

PTTEP Australasia Montara Operations Environment Plan (Five Year Review)

Fact Sheet - January 2018



PTTEP Australasia (Ashmore Cartier) Pty Ltd (PTTEP AA) is a wholly-owned subsidiary of PTTEP, the Thai national petroleum exploration and production company.

Purpose and Scope

The *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* require Environment Plans (EPs) to be revised and resubmitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) every five years. PTTEP AA has reviewed its Montara Operations EP, and will be submitting the revised EP in Quarter 2, 2018.

This factsheet provides an overview of the Montara Operations EP, the potential environmental risks and impacts, and the associated management controls.

The scope of the EP is the petroleum activities within Production Licenses AC/L7 and AC/L8.

Location

The Montara Operations are located within Production Licenses AC/L7 and AC/L8 in the Timor Sea, approximately 690km west of Darwin, 630km north of Broome and 250km from the nearest coastline (see Figure 1). The water depth is approximately 77m (LAT).

Montara Operations

The Montara Operations involve the production of oil from the Montara, Swift, Skua and Swallow fields. Production commenced in 2013 with an anticipated 12 year life span. Production will decline over the life of the project, as is typical for offshore oil field developments.

In 2017, PTTEP AA drilled an additional production well within the Montara field. The production drilling is detailed in the Montara Production Drilling EP Summary, which is available on the NOPSEMA website (Click here: <https://www.nopsema.gov.au/assets/epdocuments/A570340.pdf>).

Activity Description

The Montara Operations involve the extraction of oil from subsea production wells. The oil is transported via subsea flowlines to an unmanned Wellhead Platform (WHP) and then to the Montara Venture Floating Production Storage and Offloading (FPSO) facility. The FPSO has an operational storage capacity of 750,000 barrels and accommodation space for 58 people. The FPSO is moored in the Montara field for the life of the Project.

On board the FPSO, the production fluids are processed through a three stage separation system into three streams: oil, produced gas, and water. The processed oil is then offloaded to export tankers.

The Montara facilities and infrastructure are maintained to ensure that over the life of the Project, they can perform their intended functions such that risk to personnel, the environment and assets is minimised.

Since production commenced in 2013 the reservoir has declined as expected, resulting in additional reservoir gas and water being produced. However, produced formation water volumes have continued to be within the levels assessed in the original EP, accepted in 2013.

In response to the declining reservoir, the gas reinjection system and gas lift system became operational in August 2016, to maintain the flow of oil from subsea wells and maximise recovery of oil from the reservoir. In addition, a second flowline was commissioned in late 2017, which has increased process stability.

Description of the Environment

The Montara Operations are 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 Australia/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 in the Montara Operations area as part of the Company's commitment to understand and protect the environment. This includes:

- A comprehensive 5-year environmental monitoring program following the 2009 Montara incident,
- A marine baseline study of a number of PTTEP AA permits including those covered by the Montara Operations, and
- Field studies of shoals near the Montara Operations.

These studies have allowed PTTEP AA to have a better understanding of the existing environment including seabed biodiversity and fish communities of shoals near the Montara Operations.

The outcomes of these studies are currently available on the Commonwealth Department of Environment & 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 a systematic review of the risks and impacts that the Montara Operations could have on the environment over the next five years. This includes direct and indirect risks and impacts from routine operations and emergency events. The assessment considered the potential consequence 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.

Overview of PTTEP AA Activities

In addition to the five year review of the Montara Operations EP, PTTEP AA is working on two other key activities:

- *Cash Maple Offshore Project Proposal (OPP)*: PTTEP AA is currently preparing an OPP for the Cash Maple gas field. The proposed project is located within Commonwealth waters, approximately 680km west of Darwin, 700km northeast of Broome and 200km southeast of the Indonesian coastline. PTTEP AA is planning to submit the OPP to NOPSEMA in Quarter 2, 2018.
- *AC/P54 & AC/RL7 Exploration and Appraisal Drilling EP*: PTTEP AA is currently in the process of preparing an exploration and appraisal drilling EP for submission to NOPSEMA in Quarter 2, 2018 with drilling proposed to commence in Quarter 3, 2018.

