



BMG Full Field Development & Oil Development (Phase 2)¹

Summary Environment Plan (Operations)

AGR Asia Pacific Controlled Document

No. 09/HSEQ/ENV/PL09

Revision 3

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3	08/02/2010	Update to include FGC Compressor	LCKC.	JA	JC
2	22/10/2009	Updated to include Basker-7 Facilities	LC	JA	JC
1	03/09/2008	Updated to include ODP2 Facilities	LC	PH	ADF
0	01/12/2006	Issued	DP	LC	PH
Rev	Date	Description	By	Chkd	App.

¹ (Including Basker6ST-1, Basker-7 and Flare Gas Compressor Supplements)



1 Background

Anzon Australia Pty Ltd ('AZA'), a fully-owned subsidiary of Roc Oil Company Limited ('ROC'), holds a 30% interest and is the operator on behalf of the Basker-Manta-Gummy (BMG) Joint Venture Partners (JVP) of Production Licence Areas VIC/L26, VIC/L27 & VIC/L28 in eastern Bass Strait. The BMG JVP comprises of:

- | | |
|-------------------------------------------------------|-----|
| • Anzon Australia Pty Ltd (Operator) | 30% |
| • Beach Petroleum Limited | 30% |
| • CIECO Exploration & Production (Australia) Pty Ltd) | 20% |
| • Sojitz Energy Australia Pty Ltd | 10% |
| • Pertamina Hulu Energi Australia Pty Ltd | 10% |

AZA, in undertaking this petroleum activity adopts the ROC HSE Policy, associated HSE Management Systems and Response Plans, and utilises ROC personnel for development and operational activities in the BMG Field.

AZA has leased the Floating Production Storage Offloading (FPSO) vessel, *Crystal Ocean* to recover Hydrocarbons through a series of subsea wells connected back to the vessel. AGR is sub contracted to Operate and Maintain the *Crystal Ocean* and is the "Facility Operator" of the FPSO pursuant to the *Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996* (MoSOF) (Regulation 7) nominated by the BMG JVP and accepted by the National Offshore Petroleum Safety Authority (NOPSA).

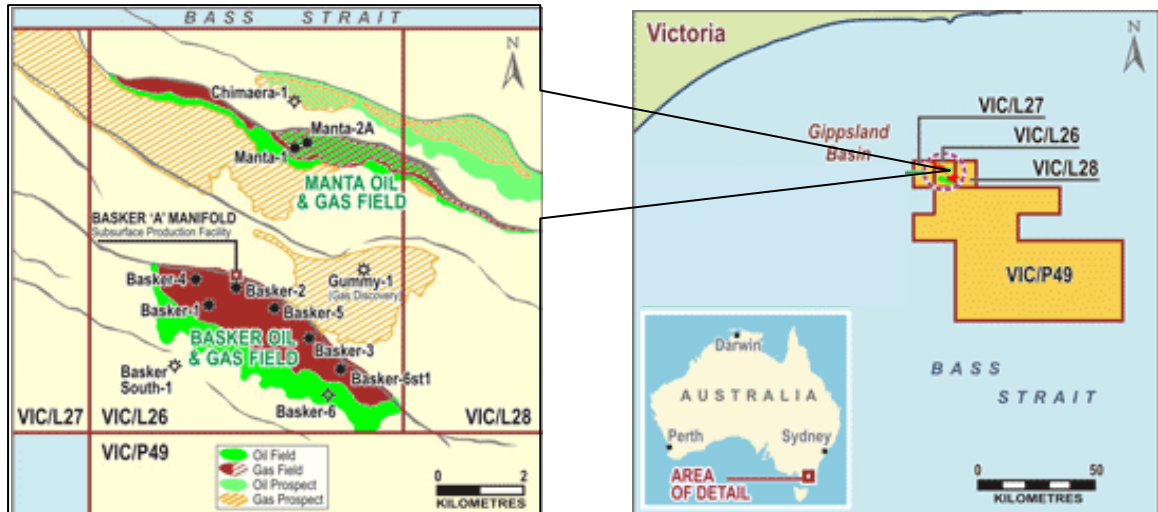
1.1 Project Location

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 (refer **Figure 1-1**). These Licences are administered by the Victorian Designated Authority (DA), the Department of Primary Industries (DPI) on behalf of the Australian Commonwealth Government and cover an area of approximately 2553km² (gross) and 531km² (net) with water depths across the licence areas varying from 135m to 350m (Anzon, 2005).

