Beehive-1 Exploration Well

Information Flyer #3

28 February 2022

EOG Resources Australia Block WA-488 Pty Ltd, a subsidiary of EOG Resources, Inc. (together 'EOG') is the Titleholder of Exploration Permit WA-488-P in the Joseph Bonaparte Gulf in Western Australia (WA).

EOG is planning to drill the Beehive-1 exploration well ('the project') (Figure 1, over page). The Beehive-1 well is targeting the Sunbird Formation and anticipates the presence of a light crude oil.

Why We're Consulting You

EOG has identified you, your group, organisation or company as a 'relevant person', defined under the Offshore Petroleum and Greenhouse Gas (Environment) Regulations 2009 as someone whose *functions* (power, duty, authority or responsibility), *activities* (things you do or have done) or *interests* (your rights, advantages, duties and liabilities, or concerns) may be affected by the project. Relevant persons typically include Commonwealth, State and Territory government agencies, commercial and recreational fisheries, asset owners and environment groups.

This information flyer aims to introduce you to EOG and provide information about the project and invites you to submit questions or concerns about the project. This process will assist to inform the preparation of the project's drilling Environment Plan (EP), which is currently in preparation for regulatory submission and acceptance.

Who is EOG?

EOG is the one of the largest independent crude oil and natural gas exploration and production companies in the United States of America (USA). EOG acquired the WA-488-P exploration permit from Finniss Offshore Exploration Pty Ltd in November 2021 with the aim of exploring known hydrocarbon prospects in the Bonaparte Basin.

EOG has operated offshore since 1992, a history of 30 years with assets in Trinidad and Tobago, UK North Sea, and the US Gulf of Mexico. In the past 10 years, EOG has drilled nearly 40 offshore wells with an excellent safety and environmental record.

The Project

The Beehive-1 exploration well is situated within Commonwealth marine waters 83 kilometres (km) off the WA coastline and 300 km southwest of Darwin in a water depth of 40 m. Drilling of the Beehive-1 exploration well is the second phase of work following the geophysical and geotechnical (G&G) investigations that are planned to occur over 4-6 weeks between April and August 2022.

This information flyer is focused on the proposed drilling activities. Additional information flyers will be issued as the project progresses.

Drilling Activities

Drilling is planned to occur between Q4 2022 and Q3 2023 (contingent on the receipt of EP acceptance, including drill rig and equipment availability).

Drilling activities are estimated to take approximately 50 to 90 days. The duration of drilling may be subject to change based on geological conditions and potential for operational challenges (e.g., sea state). Operations will be conducted 24 hours per day, seven days per week.