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.

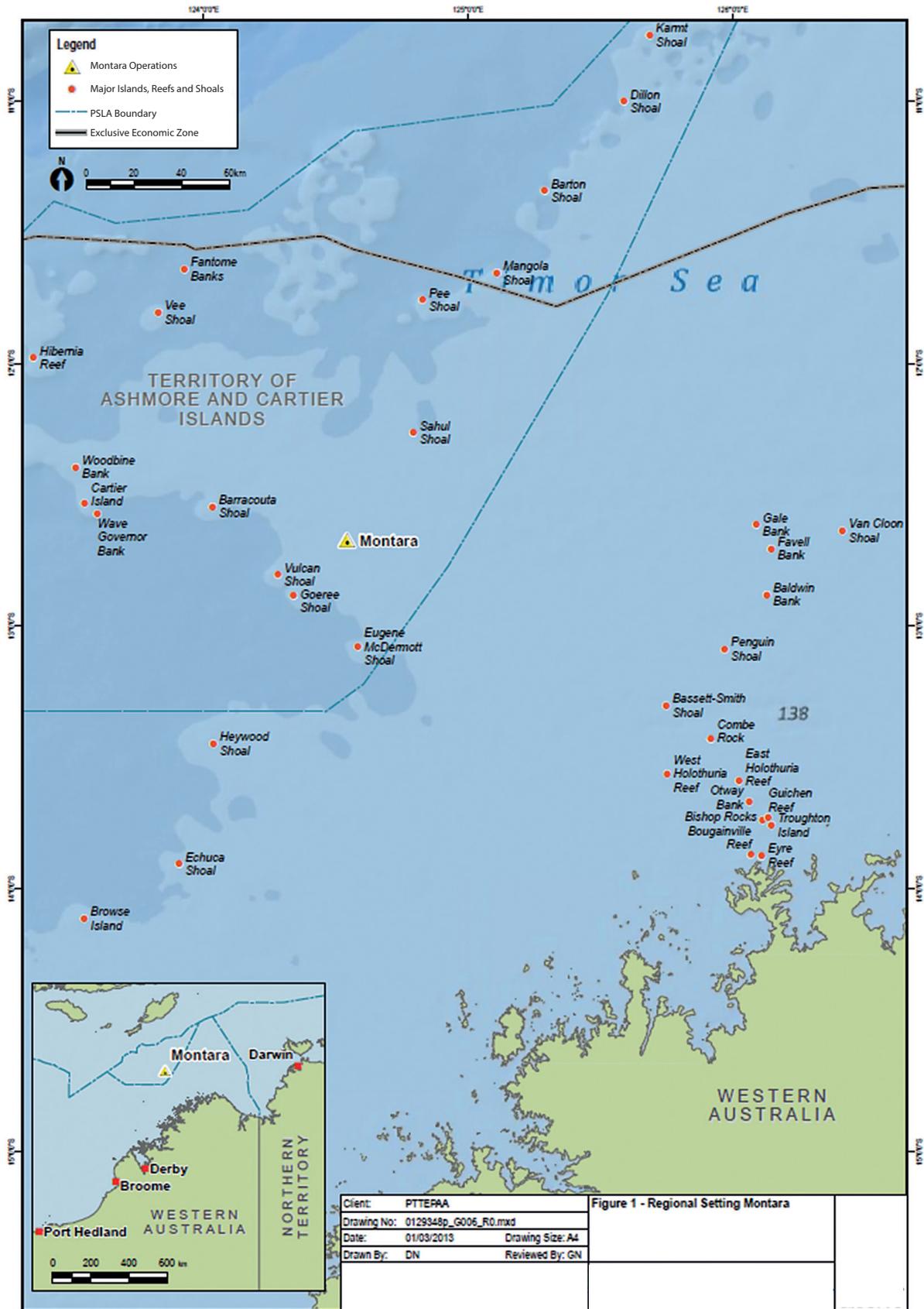
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Regional Location Map

The coordinates for the Montara Well Head Platform are as follows:

	Latitude	Longitude
Montara Well Head Platform	12° 40' 20.5" S	124° 32' 22.2" E



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 between the Montara Operations and the environment may occur as a result of having a physical presence in the project area. Interactions may result from the presence of infrastructure (i.e. the FPSO and WHP) and support vessels moving within the lease area.

