



Basker-Manta-Gummy Replacement FPSO Geotechnical Survey Environmental Plan Summary

AGR Asia Pacific Controlled Document

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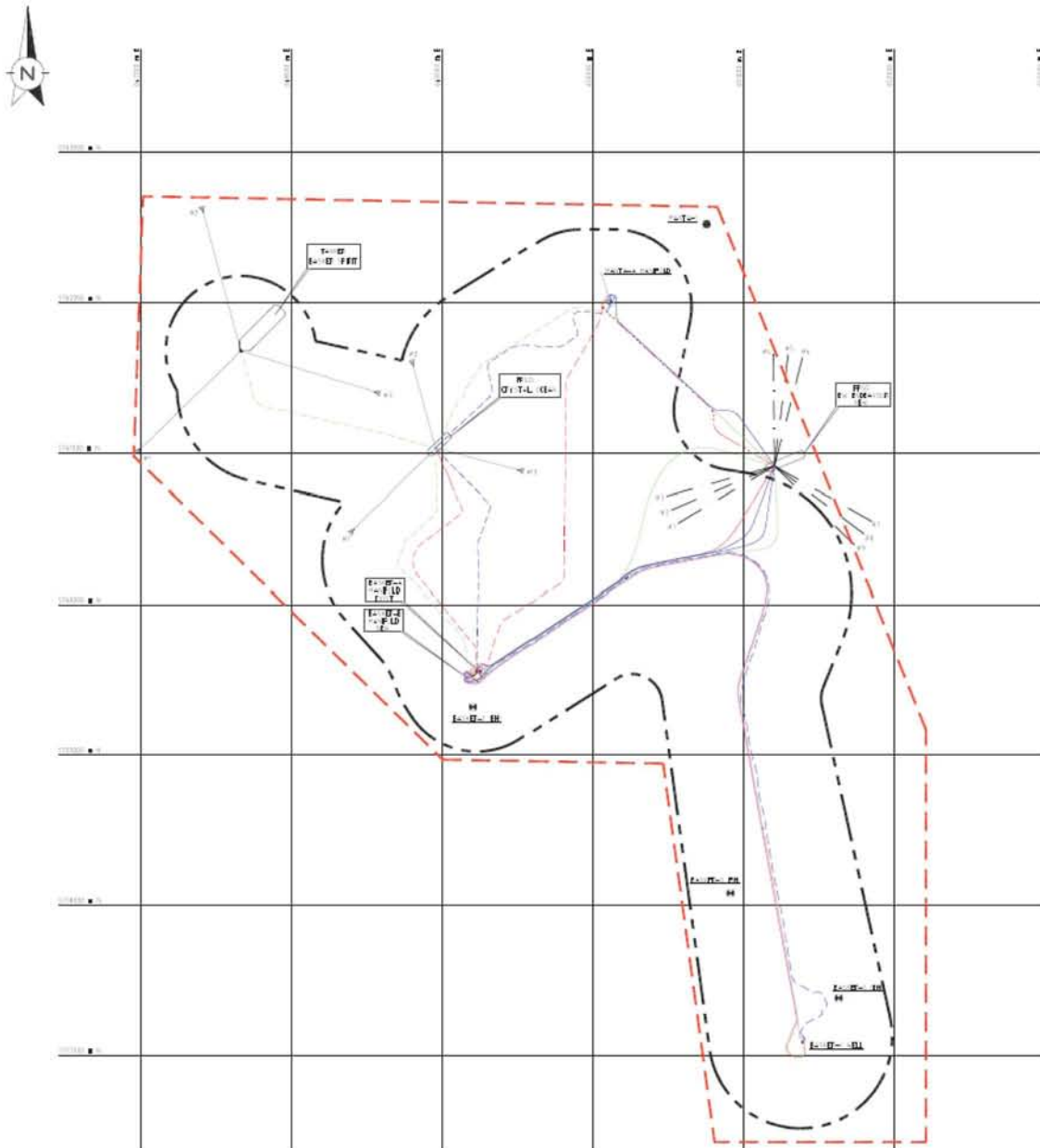
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Table 1: Replacement FPSO Coordinates

MGA Coordinates (GDA94) UTM 80 Zone 55

Item	Longitude	Latitude	Northing	Easting
Replacement FPSO	148°43'43.98"E	38°17'13.69"S	5760912mN	651203mE

Figure 2: Existing BMG Development Safety Zone





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Description of Action

The objective of the geotechnical survey is to:

- o For the Basker-6 Flowline corridor collect sufficient seabed and substrate detail to assist with trench definition and design;
- o For the Basker-B and Basker-A manifolds collect sufficient seabed and substrate detail to assist with foundation design; and
- o For the Replacement FPSO collect sufficient seabed and substrate data to assist in the design of a mooring system.