The coordinates of the BMG Facilities including the *Crystal Ocean* FPSO, *Basker Spirit* Shuttle Tanker, Basker-A Manifold (BAM) (accepting hydrocarbon fluids from the Basker-2, 3, 4, 5 and 7 wellheads), the Manta-2A wellhead and the Basker-6ST1 wellhead are shown in **Figure 1-2**. This figure also shows all associated interconnection flowlines (production and gas-lift) and the gazetted Petroleum Safety Zones and Cautionary Area for the Development.

The BAM is located approximately 1.5km south of the FPSO mooring location, the Manta-2 wellhead is located approximately 1.5km north-east of the FPSO mooring location and the Basker-6ST1 well is located approximately 4.5km south of the FPSO mooring location and 3km south of the existing BAM.

Figure 1-1: BMG Field Location



1.2 Project Scope

The BMG field has been developed on a stand-alone basis through the use of a Floating Production, Storage, and Offloading (FPSO) vessel since December 2006. Under the BMG Full Field Development (FFD) phase of the project, the Basker-2, Basker-3, Basker-4 and Manta 2A production wells were drilled and connected via manifolds and subsea flowlines to the FPSO, *Crystal Ocean*.

The Basker-6ST1 well was drilled, completed and tied into the production facilities via the BAM during 2008. Successful drilling in mid-2009 of the Basker-7 well (50m west of the BAM and within the existing gazetted Petroleum Safety Zone) has seen the flowline tie-in of this well into the BMG production system. Basker-7 was commissioned as a production well through the *Crystal Ocean* FPSO during December 2009. A field schematic of the BMG Development is provided in **Figure 1-3**.

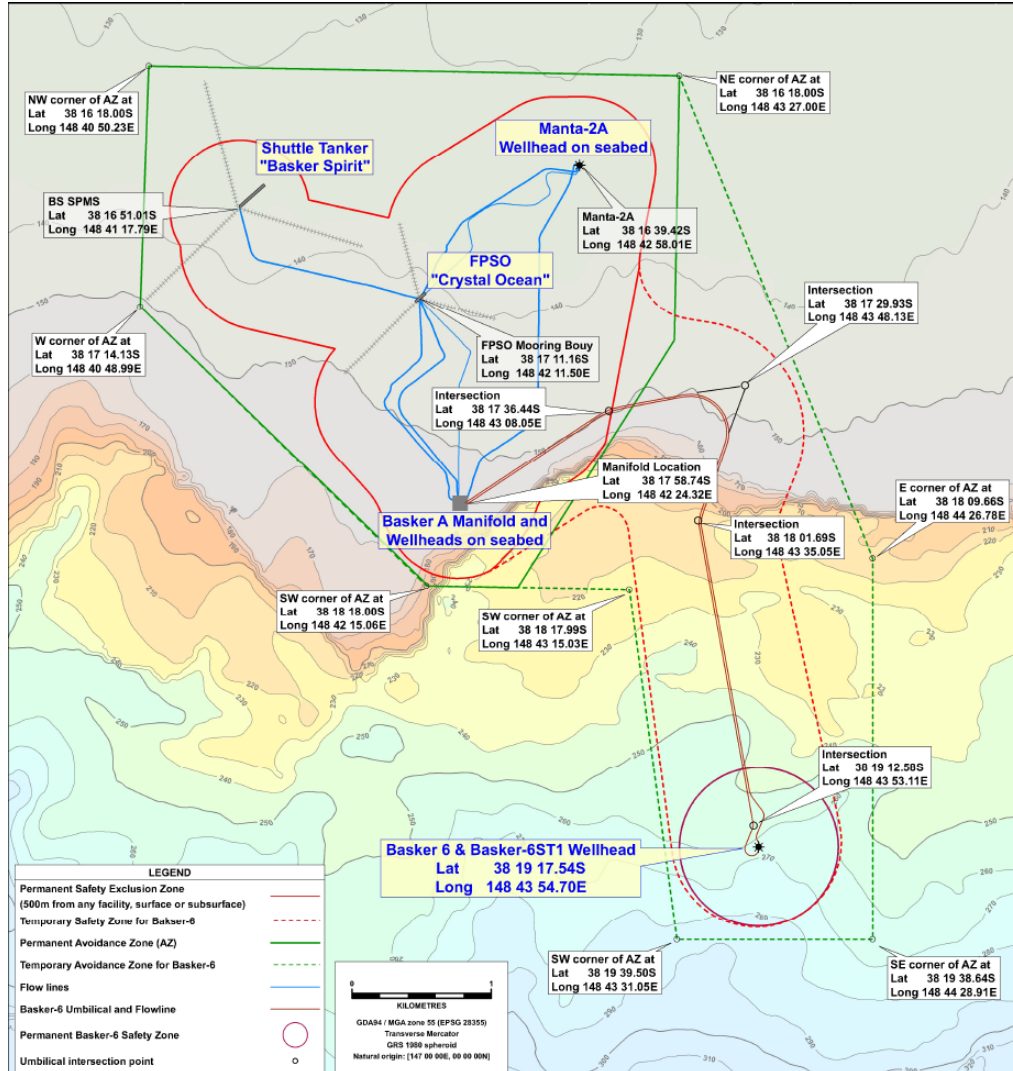
The FPSO *Crystal Ocean* separates oil, gas and water, fully stabilises the oil, treats and discharges produced water, and transfers the stabilised oil to the shuttle tanker *Basker Spirit*, moored approximately 1.5km to the north-west. The recently installed Flare Gas Compressor (FGC) together with the existing Reinjection Gas Compressor (RGC) recover associated gas from the oil processing facilities, recompress and reinject back into underlying host reservoirs.

