



WA-390-P DEEP WATER DRILLING PROGRAM ENVIRONMENT PLAN: PUBLIC SUMMARY

This summary of the Hess Exploration Australia Pty Ltd (Hess) deep water drilling program Environment Plan (EP) has been submitted to the Western Australia Department of Mines and Petroleum (DMP) to comply with Regulations 11(7) and 11(8) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS Act (E) Regulations).

INTRODUCTION

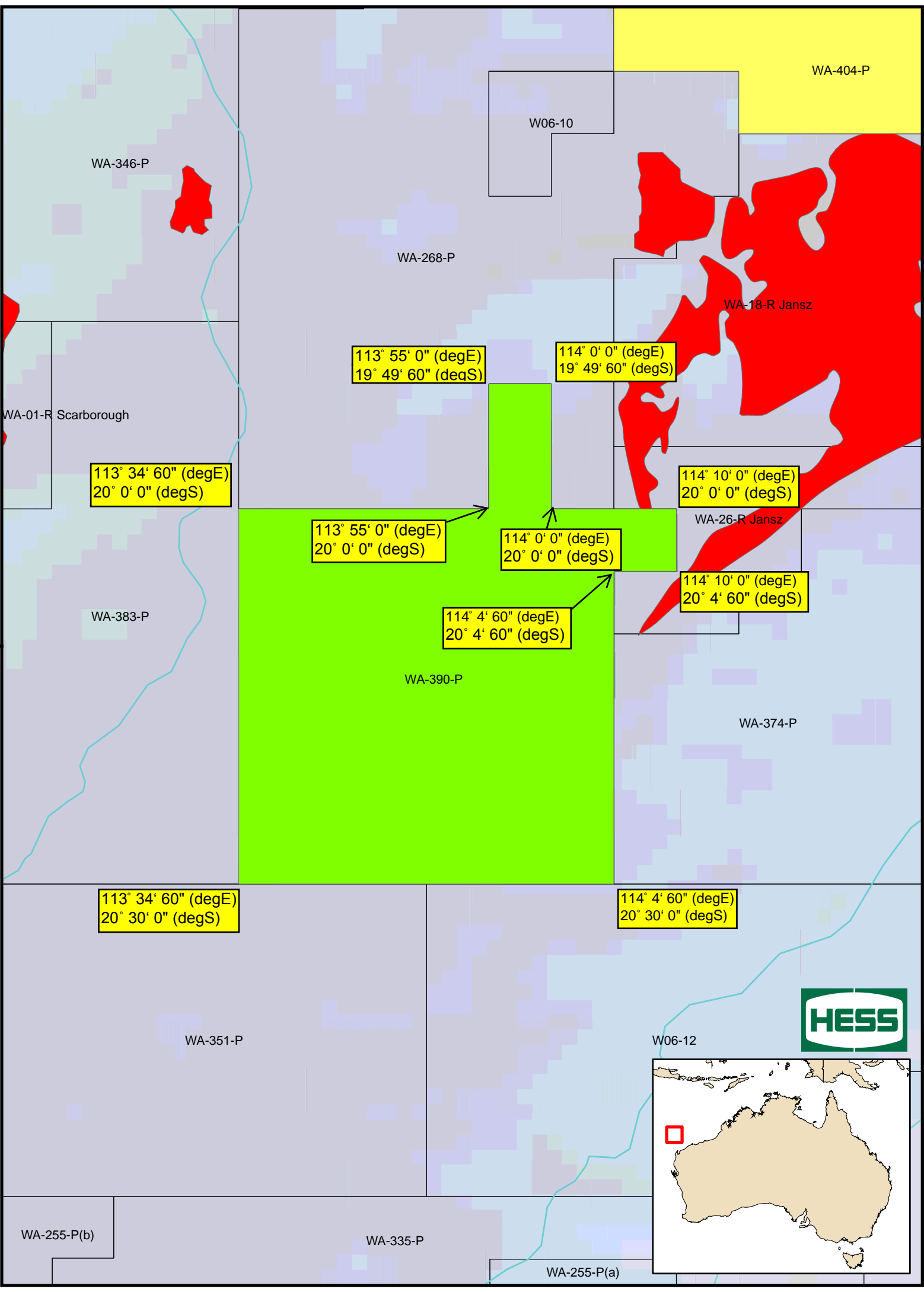
Hess is proposing to conduct an appraisal campaign as part of a deep water drilling program within Permit Area WA-390-P. The permit area is located on the continental slope of north-western Australia, approximately 145 km north of North West Cape (Figure 1).