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

- Controls**
- A permanent 500m Prescribed Safety Zone for vessels is currently present around the Montara facilities. This is to ensure restricted and controlled vessel access within close proximity of the facilities in accordance with *Maritime Transport and Offshore Facilities Security Regulations 2003 Division 6.5 (Offshore Waterside Restricted Zone)* and *OPGGSA Section 6.6: Petroleum Safety Zone*.
 - Compliance with AMSA Marine Order 30 (Prevention of Collisions) and Marine Order 21 (Safety of Navigational and Emergency Procedures).
 - 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 (DPAW 2013b).
 - 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: Underwater Noise

A number of the Montara Operations activities have the potential to generate noise. This includes the movement of support vessels within the lease area.

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 (DPAW 2013b).
 - 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: Artificial Light

Artificial lighting will be in place on the FPSO, WHP, and support vessels as required for safety and to meet navigational requirements. Flaring is also a source of artificial light - see additional potential impacts and controls for flaring below.

Potential impacts include physiological and behavioural disturbance to marine fauna.

- Controls**
- Lighting levels on the FPSO, WHP and support vessels will be minimised, whilst meeting navigational requirements and safe operational limits.
 - Compliance with the Navigation Act 2012 (Division 2) – Collisions, lights and signals.

Aspect: Invasive Pests - Marine & Terrestrial

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

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

- Controls**
- Ballast water discharges will comply with the requirements of the *Australian Ballast Water Management Requirements (Version 7) 2017* (as enforced under the *Australian Biosecurity Act 2015*).
 - Vessels will be in possession of current antifouling certificates in compliance with the *International Convention on the Control of Harmful Anti-Fouling Systems on Ships* (as appropriate to vessel class).
 - 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. Vessels arriving in Australia from an international port will also be required to submit a Pre-Arrival Report (PAR) and be assessed by a biosecurity officer in the first port of arrival in Australia.

Aspect: Atmospheric Emissions

A number of the Montara Operations activities have the potential to generate atmospheric emissions. Emissions come from the generation of power (i.e. combustion of marine diesel oil) and from the flaring and venting of reservoir gas.

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

- Controls**
- Compliance with MARPOL 73/78 Annex VI: Regulations for the prevention of air pollution from vessels.
 - Inspection, monitoring and maintenance of the WHP and FPSO equipment, including all storage infrastructure, machinery and equipment (e.g. flare equipment, generators, compressors and turbines), will be in line with the manufacturer's specifications, to ensure efficient combustion of gas and diesel.
 - Minimise continuous and non-continuous production flaring and venting of associated gas in accordance with Voluntary Standard for Global Gas Flaring and Venting Reduction (World Bank Group, 2004).
 - Emissions recording and reporting will be carried out in compliance with the National Greenhouse and Energy Reporting Act 2017 and the National Pollutant Inventory (NPI).

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.
 - Waste will be securely stored on support vessels and the FPSO. In addition, bins and skips will have lids.
 - Lifting procedures are in place to prevent loss of waste materials or dropped objects.
 - Equipment transfers are only undertaken in suitable weather conditions as determined by the Marine Supervisor, which reduces the chance of mishaps.

Aspect: Routine Domestic Discharges

Routine domestic discharges refers to the discharge of treated sewage, greywater and putrescible waste. Discharges will arise from the FPSO 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.
 - Compliance with MARPOL 73/78 Annex V - Prevention of Pollution by Garbage from Ships.