To achieve the above objectives the following data will be collected:

- o Basker-6 Flowline Corridor (*Within existing Safety Zone*): Approximately eight (8) piezocone penetration tests (PCPT) and **shallow coring (approx 5m x 3" diameter) along the B6 flowline** to support proposed trenching works;
- o Basker B & Manta A Manifold sites (*Within existing Safety Zone*): Approximately two (2) PCPT/cores at each site to confirm foundation design details; and
- o Replacement FPSO Site (*Within 1km radius of the new FPSO location*):
 - o One (1) shallow piston core sample (approx 5m) at the central FPSO location to confirm the soil condition;
 - o One (1) PCPT at each of the anchor locations (9 positions); and
 - o **One subsea core (40m depth x 3" diameter) at each of the anchor clusters (3 positions).**

The vessel, AHT *Neptune Trident*, will mobilise from Dampier (WA) and demobilise from the BMG Field to Singapore. It is expected that the geotechnical survey will commence on January 30th 2009 and will take approximately 5 days to complete (contingent on any weather delays). Geotechnical activity will be undertaken on a 24hr basis.

Coring will be undertaken by a PROD (portable remotely operated drill) Unit which is a subsea tethered drill unit that sited and operated on the seabed via a high voltage/fibre optic umbilical.

Description of Receiving Environment

Overview

The BMG fields are located in the South-East Marine Region. The recently delineated East Gippsland Commonwealth Marine Reserve is about 100km east to north-east from the current FPSO location. The marine reserve lies in waters 600m to deeper than 4000m and is characterised by a continental slope with numerous deeply incised submarine canyons on the eastern margin of the Bass Strait, such as Bass Canyon, and is identified as having important productivity and unique oceanography.



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Most infrastructure components associated with the Basker-Manta Development are located on a nearly flat sea-floor in the relatively shallow water of the continental shelf, to the north of the rapidly deepening waters of the Bass Canyon. Water depths in the vicinity of the Basker-Manta sea-floor facilities range from approximately 130m in the north of the Licence area, to 285m at the Basker-6ST well location located below the Bass Canyon scarp approximately 5km to the south of the current FPSO location.

The closest landfall to the BMG fields is Cape Conran, located approximately 55 km north, on the Ninety Mile Beach (Victoria). Ninety Mile Beach is an extensive continuous NE-SW oriented sandy beach and dune system. This beach and dune system provides a buffer zone to the wetlands and heathlands of the 400km² Gippsland Lakes' waterways.

Seabed Characteristics

Three sea-floor types have been identified at Basker Manta: calcareous fine to medium clayey sand with shells and minor marine growth; low relief rock/reef subcrop with a veneer of clayey sand; and rock/reef outcrops with high relief. Across the BMG Development area where the seabed sediments have been interpreted as calcareous clayey sand, seabed scars have been identified.

Fauna

Previous studies in eastern Gippsland have indicated that the infauna in the region is rich and diverse, with polychaetes, molluscs and crustaceans comprising the majority of individuals and species recorded. At depths of between 200 – 500 m of species found include ***ophiuroids, holothurians, decapods and pycnogonids***.

Both resident and migratory fauna, including fish, sharks, seals, sea lions, and cetaceans have been observed in the vicinity of the BMG Development. Up to 10 migratory species, including 2 endangered species (Blue Whale and Southern Right Whale) and 3 threatened species (Great White Shark, Whale Shark and Humpback Whale) may potentially migrate or temporarily forage in the Production Licence areas during certain periods. However, the area is not recognized as an aggregation area for the species and there are no threatened ecological communities listed under the EPBC Act in the vicinity of the Basker Manta fields. Commercial species of fish (shark, ling, perch, and whiting) and squid also occur in the area.

Migratory seabirds listed under the EPBC Act are known to occupy the islands of Bass Strait, the nearby coastline, and may pass through the BMG fields. However due to the lack of suitable roosting and breeding habitats for these species in the BMG area, they are not expected to be present for extended periods of time.

Other Marine Users

A wide range of human activities occurs in Bass Strait including fishing, commercial oil and gas fields, shipping as well as recreational pursuits, heritage, research and tourism.