The *Basker Spirit* periodically disconnects from its mooring and transports the stabilised crude to a nearby refinery or tank-farm. While the shuttle tanker is disconnected (for approximately three to four days) crude oil continues to be produced into storage tanks on the FPSO.

A support vessel carries out supply operations to the FPSO and shuttle tanker every 2 – 3 weeks. The supply base for the vessel is Wharf 27, Port of Melbourne, approximately 22 hours steaming time from the *Crystal Ocean*.

The BMG field commenced production on 17th of December 2006.

Figure 1-2: BMG Field Layout & Coordinates



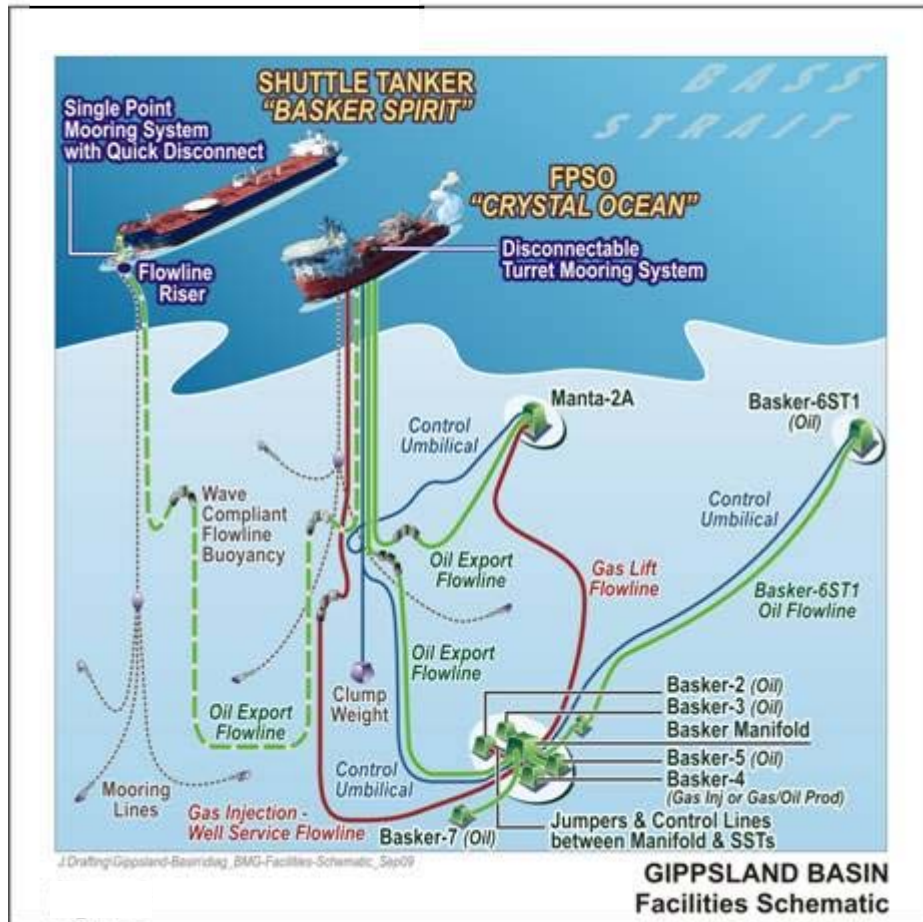
1.3 Future BMG Development Activity

The B6ST1 well is currently shut in, the flowline and control umbilicals currently lie untrenched on the seabed protected from damage by a gazetted temporary Petroleum Safety Zone. Trenching or protection, in a manner satisfactory to local fishing groups, of the the B6ST1 flowline (& associated umbilicals/gas-lift line) to the Basker-A manifold is planned should further production or injection into the well be assessed as economic. In the event that it is not, the flowline will be recovered. In either scenario it is expected that the temporary Petroleum Safety Zone will be removed.

There is also possibility of a Gas Development Project which includes the installation of subsea manifold at Manta-A, two additional Manta and one additional Gummy gas well, a new FPSO (eliminating the current two production vessels) and a high pressure gas pipeline to shore to tie into the Eastern Gas Pipeline (EGP).

These activities will be the subject of further regulatory approvals.

Figure 1-3 Field Schematic





2 Description of the Receiving Environment

2.1 Environmentally Sensitive Locations

The BMG facilities are located approximately 100km east from the East Gippsland Commonwealth Marine Reserve in the South-east Marine Region. This marine reserve has been identified in this region as an area for marine protection. It is characterised by a continental slope with deeply incised submarine canyons (such as Bass Canyon) on the eastern margin of Bass Strait and has important productivity characteristics and unique oceanography. The BMG fields are geologically located below the steeply incised edge of the Bass Canyon. The Manta field lies below the gently dipping Gippsland Shelf, 2.5km north of the canyon escarpment.

The closest landfall to the Basker Manta field is Cape Conran, located 53km 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 located around the 400km² *Gippsland Lakes* waterways. No mangrove forests, coral reefs or extensive wetland lagoons lie along the exposed coastline.

2.2 Bathymetry & Seabed Conditions

The infrastructure components associated with the BMG Development are located as follows:

- The majority of the BMG Development (including the FPSO, shuttle tanker & BAM facilities) is located on the nearly flat sea-floor in the relatively shallow water of the continental shelf, to the north of the Bass Canyon. Water depths in the vicinity of the BMG FFD sea-floor facilities range from 130.5m in the north of the Licence area to approximately 155m at the BAM in the south;
- The Basker-6ST1 well, located approximately 4.5km south of the existing FPSO location, extends over the edge of the Bass Canyon scarp. Surveys indicate the seabed at the B6ST1 well (water depth - 263m) consists of silty sand and is featureless and undisturbed. The seabed is very slightly undulating but remains smooth with gradients no greater than 2° (1:30).

The seabed along the Basker-6ST1 flowline route falls into three broad sections:

- Below the scarp: The seabed appears smooth and featureless but gently undulating and is composed of clayey, silty fine sand.
- At the scarp: Depth varies from 150m to 213m with seabed sediments comprising of predominantly clayey, silty fine sand, and expected to have a relatively high gravel, cobble and shell fragment content.
- Above the scarp: The seabed consists of predominantly sandy, silty clay, possibly with thin cemented horizons and thin layers of sand and gravel.

Surveys have concluded that there are no potential items of debris or other anomalous seabed features along the flowline route.



2.3 Fauna

Both resident and migratory fauna, including fish, sharks, seals, sea lions, and cetaceans have been observed in the vicinity of the BMG fields. Up to 11 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 Licence area 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 Database in the vicinity of the BMG 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 BMG area, however due to the lack of suitable roosting and breeding habitats for these species in the area they are not expected to be present for extended periods of time.

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 species found include *ophiuroids*, *holothurians*, *decapods* and *pycnogonids*.

2.4 Other Marine Users

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

Commercial fishing methods which predominate in the BMG area include Danish Seine (on continental shelf) and Otter-board Trawl (below the shelf break). Other methods such as long-line and gillnets (sharks) are also used in the general BMG Development area.

3 Major Environmental Hazards and Controls

A risk study has been undertaken for all aspects of the operational activities on the BMG Development in accordance with the requirements of ISO14001, 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 to medium residual environmental risk. Further details of key environmental aspects associated with operational activities are provided in Table 1.