Exploration drilling in the Permit Area has comprised two work phases: Phase 1, during which four wells were drilled in 2008, and Phase 2, which involves drilling twelve further wells, expected to be completed in 2010.

The appraisal campaign, which includes up to six wells and up to eight well tests (drill stem tests) will commence upon completion of Phase 2 and use the same semi-submersible 'Jack Bates' Mobile Offshore Drilling Unit (MODU) that has undertaken exploration drilling.

COORDINATES OF THE PETROLEUM ACTIVITY

Exploration Permit Area WA-390-P is shown on Figure 1. All well operations will be located within the permit area; however, exact locations will be finalised pending further geological interpretation.



WA-346-P

W06-10

WA-404-P

WA-268-P

WA-18-R Jansz

113° 55' 0" (degE)
19° 49' 60" (degS)

114° 0' 0" (degE)
19° 49' 60" (degS)

WA-01-R Scarborough

113° 34' 60" (degE)
20° 0' 0" (degS)

114° 10' 0" (degE)
20° 0' 0" (degS)

113° 55' 0" (degE)
20° 0' 0" (degS)

114° 0' 0" (degE)
20° 0' 0" (degS)

WA-26-R Jansz

WA-383-P

114° 4' 60" (degE)
20° 4' 60" (degS)

114° 10' 0" (degE)
20° 4' 60" (degS)

WA-390-P

WA-374-P

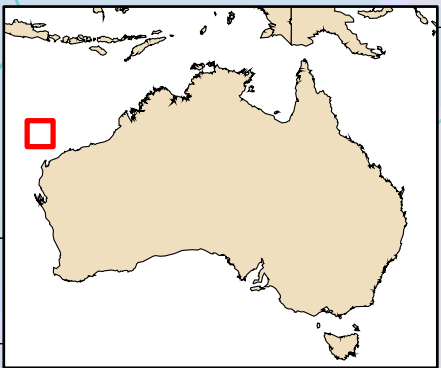
113° 34' 60" (degE)
20° 30' 0" (degS)

114° 4' 60" (degE)
20° 30' 0" (degS)

WA-351-P



W06-12



WA-255-P(b)

WA-335-P

WA-255-P(a)



DESCRIPTION OF THE ACTION

Hess proposes to conduct drilling and well testing activities during 2010–2011 to confirm the viability of gas reserves within Permit Area WA-390-P. Operations will be undertaken by the semi-submersible drill rig 'Jack Bates', which has been undertaking exploration drilling activities since 2008.

All operations will be conducted in accordance with relevant acts and regulations to meet the requirements of the Offshore Petroleum and Greenhouse Gas Storage Act (OPGGGS Act).

The base-case well design to be applied to the appraisal wells of the campaign as follows:

- 914 mm (36") casing jetted in using sea water with high viscosity sweeps to approximately 70 m Below Mud Line (BML).
- 660 mm (26") hole drilled for 508 mm (20") casing set at approximately 300 m BML. Drilled using sea water with high viscosity sweeps.
- 444 mm (17½") hole drilled, with a closed system, for 340 mm (13⅜") casing set at approximately 1,250 m BML. Drilled with water-based drilling fluid (WBM).
- 311 mm (12¼") hole drilled for 244 mm (9⅝") casing set between approximately 1,800 and 2,800 m BML. This section will be drilled with a synthetic-based drilling fluid (synthetic-based mud, SBM).

The wells will be engineered with primary and secondary blowout prevention suitable for all conditions that might be experienced in the program.

