Purpose and Scope

PTTEP AA is currently in the process of preparing an Environment Plan (EP), to undertake exploration and appraisal drilling activities within exploration permit AC/P54 and retention lease AC/RL7.

The EP is being prepared in accordance with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009. PTTEP AA is planning to submit the EP to the Regulator, the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), in Quarter 2, 2018.

This fact sheet provides an overview of the exploration and appraisal drilling EP, the potential environmental risks and impacts and the associated management controls.

Location

The exploration and appraisal drilling program will be performed within exploration permit AC/P54 and retention lease AC/RL7 (Figure 1). AC/P54 and AC/RL7 are located in the Timor Sea, approximately 240km from the Kimberley coastline of Western Australia, and approximately 700km west of Darwin. The water depths in AC/P54 and AC/RL7 range from 115m to 230m in depth (LAT).

Activity Description

The exploration and appraisal drilling program will involve the drilling, evaluation and abandonment of up to five wells, over the next five years. The proposed exploration wells are targeting prospects that may contain light crude oil and condensate.

The drilling activities will be undertaken by either a semi-submersible moored mobile offshore drilling unit (MODU) or jack up MODU. The MODU will be supported by up to three anchor handling, tug and supply (AHTS) vessels. AHTS vessels and helicopters will transport equipment, supplies and personnel to the MODU during the drilling campaign.

During the drilling program, a 500m radius Petroleum Safety Zone will be established around the MODU, in accordance with the Offshore Petroleum and Greenhouse Gas Storage Act 2006 Chapter 6, Part 6.6 Petroleum Safety Zone. This will restrict vessel access within close proximity of the MODU. The Petroleum Safety Zone for each well will be identified in a Notice to Mariners that will be issued by the Australian Hydrographic Service prior to the commencement of activities.
Timing and Duration
The first exploration well, Orchid-1, is located within the exploration permit AC/P54. The well is scheduled to be drilled, evaluated and abandoned in Quarter 3, 2018, subject to NOPSEMA’s acceptance of the EP. The approximate location of the Orchid-1 well is provided in Table 1.

Table 1 - Approximate location of the Orchid-1 Well.

<table>
<thead>
<tr>
<th>Drilling Location</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orchid-1 Exploration Well</td>
<td>11° 55’ 42.8” S</td>
<td>124° 51’ 52.7”E</td>
</tr>
</tbody>
</table>

The drilling of Orchid-1 is expected to take approximately 35 to 100 days. The exact timing for completion is subject to weather conditions and operational efficiencies.

The results and learnings of the Orchid-1 drilling program will be incorporated into exploration and appraisal well designs for additional wells that may be drilled within AC/P54 or AC/RL7. Once the timing and specific location of the additional wells is confirmed, stakeholders will be provided this information.

Description of the Environment
The exploration and appraisal drilling program is located within the North-west Marine Region (NWMR), one of six marine regions identified under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act). The NWMR extends from the Western Australian/Northern Territory border in the north, to Kalbarri in the south. The region extends from the State waters boundary (3nm from shore), to the edge of Australia’s Exclusive Economic Zone (200nm from shore).

The marine environment of the NWMR is known as being a regionally important area for supporting high biodiversity. The NWMR supports internationally important breeding and foraging grounds for a number of threatened and migratory marine species.

PTTEP AA has undertaken extensive environmental studies, as part of the Company’s commitment to understand and protect the environment. These include:

- A comprehensive 5-year environmental monitoring program following the 2009 Montara incident (including a number of shoals in the vicinity of the AC/RL7 retention lease),
- A marine baseline study for a number of PTTEP AA permits, including the AC/RL7 retention lease and parts of the AC/P54 exploration permit (as part of the Cash Maple Development), and
- Field studies of shoals near the Montara Operations.

These studies have provided PTTEP AA with a better understanding of the existing environment, including the seabed biodiversity and fish communities of shoals within PTTEP AA permits.

The outcomes of many of these studies are currently available on the Commonwealth Department of Environment and Energy website as well as the North West Atlas website (Click here: http://northwestatlas.org/nwa). The outcomes have informed PTTEP AA’s risk and impact assessment and approach to environmental management.

Environmental Risk and Impact Assessment
PTTEP AA has completed an assessment of the risks and impacts that the exploration and appraisal drilling activities could have on the environment. This includes the direct and indirect risks and impacts from routine operations and emergency events. The assessment considered the potential consequences of the impacts, and the likelihood of the impacts occurring. This information is used to select management controls, which aim to mitigate the risks and impacts. The potential risks and impacts and the associated management controls are detailed in Appendix A.

Update of PTTEP AA Activities
PTTEP AA is working on two other key activities:

- **Cash Maple Offshore Project Proposal (OPP):** As a result of the cancellation of the front end engineering design (FEED) contracting process, the date of the OPP submission to NOPSEMA has been pushed back beyond April 2018.

- **Montara Operations EP (Five Year Review):** PTTEP AA is currently conducting a five year review of the Montara Operations EP and is planning to submit the EP to NOPSEMA in Quarter 2, 2018. More information can be found on the PTTEP AA website (www.au.pttep.com).

Contact Us
If you would like further information, have any queries, or if you wish to provide feedback, please do not hesitate to contact PTTEP AA.

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Figure 1 - The location of exploration permit AC/P54 and retention lease AC/RL7.
APPENDIX A: Risk Assessment and Management Controls

The potential risks and impacts, and associated management controls are described below. The risks and impacts are presented by aspect.

**Aspect: Physical Presence**

Interactions with the marine environment, may result from the positioning of the MODU and support vessel movements within the permit and lease areas.

**Potential impacts** include interference with/or exclusion of commercial fishing or shipping vessels, injury and/or mortality to marine fauna from vessel collision, and behavioural impacts to marine fauna and birds.

**Controls**

- A 500m radius Petroleum Safety Zone will be in place around the MODU. This is to ensure restricted and controlled vessel access within close proximity of the MODU in accordance with the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* Chapter 6, Part 6.6 Petroleum Safety Zone.
- Compliance with AMSA Marine Order 30 (Prevention of collisions) 2016 and Marine Order 21 (Safety and emergency arrangements) 2016.
- Support vessels will not travel greater than 8 knots within 250m of a whale shark, or approach one within 30m, in accordance with the Whale Shark Wildlife Management Program No.57.
- Support vessels will not travel greater than 6 knots within 300m of a cetacean and approach no closer than 100m from a whale and 50m from a dolphin, where possible in accordance with EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with Cetaceans.

**Aspect: Invasive Pests - Marine & Terrestrial**

The introduction/translocation of invasive marine and terrestrial pest species can occur as a result of MODU mobilisation, ballast water exchange and support vessel movements.

**Potential impacts** include the displacement of native species (e.g. marine fauna) and a reduction in species biodiversity and ecosystem integrity of the surrounding marine environment.

**Controls**

- Ballast water discharges from the MODU and support vessels will comply with the requirements of the Australian Ballast Water Management Requirements (Version 7) 2017 (as enforced under the *Biosecurity Act 2015*) and the International Convention for the Control and Management of Ships’ Ballast Water and Sediment.
- MODU and support vessels will be in possession of current anti-fouling certificates in compliance with the International Convention on the Control of Harmful Anti-Fouling Systems on Ships (as appropriate to vessel class).
- MODU and support vessels will obtain a Ship Sanitation Control Certificate from the Department of Agriculture and Water Resources in accordance with the International Health Regulations (2005) – Article 39.
- MODU and/or support vessels arriving in Australia from an international port will be required to submit a Pre-Arrival Report (PAR) and be assessed by a biosecurity officer in the first port of arrival in Australia.
- Support vessels will utilise the biofouling risk assessment tool; Vessel Check ([http://vesselcheck.fish.wa.gov.au](http://vesselcheck.fish.wa.gov.au)) and complete the actions required to manage vessels to a low/acceptable risk rating. The Vessel Check tool will be used prior to the vessels first entry into State waters (if an international vessel is used).
Aspect: Atmospheric Emissions

Emissions come from the generation and distribution of power (i.e. combustion of marine diesel oil) and from the flaring of reservoir gas.

Potential impacts include highly localised and temporary changes in air quality, which may have an effect on transient birds.

Controls

- Only minimum volumes of hydrocarbons required for well testing will be flared, and well-testing duration will be reduced as far as possible, in accordance with the World Bank Environmental, Health, and Safety (EHS) Guidelines Offshore for Oil and Gas Development 2015.
- Compliance with MARPOL 73/78 Annex V1: Regulations for the prevention of air pollution from vessels (Regulation 9 and 14) and AMSA Marine Order 97 (Marine pollution prevention — air pollution) 2013.
- Maintenance of MODU and support vessel engines and power generation equipment in compliance with manufacturer’s specifications, to ensure efficient combustion of gas and diesel.

Aspect: Seabed Disturbance

Seabed disturbance may occur as a result of the placement of the MODU mooring system or jack up drilling rig legs, or during a pre-drill geophysical/geotechnical site survey.

Potential impacts include a localised and minor physical disturbance to seabed habitats and communities. No significant benthic communities are known to be located within the AC/P54 and AC/RL7.

Controls

- A pre-drill geophysical/geotechnical site survey will be conducted to determine if there are any surface or subsea drilling hazards or seabed features in the vicinity of each well location.
- A pre-drill geophysical/geotechnical site survey will be conducted to determine if there are any surface or subsea drilling hazards or seabed features in the vicinity of each well location.
- Whilst undertaking borehole seismic surveying or use of of a sub-bottom profiler during daylight hours, pre-start observations will be undertaken along with soft-starts (ramp up) of the airgun array in compliance with defined procedures. Shut-down procedures in the event of a whale or whale shark sighting will be in place. During night time borehole seismic surveying, soft-starts will continue to be implemented.

Aspect: Underwater Noise

A number of activities associated with the exploration and appraisal drilling program have the potential to generate underwater noise. This includes the mobilisation of the MODU, drilling operations, borehole seismic surveying (check shot or vertical seismic profiling), pre-drill geophysical/geotechnical site surveys (e.g. side scan sonar, echo sounders and sub-bottom profilers) and support vessel movements within the permit and lease areas. Borehole seismic surveying involves the use of a cluster of three airguns. This may be conducted once for each exploration well, and is usually limited to a duration of several hours.

Potential impacts include physiological and behavioural disturbance to marine fauna.

Controls

- Support vessels will not travel greater than 8 knots within 250m of a whale shark, or approach one within 30m, in accordance with the Whale Shark Wildlife Management Program No.57.
- Support vessels will not travel greater than 6 knots within 300m of a cetacean and approach no closer than 100m from a whale shark and 50m from a dolphin, where possible, in accordance with EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with Cetaceans.
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- Whilst undertaking borehole seismic surveying or use of of a sub-bottom profiler during daylight hours, pre-start observations will be undertaken along with soft-starts (ramp up) of the airgun array in compliance with defined procedures. Shut-down procedures in the event of a whale or whale shark sighting will be in place. During night time borehole seismic surveying, soft-starts will continue to be implemented.
**Aspect: Routine Domestic Discharges**

Routine domestic discharges refers to the discharge of treated sewage, greywater and putrescible waste. Discharges will arise from the MODU and support vessels.

**Potential impacts** include temporary reduction in water quality, which can lead to physiological effects on marine fauna.

### Controls

- Compliance with MARPOL 73/78 Annex IV – Prevention of Pollution by Sewage from Ships and AMSA Marine Order 96 (Marine pollution prevention — sewage) 2013.

- Compliance with MARPOL 73/78 Annex V – Prevention of Pollution by Garbage from Ships.

- Compliance with the World Bank EHS Guidelines for Offshore Oil and Gas Development 2015 with respect to sewage and putrescible waste.

- Preventative maintenance will be undertaken on the sewage treatment facility and food macerator as per manufacturer’s specifications.

### Bilge and slops

- Oil water from bilge machinery spaces and contaminated deck drainage from bunded areas on the MODU will be treated prior to discharge via an oil-water separator in accordance with MARPOL Annex I requirements (<15 ppm [vol] oil-in-water).

**APPENDIX A - Exploration and Appraisal Drilling EP**

**Aspect: Routine Operational Discharges**

Routine operational discharges refers to the discharge of cooling water, brine, drill cuttings and drilling fluids, cement and other wastes. Discharges will arise from the MODU.

**Potential impacts** include temporary reduction in water quality, which can lead to physiological effects on marine fauna.

### Controls

#### Cooling water and brine

- The desalination system will be maintained in accordance with the manufacturer’s specification.

- Compliance with the OSPAR Harmonised Mandatory Control Scheme for the use and discharge of offshore chemicals in accordance with the Offshore Chemical Notification Scheme, if relevant.

#### Drilling fluid and drill cuttings

- Compliance with defined effluent levels for drilling fluids and cuttings as described in the World Bank EHS Guidelines for Offshore Oil and Gas Development 2015.

- Compliance with the OSPAR Harmonised Mandatory Control Scheme for the use and discharge of offshore chemicals in accordance with the Offshore Chemical Notification Scheme.

- Excess water based mud (WBM) will be mixed to low concentrations and discharged in the high current (e.g. turn of tide) to maximise dispersion.

- If synthetic based muds (SBM) are used, a closed loop mud system will be operated to reduce the residual amount of SBM cuttings discharged overboard (<10% synthetic fluid on cuttings averaged over the hole section). In addition, there will be no planned discharges of whole SBM to the environment.

#### Cement

- Compliance with the OSPAR Harmonised Mandatory Control Scheme for the use and discharge of offshore chemicals in accordance with the Offshore Chemical Notification Scheme.

- The volume of cement required for well control, will be pre-determined and planned to minimise excess volumes. If excess volumes are left, which cannot be passed on to the next operator, downhole disposal is a possible option.
Aspect: Marine Chemical Spill

There is potential for an unplanned release of chemicals used for operational activities to occur during chemical handling, transfer and storage.

**Potential impacts** can include toxic or physiological effects on marine fauna and flora, and accumulation of chemicals in the food chain and loss of biodiversity.

**Controls**

- Secure storage of chemicals in compliance with MARPOL 73/78 Annex III: Prevention of Pollution by Harmful Substances Carried by Sea in Package Form.
- Chemical transfers are only undertaken in suitable weather conditions, as determined by the Offshore Installation Manager (OIM).
- Use of dry-break couplings for hydrocarbons and synthetic based mud transfers.
- Compliance with MODU lifting and transfer procedures.

Aspect: Marine Hydrocarbon Spill

There is potential for an unplanned release of hydrocarbons to occur as a result of a vessel collision, infrastructure failure, or a loss of well control.

**Potential impacts** can include toxic or physiological effects on marine fauna and flora, accumulation of oil in the food chain and loss of biodiversity.

**Controls**

- A 500m radius Petroleum Safety Zone for vessels will be in place around the MODU. This is to ensure restricted and controlled vessel access within close proximity of the MODU in accordance with the Offshore Petroleum and Greenhouse Gas Storage Act 2006 Chapter 6, Part 6.6 Section 6.6 Petroleum Safety Zone.
- Compliance with AMSA Marine Order 30 (Prevention of collisions) 2016. Standard maritime safety procedures for supply vessels including 24 hour watch, radio contact and display correct navigational lights and beacons.
- Fuel transfers to the MODU will be undertaken in accordance with drilling contractor standard operating procedures and only during daylight hours.
- In the event of an unplanned release of hydrocarbon to the environment, the NOPSEMA accepted Oil Pollution Emergency Plan (OPEP) will be initiated.
- Compliance with MARPOL 73/78 Annex I - Regulation 37 – Shipboard Oil Pollution Emergency Plan (SOPEP) for supply vessels with procedures to minimise loss to the environment.

Aspect: Dropped Objects and Waste Management

Solid waste or equipment may be dropped or lost to the marine environment during storage, handling or transfer.

**Potential impacts** include mortality of marine fauna through ingestion or entanglement.

**Controls**

- Compliance with MARPOL 73/78 Annex V – Prevention of Pollution by Garbage from Ships, and AMSA Marine Order 95 (Marine pollution prevention — garbage) 2013.
- Lifting procedures are in place to prevent loss of waste materials or dropped objects.