4 Environmental Management

AGR-AP, as the responsible party for the BMG Development operations, has taken a systematic approach in identifying and assessing FFD and ODP2 operational activities, their associated environmental risks, and establishing 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 to ensure environmentally responsible management of operational activities. AGR-AP's IMS is certified to ISO 14001 and provides a framework for the management of environment during operational activities. The IMS applies to all employees, contractors and other associated third parties.



5 Consultation Process

Anzon/AGR-AP has consulted with fishery groups, fishing industry groups and regulatory agencies associated with the BMG 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 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 BMG Development which may affect their activities. All practicable effort will be made to minimise impacts.

Continued liaison with the fishery groups will occur throughout the continued BMG development phases. Consultation forums will include:

- Consultative meetings with affected fishery stakeholders (currently LEFCOL, SIV given the deep-water location of the BMG Development) where infrastructure decisions may impact on fishing activities;
- Routine publishing of Fisheries Information Sheets to provide information content to the fishing community on current activities within the BMG Development area. Clear ANZON/AGR contact points for queries and concerns are provided with that literature; and
- Industry forums (e.g. APPEA/SIV) where peak industry bodies can establish industry-wide practices/protocols to be adopted between groups.

6 Contact Details

Further information associated with the environmental aspects of the BMG FFD and ODP2 operational activities may be obtained from ROC by writing to:

David McCall
BMG Production Manager
Roc Oil Company Limited
Level 2, 342 Flinders St
Melbourne, VICTORIA, 3000



Table 1: Summary of Risk Assessment

No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
1	<i>Physical Presence of FPSO, shuttle tanker, subsea facilities & Support Vessels (Marine Fauna impacts)</i>	<ul style="list-style-type: none"> Anchoring disturbs sea-floor - localised loss of fauna & disturbance to local habitat Localised impacts from disconnects on SPM Subsea & manifold structures become an artificial reef Disturbance to marine fauna with altered behaviour 	Minimise impacts to marine mammals	<ul style="list-style-type: none"> Development Footprint minimised as far as practicable; Vessels on DP utilising moorings - anchoring minimised; Environmental awareness program associated with marine impacts for crews; Cetacean Monitoring Program for <i>Crystal Ocean</i> & attendant vessels with reporting to DEWHA; and Adhere to proximity distances in Australian National Guidelines for Whale & Dolphin Watching (DEWHA, 2005). 	Low
2	<i>Physical Presence of FPSO, shuttle tanker, subsea facilities & Support Vessels (Socio-economic impacts)</i>	Hazard to commercial fishing and shipping (obstacle & oil spill potential)	Eliminate incidents which may result in oil spills to marine waters.	<ul style="list-style-type: none"> Petroleum Safety zone gazetted to protect infrastructure; Consultation with commercial fishing Industry undertaken and to continue; Areal footprint & infrastructure minimised as far as practicable; Marine Notices issued (including prohibition for seabed trawling); Emergency Response and SOPEP established, approved and tested; <p>When FPSO is connected:</p> <ul style="list-style-type: none"> Continuous radio and radar watch; Work lights present on FPSO and shuttle; <p>When FPSO is disconnected:</p> <ul style="list-style-type: none"> A security vessel is deployed to site sea-state permitting to protect subsea infrastructure. 	Low



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
3	<i>Physical Presence of FPSO, shuttle tanker, subsea facilities & Support Vessels (Socio-economic impacts)</i>	Disruption of fishing activities (loss of access)	Minimise impacts to commercial fishing industry	<ul style="list-style-type: none"> ▪ Development area minimised as far as practicable; ▪ Fishing plotter information provided to fishing vessels to ensure subsea infrastructure is identifiable; ▪ Infrastructure to be decommissioned and removed in alignment with industry practice at the end of field life in accordance with OPGSSA; ▪ Consultation with commercial fishing industry providing timing and coordinates of activity; and ▪ Navigation charts reflect BMG location. 	Medium
4	<i>Discharge of Produced Formation Water (Normal Operations)</i>	<p>Potentially harmful/toxic discharges to marine environment</p> <p>Changed water quality properties at discharge point (pH, DO, etc)</p> <p>Uptake by fish of trace metals, NORM and organics over field life</p>	Minimise impact on surrounding water quality and marine species	<ul style="list-style-type: none"> ▪ PFW treatment prior to discharge to meet OPGGS(MoE) Regulation discharge constraints; ▪ Water discharge stream continuously monitored; ▪ Oil-in-Water Monitors routinely calibrated; ▪ Independent NATA certified oil-in-water test undertaken to verify results; • In the event of a water quality excursion (i.e. >30mg/l), the following response hierarchy is adopted: <ul style="list-style-type: none"> ○ Water stream diverted inboard or to the Basker Spirit for later import to the <i>Crystal Ocean</i> for reprocessing; ○ production cutback to specific wells; and ○ production shutdown ▪ Small volumes of low environmental hazard chemicals added to PFW stream to assist in oil/water separation. 	Medium



