ENVIRONMENT PLAN SUMMARY METOCEAN STUDY

1.0 SUMMARY

Hess Exploration Australia Pty Limited (Hess) has contracted the metocean division of Fugro Survey Pty Ltd (Fugro) to undertake a metocean study in Commonwealth waters off the North West coast of Western Australia. The study entails the retrieval, maintenance and redeployment of up to six (6) moorings over a period of up to seven (7) days, approximately every four months until 2015.

There are neither ground disturbance activities nor use of sound emitting devices, and no refuelling at sea is required.

All aspects of the maintenance activities have been subjected to risk assessment in order to evaluate potential impacts. Risks associated with the vessel as well as the presence of the moorings themselves are deemed as low as reasonable practicable (ALARP) and can not be reduced any lower.

An Environment Plan (EP) has been developed by Hess, in accordance with the Offshore Petroleum and Greenhouse Gas (Environment) Regulations 2009, to support the series of maintenance voyages. The EP was accepted by NOPSEMA on 6th December 2012.

2.0 DESCRIPTION OF ACTIVITY

Hess must perform vessel-based maintenance activities in support of a metocean study to obtain information on a range of meteorological and oceanographic conditions, such as wind, tides, currents, waves, temperature and salinity (conductivity) etc.

Fugro activities may include the following:

- Recovery, servicing (including downloading of data and changing batteries) and re-deployment of a deep-water Current Meter Mooring (ADCP Mooring)
- Recovery, servicing (including downloading of data and changing batteries) and re-deployment of a deep-water Waverider Mooring with HF and Satellite Telemetry (DWR Mooring)
- Recovery, servicing (including downloading of data and changing batteries) and re-deployment of up to four (4) current meter moorings (CMM) along the scarp
- Deployment and subsequent recovery and servicing of further instrumentation for metocean studies if required

Each service visit will last approximately seven (7) days with the vessel generally mobilising from Exmouth. Due to the short duration there is no requirement for refuelling at sea.

All servicing shall be undertaken by experienced personnel. Once retrieved all moorings are serviced and tested before being re-deployed. If moorings are not fully functioning they will not be re-deployed.

It is anticipated that all activities shall be undertaken offshore. However, if the weather is not conducive, moorings may be retrieved, returned to port for servicing, and then returned to site.

2.1 Location

All study activity shall occur within Commonwealth waters. There are two distinct areas where moorings may be deployed as indicated in Figure 1 and detailed below.

Mooring locations have been communicated through Notice to Mariners (via AMSA).

Two (2) deepwater moorings are located on the continental slope, approximately 145 km north of North West Cape, in water depths up to 1,100 m (Location 1). There are no islands or other emergent land in the area. Table 2 outlines the location of the moorings; these are approximate only and subject to minor variation.

Table 1: Deepwater mooring approximate positions

Mooring ID		
DWR	20° 12.56' S	113 ° 51.37' E
ADCP	20° 12.54' S	113 ° 51.42' E

It is anticipated that a further four (4) current meter moorings (CMM) may be placed along the scarp (Location 2) during futire visits. An approximate footprint for Location 2 is provided in Table 3 and indicated in Fugure 1.

Table 2: Scarp mooring approximate bounding coordinates

Location point		
1	19° 50 S	115 ° 00' E
2	20° 00 S	115 ° 00' E
3	19° 50 S	115 ° 15' E
4	20° 00 S	115 ° 15' E

