



BMG BAM Inspection 2010 Summary Environment Plan

AGR Asia Pacific Controlled Document

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1 Activity Description

Anzon Australia Pty Ltd (Anzon), a wholly owned subsidiary of Roc Oil Company (ROC) Limited, together with Beach Petroleum Limited, CIECO E&P (Australia) Pty Ltd, Sojitz Energy Australia Pty Ltd and Pertamina Hulu Energi Australia Pty Ltd are the participants of the Basker Manta Gummy (BMG) Joint Venture (JV) Development in the commonwealth waters of Bass Strait. Anzon is the operator of the Licence area on behalf of the JV Partners.

Anzon, in undertaking the BMG BAM Inspection works (i.e. the 'petroleum activity') adopts the ROC HSE Policy and utilises ROC personnel to undertake development activities in the BMG Field. ROC will project manage this activity on behalf of Anzon and has commissioned AGR Asia Pacific Pty Ltd (AGR), formerly Upstream Petroleum Pty Ltd, to provide engineering services for the activity.

1.1 Scope of Work

The BMG field Subsea Inspection comprises further inspection works resulting from the inspection works carried out in 2009, along with additional Non Destructive Testing (NDT) work to be executed on the Basker A Manifold (BAM) and associated wellheads. It is proposed to conduct the inspection works utilising a Remotely Operated Vehicle (ROV) and/or saturation divers from a Dive Support Vessel (DSV).

Subsea inspection activities include the following:

- Mobilisation of a Support Vessel (SV) from Port of Eden to the BMG field with ROV and/or mobilisation of the DSV (and attendant Hyperbaric Rescue Vessel (HBV)) from Port of Eden with Saturation Diving System;
- Cleaning (utilising high pressure water to remove soft marine growth) and inspection of the Basker Spirit Riser 6" Manuli hose;
- Location fix and inspection of scouring of the embedment anchor on FPSO Mooring Leg No. 2;
- CP Inspection on the FPSO DTM Buoy Hull;
- Cleaning (utilising high pressure water to remove soft marine growth) and NDT Inspection at the BAM;
- NDT and CP Inspection at B2, B3, B5 and B7 wellheads.

These proposed works will be undertaken in a water depth of approximately 155m, within the existing gazetted Petroleum Safety Zone for the BMG Development.

The vessels will be mobilised for approximately 8 days (weather and sea-state dependent) (4 days on location). The DSV will schedule a further 3 - 4 days in port to complete diver decompression. The HBV will be on standby in the event of an emergency.



1.2 Location

The BMG oil and gas fields, located in the Production Licence VIC/L26, VIC/L27 and VIC/L28, are situated in the Commonwealth waters of Bass Strait approximately 50km from the Victorian Coast and 15km east of the Flounder oil and gas field. The BAM is located approximately 1.5km south of the FPSO mooring location.

The BAM and wellheads are located approximately 1.5 km south of the FPSO mooring location. The coordinates of the FPSO DTM Buoy, Basker Spirit SPM, BAM and wellheads are shown in Table 1. The field layout is shown schematically in Figure 1. All activity will occur within the existing development's petroleum safety zone.

Table 1 Location coordinates

Location	Longitude	Latitude
Basker-A Manifold	148° 42' 24.32"	-38° 19' 58.74"
Basker-2 wellhead	148° 42' 24.72"	-38° 17' 58.51"
Basker-3 wellhead	148° 42' 58.03"	-38° 16' 39.41"
Basker-5 wellhead	148° 42' 23.80"	-38° 17' 59.31"
Basker-7 wellhead	148° 42' 22.31"	-38° 17' 58.79"
FPSO DTM Buoy	148° 42' 11.43"	-38° 17' 11.03"
Basker Spirit SPM	148° 41' 17.79"	-38° 16' 51.10"