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Details of Major Environmental Hazards & Controls

A risk assessment has been undertaken for all the environmental aspects associated with the geotechnical survey activities for the Replacement FPSO scope of works. This process is consistent with the requirements of AS/NZ4360:2004 (Risk Management) and HB203: Environmental Risk Management (Principles and Processes). The analysis indicates that, with the identified management and mitigation measures implemented, no significant environmental impacts are expected and the activities carry a low residual environmental risk. Further details of key environmental aspects of the geotechnical activities are provided in **Table 2**. This table summarizes the management/mitigation measures to be adopted for the survey activities and the associated residual environmental risk.

Management System Approach

As the project manager of the BMG development, AGR-AP has taken a systematic approach in identifying and assessing geotechnical activities (aspects) and their associated environmental risk and has established objectives, performance standards and criteria to manage and measure environmental performance.

AGR-AP has activated its Integrated Management System (IMS) to **fulfil the company's environmental policy and objectives and act in an environmentally responsible manner**. AGR-AP's IMS is certified to ISO 14001 and provides a framework for the management of environment during geotechnical activities. The IMS applies to all employees, contractors and other third parties.

Consultation

Anzon/AGR-AP has consulted with fishery groups, fishing industry groups and regulatory agencies associated with the proposed Basker-South development, including Victorian Department of Primary Industries (DPI), Australian Fisheries Management Authority (AFMA), Seafood Industries Victoria (SIV), Lakes Entrance Fisherman Co-op (LEFCOL), South-east Trawl Fishing Industry Association (SETFIA), South-East Fishing Association (SEFA), Twofold Bay Fishing Co-op, San Remo Fishing Cooperative and VR Fish (Peak Body for Recreational Fishing).

Anzon/AGR-AP will continue to maintain regular communications with identified stakeholders and other interested parties to ensure that they are informed of any changes to the installation program affecting their activities. Continued liaison with the fishery groups will occur throughout the continued BMG development phases.

Contact details

Further information associated with the environmental aspects of the BMG Replacement FPSO Geotechnical activities may be obtained from AGR Asia Pacific by writing to:

Aaron de Fina
AGR Asia Pacific - HSEQ Manager
3/342 Flinders Street
Melbourne Vic 3000+



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Table 2 – Summary of Environmental Hazards, Controls and Residual Environmental Risk

Environmental Aspects	Description of Potential Impact	Environmental Objective	Mitigation Measures/Action	Residual Risk
PHYSICAL PRESENCE OF VESSEL				
Presence of Vessel: Marine Habitat/Fauna Impacts	Disturbance to local seabed habitat & associated fauna from anchor impacts	Minimise impacts to seabed habitats	Anchoring only to be undertaken during emergencies Vessel positioning maintained via DP	LOW
	Disturbance to marine mammals and fauna (altered behaviour)	Minimise impacts to marine fauna	Adherence to <i>National Guidelines for Whale & Dolphin Watching (2005)</i> for <i>AHTS Neptune Trident</i> while mobile Whale and Dolphin sighting reports to be completed and submitted to DEWHA Environmental Induction for crew	LOW
Presence of Vessel: Socio-economic Impacts	Commercial fishing impacts in proximity to Survey Vessel or resulting from survey activities	Minimise impacts to fishing activities (presence and hazards)	Temporary (5 days) and localised activity Consultation with Fishing Industry & Notice to Mariners Issued Dropped objects program for survey vessel	LOW
	Hazard to commercial fishing and shipping (obstacle) (collision and oil spill potential)	Eliminate incidents which may have adverse water quality impacts	Navigation lights on vessel and continuous radio and radar watch Tested and implemented shipboard SOPEP Vessel Interaction log & incident reporting	LOW
MARINE DISCHARGES				
Coring Fluid/Cuttings Discharge	Smothering of benthic communities Alteration to sediment characteristics & turbidity affecting sunlight to phytoplankton Alteration to water chemistry affecting marine life	Minimise impact on pelagic and benthic communities	Use of low toxicity, biodegradable coring fluid in dispersive environment Open hole method with small coring fluid/cutting volume discharged at seabed to marine environment Small cuttings size – rapidly dispersed	LOW