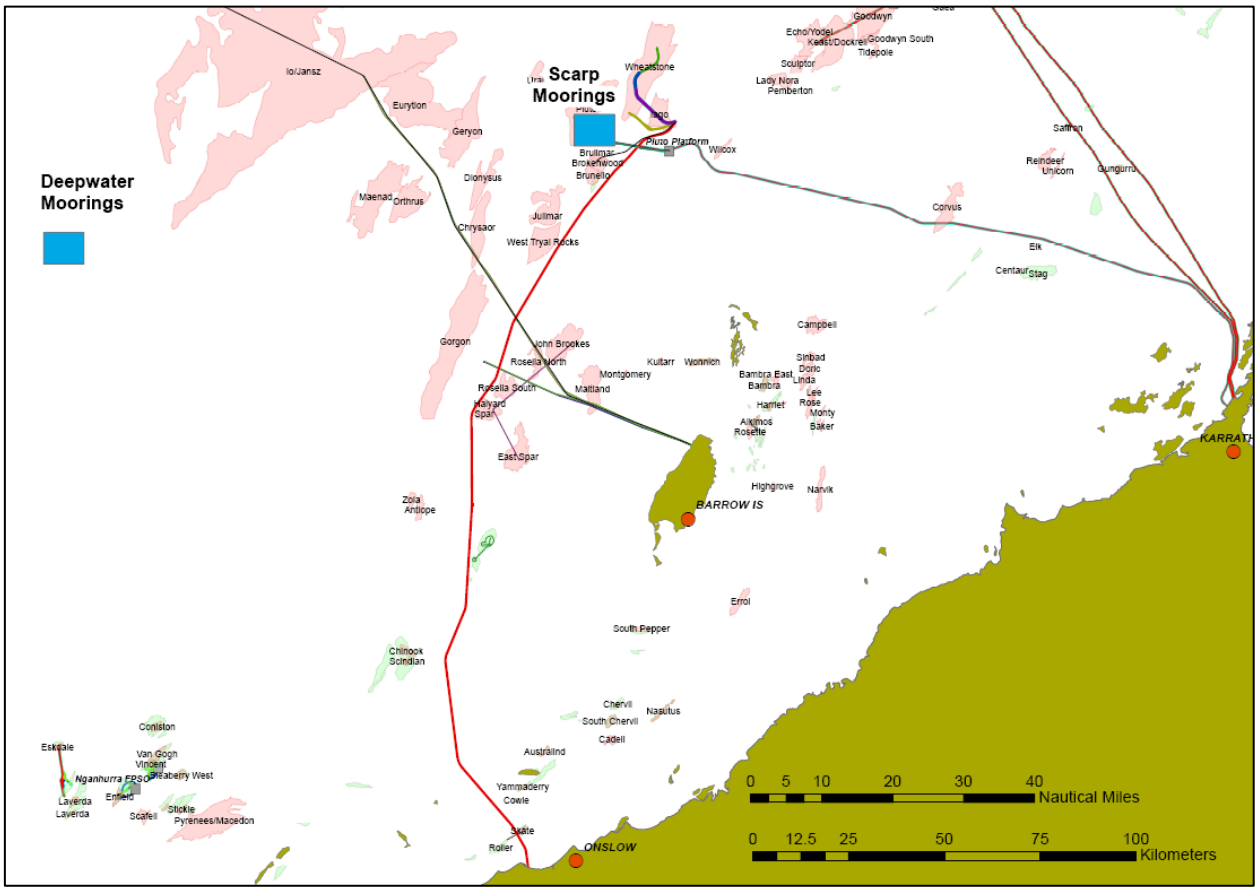

Figure 1: Approximate locations of metocean moorings

2.2 Survey Vessel

It is anticipated that all Fugro metocean maintenance activities will be completed from the MV Warrego which is owned by Gun Marine Services (GMS). If unavailable, another suitable vessel shall be sourced. Any vessel used by Hess will be audited, surveyed and equipped for the particular work scope, and comply with all relevant legislation and Hess contractual requirements.

Table 3: Details MV Warrego

Vessel Type	Con. Year	Length	Max. Speed	Total Fuel Capacity	DP	Max. Accom.
Survey Vessel	2011	24 m	18 kn	16.4 m^3	N/A	18 px

3.0 RECEIVING ENVIRONMENT

3.1 Physical Environment

3.1.1 Metocean Conditions

The region is characterised by two seasons: a hot "summer" between October and April, and warm "winter" between May and September (Pearce et al. 2003). Tropical cyclones typically occur in the region three to four times per year, bringing strong winds, heavy rain and high seas. These cyclones are unpredictable in occurrence, intensity and behaviour, but are most common between November and April (Pearce et al. 2003).