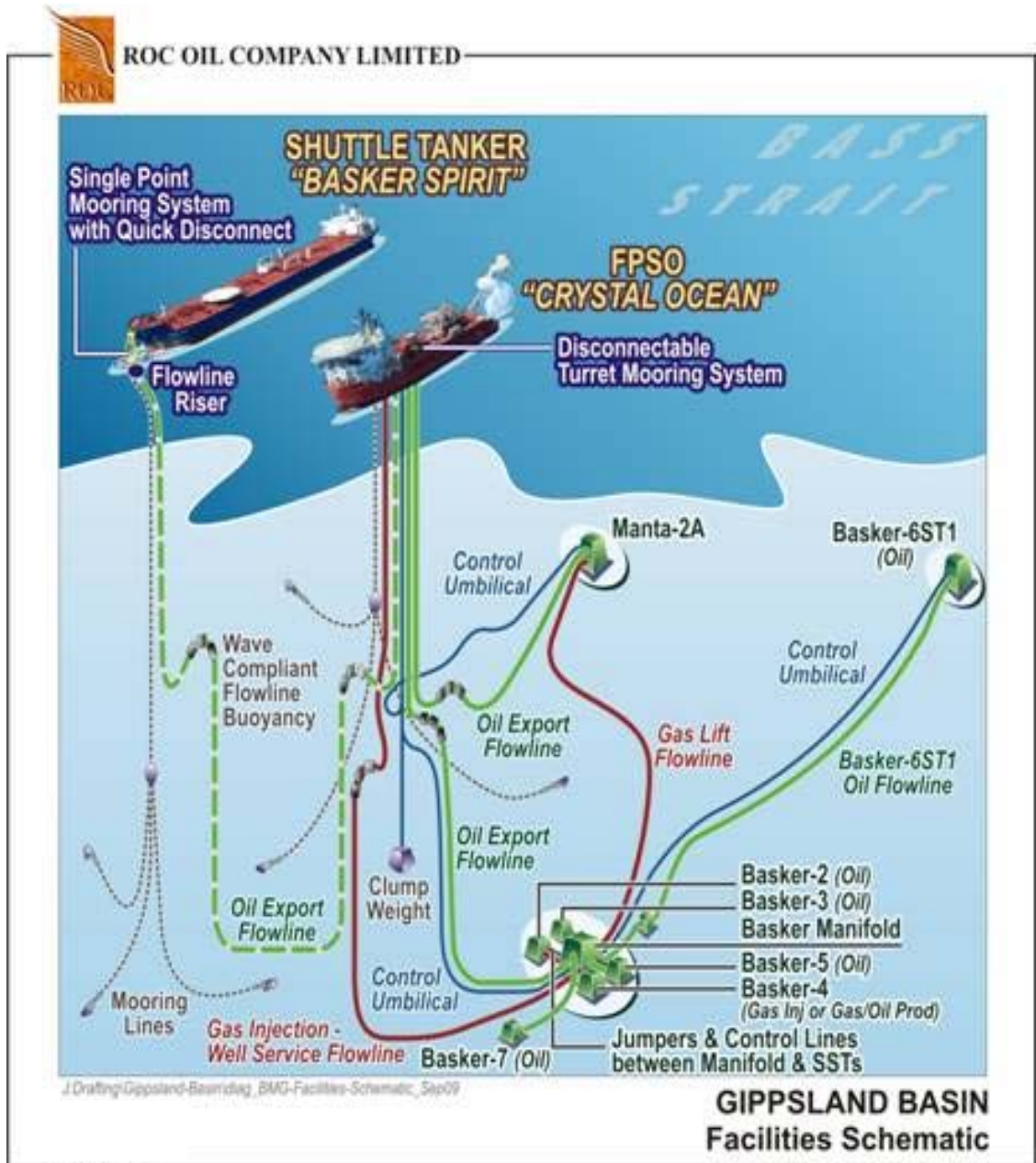


Figure 1 Field Schematic

2 Receiving Environment

The BMG field is located in the south-east Marine Region. The closest landfall to the BMG Development is Cape Conran, located 53km north, on the Ninety Mile Beach (Victoria), 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 located around the 400km² Gippsland Lakes waterways.

The BAM infrastructure is located in a water depth of approximately 155m on the continental shelf. Geophysical survey data shows that the seabed at and around the BAM site is featureless and undisturbed with the seabed comprising of silty sand. The underlying geological structure is dipping and slightly irregular, grading from silty fine sand at the seabed to over-consolidated sandy, silty clay at 10m below seabed.



The seafloor habitat at the BAM site is expected to be similar to the habitat experienced at the Patricia-Baleen development (VIC/L21), located in water depths of 130m approximately 30km NE of the BMG fields. Seabed sediment infauna from these previous studies undertaken in east 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. Substantial variation has been found in species composition between seasons, as well as between sites due to grain size, depth and sediment sorting (CEE Consultants, 2001).

Both resident and migratory fauna, including fish, sharks, seals, sea lions, and cetaceans have been observed in the vicinity of the BMG field. Up to ten marine migratory species, including two endangered species (Blue Whale and Southern Right Whale) and three threatened species (Great White Shark, Whale Shark and Humpback Whale) may potentially migrate or temporarily forage in the Licence area during certain periods. However, the area is not recognized as an aggregation area for these species and there are no threatened ecological communities listed under the EPBC Act in the vicinity of the site. 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 on the islands of Bass Strait, the nearby coastline, and may pass through BMG field during the inspection activities. 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.

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.