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
4a	<i>Discharge of Produced Formation Water (Commissioning)</i>	<p>Potentially harmful/toxic discharges to marine environment</p> <p>Changed water quality properties at discharge point (pH, DO, etc)</p> <p>Uptake by fish of trace metals, NORM and organics over field life</p>	Minimise impact on surrounding water quality and marine species	<ul style="list-style-type: none"> Activity which could impact on water quality compliance identified and 48hr consent application submitted to DPI Operational controls adopted as per PFW (Normal Operations – above) 	Medium
5	<i>Discharge of Naturally Occurring Radioactive Materials (NORM)</i>	<p>Harmful low-level radioactive discharges to the marine environment</p> <p>Exposure to humans of low-level radioactive materials</p>	Avoid or minimise impact of NORM to the environment and humans	<ul style="list-style-type: none"> No special management action due to the small amount of NORM in PFW and highly dispersive environment; All other wastes containerised and sent onshore for disposal; Radiation survey to confirm exposures & identify high-risk areas in gas processing areas; Train personnel in NORM awareness, management & protection (as necessary); and Establish vessel entry, vessel cleaning and waste management procedures. 	Low
6	<i>Discharge of Cooling Water</i>	<p>Thermal Impacts to Marine Flora/Fauna</p> <p>Chemical/Oil Impacts to Marine Life</p>	Minimise water quality impacts	<ul style="list-style-type: none"> Oil in water meter to detect ingress of oil in cooling water discharge; and Use of Cathelco system, which requires no chemical dosing, to prevent marine growth in cooling water system. Elevated temperature liquid volumes quickly dissipated in the Bass Strait Environment. Localised impact possible 	Low



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7	<i>Discharge of Food-scrap & Sewage</i>	Increase in nutrient/BOD availability Visual amenity impacts Bacterial Impacts to environment/humans	Avoid water quality impacts. Minimise waste	<ul style="list-style-type: none"> • Sewage/grey-water treated though JETS vacuumator • Small volume, rapid dispersion in Bass Strait environment • BOD loading oxidised in marine environment • Water intake on potable water unit shut-in during to sewage discharge • Future installation of disinfection unit for MARPOL Compliance 	Medium
8	<i>Discharge of effluent from Equipment/ Machinery Spaces</i>	Potentially harmful/toxic discharges to marine environment Potential turbidity and BOD reduction if discharged	Avoid water quality impacts	<ul style="list-style-type: none"> ▪ Area contained and collected in bilge tank & slops oil system; ▪ Oily water discharged as per deck drainage; ▪ Residual oil piped through 3-phase separator and reprocessed; and ▪ Chemical storage within spaces minimised. 	Low



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9	<i>Discharges from Deck Drainage</i>	<p>Toxicity impacts to marine flora and fauna</p> <p>Turbidity of waters about discharge point</p> <p>Potential nutrient increases</p>	Avoid water quality impacts	<ul style="list-style-type: none"> ▪ Oil & Chemical Stores banded with no residues/spills permitted to enter the drainage system; ▪ Spill equipment available to remove chemical and oil spills; ▪ At purchasing chemicals are reviewed to ensure availability of MSDS's, spill cleanup materials & storage compatibilities; ▪ Deck drainage flows to the Spill tank; ▪ Oil-in-Water Monitor continuously monitors discharge to 15 mg/l oil-in-water quality when vessel en-route and not on location; ▪ Monitor is routinely calibrated; ▪ NATA certified test to confirm oil-in-water readings routinely undertaken; ▪ Oil residues are piped back to the 3-phase separator and re-processed; and ▪ Washdown detergents are biodegradable. 	Low
10	<i>Discharges of Ballast Water</i>	Species introduction to productive fishery area	Avoid invasion by non-endemic species	<ul style="list-style-type: none"> ▪ Vessel to comply with the Australian Ballast Water Management Requirements (AQIS) on entry to Australian waters; ▪ AQIS clearances; and ▪ Local ballasting only during operations. 	Low