Maintenance activities for the Location 1 moorings will take place in water depths over 1,000 m, while those of Location 2 will be up to 500m. There have been no significant or shallow seabed features identified from available bathymetry of the area and the areas are highly likely to be featureless with sediments comprising fine silt, sand and clay which support diverse burrowing infauna and sparse epifauna.

3.2 Biological Environment

3.2.1 Benthic Assemblages

There is limited information concerning the benthic communities of the area primarily due to its remoteness and water depths. However, the biological productivity of the benthic environment is expected to be limited due to high light attenuation at the depths involved, generally low nutrient availability, and limited extent of exposed hard substrates).

3.2.2 Macrofauna

The deep offshore environment is typical of the NWS and is not expected to represent habitat of particular significance for many macrofauna, including any Threatened or Migratory species listed under the EPBC Act.

The EPBC Protected Matters Database lists fourteen Migratory and Threatened species that could occur in the area (Table 5).

Table 4: Threatened & Migratory Species that may occur near the proposed locations

Scientific Name	Common Name	Status
Birds		
Macronectes giganteus	Southern Giant-Petrel	As the northernmost extent of this species' distribution does not overlap with the study area (disperses north towards the Tropic of Capricorn some 325 km south of the study area), the southern giant-petrel is not expected to occur in significant numbers in the metocean locations.
Reptiles		
Caretta caretta	Loggerhead turtle	The study area does not contain any emergent land or shallow subtidal (reef) features and the nearest areas of known turtle breeding or feeding importance are located at the Barrow and Montebello Islands, approximately 80 km to the south-east of Location 2. Given the distance from land it is expected that only very small numbers of marine turtles are likely to occur in the area during the proposed activities.
Chelonia mydas	Green turtle	
Dermochelys coriacea	Leatherback turtle	
Eretmoschelys imbricate	Hawksbill turtle	
Natator depressus	Flatback turtle	
Mammals		
Balaenoptera bonaerensis	Antarctic minke whale	*A widespread distribution of the mammals plus an absence of particular bathymetric features within close proximity to the metocean locations, suggest that the environment is unlikely to represent important habitat for any of these species.*
Balaenoptera edeni	Bryde's whale	
Orcinus orca	Killer whale	
Physeter macrocephalus	Sperm whale	
Balaenoptera musculus	Blue whale	The permit area is outside (seaward) of the main humpback and blue whale migration routes and is distant from the nearest known whale aggregation areas
Megaptera novaeangliae	Humpback whale	
Sharks		
Isurus oxyrinchus	Shortfin mako	These species occur within a wide-ranging habitat and have a highly transient nature. Although these sharks may pass through the activity areas, no bathymetric features or aggregation areas of importance for these species are known within the areas.
Isurus paucus	Longfin mako	

3.3 Social and Economic Environment

3.3.1 Petroleum Activities

There is no existing infrastructure near Location 1; however there is petroleum exploration and production activity near location 2 as described below:

- NWS Joint Venture offshore production facilities, approximately 100 km to the north-east, which includes the Goodwyn, North Rankin and Angel Platforms

- John Brookes unmanned platform, located approximately 50 km east of the study area, from which gas is sent to the Varanus Island processing facility via a 55 km pipeline
- Pluto Riser platform approximately 40km east of location 2
- The nearest land based production facility is situated on Barrow Island, 135 km south-east of the study area
- Jansz pipeline which is under construction, directly to the south of the location

3.3.2 Fisheries

Consultations with various state and federal departments indicate fishing activity in the area is low due to the water depths, remote location, distance offshore and often unpredictable weather.