3 Major Environmental Hazards and Controls

A risk analysis has been undertaken for all aspects of the proposed subsea inspection activity in accordance with the requirements of ISO14001 – *Environment Management Systems*, AS4360:2004 *Risk Management* and HB203-*Environmental Risk Assessment – Principles and Process*. The analysis indicates that, with the proposed management/mitigation measures implemented, no significant environmental impacts are expected and the activities carry a low residual environmental risk. Further details of key environmental aspects and management measures to minimise impacts from the subsea inspection activity are provided in Table 2.

4 Summary of Management Approach

As the Licence operator of the BMG Development, Anzon has taken a systematic approach in identifying and assessing subsea inspection activities (aspects), their associated impacts and environmental risk after environmental control measures have been implemented. This process also establishes objectives, performance standards and criteria to manage and measure environmental performance during the subsea inspection activities.

For this activity, Anzon will adopt the AGR Integrated Management System (IMS) to fulfil the company's environmental policy, objectives and ensure environmentally responsible management of activities. AGR's IMS is certified to ISO 14001 and provides a framework to management of environment during the inspection activities. The IMS applies to all employees, contractors and other associated third parties.



5 Consultation Process

Anzon has consulted with fishery groups, fishing industry groups and regulatory agencies regarding the proposed subsea inspection activities, including the Lakes Entrance Fisherman Co-op (LEFCOL), South-east Trawl Fishing Industry Association (SETFIA), South-East Fishing Association (SEFA), Twofold Bay Fishing Co-op, and San Remo Fishing Co-operative.

Anzon will continue to maintain regular communications with identified stakeholders and other interested parties to ensure that they are informed of any changes to the inspection program which might affect their activities. Continued liaison with the fishery groups will occur throughout the continued BMG development phases.

6 Contact Details

Further information associated with the environmental aspects of the BMG BAM Inspection activities may be obtained from ROC by contacting:

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Table 1 Summary of Risk Assessment

No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
1	Presence of Vessels	<ul style="list-style-type: none"> Interference with <i>Crystal Ocean</i> Facility, shipping and fishing vessels increasing the risk of collisions 	<ul style="list-style-type: none"> Minimise interference with <i>Crystal Ocean</i> Facility, commercial vessels and avoid shipping collisions 	<ul style="list-style-type: none"> Work is of short duration (approx. 4 days). Adherence to Simultaneous Operations protocols. Work undertaken within the existing gazetted BMG Development Petroleum Safety Zone. Consultation with commercial fishing industry undertaken and notification on coordinates/timing issued. Lighting and continuous radar/radio monitoring while the vessels are on location. Emergency Response and SOPEP established. 	Low
2		<ul style="list-style-type: none"> Disturbance to marine mammals & fauna with altered behaviour (entanglement, etc) 	<ul style="list-style-type: none"> Minimise disruption to Marine Life 	<ul style="list-style-type: none"> Work is of short duration only (approx. 4 days). Cetacean Monitoring Program for vessels and reporting to Department of Environment, Water, Heritage and the Arts (DEWHA). Vessels will adhere to the proximity distance in 2005 Australian National Guidelines for Whale & Dolphin Watching (DEH, 2005). 	Low
3	Presence of Sub-sea Infrastructure	<ul style="list-style-type: none"> Disruption of fishing activities (end of field life) 	<ul style="list-style-type: none"> Minimise interference with commercial fishing vessels 	<ul style="list-style-type: none"> No additional subsea infrastructure Implementation of dropped objects program & retrieval. 	Low
4	Seabed Disturbance	<ul style="list-style-type: none"> Disturbance to seafloor resulting in loss of seabed fauna 	<ul style="list-style-type: none"> Minimise disturbance to the seabed and benthic habitats 	<ul style="list-style-type: none"> Vessels will operate on DP throughout the campaign hence no seabed disturbance from anchoring. 	Low
5	Discharge of Ballast Water & Biofouling	<ul style="list-style-type: none"> Potential discharge of exotic organisms from ballast water which may cause ecological disruption 	<ul style="list-style-type: none"> Minimise disturbance to the marine environment as a result of exotic organism introduction 	<ul style="list-style-type: none"> Vessels mobilising from Port of Eden following operations in Bass Strait (i.e. within Australian waters). 	Low



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6	Discharge of Cooling Water	<ul style="list-style-type: none"> Thermal impacts to marine flora/fauna near the discharge point 	<ul style="list-style-type: none"> Minimise impact of on marine environment. 	<ul style="list-style-type: none"> Warm cooling water is expected to disperse near the sea surface very rapidly within a few tens of metres from the discharge point. 	Low
7		<ul style="list-style-type: none"> Chemical/Oil Impacts to Marine Life 		<ul style="list-style-type: none"> Very small quantities of corrosion inhibitor added. Chemicals used are biodegradable. Rapid dispersion will help dilute the chemicals to no effect concentration. 	Low
8	Disposal of Sewage, Greywater and Food-scrap	<ul style="list-style-type: none"> Nutrient enrichment of surrounding water Visual amenity impacts 	<ul style="list-style-type: none"> Minimise impact of on marine environment. 	<ul style="list-style-type: none"> Sewage is treated and discharged in accordance with MARPOL requirements. Foodscrap are macerated to below 25mm prior to discharge. Cleaning agents (detergents) selected are biodegradable. 	Low