Sections of the wells drilled riserless will use sea water with high viscosity (bentonite/guar gum) sweeps. For sections drilled with a closed-fluid system, WBM and SBMs will be used. The WBM used will be an 8% potassium chloride (KCl)/polymer drilling fluid. This type of WBM used at shallower depths is recognised to have minimal offshore environmental impact.

Two SBMs have been selected for safety, environmental (reduced time on location, better well control), operational and economic performance: Baker Hughes Drilling Fluids (BHDF)'s Syn-Teq and BHDF's Shell Saraline 185V (Saraline). Both SBMs, which have low environmental toxicity and are readily biodegradable under aerobic conditions, have been previously used during exploration drilling undertaken within Permit Area WA-390-P following approval by the WA DMP.

During top hole drilling, while using bentonite/guar gum sweeps, the cuttings/drilling fluid will be returned at the sea floor. Following connection of the riser, drill cuttings will be returned to the surface and drilling fluid recovered for recycling. After separation from the drilling fluid, cuttings will be discharged overboard. No whole SBM will be discharged during the drilling program.

On completion of the upper hole sections, steel pipe casing will be inserted and the gap between the casing and the hole will be sealed with cement. Cementing fluids are not routinely discharged to the environment during this operation, although very small amounts will be unavoidably released when the cement mixture is circulated to the seabed during grouting of the surface casing strings, or when surplus fluids require disposal after cementing operations.

After reaching total depth, electrical wireline logs will be run in the well to determine the presence of any hydrocarbons. Vertical seismic profiling (VSP) may also be conducted. Flow and drill stem tests may be carried out on up to eight wells.

At the completion of drilling, the well(s) will be abandoned in accordance with the requirements of the OPGGS Act and industry best practice.



The appraisal campaign is scheduled to commence after Phase 2 of the drilling program. Drilling will take approximately forty-five days at each location, including mobilisation/demobilisation between each well site. Well testing will take an additional twenty-five days per well. All well operations are currently scheduled to be completed in 2011.

DESCRIPTION OF THE RECEIVING ENVIRONMENT

Physical Environment

The proposed exploration wells are located on the continental slope of north-western Australia, over 145 km north of North West Cape. Water depths in the area range from 1,100 to 1,200 m. There are no islands, emergent land or shallow seabed features in the permit area, the nearest landfall being Barrow Island, some 135km to the south-east.

The substrate over the permit area is expected to comprise loose, silty carbonate sands with occasional exposed hard substrate and is likely to be broadly homogenous over extensive areas of similar water depth and distance offshore along the continental slope of the North West Shelf.

Biological Environment

The deep offshore environment of the proposed drilling program is typical of wide expanses of the continental slope and is not expected to represent habitat of particular significance for any macro fauna.

Some marine migratory species with broad distributions, such as cetaceans, fish, sharks, sea turtles and seabirds, may traverse the area, at least on occasion. Seven species listed as Threatened/ Migratory under the EPBC Act and six additional Migratory species could occur in the area (DEWHA, 2008a). However, the permit area does not contain recognised critical habitat for any Threatened or Migratory fish, sharks, sea turtles, cetaceans or seabirds.

Further detail regarding the main fauna groups that might occur in the area is provided in the following sections.

Fish

A number of sharks and pelagic finfish, including mackerels, tunas and billfishes, occur in the waters of the North West Shelf and would be expected to occur in the area of slope located within the permit area. Due to this habitat being widely represented along the North West Shelf, it is not expected that the permit area is of particular significance to sharks and finfish.

Sea Turtles

Four species of marine turtles may occur in the permit area: green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), flatback (*Natator depressus*), and loggerhead (*Caretta caretta*) turtles, all of which are listed as Vulnerable under the EPBC Act. Marine turtles, particularly green turtles, undertake extensive migrations and low numbers of individuals may transit the permit area. Migration and nesting activity generally occurs between September and April. The permit area does not contain any emergent land or shallow reef and the nearest areas of known turtle breeding or feeding importance are more than 135 km distant. The likelihood of significant numbers of any turtle species occurring at a given drilling location during operations is very low.



Cetaceans

Several species of whale and dolphin are known to frequent the waters of the North West Shelf, including the blue whale (*Balaenoptera musculus*), which is listed as Endangered, and the humpback whale (*Megaptera novaeangliae*), which is listed as Vulnerable under the EPBC Act.

