Bayu-Undan to Darwin Gas Export Pipeline
Production Cessation
ENVIRONMENT PLAN

DCOM-652-EN-EPP-00001

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Revision History

Revision	Date	Description	Preparer & Title	Reviewer & Title	Approver & Title
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Authorisations

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Position title	Name	Signature	Date
ABU-W VP Operations, Drilling & Supply Chain	David Boyle	D Boyle.	10/7/19.
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Bayu-Undan Decommissioning Project Manager	Dave Fillman Jr	Dave Fillman	09/07/2019
Bayu-Undan Decommissioning Project HSE Lead	Norman Scott	N Scott	5 July 2019

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1. INTRODUCTION

1.1 OVERVIEW

ConocoPhillips Pipeline Australia Pty Ltd (COPPA) is the operator of the existing Bayu-Undan to Darwin Gas Export Pipeline (herein referred to as the Pipeline) in the Timor Sea. The Pipeline transports dry natural gas export from the Bayu-Undan Field located in Timor-Leste waters to the Darwin liquefied natural gas (DLNG) Plant near Darwin, Northern Territory (NT), Australia. The Pipeline has been in operation since 2005.

The Bayu-Undan Field is approaching the end of its commercially productive life. In anticipation of the end of Bayu-Undan production, the DLNG infrastructure owners are currently assessing multiple options to backfill the facility's existing LNG train. One option for new supply of feed gas from 2023 is connection of a new upstream gas supply at Kilometre Point (KP) 380 (**Figure 1-1**). Accordingly, COPPA is preparing to decommission the Pipeline between the Bayu-Undan Field (KP0) and the future location of a tie-in valve skid (KP380) for an upstream party to connect to. In preparation for decommissioning of this section of the Pipeline, COPPA intends to cease production, isolate the Pipeline upstream of KP0 and at KP380, cut and remove sections of the Pipeline at KP380 and install either an end cap or an upstream skid with pig launcher/receiver (PLR) at KP380. Once these activities are completed, the Pipeline section KP0 to KP380 will be retained in place on the seabed, pending a subsequent decommissioning program and Environment Plan submission. These activities, including retention of the Pipeline in place, are referred to as Production Cessation.

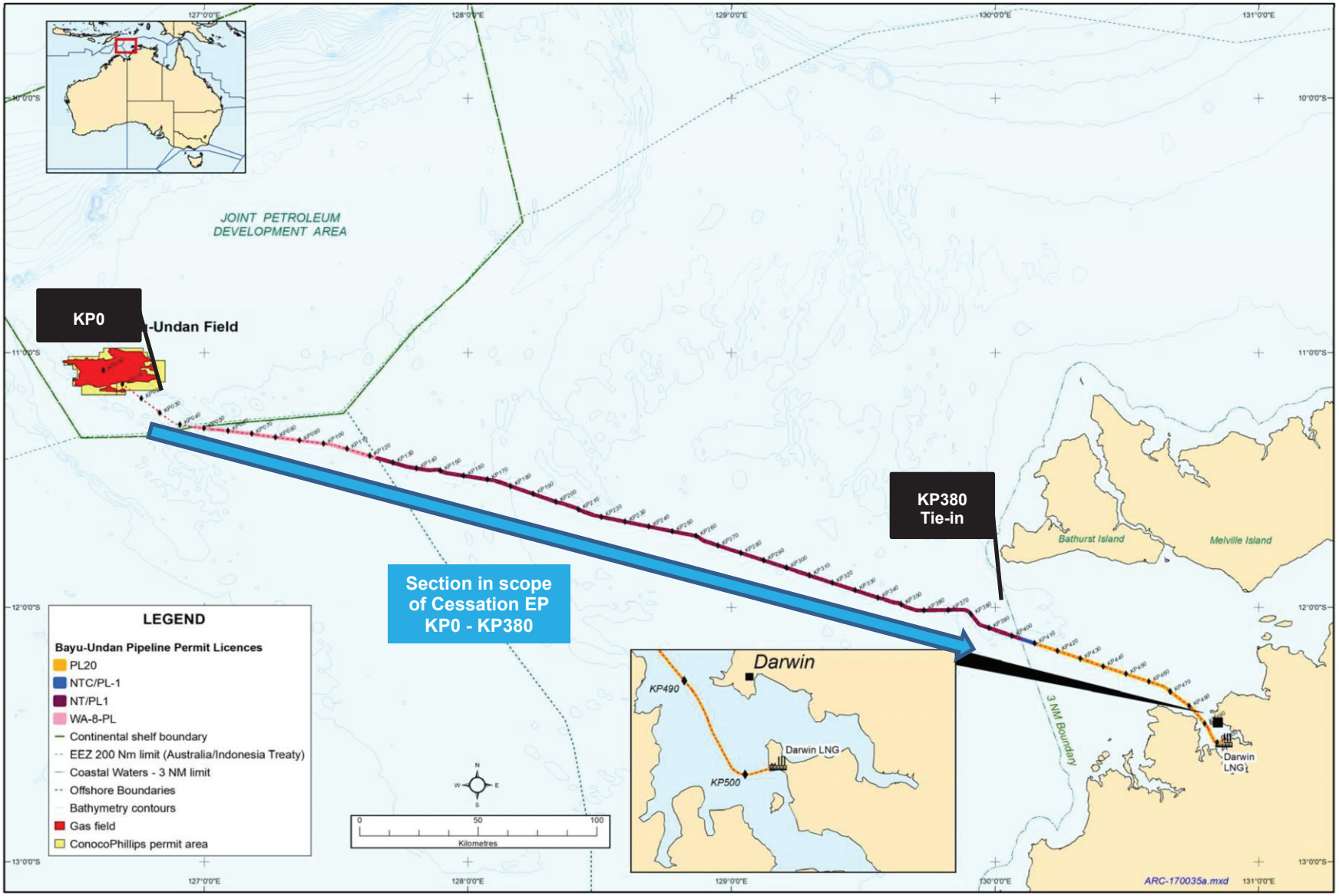


Figure 1-1: Location of Production Cessation Activities

1.2 SCOPE

The Petroleum Activity in this Environment Plan (EP) consists of Production Cessation activities associated with the Pipeline between KP0 and KP380. The activities within the scope of this EP are described in **Section 3** and comprise:

- Temporary isolation of the Pipeline upstream of KP0 and at KP380 (upstream and downstream of the section of pipeline that will be removed);
    - the temporary isolation immediately downstream of the cut at KP380 will remain in place pending commencement of the tie-in valve skid campaign leaving a section of pipeline temporarily open to sea;
- Cutting and removal of approximately 100 m section of the Pipeline at KP380;
- Installation of a mechanical connector and end cap or PLR skid upstream of the cut at KP380;
- Retention of the isolated and water-filled Pipeline section KP0 – KP380 on the seabed pending final decommissioning authorisation.
- In the event of a split campaign, a mechanical connector and end cap will also be installed on the downstream end of the cut pipeline. A split campaign would see separate campaigns for the initial isolation and cutting of the pipeline and a second campaign to install the tie-in valve skid.

The activities within this EP will take place within an Operational Area, which is defined as a 500 m buffer around the Pipeline between KP0 and the isolation location at KP380. The EP considers both planned and unplanned (including accidents and emergencies) environmental impacts and risks that may credibly occur as a result of these activities.

Production Cessation activities for the Pipeline section KP0 – KP380 will occur after the end of Bayu-Undan field life, which may occur between 2021 and 2023, prior to final decommissioning. It is anticipated that this production cessation activity will take place as a 4 – 6 week subcomponent of an approximately 12-week campaign, or as the initial 4 – 6 week phase of a split 12 week campaign after end of Bayu-Undan field life. Campaign activities on the downstream end of the cut pipeline at KP380 will be the subject of a separate EP.

The EP is intended to be assessed against the requirements of the Commonwealth *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (OPGGS(E) Regulations 2009). This EP is a new submission; it is not a revision of the accepted Bayu-Undan to Darwin Gas Export Pipeline Operations Environment Plan (ALL/HSE/PLN/024). Unless otherwise stated, all references to an EP contained herein refer to this document.

The Treaty Between Australia and the Democratic Republic Timor-Leste Establishing Their Maritime Boundaries in the Timor Sea (the Treaty) was signed in March 2018. Once ratified, this Treaty will transfer exclusive jurisdiction of the Pipeline to Australia (and hence the National Offshore Petroleum Safety and Environmental Management Authority's (NOPSEMA's) regulatory jurisdiction). This EP has been premised on the Treaty being ratified (i.e. NOPSEMA having regulatory jurisdiction over the Pipeline within Timor-Leste and Commonwealth waters). Refer to **Section 2.2** for further information about the Treaty. Activities within the scope of this EP within Timor-Leste waters consist of the retention of the Pipeline on the seabed.

The activities to isolate the Pipeline upstream at KP0 may be undertaken from the Bayu-Undan Central Production and Processing (CPP) complex. Activities at the Bayu-Undan CPP are beyond the scope of this EP and are within Timor-Leste's jurisdiction. The environmental impacts and risks of activities at Bayu-Undan facilities are managed under the Bayu-Undan Operations Environmental Management Plan (BU/HSE/PLN/006), which has been approved by the Timor-Leste Autoridade Nacional do Petróleo e Minerais (ANPM) under applicable regulations.

Following Production Cessation, the Pipeline will be decommissioned. All activities associated with decommissioning are beyond the scope of this EP and will be addressed in a subsequent EP which will be submitted at a later date.

Also, all downstream activities associated with installation of the tie-in valve skid from the point at which the Pipeline is cut and isolated at KP380 are beyond the scope of this EP and will be addressed in a subsequent EP at a later date.

Vessel activities outside the Operational Area (e.g. transits to and from port) are beyond the scope of this EP.

This EP may be in force for up to five years from the date it is accepted by NOPSEMA. COPPA will notify NOPSEMA when the EP has ended in accordance with regulations 25A and 29 of the OPGGS(E) Regulations.

1.3 PURPOSE AND OBJECTIVE

The purpose of this EP is to:

- provide a plan that meets the relevant requirements of:
  - the Commonwealth OPGGS(E) Regulations 2009, as administered by NOPSEMA; under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGS Act)
  - the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) in Commonwealth waters, as administered by NOPSEMA[1]; including relevant management and recovery plans and conservation advice for Matters of National Environmental Significance (MNES) and Commonwealth Marine Reserves Network Management Plans;
  - international agreements, conventions, guidelines and codes of practice; and
  - COPPA's Health, Safety and Environmental Management System (HSEMS).
- provide the workforce with a document that details how the Petroleum Activity is to be undertaken to reduce the potential environmental impacts and risks to a level that is 'as low as reasonably practicable' (ALARP) and acceptable.

Refer to **Section 2** for relevant requirements of these pieces of legislation in relation to the Petroleum Activity. Additional relevant requirements are provided in **Appendix A**.

1.4 STRUCTURE OF THE ENVIRONMENT PLAN

As outlined above in **Section 1.3**, this EP is intended to meet the requirements of the Commonwealth OPGGS(E) Regulations 2009. The structure of the EP in relation to the OPGGS(E) Regulations 2009 is provided in **Table 1-1**.