Aspect: Routine Operational Discharges

Operational discharges from the FPSO and support vessels may include the discharge of cooling water, brine, oily water from the bilge, and fire fighting foam. In addition, discharges from the Montara Operations includes subsea control fluids, well suspension fluids, produced formation water, hydrotest fluids and corrosion inhibitors/biocides.

Potential impacts include temporary reduction in water and sediment quality, which can lead to toxic effects on marine fauna and benthic habitat.

- Controls**
- Monitoring of produced formation water discharge volumes will be in accordance with the conditions of approval (EPBC 2002/755) under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.
 - Environmental monitoring of seawater and sediment quality will be in accordance with ANZECC/ ARMCANZ (2000) Guidelines for Fresh and Marine Water Quality.
 - Calibration of oil in water monitoring equipment will be in accordance with AS/NZ ISO 9001:2008 Quality Management Systems – Requirements.
 - Compliance with MARPOL 73/78 Annex I – Prevention of Pollution by Oil from Ships.
 - Alignment with recommendation 2001/1 – OSPAR Commission performance standard of dispersed oil in produced water of 30 mg/L (maximum monthly average condition).
 - Cooling water effluent temperature (100m from discharge point) to be no greater than 3°C more than the ambient water temperature in accordance with the World Bank Group Environmental, Health and Safety (EHS) Guidelines – International Finance Corporation.
 - Calibration of oil in water monitoring equipment will be in accordance with AS/NZ ISO 9001:2008 Quality Management Systems – Requirements.

Aspect: Marine Chemical Spill

There is potential for an unplanned release of chemicals used for operational activities to occur as a result of a vessel collision, infrastructure failure or during chemical handling 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**
- A permanent 500m Prescribed Safety Zone for vessels is currently present around the Montara facilities. This is to ensure restricted and controlled vessel access within close proximity of the facilities in accordance with the *Maritime Transport and Offshore Facilities Security Regulations 2003 Division 6.5 (Offshore Waterside Restricted Zone)* and *OPGGSA Section 6.6: Petroleum Safety Zone*.
 - Compliance with AMSA Marine Orders Part 30: Prevention of Collisions. Standard maritime safety procedures for supply vessels including 24 hour watch, radio contact and display of correct navigational lights and beacons.
 - Inspection and monitoring of subsea equipment to ensure the technical integrity of the infrastructure and pipelines.
 - Relevant personnel will have the appropriate qualification and competency in compliance with the *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW95)*.
 - Inspection, monitoring and maintenance of the WHP and FPSO equipment.
 - Secure storage of chemicals in compliance with MARPOL 73/78 Annex III: Prevention of Pollution by Harmful Substances Carried by Sea in Package Form.

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 permanent 500m Prescribed Safety Zone for vessels is currently present around the Montara facilities. This is to ensure restricted and controlled vessel access within close proximity of the facilities in accordance with *Maritime Transport and Offshore Facilities Security Regulations 2003 Division 6.5 (Offshore Waterside Restricted Zone)* and *OPGGSA Section 6.6: Petroleum Safety Zone*.
- Compliance with MARPOL 73/78 Annex 1: Regulation 37 - Shipboard Oil Pollution Emergency Plan (SOPEP) for supply vessels with procedures to minimise loss to the marine environment.
- Compliance with AMSA Marine Orders Part 30: Prevention of Collisions. Standard maritime safety procedures for supply vessels including 24 hour watch, radio contact, and display of correct navigational lights and beacons.
- Inspection and monitoring of subsea equipment to ensure the technical integrity of the infrastructure and pipelines.
- Relevant personnel will have the appropriate qualification and competency in compliance with the *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW95)*.
- Inspection, monitoring, and maintenance of the WHP and FPSO equipment.
- Refuelling will be undertaken by fully trained, certified, and competent personnel. Communication (i.e. radio contact) will be maintained between the FPSO and supply vessels during refuelling operations and refuelling personnel will maintain continuous observation to allow for rapid shutdown of fuel pumps and spill response.
- In the event of a hydrocarbon spill to the environment, the NOPSEMA accepted Montara Operations Oil Pollution Emergency Plan will be initiated.