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No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
9	Discharge of Deck Drainage	<ul style="list-style-type: none"> • Toxicity impacts to marine flora & fauna • Turbidity of waters about the discharge point • Potential nutrient increases 	<ul style="list-style-type: none"> • Minimise impact on marine environment. 	<ul style="list-style-type: none"> • Deck areas which contain rain/sea spray only directed overboard. • Chemicals, oils and wastes are stored in the designated storage areas with spill cleanup materials (e.g. absorbents, containers) are maintained in accessible locations. • Bunding (temporary or permanent) is provided for those areas/activities where there is an increased risk of spill. • High standards of housekeeping are maintained on the vessel with spill residues collected prior to any deck washing activities. In the event of a small chemical or oil spill, absorbents are used to remove spill material prior to any washing activities. Cleanup materials are containerised and sent to shore as hazardous waste. • Detergents for washdown activities are biodegradable. • Deck drainage, where appropriate is processed via the vessel's slops system where the water discharge stream is continuously monitored (monitor routinely calibrated and certified) to ensure a 15ppm oil-in-water discharge. Stream is shut-down in event of excursion above this concentration. 	Low
10	Discharge of Effluent from Equipment/ Machinery Spaces	<ul style="list-style-type: none"> • Potentially harmful/toxic discharges to marine environment • Potential turbidity and BOD Reduction 	<ul style="list-style-type: none"> • Minimise impact on marine environment 	<ul style="list-style-type: none"> • Area contained and collected in bilge tank & treated in the oily-water system. 	Low



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No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
11	Storage & Disposal of Environmentally Hazardous Waste & General Waste	<ul style="list-style-type: none"> Toxicity and physical impacts to marine flora and fauna Visual Pollution to the marine environment 	<ul style="list-style-type: none"> Minimise potential impacts of solid and hazardous wastes on the environment 	<ul style="list-style-type: none"> Wastes minimised whenever possible. Wastes are segregated and retained onboard for eventual disposal through an approved contractor ashore. Wastes storage areas are covered, bunded and inspected regularly. No waste overboard policy. All personnel are trained in waste management requirements. 	Low
12	Atmospheric emissions of combustion products	<ul style="list-style-type: none"> Reduction in air quality 	<ul style="list-style-type: none"> Minimise impacts to atmosphere 	<ul style="list-style-type: none"> All combustion equipment maintained in accordance with the maintenance standards and manufacturer's specification to maximise fuel efficiency and minimise black smoke/particulates. Fuel volumes monitored and minimised where possible. 	Low
		<ul style="list-style-type: none"> Release of Greenhouse gases emissions 			Low
13	Noise	<ul style="list-style-type: none"> Potential impacts to marine mammals. 	<ul style="list-style-type: none"> Minimise risks of adverse impacts of noise on marine fauna 	<ul style="list-style-type: none"> Vessels to observe the approach requirements for cetaceans in the Australian National Guidelines for Whales and Dolphin Watching (DEH, 2005). Cetacean monitoring and report to DEWHA. 	Low
14	Fuel Oil Spill (Vessel Collision or Grounding)	<p>Potential effects include:</p> <ul style="list-style-type: none"> Oiling of Seabirds Fish Tainting Disruption to fishing activities 	<ul style="list-style-type: none"> Minimise impacts to marine fauna and commercial fishing activities 	<ul style="list-style-type: none"> HRV to be positioned in cautionary area on stand-by. Adherence to 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. Emergency Response and SOPEP established, approved and tested. 	Low



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No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
15	Spills of Crude Oil (Dropped Objects & Infrastructure Integrity)	Potential effects include: <ul style="list-style-type: none"> • Oiling of Seabirds • Fish Tainting • Disruption to fishing activities 	<ul style="list-style-type: none"> • Minimise impacts to marine fauna and commercial fishing activities 	<ul style="list-style-type: none"> • Vessels to maintain sufficient buffer distance (where practicable) to reduce risk of impact to subsea infrastructure. • Inspections undertaken in accordance with written procedures. • Use of certified crane operator, riggers and dogmen. • Certified cranes and rigging inspected and maintained. • Adherence to operational weather limitations. • Use of experienced and qualified marine crew. • Minimisation of lift over subsea infrastructure. • Emergency Response and SOPEP established, approved and tested. 	Low