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11	<i>Hydraulic Fluid releases from Subsea Valves</i>	Impact to water quality parameters	Avoid negative effects of marine water quality.	<ul style="list-style-type: none"> ▪ Hydraulic fluid selected to operate valves is low toxicity (OCNS Group D), readily biodegradable, does not bioaccumulate and is water soluble; and ▪ Small volumes released on an infrequent basis. 	Low
12	<i>Storage & Disposal of Environmentally Hazardous and General Wastes</i>	<ul style="list-style-type: none"> ▪ Toxicity and physical impacts to marine flora and fauna ▪ Visual Pollution to the marine environment 	<p>Avoid negative effects of marine water quality.</p> <p>Minimise wastes</p>	<ul style="list-style-type: none"> ▪ Wastes minimised as part of job planning; ▪ Wastes segregated, containerised and labelled; ▪ Wastes storage areas are covered and banded; ▪ All Environmentally Hazardous and General waste returned to shore for disposal; ▪ No waste overboard policy; ▪ All personnel are trained in waste management requirements; and ▪ Storage areas are regularly inspected. 	Low
13	<i>Emissions from Combustion Sources (Includes: Generators, flares)</i>	<ul style="list-style-type: none"> • Inefficient use of hydrocarbon resources 	Maximise Resource Utilisation	<ul style="list-style-type: none"> • Equipment maintenance program tied to condition monitoring • Flaring in accordance with flare approvals • Marine Distillate use monitored 	Low



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
14	<i>Emissions from Combustion Sources (Includes: Generators, flares)</i>	<ul style="list-style-type: none"> Release of Greenhouse Gas Emissions 	Minimise emissions to the atmosphere	<ul style="list-style-type: none"> Development now designed to a 'no flare' policy² Hydrocarbon flaring limited to emergency or startup/shutdown activities Apart from commissioning, transient plant upsets and well management over 24hrs, production will be reduced to reduce flare volumes until upsets have been rectified. TEG overhead flaring minimised to extent practicable (not a hydrocarbon gas stream) Fuel use and flare volume monitored. Addition of FGC not expected to have a substantial impact to fuel consumption onboard <i>Crystal Ocean</i> 	Medium
15		<ul style="list-style-type: none"> Aesthetics of smoke & particulates 	Minimise black smoke to the environment	<ul style="list-style-type: none"> Routine maintenance on all combustion equipment (including flare tip) to maximise efficiency Reduced flare contributing to black smoke incidents Smoke incidents managed in accordance with the Basker-Manta Flaring Procedure (09/HSEQ/ENV/PC05) & associated Work Instruction (09/HSEQ/ENV/PC05/WI01) 	Low
16	<i>Atmospheric Emissions (Ozone Depleting Chemicals)</i>	<ul style="list-style-type: none"> Reduces ozone layer increasing humans to UV exposure Contributes to global warming 	Minimise release of Ozone Depleting Substances chemicals	<ul style="list-style-type: none"> Personnel maintaining system have been appropriately training with protocols to minimise emissions; System to be maintained in accordance with requirements of the Victorian Industrial Waste Management Policy (Protection of the Ozone Layer); and R22 inventory monitoring undertaken. 	Low

² Flare system purge is required to maintain safety within the flare system



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17	<i>Generation of Noise</i>	Disturbance to marine mammals, seabirds and other marine fauna	Minimise risks of adverse impacts of noise on marine fauna	<ul style="list-style-type: none"> • <i>Crystal Ocean</i> and other supply vessels to observe the approach requirements for cetaceans in the Australian National Guidelines for Whales and Dolphin Watching (DEW, 2005); • Cetacean monitoring and report to DEWHA. 	Low
18	<i>Oil Spill (Blow-Out of Wells) (Overall Risk from Development) [Non-Routine]</i>	Potential effects include: <ul style="list-style-type: none"> ▪ Oiling of Seabirds ▪ Fish tainting ▪ Shoreline Pollution ▪ Disruption to fishing activities 	Avoid negative impact of hydrocarbon releases on surrounding water quality.	<ul style="list-style-type: none"> ▪ Approved and tested Emergency Response Plan (ERP) & Oil Spill Contingency Plan (OSCP); ▪ Wells/Subsea equipment manufactured and installed to approved standards; and ▪ SSSV are fail close. 	Low
19	<i>Oil Spill during Fuel Transfer [Non-Routine]</i>	Potential effects include: <ul style="list-style-type: none"> ▪ Oiling of Seabirds ▪ Fish tainting ▪ Disruption to fishing activities 	Avoid impacts on surrounding water quality	<ul style="list-style-type: none"> ▪ Approved and tested ERP & OSCP; ▪ Approved Fuel Transfer procedures; ▪ Transfer hose couplings dry-break. Hoses visually inspected at each transfer and replaced every 2 years; ▪ Transfers during daylight hours under constant visual supervision; ▪ Transfers in calm weather conditions only; and ▪ Overfill protection devices present on Fuel Tanks. 	Medium