The following Commonwealth-managed fisheries are authorised to operate in the area:

- Western Tuna and Billfish Fishery
- North-west Slope Trawl Fishery
- Southern Bluefin Tuna Fishery
- Western Deepwater Trawl Fishery
- Western Skipjack Fishery.

In addition, state-managed fisheries are permitted to operate in waters within and adjacent to the study area and include:

- Deep Water Wet Line Fishery
- WA North Coast Shark Fishery
- West Coast Deep Sea Crab Fishery
- Onslow Prawn Fishery
- Pilbara Trap Fishery
- Spanish Mackeral Fishery.

3.3.3 Shipping

Australian Maritime Safety Authority (AMSA) data indicates that vessel traffic is generally at low to medium levels. Neither metocean location form part of an approach to any regional ports and there are no channels or navigation hazards that restrict vessel movements.

3.3.4 Recreational and Tourism Activities

The distance offshore, unpredictable weather, and deep water are likely to preclude recreational fishing and charter vessel activity in the study area.

3.3.5 Marine Protected Areas

The metocean studies will not impact the Ningaloo Coast World Heritage Area or the Barrow Island Marine Management Area with Location 1 approximately 130 km away from both and Location 2, 80km away from Barrow Island (Figure 4).

3.3.6 Cultural Heritage

No features of cultural heritage importance have been identified within the study area

4.0 ENVIRONMENTAL HAZARDS AND CONTROLS

The risk management philosophy of Hess is to demonstrate appropriate systems are in place to ensure hazards are identified and risk managed to a level that is as low as reasonably practicable (ALARP) during both day-to-day activities and emergency situations.

A comprehensive risk assessment has been carried out for all aspects of operations, in accordance with Hess EHS Risk Management Key Process and the principles outlined in the Australian Standard AS/NZS 4360:2004 Risk Management, and ISO 140001 Environmental Management Systems

The key environmental hazards and control measures to be applied to the activities are illustrated in the table below. All control measures associated with the hazards will be used to reduce environmental risk to ALARP.

All risks carried a 'low' risk ranking (Hess Risk Matrix).

Table 5: Summary of Environmental Hazards, Potential Effects and Mitigation

Hazard/ Risk	Potential Consequence / Impact	Safeguards – Mitigation Methods
Domestic waste disposal – sewage, grey water, putrescible wastes	Adverse effects on marine life due to reduction in water quality (e.g. nutrient enrichment).	Biodegradable detergents only. Approved onboard sewage treatment plant. Treat in accordance with MARPOL 73/78 prior to discharge. Maceration to <25 mm prior to discharge. Offshore discharge (>12 NM from land) only.
Bilge water discharge	Localised and temporary acute toxic effects.	All potentially contaminated water collected and passed through an oil/water separator prior to discharge at <15 ppm. Discharge quality automatically monitored with alarm.
Contaminated deck run-off	Localised and temporary acute toxic effects.	All materials stored and handled in accordance with relevant procedures and Material Safety Data Sheet (MSDS). Chemicals stored in bunded store. Bund integrity ensured through regular inspections. Drains maintained closed and regularly inspected. Absorbent materials available onboard. Good housekeeping – maintain decks in clean condition (free of hydrocarbons).
Hydraulic releases	Environmental contamination	Regular maintenance All hydraulics serviced as part of annual refit Regular inspections Bunding used where possible A Frame" has hose guarding Spill kits available Vessel Management Plan
Solid and hazardous waste disposal	Reduction in habitat/water quality from incorrect disposal.	Wastes segregated and recycled where possible. Disposal to licensed facility via licensed wastes contractor.
Atmospheric emissions	Localised reduction in air quality.	Engines maintained to operate at optimum efficiency to minimise emissions.
Ballast Exchange and Biofouling	Introduction of marine pests. Alteration to community composition and function - competition with indigenous species.	Vessel will always remain in Australia waters Vessel does not carry ballast.
Artificial lighting	Alteration in fauna behaviour from attractant/disturbance effect of lighting.	Lighting will be maintained at minimum required for navigation and safety requirements.
Underwater noise	Physiological damage or disruption to behaviour patterns of sensitive marine fauna.	Low energy acoustic sources. Marine fauna observation to allow avoidance measures to be taken. Vessels report sightings of cetaceans and marine turtles to SEWPaC No seismic activities.
Anchoring	Localised reduction in benthic productivity. Damage to sensitive benthic habitat or habitats of conservation significance.	Anchoring not a planned activity Anchoring not achievable in area due to depth As such ALARP