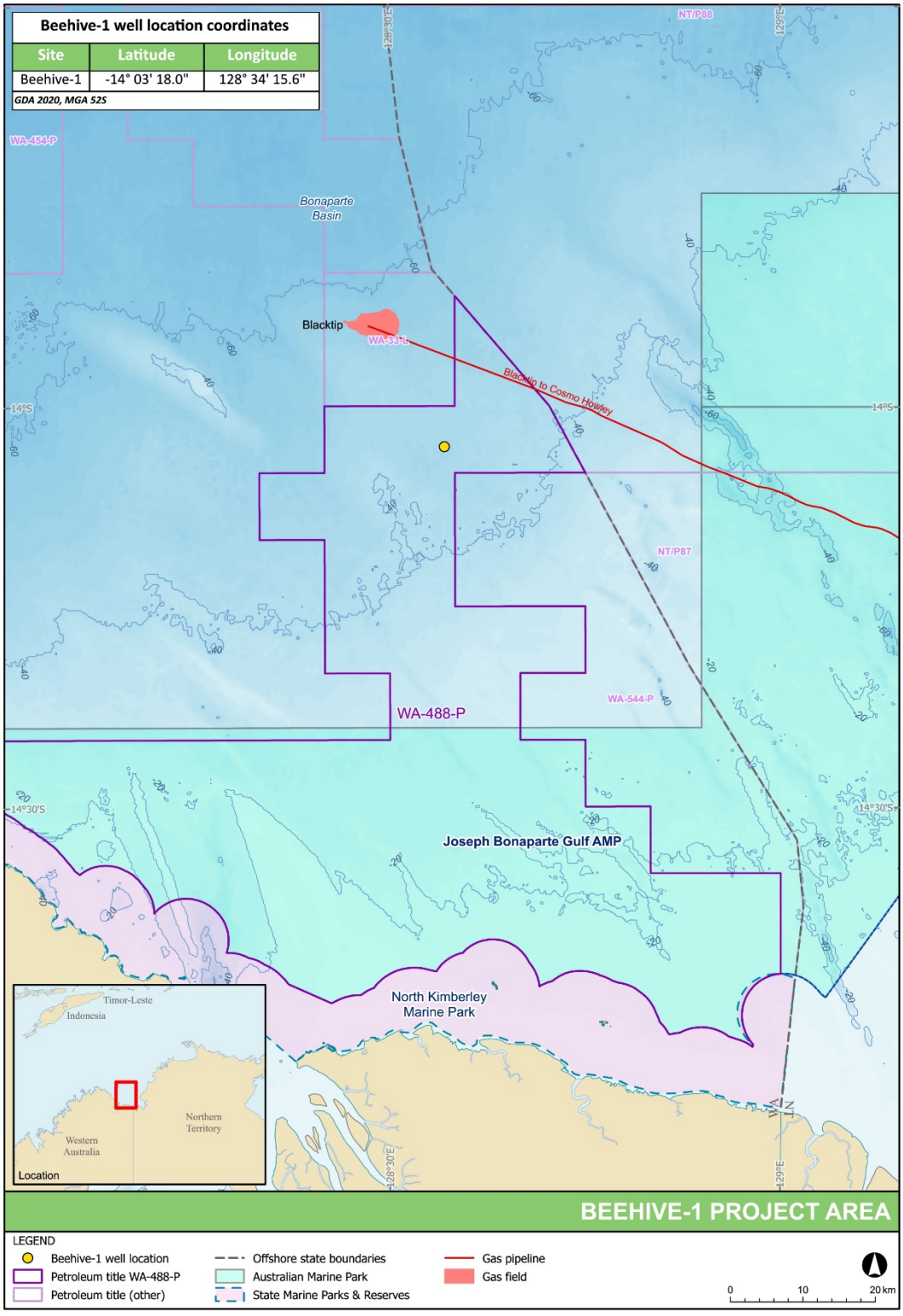

Figure 1. Beehive-1 Location map

Approach and Equipment

EOG proposes to undertake the activity using a jack-up mobile offshore drilling unit (MODU) with a 500 m exclusion zone. There will also be auxiliary activities including the use of support vessels and helicopters.

EOG is currently evaluating the availability of drill rigs for this activity. Further information on the nominated drill rig will be made available as part of EOG's ongoing consultation.

The approach to and setup of the jack-up MODU on location is summarised in Figure 2, over page.

Drilling Program

The following phases describe the planned drilling activity:

- Move the MODU to location, position MODU, pre-load and jack-up to operational elevation.
- Drill conductor hole and run conductor pipe.
- Drill surface hole section.
- Run and cement surface casing.
- Install the surface wellhead and blowout preventor (BOP).
- Perform a pressure test.
- Drill intermediate hole section(s).
- Run and cement intermediate pipe (casing) strings.
- Drill remaining sections to well total depth (TD).
- Run well evaluation program (wireline logging, sidewall cores, vertical seismic profiling [VSP] and possibly a drill stem test).
- Plug and abandon (P&A) or temporarily suspend the well.
- Demobilise the MODU and tow it away.

Environment Plan

Preparation of a Drilling EP is underway. This will be submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment.

The full EP will be made available on NOPSEMA's website for public exhibition prior to formal assessment by NOPSEMA.

The EP is a comprehensive document that describes the project, outlines stakeholder feedback, details the existing marine and socio-economic environment, describes and assesses impacts and risks (see Table 1) and outlines the control measures to avoid, minimise and mitigate environmental impacts and risks to be acceptable and ALARP (As Low as Reasonably Practicable).

The project will be subject to industry best practice standards and undertaken in accordance with all relevant environmental and safety legislation and regulations.