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
20	<i>Oil Spill (Export/Flowline Rupture) & Equipment Leak (Overall Risk from Development) [Non-Routine]</i>	<p>Potential effects include:</p> <ul style="list-style-type: none"> ▪ Oiling of Seabirds ▪ Fish tainting ▪ Shoreline Pollution (very low probability) ▪ Disruption to fishing activities 	Avoid impact of hydrocarbon releases on surrounding water quality.	<ul style="list-style-type: none"> ▪ Approved and tested ERP & OSCP; ▪ Crude Export Procedure; ▪ Greenline telemetry system to prevent loss of oil during transfer; ▪ QCDC couplings & export line regularly maintained and tested; ▪ Operation continuously supervised; ▪ Navigation charts reflect anchor prohibition around subsea facilities; ▪ SSSV are fail-close & routinely tested; ▪ Equipment selected and maintained so it is Fit-for-Purpose. 	Medium
21	<i>Oil Spill (Vessels Collision) [Non-Routine]</i>	<p>Potential effects include:</p> <p>Oiling of Seabirds</p> <ul style="list-style-type: none"> ▪ Fish tainting ▪ Shoreline Pollution ▪ Disruption to fishing activities 	Avoid negative impact of hydrocarbon releases on surrounding water quality.	<ul style="list-style-type: none"> ▪ Approved and tested ERP & OSCP; ▪ Dispersant pre-approval; ▪ Shuttle tanker is moored 1.5km away from the FPSO when on location; ▪ Double hull designs for the FPSO and shuttle tanker crude oil tanks; ▪ Adherence to all marine navigation safety requirements and approved safety exclusion zone; ▪ Fishing Vessel plotter upgrade & consultation; • 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; and • Ability to change heading or move off on DP. 	Low



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22	<i>Hazardous Substance Spill as a result of Transportation & Handling by Supply Boat [Non-Routine]</i>	Loss of Chemicals or Waste Materials impacting marine environment	Avoid negative impact on surrounding water quality.	<p>The OSV Code will be observed in the following areas:</p> <ul style="list-style-type: none"> ▪ Cargo handling equipment maintained and operational; ▪ Stowage requirements (including segregation) in accordance with IMDG code; ▪ Containers used are fit-for-purpose, approved for use and labelled; ▪ MSDSs available for all chemicals; and ▪ SOPEP kits provided in appropriate locations. 	Low
23	<i>Discharge of Commissioning Fluids [Non-Routine]</i>	Fluid may contain chemicals that are harmful to the environment	Minimise impact of commissioning and well completion fluids on marine environment	<ul style="list-style-type: none"> • Well completion & pre-commissioning fluids selected which are low-environmental harm • Small volumes of completion and pre-commissioning fluids entering the marine environment • Liquids treated via the <i>Crystal Ocean</i> processing system whereby any hydrocarbons entrained with fluids are recovered to the gas injection and product streams • Water stream treated in the produced formation water system to legislated water quality criteria. • Short duration, once-off activity • Rapid Dispersion in Bass Strait Marine Environment 	Medium



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Operations Environment Plan Summary



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
24	<i>Compressor oil leaks to marine environment [Non-routine]</i>	<ul style="list-style-type: none">• Chemical impacts on marine water quality• Impacts to marine fauna	Minimise impact of non-routine leaks of compressor oil to environment	<ul style="list-style-type: none">• Compressor oil is toxic, biodegradable & non-bioaccumulative• Shutdown system to minimise compressor oil spill volume in the event of a leak in second stage cooler• Small volumes emitted in the unlikely event of a leak• Rapid dispersion and dilution within marine environment	Low