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Discharge of Cooling Water	Chemicals impacts to marine environment & fauna Thermal Impacts to Marine Flora/Fauna	Avoid negative impacts on surrounding marine waters	Small batch dosing to minimise volumes of chemical released to the marine environment Chemical is not bio-accumulative and biodegradable Highly dispersive environment (chemical & heat impacts)	LOW
Discharge of sewage, grey water & food scraps	Nutrient enrichment of surrounding water Visual amenity impacts Chemical impacts	Avoid negative impacts on surrounding marine waters	All foodscraps macerated to 25mm All sewage and greywater treated to MARPOL requirements with approved equipment & discharged in accordance with marine legislation Equipment inspected and maintained on a routine basis Low environmental impact chemicals selected	LOW
Discharge of deck drainage	Toxic impacts to marine fauna Turbidity of waters at discharge point Potential nutrient increases	Avoid negative impacts on surrounding marine waters	Oil and chemical stores are contained with no residues/spills discharged overboard Decks kept free of oil, grease, and other residues (high housekeeping standards) Deck spill equipment available and used prior to deck washing Chemical selection ensures MSDS availability Oily/water deck drainage to oil/water separation unit Oil-in-water discharge monitored, ODME monitor calibrated, and records retained Oils collected for onshore disposal System routinely monitored and maintained	LOW



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Discharge of Effluent from Equipment/Machinery Spaces	Toxic discharges to environment Turbidity & BOD reduction at discharge pt	Avoid negative impacts on surrounding marine waters	Effluent collected in onboard tank Oil directed onshore for disposal & logged in oil record logbook Oily water discharge stream 15ppm oil-in-water & discharged in accordance with marine legislation Water discharge monitored & curtailed if spec. exceeded ODME calibrated and certified System routinely monitored and maintained	LOW
Ballast Water Discharge	Potential introduction of marine pests	Avoid negative impacts on surrounding marine waters	Vessel mobilising from within Australian waters Ballast Water clearances & biofouling assessments undertaken	LOW
WASTE DISPOSAL	Toxic impacts to marine fauna from oil contamination of ballast water tanks	Avoid negative impacts on surrounding marine waters	AHTS <i>Neptune Trident</i> has segregated Ballast Water Tanks	LOW
Storage & Disposal of Environmentally Hazardous Wastes & general waste	Visual pollution of marine environment Degradation of seabed habitat Potential mortality of marine fauna through ingestion or entanglement	Avoid negative impacts on surrounding marine waters	Wastes segregated, containerised and appropriately labelled Wastes are stored in areas which are covered and contained All environmentally hazardous and general waste is returned to shore for disposal Documented waste management procedures and disposal records All personnel are trained in waste management requirements Storage areas inspected on a routine basis	LOW



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AIR EMISSIONS				
Emissions from Combustion Sources (Combustion Equipment)	Inefficient use off hydrocarbon resources Release of greenhouse gas emissions Aesthetics of smoke & particulates	Minimise emissions, use energy efficiently and avoid aesthetic impacts of combustion	Equipment maintained in accordance with manufacturers specifications to maximise combustion efficiencies Equipment fuel consumption monitored and assessed for performance requirements	LOW
NOISE EMISSIONS				
Noise (Sources: Vessels, Coring)	Potential impacts to marine mammals	Avoid or minimise adverse effects of noise on sensitive species	Activity outside peak migration periods for cetaceans Noise sources continuous and similar to commercial vessels in the area Adherence to <i>National Guidelines for Whale & Dolphin Watching (2005)</i> for <i>AHTS Neptune Trident</i> while mobile Cetacean sighting forms forwarded to DEWHA	LOW
NON-ROUTINE OPERATIONS				
Hydrocarbon Spills	Potential Impacts to marine fauna and water quality	Minimise occurrence and effects of spills	AIS / Radar / VHF / Watch keeping procedures Marine Safety Information warnings per AUSREP system Flares and ALDIS lamp as per SOLAS Navigational aids including light and foghorns Ability to change heading or move off on DP SOPEP established, approved, tested & SOPEP kits provided in appropriate locations No refuelling to be undertaken at sea Incident resulting in an oil spill reported via the AHTS <i>Neptune Trident</i> Incident Management System to the AGR Project Manager Spills in excess of 80 litres are reported immediately to DPI/AMSA	LOW



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Chemical Spills	Potential Impacts to marine fauna and water quality	Minimise occurrence and effects of spills	Chemicals stowed with appropriate segregation in accordance with the IMDG Code Chemical containers adhere to IMDG Code for labelling and integrity Lashing/Securing and restraining loads; MSDSs to be made available for all chemicals; Personnel trained in chemical handling	LOW