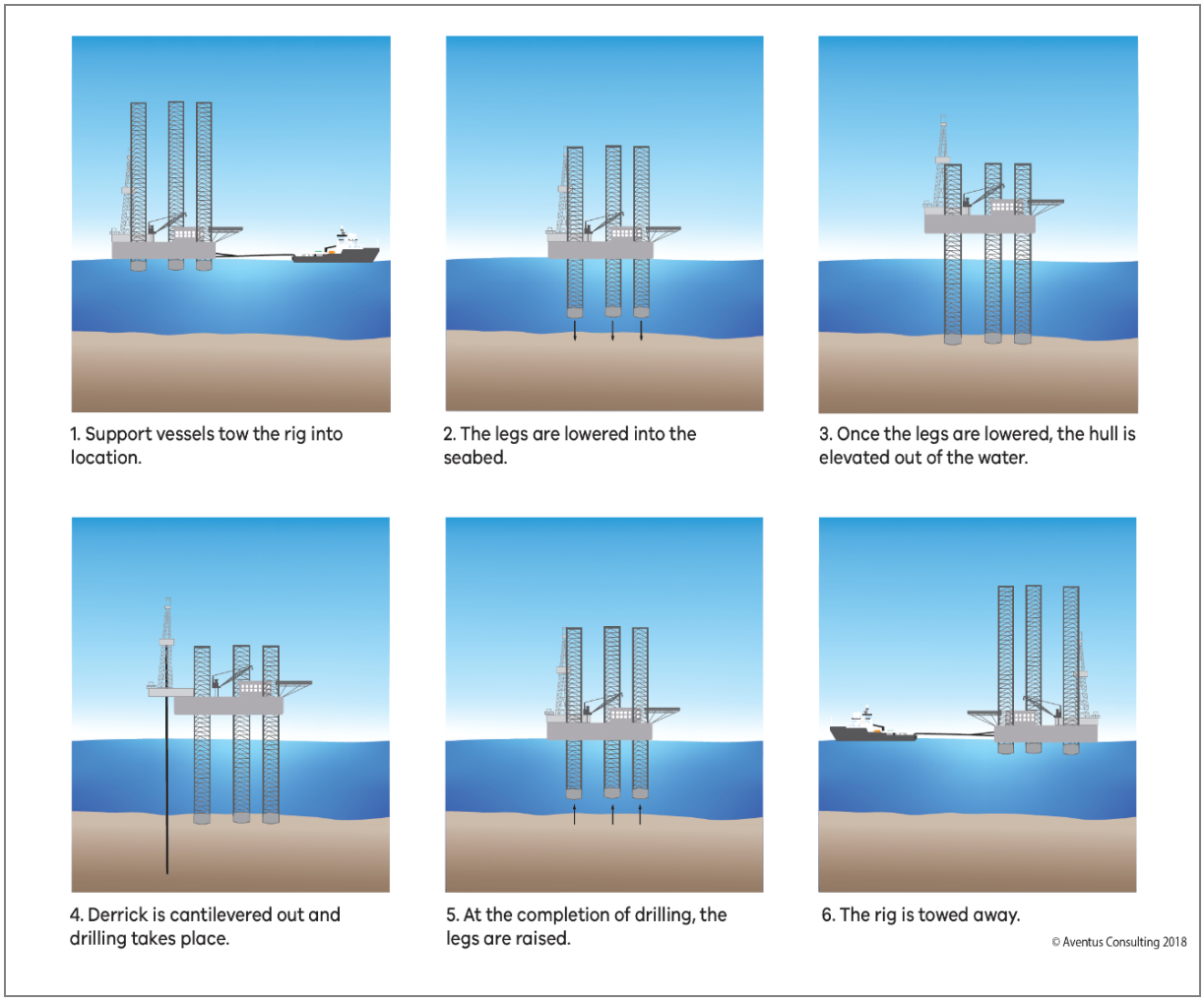

Figure 2. Overview of the jack-up MODU setup

Ongoing Consultation

Consultation with relevant persons will be ongoing throughout the project planning phase, with additional information flyers to be distributed at various milestones.

How to Provide Feedback

EOG encourages you to provide feedback on the project using the following contact details:

Email: australia@eogresources.com

Phone: 0409 772 170

EOG will respond to feedback in a timely fashion.

Additional background project information (and this information flyer) is available on the EOG website at:
https://www.eogresources.com/australia

Table 1. Preliminary environmental impact and risk assessment for Beehive-1 exploration well drilling

Hazard	Potential impacts & risks	Preliminary avoidance, mitigation & management strategies
Planned Events		
Physical presence		
Seabed disturbance	• Physical removal or disturbance of seabed sediments. • Increase in turbidity of the water column near the seabed.	• Seabed disturbance will be kept to the minimum area necessary for safe operations. • Procedures will be in place to avoid objects being dropped overboard. • If large objects are dropped overboard, they will be retrieved wherever possible.
Displacement of other marine users	• Diversion from a planned travel route and additional time to re-join the planned route. • Increased fuel use (and cost) as a result of this diversion. • Temporary exclusion from fishing grounds.	• The exclusion zone will be reduced to the lowest area possible for safe operations. • The required area of displacement for the duration of the activity will be communicated to commercial fisheries and authorities.
Routine emissions and discharges		
Light	• Light glow may act as an attractant to light-sensitive species, in turn affecting predator-prey dynamics (due to attraction to or disorientation from light). • Continuous lighting may result in localised alterations to normal marine fauna behaviours.	• MODU and support vessel external lighting will be kept to levels required for navigation and safety of deck operations. • Blinds on portholes and windows will be lowered on support vessels at night. • Lighting will be directed to working areas only (i.e., not overboard, unless in an emergency). • The duration of flaring will be kept to the minimum time necessary.
Air	• Localised and temporary decrease in air quality due to emissions from diesel combustion. • Addition of greenhouse gas (GHG) to the atmosphere (influencing climate change).	• Only low sulphur (<0.5% m/m) marine diesel oil will be used. • A planned maintenance system (PMS) will be implemented for combustion equipment. • International Air Pollution Prevention (IAPP) certification will be maintained. • A Ship Energy Efficiency Management Plan (SEEMP) will be in place and implemented. • An Ozone Depleting Substances (ODS) procedure will be in place and implemented. • Waste incineration will be managed in accordance with MARPOL and Marine Orders. • The duration of flaring will be kept to the minimum time necessary. • Fuel use will be monitored for abnormal consumption.

Hazard	Potential impacts & risks	Preliminary avoidance, mitigation & management strategies
Noise	• Behavioural effects to sound-sensitive species (e.g., whales). • Temporary or permanent threshold shift in sound-sensitive species (e.g., whales).	• EPBC Policy Statement 2.1 – Part A (Standard management procedures) will be implemented during VSP activities. • Environmental awareness induction will be provided for all crew. • Vessels and helicopters will comply with EPBC Regulations 2000. • Vessel engines and thrusters will be well maintained.
Drill cuttings and muds	• Localised and temporary increase in total suspended solids in the water column. • Smothering of benthic habitat and fauna. • Alteration of benthic substrate. • Potential toxicity impacts to fauna. • Reduction of visual amenity from turbidity plumes.	• Water-based mud (WBM) will be used for drilling (rather than synthetic- or oil-based muds). • Only low-toxicity additives will be added to the WBM system. • Mud operations will be managed to minimise discharge volumes. For example, shaker screens are used to maximise mud separation prior to overboard discharge.
Cement	• Localised and temporary increased turbidity of the water column. • Smothering of benthic habitat and fauna. • Alteration of benthic substrate. • Potential toxicity impacts to fauna.	• Cement operations will be managed to minimise discharge volumes. For example, once good returns are noted at the seabed, the mixing and pumping of cement will cease and displacement of the string with drilling fluid will begin. • Only low-toxicity additives will be added to the cement system.
Putrescible waste	• Temporary and localised increase in the nutrient content of waters surrounding the discharge point. • An associated increase in scavenging behaviour of marine fauna and seabirds (at the sea surface or within the water column).	• A Garbage Management Plan will be in place and implemented. • Putrescible waste will be treated as per MARPOL Annex V requirements prior to discharge. • Environmental awareness induction will be provided for all crew.
Sewage and grey water	• Increase in the nutrient content of surface waters around the MODU and support vessels. • An associated increase in scavenging behaviour of marine fauna and seabirds (at the sea surface or within the water column).	• Treatment will be via a MARPOL-compliant sewage treatment plant prior to overboard discharge. • The sewage treatment plant will be maintained in accordance with the PMS.
Cooling and brine water	• Increase in sea water temperature, causing thermal stress to marine biota.	• Engines and associated equipment that require cooling by water will be maintained in accordance with the PMS so they are operating within accepted parameters.

Hazard	Potential impacts & risks	Preliminary avoidance, mitigation & management strategies
	• Increase in sea surface salinity, potentially causing harm to fauna unable to tolerate higher salinity. • Potential toxicity impacts to marine fauna from the ingestion of residual biocide and scale inhibitors.	• Only low-toxicity biocide will be used.
Bilge water and deck drainage	• Temporary and localised reduction of surface water quality around the discharge point. • Acute toxicity to marine fauna through ingestion of contaminated water in a small mixing zone.	• All bilge water passes through a MARPOL-compliant oily water system set to limit oily-in-water to <15 ppm prior to overboard discharge. • The oily water system is maintained in accordance with the PMS. • Bunding of hydrocarbons and chemical storage areas. • Shipboard Marine Pollution Emergency Plan (SMPEP) is in place. • Use of non-toxic, biodegradable deck cleaning products. • Spill kits are availability on deck and crew are trained in spill response.
Unplanned Events		
Accidental discharge of waste to the ocean	• Marine pollution. • Acute toxicity to marine fauna through ingestion or absorption. • Injury and entanglement of individual animals (such as seabirds and seals). • Smothering or pollution of benthic habitats.	• Waste is managed in accordance with the Garbage Management Plan. • Recover accidentally discharged wastes or lost equipment. • Chemical lockers are in place and used. • Follow established handling and storage procedures. • All crew are inducted in waste management procedures.
Vessel collision with megafauna	• Injury or death of marine megafauna (e.g., whales, dolphins, turtles).	• Australian National Guidelines for Whale and Dolphin Watching (2017) are implemented by the support vessels. • All vessel crew are inducted in the guidelines. • Incident reporting procedure will be in place.
Introduction and establishment of invasive marine species (IMS)	• Reduction in native marine species diversity and abundance. • Depletion of commercial fish stocks (and associated socio-economic effects). • Changes to conservation values of protected areas.	• A MODU and support vessels already in Australia are likely to be used (reducing the risk of introducing IMS). • An IMS risk assessment will be undertaken. • The International Anti-fouling System (IAFS) Certification will be maintained. • Implement a Biofouling Management Plan and Biofouling Record Book. • Implement a Ballast Water Management Plan. • Incident reporting procedure will be in place.

Hazard	Potential impacts & risks	Preliminary avoidance, mitigation & management strategies
Interference with other marine users	• Damage to third-party vessels in the case of collision. • Damage to or loss of fishing equipment and/or loss of commercial fish catches.	• An Exclusion (Safety) zone will be designated around the MODU. • Navigation equipment and associated procedures will be used, including constant bridge watch. • Crew will be appropriately qualified. • Stakeholder notification process will be in place.

Marine diesel oil spill	• Temporary and localised reduction in water quality.
	• Injury or death of exposed marine fauna and seabirds.
	• Habitat damage where the spill reaches shorelines.
	• Changes to the functions, interests or activities of other users (e.g., commercial fisheries).
		• As per '*Interference with other marine users*.'
		• A bunkering procedure for any at-sea refuelling will be used.
		• Crews will be trained in spill prevention and response.
		• The following plans will be implemented in the event of a spill:
		  ○ SMPEP.
		  ○ Project-specific Oil Pollution Emergency Plan (OPEP).
		  ○ Project-specific Operational and Scientific Monitoring Program (OSMP).

Loss of well containment	• Temporary but potentially widespread reduction in water quality. • Tainting of commercial fisheries species. • Injury and death of species such as seabirds. • Pathological effects on fish larvae and plankton. • Pollution of shoreline habitats such as sandy beaches, mudflats and mangroves.	• Well design (including casing) will be based on geotechnical data and previously drilled wells in the area (i.e., review of offset well data). • Continuous monitoring of mud weight and other mud flow parameters will occur to ensure primary well control barrier is operating as designed. • Blow out preventer (BOP) will be tested and installed before entering the hydrocarbon zone. • Well casing will be pressure tested after drilling prior to drilling ahead. • Well control exercises will be undertaken. • An approved Well Operations Management Plan (WOMP) and Safety Case Revision will be in place. • A blowout contingency plan will be in place. • EOG will be a member of the Australian Marine Oil Spill Centre (AMOSC), who would be called upon to assist in spill response.
Hydrocarbon spill response activities	• Routine and non-routine impacts and risks associated with vessel operations. • Noise disturbance to marine fauna and shoreline species by aircraft and vessels.	• Maintain access to spill response capabilities (including capable personnel and equipment) and implement as required. • An appropriate distance will be maintained from marine fauna during spill response activities.