A table summarising the content of the EP in accordance with template and instructions provided by NOPSEMA's *Environment Plan Summary Statement Form (N-04750-FM1848 Rev 0)* is provided in **Table 1-2**.

Table 1-1: EP content in relation to Division 2.2A and Division 2.3 of the OPGGS(E) Regulations 2009

Environment Plan Section	EP Section Reference	OPGGS(E) Regulations 2009
Introduction	**1**	Not applicable
Overview	**1.1**	6 – Accepted environment plan required for an activity
Scope	**1.2**	7 – Operations must comply with the accepted environment plan 10A – Criteria for acceptance of environment plan 13(1) Environmental assessment – Description of the activity

[1] As of 28 February 2014, NOPSEMA has been endorsed as the sole environmental regulator for petroleum activities in Commonwealth waters. This is the result of arrangements intended to streamline environmental regulation of petroleum activities in Commonwealth waters.

Environment Plan Section	EP Section Reference	OPGGS(E) Regulations 2009
		29(1) & 29(2) – notifying start and end of activity
Purpose and Objective	**1.3**	10A – Criteria for acceptance of environment plan
Structure of the Environment Plan	**1.4**	Not applicable
Description of Titleholder	**1.5**	15(1), 15(2) & 15(3) – Details of titleholder and liaison person
Environmental Legislation and Other Requirements	**2**	13(4) Environmental assessment – Requirements **Appendix A**
Description of the Activity	**3**	13(1) Environmental assessment – Description of the activity
Description of the Environment	**4**	13(2) & 13(3) Environmental assessment – Description of the environment
Description of Environmental Risks and Impacts	**5**	13(5) & 13(6) Environmental assessment – Evaluation of environmental impacts and risks
Environmental Performance Outcomes, Performance Standards and Measurement Criteria	**6**	13(7) Environmental assessment – Environmental performance outcomes and standards
Implementation Strategy	**7**	8(1) Operations must not continue if new or increased environmental risk identified; 14(1), 14(2), 14(3), 14(4), 14(5), 14(6), 14(7), 14(8A), 14(8B), 14(8C), 14(9) & 14(10) – Implementation strategy for the environment plan 16 – Other information in the environment plan 26(4) & 26(6) – Notifying reportable incidents 26A (4) & 26A(5) – Written report of reportable incidents 26B(4) – Reporting recordable incidents 26C(1) – Reporting environmental performance
Stakeholder Consultation	**8**	11A Consultation with relevant authorities, persons and organisations, etc. 14(9) – Implementation strategy for the environment plan 16 – Other information in the environment plan
Oil Pollution Emergency Plan (OPEP) (DCOM-652-EN-OPE-00001)	**N/A**	14(8), 14(8AA), 14(8D) & 14(8E) – Implementation strategy for the environment plan

Table 1-2: EP Summary Table

EP Summary Material Requirement	Relevant Section of EP containing EP Summary Material
The location of the activity	**Section 3.2** and **Figure 3-1**
A description of the receiving environment	**Section 4**
A description of the activity	**Section 3**
Details of the environmental impacts and risks	Risk assessment methodology – **Section 5.2** Assessment of planned impacts – **Section 5.3** Assessment of unplanned risks – **Section 5.4**
The control measures for the activity	Assessment of planned impacts – **Section 5.3** Assessment of unplanned risks – **Section 5.4** Summary of controls – **Section 6**, **Table 6-1** and **Table 6-2**
The arrangements for ongoing monitoring of the titleholder's environmental performance	Summary of controls – **Section 6**, **Table 6-1** and **Table 6-2** Monitoring, audit and management of non-conformances – **Section 7.5**
Response arrangements in the OPEP	OPEP – Section 7.9.3 Operational and Scientific Monitoring Plan – **Section 7.9.3** and **Appendix F: OSMP Summary Table**
Consultation already undertaken and plans for ongoing consultation	Stakeholder consultation – **Section 8** and **Appendix E: Stakeholder Consultation** Error! Reference source not found.
Details of the titleholders nominated liaison person for the activity	Nominated Liaison Person details – **Section 1.5.2**

1.5 DESCRIPTION OF THE TITLEHOLDER

ConocoPhillips (United States) is the world's largest independent exploration and production company. Through various Australian registered company subsidiaries, ConocoPhillips Australia undertakes exploration activities and holds and operates assets in the Timor Sea, NT, Western Australia (WA) and Queensland. ConocoPhillips Australia has been operating in Australia since the mid-1970s and its activities in Australia are currently managed, operated and administered through its Australian Business Units (ABUs); Australia Business Unit-West (ABU-W) and Australia Business Unit-East (ABU-E). ABU-W is responsible for the Bayu-Undan Field in the Timor Sea, the DLNG Plant in the NT and the Pipeline. ABU-E is responsible for the Australia Pacific LNG facilities located on Curtis Island.

Further information about ConocoPhillips in Australia can be found at:

- http://www.conocophillips.com.au.

Details of the titleholder and liaison person are described below in accordance with Regulation 15 of the OPGGS(E) Regulations 2009.

COPPA will notify NOPSEMA should there be a change in the titleholder, a change in the titleholder's nominated liaison person or a change in the contact details for either the titleholder or the liaison person.

1.5.1 Titleholder

The Pipeline is operated under the following licences granted by the National Offshore Petroleum Titles Administrator (NOPTA):

- Timor-Leste waters (pursuant to the Treaty): BU-PL-1 (former Production Sharing Contracts JPDA 03-12)
- Australian Commonwealth waters: WA-8-PL and NT/PL1

COPPA is the titleholder of each of the pipeline licences listed above. Contact details for the titleholder are provided below.

ConocoPhillips Pipeline Australia Pty Ltd

Address: 53 Ord Street, West Perth WA 6005

Telephone: +61-8-9423-6666

Australian Company Number (ACN): 093-316-959

As a titleholder, COPPA operates the Pipeline on behalf of the other titleholders, being affiliates of co-venturers Santos, INPEX, Eni, Tokyo Timor Sea Resources, a consortium of Tokyo Gas and JERA (a joint venture between Tokyo Electric and Chibu Electric).

1.5.2 Nominated Liaison Person

Name:	Norman Scott
Title:	HSE Lead, Bayu-Undan Decommissioning Project
Address:	1 Cambridge St, West Leederville WA 6007
Telephone:	+61-8-6363-2321
Email:	pipeline2@conocophillips.com

2. ENVIRONMENTAL LEGISLATION AND OTHER REQUIREMENTS

In accordance with Regulation 13(4) of the OPGGS(E) Regulations 2009, this section provides an overview of the legislative requirements, standards and guidelines that are applicable to the petroleum activities within the scope of this EP. including:

- Key Commonwealth legislation (**Section 2.1**); and
- Relevant provisions from international conventions to which Australia is a signatory (**Section 2.2**).

Additional relevant requirements are summarised in **Appendix A**.

The HSEMS (Element 3, **Section 7.1.1**) establishes requirements for maintaining a process to monitor changing laws / regulations and site activities, and assigning responsibilities to help assure compliance with legal requirements and standards of operation applicable to the ABU-W.

The ABU-W HSE Legal Requirements Identification and Monitoring Procedure (ALL/HSE/PRO/087) outlines the process for monitoring changing legal requirements and achieving legal compliance.

2.1 COMMONWEALTH LEGISLATION

2.1.1 OPGGS Act 2006

The OPGGS Act provides the regulatory framework for all offshore petroleum exploration, production and greenhouse gas activities in Commonwealth waters. The OPGGS Act is supported by a range of subordinate legislation, including:

- the Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009;
- the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011; and
- the OPGGS(E) Regulations 2009.

Of particular relevance to this EP are the OPGGS(E) Regulations (**Section 2.1.2**), which require the environmental impacts and risks of offshore petroleum and greenhouse gas storage activities be managed to a level that is acceptable and ALARP.

The OPGGS Act also applies to the Pipeline within Timor-Leste waters (refer to **Section 2.2.1**).

2.1.2 OPGGS(Environment) Regulations 2009

The OPGGS(E) Regulations 2009 provide for the protection of the environment in Commonwealth waters by requiring that petroleum and greenhouse gas storage activities be managed in a way that:

- reduces the environmental impacts and risks of the activity to a level that is ALARP;
- reduces the environmental impacts and risks of the activity to an acceptable level; and
- is consistent with the principles of ecologically sustainable development (ESD), as defined in section 3A of the EPBC Act, which include:
  - decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;
  - if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
  - the principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
  - the conservation of biological diversity and ecological integrity should be a

fundamental consideration in decision-making; and

- improved valuation, pricing and incentive mechanisms should be promoted.

The OPGGS(E) Regulations 2009 include requirements for the consideration of MNES, including the following (as per Regulation 13(3):

- the world heritage values of a declared World Heritage property within the meaning of the EPBC Act;
- the national heritage values of a National Heritage place within the meaning of that Act;
- the ecological character of a declared Ramsar wetland within the meaning of that Act;
- the presence of a listed threatened species or listed threatened ecological community within the meaning of that Act;
- the presence of a listed migratory species within the meaning of that Act;
- any values and sensitivities that exist in, or in relation to, part or all of:
  - a Commonwealth marine area within the meaning of that Act; or
  - Commonwealth land within the meaning of that Act.

The acceptance criteria, as per Regulation 10A of the OPGGS(E) Regulations 2009, are that the EP:

- is appropriate for the nature and scale of the activity; and
- demonstrates that the environmental impacts and risks of the activity will be reduced to ALARP; and
- demonstrates that the environmental impacts and risks of the activity will be of an acceptable level; and
- provides for appropriate Environmental Performance Outcomes (EPOs), Environmental Performance Standards (EPSs) and measurement criteria (MCs); and
- includes an appropriate implementation strategy and monitoring, recording and reporting arrangements; and
- does not involve the activity or part of the activity, other than arrangements for environmental monitoring or for responding to an emergency, being undertaken in any part of a declared World Heritage property within the meaning of the EPBC Act; and
- demonstrates that:
  - the titleholder has carried out the consultations required by Division 2.2A; and
  - the measures (if any) that the titleholder has adopted, or proposes to adopt, because of the consultations are appropriate; and
- complies with the OPGGS Act and the Regulations.

2.1.3 EPBC Act 1999

The EPBC Act and supporting regulations provide for the protection of the environment and conservation of biodiversity in Australia. Amendments to the OPGGS Act and OPGGS(E) Regulations 2009 in February 2014, undertaken as part of the streamlining of environmental approvals for petroleum activities in Commonwealth waters, require MNES to be addressed in assessments of EP. Following the streamlining arrangements, NOPSEMA became the sole environmental regulator for petroleum activities (i.e. regulates activities under the OPGGS Act and EPBC Act) in Commonwealth waters. The components of the EPBC Act that are requires by the OPGGS(E) Regulations 2009 are outlined above in **Section 2.1.2**.

Environmental approval to construct, operate and decommission the Pipeline pre-dates the EPBC Act. Hence, the construction, operation and decommissioning of the Pipeline was not

referred for assessment under the EPBC Act. No requirements (e.g. particular manners) determined by an EPBC Act assessment process apply to the Pipeline.

2.1.3.1 Class Approval – Mining Operations and Greenhouse Gas Activities for the North Marine Parks Network Management

Part of the Pipeline lies within the Multiple Use and Special Purpose (trawling) zones of the Oceanic Shoals Australian Marine Park (AMP) proclaimed under the EPBC Act. Mining operations, including oil and gas operations, may be conducted in a Multiple Use Zone (VI) subject to the class approval and prescriptions within the *Australian Marine Parks - North Marine Parks Network Management Plan 2018* (Director of National Parks 2018). The 'Class Approval – Mining Operations and Greenhouse Gas Activities' came into effect on 1 July 2018 at the same time as the management plans for AMPs. The conditions of the Class Approval for the North Marine Network Management Plan that are relevant to the scope of this EP are provided in **Table 2-1**.

Table 2-1: Conditions from the Class Approval – Mining Operations and Greenhouse Gas Activities for the North Marine Parks Network Management Plan 2018 relevant to the activities in this EP.

Condition Number	Condition	Relevant Section of EP
1	Approved action must be conducted in accordance with: • An Environment Plan accepted under the OPGGS (E) Regulations 2009	This EP
	• The EPBC Act	**Section 2.1**
	• The EPBC Regulations	**Section 2.1**
	• the North Network Management Plan	**Section 5.3**
	• Any prohibitions, restrictions or determinations made under the EPBC Regulations by the Director of National Parks	Not applicable
	• all other applicable Commonwealth and state and territory laws (to the extent those laws are capable of operating concurrently with the laws and instruments described in paragraphs a to e)	**Section 2** and Appendix A.
2	If requested by the Director of National Parks, an Approved Person must notify the Director prior to conducting Approved Actions within Approved Zones Note: the timeframe for prior notice will be agreed to by the Director of National Parks and the Approved person	**Section 7.10** and Appendix E. Refer to the OPEP (DCOM-652-EN-OPE-00001)
3	If requested by the Director of National Parks, an Approved person must provide the Director with information relating to undertaking the Approved Actions or gathered while undertaking the Approved Actions) that is relevant to the Director's management of the Approved Zones. Note: the information required and timeframe within which it is required will be agreed to by the Director of National Parks and the Approved Person	Not applicable

The International Union for the Conservation of Nature (IUCN) Categories and management principles overlapping the Operational Area, the North Marine Parks Network Management Plan and the class approval allow for activities outlined in this EP. The relevant controls and EPSs detailed in **Section 5.3** and **Section 5.4** are consistent with the North Marine Parks Network Management Plan.

2.2 INTERNATIONAL AGREEMENTS AND CONVENTIONS, GUIDELINES AND CODES OF PRACTICE

Australia is a signatory to various international agreements and conventions that are relevant to the management of environmental risks and impacts considered in this EP. COPPA is required to comply with the relevant requirements of each treaty while undertaking the petroleum activity. Relevant international agreements, conventions, guidelines and codes of practice along with an assessment of their relevance to the petroleum activity, are provided in **Appendix A**.

2.2.1 Treaty between Australia and the Democratic Republic Timor-Leste Establishing their Maritime Boundaries in the Timor Sea

Australia and Timor-Leste signed the *Treaty Between Australia and the Democratic Republic Timor-Leste Establishing Their Maritime Boundaries in the Timor Sea* (the Treaty) in March 2018 to establish maritime boundaries between the two signatory countries. Upon ratification[2], this Treaty replaces the *2003 Timor Sea Treaty* and the *2003 International Unitisation Agreement for Greater Sunrise* and establishes permanent maritime boundaries between Australia and Timor-Leste. This EP is premised on the assumption that the Treaty has been ratified.

It encompasses the delimitation between Timor-Leste and Australia of both the continental shelf (which entails rights to exploit seabed resources, such as petroleum) and the exclusive economic zone in the Timor Sea.

Under the Treaty (Article 3 of Treaty Annex D) Australia shall exercise exclusive jurisdiction over the Pipeline, and in exercising this exclusive jurisdiction shall cooperate with the relevant Timor-Leste statutory authority in relation to the Pipeline. Consequently, NOPSEMA becomes the regulator of the environmental management of the Pipeline in Timor-Leste and Commonwealth waters. Given Australia has exclusive jurisdiction over the Pipeline, all Australian relevant environmental requirements are assumed to apply within the Operational Area in Timor-Leste waters.

2.2.2 Treaties for the Protection of Migratory Species

Australia is a signatory to, and has authorised, several conventions and agreements for the protection of migratory species, including:

- Convention on the Conservation of Migratory Species of Wild Animals (the Bonn convention);
- The Convention on Wetlands (the Ramsar convention);
- Japan-Australia Migratory Bird Agreement;
- China-Australia Migratory Bird Agreement;
- Republic of Korea-Australia Migratory Bird Agreement; and
- Agreement on the Conservation of Albatrosses and Petrels.

Fauna listed under these conventions and agreements are typically listed as Migratory under the EPBC Act and consequently are MNES.

[2] At time of writing (June 2019) this Treaty has been signed but not yet ratified.

3. DESCRIPTION OF THE ACTIVITY

This section has been prepared in accordance with Regulation 13(1) of the OPGGS(E) Regulations 2009. This section describes the activities that will be undertaken within the scope of this EP in Timor-Leste waters and Australian Commonwealth waters. The following sub-sections provide a detailed description of all activities and is considered suitable to inform the assessment of environmental impacts and risks that may credibly arise from the activity.

3.1 ACTIVITY OVERVIEW

Table 3-1 provides an overview of the activities within the scope of this EP.

Table 3-1: Summary of attributes within the scope of this EP

Attribute	Summary
Petroleum Sharing Contract and Pipeline License	Timor-Leste waters: BU-1-PL (former Production Sharing Contract JPDA 03-12) Australian Commonwealth waters: WA-8-PL and NT/PL1
Hydrocarbon Type	During operations the Pipeline conveys dry natural gas from Bayu-Undan field to the Darwin LNG Plant at Wickham Point, NT.
Activity Location	The pipeline section in Timor-Leste waters is located from the subsea isolation valve flange downstream of the Bayu-Undan Facility CPP Complex to the Timor-Leste – Australia maritime boundary between points TA-5 and TA-6 (as established in the Treaty) at kilometre point 34.2. The pipeline section in Australian Commonwealth Waters is located within pipeline licenses WA-8-PL and NT/PL1. The Commonwealth waters section of the pipeline under consideration for production cessation activities extends from KP34.2 to KP380, as shown in **Figure 3-1**. COPPA has defined an Operational Area as a 500 m buffer around the Pipeline section from KP0 to the isolation point at KP380 as within the scope of this EP.
Activity Description	The activities associated with Production Cessation EP for the KP0 – KP380 section of the pipeline include: • Displacement of sediment around the pipeline at KP380 to expose the pipeline in preparation for isolation, cutting, and installation of a mechanical connector and end cap or an upstream skid and pig launcher/receiver (PLR). The PLR will be used to launch a pig to push residual gas in the Pipeline to the Bayu-Undan platform flare, if the local line stops method is used. • Isolation of the pipeline at KP380 either by: - launch of a HPIT from the Bayu-Undan platform pushed with seawater to the isolation point at KP380 (referred to as the platform launched HPIT isolation method). Approximately 2km of the water push immediately upstream of the HPIT will be treated with chemicals; or - installation of two local line stops in a production gas-filled pipeline at KP380 (referred to as the local line stops isolation method). • Isolation upstream of KP0 at the Bayu-Undan platform by air gapping from the CPP export compressors to the Pipeline. • Once isolated, either: - cutting out a section of the Pipeline upstream of the platform launched isolation tool at KP380; or - venting gas between the two local line stop isolation tools installed at KP380 to a subsea skid and then cutting out the degassed pipeline section. • Removal of the cut section of pipeline to vessel for onshore disposal. • Installation of temporary debris caps on both the upstream and downstream ends of the pipeline at KP380 after the cut sections of pipeline have been removed. • Replacement of the temporary debris cap on the upstream end of the pipeline with a mechanical connector and either an end cap or an upstream skid/PLR to provide longer term isolation of the pipeline internals from the marine environment. • In the event of a split campaign, a mechanical connector and end cap will also be installed on the downstream end of the cut pipeline. A split campaign would see

	separate campaigns for the initial isolation and cutting of the pipeline and a second campaign to install the downstream tie-in valve skid which is outside the scope of this EP. Note: Residual production gas in the upstream KP0 – KP380 pipeline section from the local line stops isolation method will be sent to the Bayu-Undan platform flare from KP380 by a seawater pushed pig using the upstream skid/PLR. The emissions associated with flaring of this residual gas will occur from a facility in a different jurisdiction and is outside the scope of this EP. The pipeline from KP0 to KP380 will have been gas freed during deployment of the platform launched HPIT isolation method. • Leaving the isolated, water-filled and capped Pipeline section KP0 to KP380 in place on the seabed pending final decommissioning authorisation.
Vessels	Vessel activities will include: • Pipeline pre-works (sediment displacement, seabed and pipeline preparation) at KP380, • Pipeline line stops assembly and installation (for the local line stops isolation option), • Pipeline venting / flushing operations (for the local line stops insolation method), • Pipeline section cutting and recovery operations at KP380, • Installation of temporary debris caps on both the upstream and downstream ends of the pipeline at KP380 once the cut sections have been removed, • Installation of a mechanical connector and end cap or upstream skid/PLR on the upstream end of the cut Pipeline at KP380 after debris cap removal, • Post-isolation and cutting works (installation of stabilisation mattresses, scour protection and free span supports) at KP380, and • Sending a seawater pushed pig from KP380 using the upstream skid/PLR to Bayu-Undan platform to degas the KP0 to KP380 section (for the local line stops isolation method only). The vessels will use Group II hydrocarbon fuels such as marine gas oil (diesel).
Duration	It is anticipated that this production cessation activity will take place as a 4 – 6 week component of an approximately 12 week campaign, or as the initial 4 – 6 week phase of a split 12 week campaign, after the end of Bayu-Undan field life which may commence as early as 2021 or as late as 2023. Subsequent tie-in valve skid installation campaign activities on the downstream end of the cut pipeline at KP380 will be the subject of a separate EP.

3.2 LOCATION

The Pipeline section in Timor-Leste waters is located from the downstream flange of the subsea isolation valve flange off the Bayu-Undan Drilling Processing Platform to the Timor-Leste – Australia maritime boundary between points TA-5 and TA-6 (as established in the Treaty) at KP34.2.

The Pipeline section in Australian Commonwealth Waters is located within pipeline licenses WA-8-PL and NT/PL1. The Commonwealth waters section of the Pipeline extends from KP34.2 to KP380 which is the proposed location of DLNG Life Extension Project Subsea Tie-in, as shown in **Figure 3-1**.

The relevant section of the Pipeline from KP0 lies in approximately 80 m water depth at the Bayu-Undan facility, reaches a maximum depth of 134 m at approximately KP131 and then the seafloor rises to a depth of less than 100 m in the vicinity of KP180 and follows a general shallowing trend towards Darwin, reaching a depth of approximately 50 m at KP380. The nearest land to the KP0 to KP380 Pipeline section is Bathurst Island located approximately 20 km to the north-east of KP380.

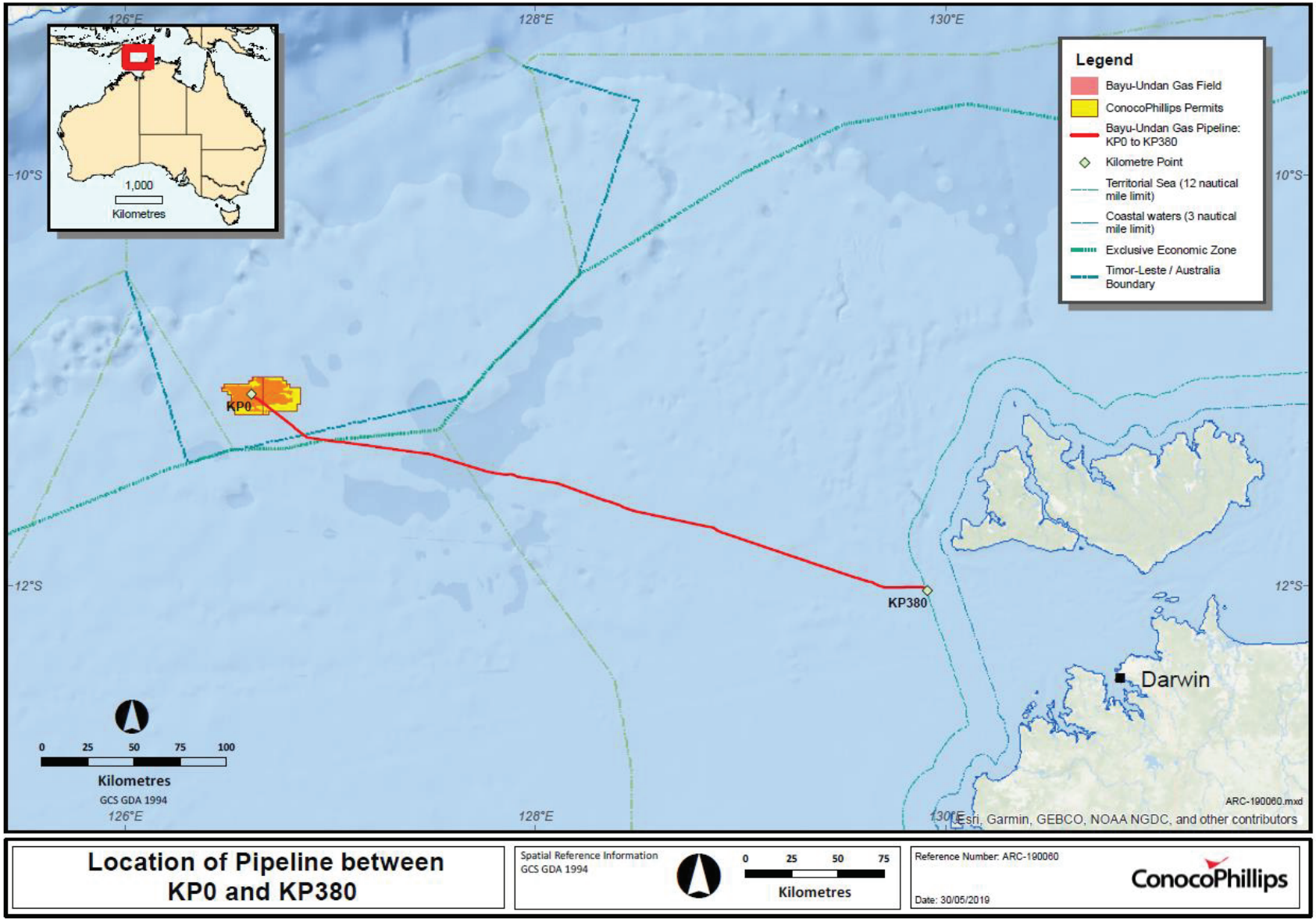


Figure 3-1: Location of the Pipeline between KP0 and KP380

3.3 PIPELINE DESIGN AND CONSTRUCTION

The section of the Pipeline within the scope of this EP is a 26" diameter 380 km long welded steel pipeline extending from the Bayu-Undan field to KP380. The Pipeline system was designed in accordance with DNV OS-F101 DNV Submarine Pipeline Systems[3]. Relevant pipeline design parameters are summarised in **Table 3-2**.

Independent verification of the Pipeline design was performed during the design process. Compliance with the installation, testing, and commissioning of the Pipeline was verified by a Bureau Veritas certificate of installation following the completion and commissioning activities and introduction of hydrocarbon gas.

The Pipeline was laid directly on the seabed and has been in operation since September 2005.

Table 3-2: Structural Design Parameters for the Pipeline

Parameter	Value
Pipeline Length (km)	380 in total • 34.7 in Timor-Leste waters under Australian Commonwealth jurisdiction (KP0 to KP34.2); • 345.3 in Australian Commonwealth waters (KP34.2 to KP380).
Pipeline Outside Diameter (inches)	26
Wall Thickness of 26" Pipeline (mm)	23.5 / 20.7 / 20.1
Wall Thickness Corrosion Allowance (mm)	1.5
Material	Carbon Steel
Material Grade	American Petroleum Institute (API) 5L X65
Anode Type	Al-Zn-In
Anode Spacing	Not greater than every 12 joints
Weight Coating	High Density Concrete to ensure on-bottom Stability
Weight Coating Thickness (mm)	40-90
Design Life (years)	25

3.3.1 Pipeline Protection

The Pipeline is protected by cathodic protection systems using sacrificial anodes with a design life of 25 years. The Pipeline external surface is also coated with 5 mm asphalt enamel, with high density polypropylene heat shrink sleeves applied to the field joints. These coatings are intended to protect the Pipeline from external corrosion. The Pipeline is further coated with high density concrete to ensure stability on the seabed and protect against physical impacts.

The Pipeline internal surface has a 75 micron thick flow coating made of epoxy. There is about 50 mm of exposed steel (no flow coat) on either side of each girth weld (i.e., approximately 100 mm per pipe joint). This means that, based on a 12.2 m joint length, approximately 99.18% of the internal surface of the pipeline is coated and 0.82% is exposed steel.

3.4 PRODUCTION CESSATION ACTIVITIES

The activities associated with Production Cessation EP for the KP0 – KP380 section of the Pipeline include:

- Displacement of sediment around the pipeline at KP380 to expose the pipeline in preparation for isolation, cutting, and installation of a mechanical connector and end cap or an upstream skid / PLR (**Figure 3-2A**). The PLR will be used to launch a pig to push

[3] DNV OS-F101 has been superceded by DNVGL-ST-F101.

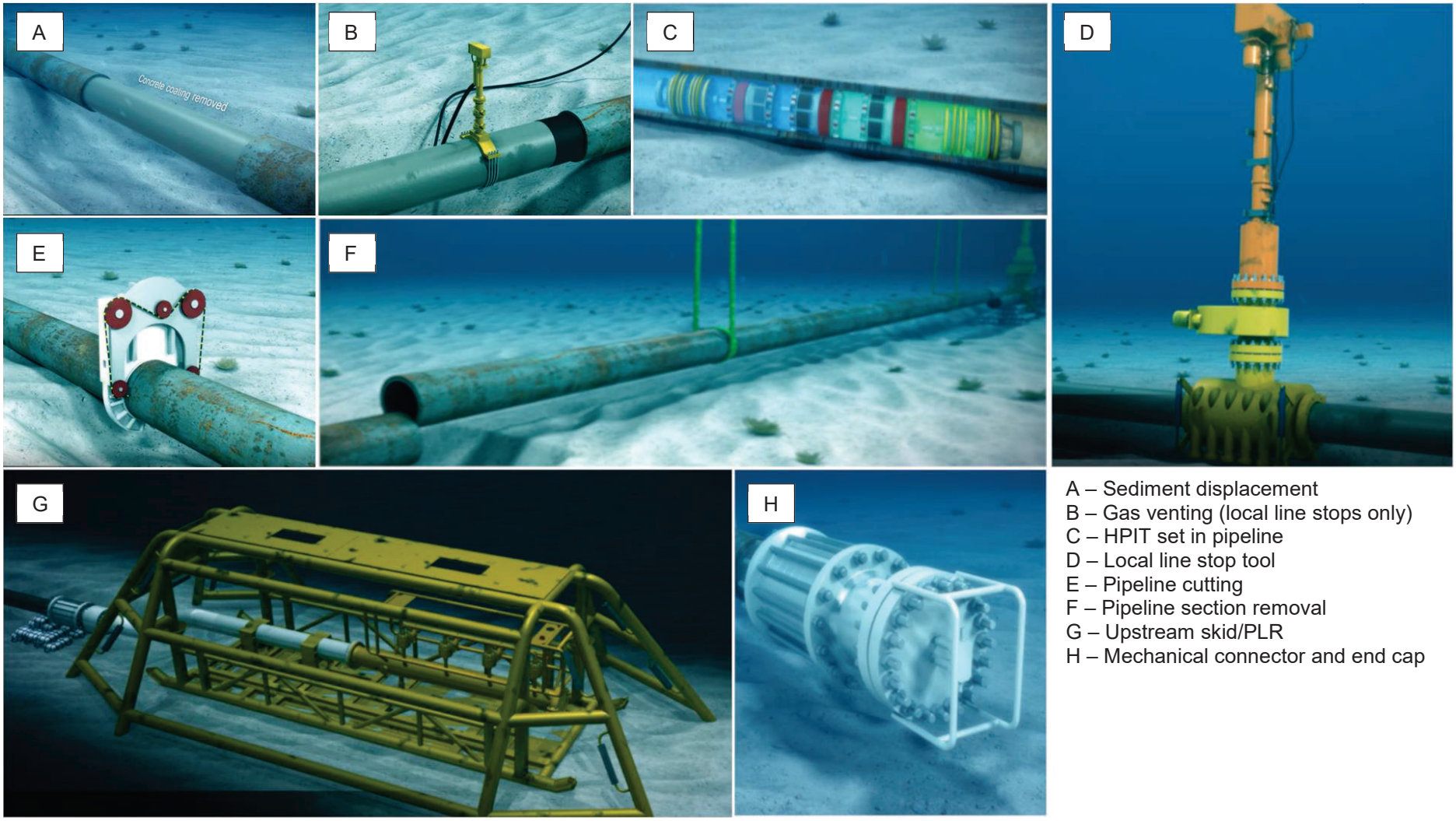
residual gas in the pipeline to the Bayu-Undan platform flare, if the local line stops method is used.

- Isolation of the pipeline at KP380 by either:
  - launch of a HPIT from the Bayu-Undan platform pushed with seawater to the isolation point at KP380 (referred to as the platform launched HPIT isolation method) (**Figure 3-2C**). Approximately 2km of the water push immediately upstream of the HPIT will be treated with chemicals; or
  - installation of two local line stops in a production gas-filled pipeline at KP380 (referred to as the local line stops isolation method) (**Figure 3-2C**).
- Isolation upstream of KP0 at the Bayu-Undan platform by air gapping from the CPP export compressors to the pipeline.
- Once isolated at KP380, either
  - cutting out a section of the pipeline upstream of the platform launched HPIT isolation (**Figure 3-2E**); or
  - venting gas between the local line stop isolation tools installed at KP380 to a subsea skid and then cutting out the degassed pipeline section (**Figure 3-2B**).
- