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Fisheries Operator: Pilbara Line Fishery	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Government Agency	No issues	Not required	Email and Fact Sheet	Yes
Local business	No issues	Not required	Email and Fact Sheet	Yes
Local business	No issues	Not required	Email and Fact Sheet	Yes
Government Agency	Maritime Border Command advised they do not comment on activities and only need to be informed for information.	Not required	Email, Fact Sheet and Phone Call	Yes
Fisheries Operator: Abalone Managed Fishery	No response to email and no alternate contact provided by the licence holder.		Email and Fact Sheet	No
Fisheries Operator: Western Skipjack Tuna Fishery; Western Tuna and Billfish Fishery; Pilbara Line Fishery; Exmouth Gulf Prawn Managed Fishery	No issues	Not required	Email and Fact Sheet	Yes
Regulator	No issues	Not required	Email and Fact Sheet	Yes
Fisheries Operator: Marine Aquarium Fish Managed Fishery	No issues, only active in Exmouth Gulf	Not required	Email and Fact Sheet	Yes
Environmental NGO	No issues	Not required	Email and Fact Sheet	Yes
Local Business	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Community Organisation	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Indigenous Community Organisation	No issues	Not required	Email and Fact Sheet	Yes
Local Business	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
University	Asked if impact of noise on Humpback migration would be considered in the EP.	Advised that the impacts of noise on the marine environment would be considered in the EP.	Email, Fact Sheet and Phone Call	Yes
Industry funded oil spill	No issues	Not required	Email and Fact Sheet	Yes

Stakeholder	Stakeholder Response	BHP Billiton Comments	Contact method	Acknowledge receipt of information
response agency				
Fisheries Operator: Pilbara Fish Trap and Trawl Interim Managed Fishery	No issue	Not required	Email, Fact Sheet and Phone Call	Yes
Industry Association for pearl oyster fishery	No issues	Not required	Email, Fact Sheet and Phone Call	Yes
Government Agency	No issues	Not required	Email and Fact Sheet	Yes
Local Business	No issues	Not required	Email and Fact Sheet	Yes
Government Agency	No issues	Not required	Email and Fact Sheet	Yes
Recreational Fishing Association	No issues	Not required	Email and Fact Sheet	Yes
Regional oil and gas operator	No issues	Not required	Email and Fact Sheet	Yes
Local Government	No issues	Not required	Email and Fact Sheet	Yes
Local Business	No issues	Not required	Email and Fact Sheet	Yes
Fisheries Operator: Pilbara Trap and Trawl Fishery; North West Slope Trawl Fishery; Western Deepwater Trawl Fishery	No Issues	Not required	Email, Fact Sheet and Phone Call	Yes
Fisheries Operator: Abalone Managed Fishery	No response to email and no alternate contact provided by the licence holder		Email and Fact Sheet	No
Fisheries industry association. 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	No issues	Not required	Email and Fact Sheet	Yes

Stakeholder	Stakeholder Response	BHP Billiton Comments	Contact method	Acknowledge receipt of information
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. Pilbara Line Fishery				
Fisheries Operator: Pilbara Fish Trawl Fishery; North West Slope Trawl Fishery; Western Deepwater Trawl Fishery	No Issues	Not required	Email, Fact Sheet and Phone Call	Yes

9 NOMINATED LIASION PERSON

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

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