Hazard/ Risk	Potential Consequence / Impact	Safeguards – Mitigation Methods
Vessel presence	Disturbance to migrating whales and other sensitive marine fauna.	Maintain cetacean watch on all transits. All vessels to maintain adequate separation distances from cetaceans where practicable and implement whale watch guidelines.
Interaction with other users	Disruption of commercial fishing/shipping activity	Notice to Mariners issued. Liaison with AMSA, AFMA, fishermen and other commercial mariners to minimise conflict.
Accidental hydrocarbon (fuel) loss from collision	Potential acute/chronic toxic effects on marine organisms from hydrocarbon loss.	Vessels operated by accredited crew, compliant with all relevant maritime statutes and carry all navigation equipment. Approved OSCP. AMOSC oil spill resources available off site. 24 hour watch
Mooring presence	Marine fauna entanglement Damage to sensitive benthic habitat or habitats of conservation significance.	Placement of equipment is not in cetacean migration pathway Design is not conducive to entanglement Moorings checked regularly Moorings are checked and maintained every 3 to 4 months
Detached mooring	Marine fauna entanglement Environmental debris	Engineered configuration of equipment to reduce the likelihood of buoy becoming detached Regular servicing and maintenance (such as this scope) of equipment ensure durability Placement of equipment is not in cetacean migration pathway Moorings are checked and maintained every 3 to 4 months

5.0 MANAGEMENT APPROACH

The Metocean EP identifies environmental risks associated with the proposed activities, the controls that must be instigated to avoid or minimise adverse impacts upon the environment and corresponding measurement criteria.

The management controls, monitoring and review processes that will be implemented for the activities, and the systems that underpin them as decribed in the Metocean EP are outlined below.

Key Implementation Measures	Brief Description
Systems and Practices	All activities will be governed by the Hess Equus Project Environment, Health, Safety and Social Responsibility (EHS&SR) Management Plan which has been developed in line with the following systems: • AS/NZS 4801 - Health and Safety Management Systems • AS/NZS 4804 - Guidelines and Principles in establishing HSE Management Systems • ISO 14001 - *Environmental Management Systems* • ISO 31000- *Risk Management* Hess' objectives of minimising negative impacts upon the environment will be achieved by addressing issues systematically, consistent with the EHS&SR Management System and Environment Policy, and in alignment with applicable Australian legislation and accepted

Key Implementation Measures	Brief Description
	standards. All personnel and Contractors shall comply with the EHS&SR Plan and the Metocean EP.
Roles and Responsibilities	Hess as Operator for the activities has ultimate accountability for execution of the study in line with conditions of any approvals and the EP Key roles and responsibilities of personnel with respect to meeting environmental management and performance objectives are outlined within the EP. Responsibilities as they relate to emergency response are outlined in the Hess OSCP, Vessel Management Pan and Fugro ERP. Emergency response protocols and organisation will take precedence over any others should an emergency arise.
Induction and Training	All personnel must undertake an induction which includes: ▪ the Hess EHS Policy ▪ information within the EP, particularly in regard to the aspects and risks identified as requiring management ▪ An outline of information in the Vessel Management Plan, including use of sewage and garbage log books ▪ environmental objectives for the program and the management strategies that will be applied to achieve those objectives ▪ a description of environmental responsibilities ▪ Spill response training Personnel with responsibilities in specific environmental practices will be adequately trained to ensure effective implementation of the tasks which they are required to undertake,
Monitoring	Monitoring of environmental performance as outlined by the measurement criteria for each objective and related standards shall be via: • Pre-mobilisation audits • Inspections (Hess, GMS and/ or Fugro inspections) • Audit (if deemed necessary) • Drills • Internal reports • Incident reports • Review of this EP
Audits and Inspections	Hess has a robust system of audits and inspections in place. The auditing of environmental performance and the implementation strategy will form part of the general EHS auditing and inspection requirements. Vessel pre-mobilisation audits shall occur. Inspections of work activities, processes and systems shall be performed at regular intervals during the voyage. Non-conformances or findings will be classed, recorded, tracked and closed out as per Hess procedures. Results will be communicated to relevant personnel via reporting, management meetings and pre-start/toolbox meetings.
Review and Improvement	Hess will undertake a review of environmental performance and the EP which will involve an evaluation of: ▪ Records and reports ▪ compliance with the requirements of the EP ▪ compliance with company standards and procedures ▪ environmental incidents or issues (e.g. fuel spills, unauthorised waste discharges) ▪ any observations or reports of wildlife impact ▪ appropriateness of the EP including performance objectives, standards, and the implementation strategy The results of the review and any recommended modifications to either procedures or the EP will be included in the close-out report to NOPSEMA. If necessary, the EP may be revised to account for any findings and non-conformances and re-submitted for acceptance by NOPSEMA.
Oil Spill Contingency Plan	Hess have developed an OSCP as part of the EP, specific for non-hydrocarbon activities associated with the metocean study. However, in the first instance, any response to an oil spill will be undertaken in accordance with the vessel response plan (VRP). Both the OSCP and VRP will be tested and revised by Hess in accordance with Regulation 14(8A) and 14(8AA) of the OPGGS(E) Regulations
Record Keeping	Hess have prescribed storage and maintenance periods for all records and documents
Reporting	Daily internal reporting, including any incidents, shall be undertaken by contractors and Hess personnel.

Key Implementation Measures	Brief Description
	All reportable incidences shall be reported to the relevant authority as stipulated in legislation. Within 7 days of returning to shore on completion of all activities, Hess shall submit a report, in an approved manner, to NOPSEMA

6.0 CONSULTATIONS

Hess undertook two rounds of extensive stakeholder consultations in regards to future activities in WA-390-P (the Permit) during 2011 and 2012. The engagements discussed all facets and anticipated activities, and built upon the stakeholder consultation previously undertaken for seismic and drilling exploration operations in the area.

The following stakeholder groups were consulted in 2011 and 2012:

- Australian Fisheries Management Authority
- Cape Conservation Group
- Dampier Port Authority
- Department of Agriculture, Fisheries and Forestry
- Exmouth Chamber of Commerce
- Gascoyne Development Commission
- Karratha and Districts Chamber of Commerce and Industry
- North West Cape Exmouth Aboriginal Corporation
- Pilbara Development Commission
- Shire of Exmouth
- Shire of Roebourne
- WA Department of Environment and Conservation
- WA Department of Fisheries
- WA Department of State Development
- WA Department Mines and Petroleum
- WA Fishing Industry Council
- Various State Member of Parliament

Furthermore, email notification regarding metocean activities was sent to the Australian Maritime Safety Authority.

To date, except for an email from AMSA acknowledging the proposed metocean activities, no official verbal or written responses have been received in regards to the Project or the proposed activities.

The five main areas of discussion raised by stakeholders during the Hess engagement program were:

- the arrangements of fly in/fly out personnel
- potential employment and business opportunities
- potential training opportunities
- establishment of a supply base in Exmouth
- potential environmental impact on the environment (including fisheries)

Key Project personnel will periodically visit Exmouth and Karratha to meet with, and update, key stakeholder groups. In addition, electronic updates of the Project's development will be provided as milestones are achieved.

8.0 CONTACT DETAILS

For further details regarding the Metocean activities please contact the following:

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