The humpback, which is the most common whale species in the region, migrates between Antarctic waters and the Kimberley each winter to mate and breed. The northbound migration passes Barrow Island and Montebello Islands (135 km to the south-east) from June to mid August and the southbound migration occurs between mid September until the end of November, although the exact timing of migration may vary by up to three weeks.

The permit area is outside (seaward) of the main humpback migration routes and distant from the nearest known whale aggregation areas. Although drilling of some wells is expected to overlap with the migration periods, the likelihood of humpback whales occurring in significant numbers in the permit area is very low.

Blue whale migration patterns are similar to those of the humpback whale, with the species feeding in mid-high latitudes (south of Australia) during the summer months and temperate/tropical waters in the winter for mating and breeding. However, the blue whale tends to be more widely dispersed and rarely present in large numbers outside aggregation areas. The permit area does not include any recognised blue whale migratory routes or known feeding, breeding or resting areas, hence the likelihood of encountering significant numbers of blue whales during drilling operations is very low.

Four whales listed as migratory species under the EPBC Act may occur in the proposed drilling area on occasion: the Antarctic minke whale (*Balaenoptera bonaerensis*), Bryde's whale (*Balaenoptera edeni*), killer whale (*Orcinus orca*) and the sperm whale (*Physeter macrocephalus*). Given their widespread distributions and the absence of particular bathymetric features in the area, the permit area is unlikely to represent important habitat for any of these species.

Dolphin species known to occur in depths greater than 500 m are the striped (*Stenella coeruleoalba*), Risso's (*Grampus griseus*) and rough-toothed (*Steno bredanensis*) dolphins, although a number of other dolphins (e.g., common spotted, long-snouted, Fraser's, bottlenose) also occur in the region and could be encountered during the program. None of these species are considered threatened or likely to occur in significant numbers in the permit area.

Sea Birds

The Southern giant petrel (*Macronectes giganteus*) is listed as Endangered under the EPBC Act and may be found in the permit area. The southern giant petrel breeds in the sub-Antarctic waters during the summer, while in winter most disperse north from 50°S to the tropic of Capricorn and sometimes beyond. The Tropic of Capricorn is located some 400 km south of the permit area; therefore the Southern giant petrel is not expected to be present in significant numbers during any time of the year.

Benthic Assemblages

The biological productivity of the benthic environment is expected to be limited due to low light availability at depth, low nutrient availability and limited extent of exposed hard substrata within the permit area.



The seafloor is likely to comprise predominantly unconsolidated soft sediments inhabited by sparse communities of relatively larger benthic species (urchins, seastars and crustaceans). Infaunal communities are likely to be comprised of smaller burrowing invertebrates. Any areas of exposed hard substrate that occur may support more diverse assemblages, including deep water filter feeding organisms, such as hydroids and sponges.

Socio-Economic Environment

Extensive petroleum exploration and production activity occurs in the region and the industry has developed major production and/or storage operations on Barrow, Thevenard, Airlie and Varanus Islands. However, there is no existing petroleum infrastructure in WA-390-P or adjacent permit areas. The nearest land based production facility is situated on Barrow Island, 135 km south-east of the permit area.

Consultation with Commonwealth and State fishing authorities and commercial operators indicated that fishing activity in the area is likely to be low. No tourism, recreational or game fishing is known to occur within the area.

Commercial shipping is known to traverse the area; however, there are no bathymetric features or other navigational hazards in the area that will restrict ships avoiding the drill rig and support vessels.

There are no Marine Protected Areas (MPAs) within the permit area. The nearest MPAs are the Barrow Island Marine Management Area located approximately 135 km to the south-east and the Ningaloo Marine Park, approximately 145 km south of the permit area (Figure 1). The proposed action is not expected to affect those areas.

MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

Risk analysis has been used to determine risk likelihood and severity and to evaluate the environmental risks and effects, as summarized in Table 1.

The risk analysis indicates that because of the short term nature of the drilling for each well, coupled with the low volumes of discharges and high dilution and dispersion rates, drilling at the well locations is unlikely to have any discernible effect on the environment beyond a small area beneath and adjacent to the drilling rig. The localized nature of the impact and the uniformity of the seafloor and associated biota over broad expanses in the vicinity of the wells suggest that any impacts associated with the drilling program will be insignificant on a regional scale.

Table 1: Summary of Environmental Risks & Management Approach

Hazard/Event	Potential Hazard Consequence	Risk and Mitigation Methods
Anchoring	Localised reduction in benthic productivity. Damage to sensitive benthic habitat or habitats of conservation significance	Low – Adherence to anchoring procedures to minimize anchor drag.
Artificial Lighting	Alteration in fauna behaviour resulting from attractant/ disturbance effect of lighting.	Low – Lighting minimum required for navigation and safety requirements.
Underwater noise generated by	Physiological damage or disruption to behaviour	Medium – DEWHA seismic guidelines (DEWHA, 2008) implemented during VSP operations to ensure



Hazard/Event	Potential Hazard Consequence	Risk and Mitigation Methods
operations	patterns of sensitive marine fauna	no sensitive fauna in vicinity. Minimise use of thrusters to maintain position during whale migration periods. Report sightings of cetaceans and marine turtles to DEWHA.
Vessel movements	Disturbance to migrating whales and other sensitive marine fauna.	Medium – Maintain cetacean watch on all transits. All vessels to maintain adequate separation distances from cetaceans where practicable and implement whale watch guidelines. Minimise use of thrusters to maintain position.
Flight noises (helicopters)	Biological impacts to birds along flight paths due to behavioral disturbance	Low – Flight paths selected to minimize potential for disturbance. Minimise low flying and/or flying over recognised nesting areas.
Discharge of SBM	Localised and temporary acute/ chronic toxicity effects to marine life.	Medium – Selection of low toxicity, biodegradable SBMs. Use of BAT (shakers, solids control equipment) to optimize recovery from cuttings. Cuttings dryer to further reduce residues and minimize cutting aggregates. Recycling of return of recovered SBM to shore based storage, no discharge to sea.
Discharge of cuttings	Localised reduction in benthic productivity. Damage to sensitive benthic habitat or habitats of conservation significance.	Low – Discharge at surface to maximize dispersion. Use of cuttings dryer to reduce potential for cuttings aggregates.
Grey water/sewage disposal	Adverse effects on marine life due to reduction in water quality (e.g. nutrient enrichment).	Low – Biodegradable detergents only. Approved onboard sewage treatment plant. Treat in accordance with OPGGS Act (E) Regulations and MARPOL 73/78 prior to discharge. Offshore discharge (>12 Nm from land) only.
Putrescible galley waste disposal	Adverse effects on marine life due to reduction in water quality. (e.g. nutrient enrichment)	Low – Maceration to <25mm prior to discharge. Discharge in accordance with MARPOL 73/78 and OPGGS Act (E) Regulations.
Wastes disposal	Reduction in habitat/water quality from incorrect disposal	Low – Wastes segregates and recycled where possible. Disposal to licensed facility via licensed wastes contractor.
Cooling water discharged	Elevation in sea temperature affects marine life.	Low – Discharge above sea surface.
Discharged of oily water	Potential localized and temporary acute toxic effects	Low – All potentially contaminated water collected and passed through an oil/water separator prior to discharge at <15ppm. Discharge quality automatically monitored with alarm.
Flaring of Hydrocarbons	Potential for hydrocarbon loss to sea surface with localized and temporary acute toxic effects	Low – Use of “green” type burners to optimise efficiency. Operation proceduralised and reviewed via HAZID. Continuous monitoring and test shut-in if fallout observed.
Atmospheric	Localised reduction in air	Low – Engines maintained to operate at optimum



Hazard/Event	Potential Hazard Consequence	Risk and Mitigation Methods
emissions	quality	efficiency to minimise emissions.
Navigation hazards / collision	Potential for hydrocarbon or debris discharge to environment following collision.	Low – 500 m exclusion zone. Rig and vessels carry all appropriate navigation lighting and well lit for operations. All vessels operated by accredited seamen maintaining 24 hour visual, radio and radar watch for other vessels. Notification of rig presence via Notice to Mariners.
Drilling blowouts	Potential smothering or acute/chronic toxic effects on marine organisms from liquid hydrocarbons.	Low – Approved well application. Adherence to well integrity standards/ best practice. BOPs as per DMP requirements. Approved OSCP. AMOSC oil spill response resources available offsite.
Drilling material discharge	Potential contaminations of marine environment.	Low – All substances transported and stored in accordance with Rig Specific Procedures, relevant legislation and Australian Standards.
SBM loss	Potential acute/chronic toxic effects on marine organisms	Low to Medium – Transfer operations conducted in accordance with Rig Specific Procedures (Ref: MAR-Fluid Transfer-013). Operation restricted to daylight hours only. Circulation and conditioning of drilling fluid prior to commencement of displacement operations
Diesel fuel loss during transfer	Potential acute/chronic toxic effects on marine organisms from hydrocarbon loss.	Low – Strict adherence to rigs refueling procedure. Operation restricted to daylight wherever possible. Approved OSCP. AMOSC oil spill resources available offsite. Reinforced hoses with dry break couplings and fail safe fittings.
Diesel fuel loss through rupture of supply vessel or rig fuel tanks	Acute/chronic toxic effects on marine organisms from hydrocarbon loss.	Low – Strict adherence to rigs refueling procedure. Approved OSCP. AMOSC oil spill resources available offsite.
Chemical spill run off to sea	Localised and temporary acute toxic effects.	Low – All materials stored and handles in accordance with relevant procedures and MSDS. Chemicals stored in bunded store. Bund integrity ensured through regular inspections. Drains maintained closed and regularly inspected. Absorbent materials available onboard.
Quarantine-introduction of exotic marine species	Alteration to community composition and function – competition with indigenous species.	Low-Medium – All vessels will comply with Australian quarantine laws. Ballast exchanges conducted outside the Australian 12 Nm limit.
Displacement of other users of marine environment	Disruption of commercial fishing/ shipping activity.	Low – Notice to Mariners issued. Liason with AMSA, AFMA, fisherman and other commercial mariners to minimize conflict.

MANAGEMENT APPROACH

The drilling program has been planned and will be implemented in accordance with the strategy for managing Environment, Health, Safety and Social Responsibility (EHS&SR) risks that has been established by Hess Corporation's Exploration and Production Leadership Team (EPLT).



Hess' overall environmental objective for the program is to avoid or minimise environmental risks to as low as reasonably practicable (ALARP)

The environmental management approaches relevant to each aspect of the drilling program are summarised in Table 1. All activities will be conducted to the satisfaction of the DMP and in accordance with relevant legislative and regulatory requirements.

CONSULTATIONS

Consultations and/or notifications regarding the drilling program have been undertaken with all relevant stakeholders including:

- Department of Environment, Water, Heritage and the Arts (DEWHA)
- Australian Maritime Safety Authority (AMSA), Canberra
- Australian Fisheries Management Authority (AFMA)
- Department of Defense (Royal Australian Navy and the Royal Australian Air Force)
- Department of Mines and Petroleum
- Western Australian Fisheries Department
- Western Australian Fishing Industry Council (WAFIC)
- Commonwealth Fisheries Association
- Western Tuna and Billfish Fishery
- North-west Slope Trawl Fishery
- Southern Bluefin Tuna Fishery
- Western Deepwater Trawl Fishery
- Western Skipjack Fishery
- Deep Water Wet Line Fishery
- WA North Coast Shark Fishery
- West Coast Deep Sea Crab Fishery
- Recfishwest

These consultations indicated that conflicts with other users of the area are unlikely as commercial and recreational fishing activity in the area is absent or at low levels. The Learmonth military restricted airspace areas will not be active during the drilling program. In addition, no sensitive environmental resources are known for the area, and it is unlikely there will be any significant impact of national environmental significance, including fauna species listed as threatened and/or migratory and the Commonwealth marine environment.

FURTHER DETAILS

For further information about the exploration drilling program, please contact:

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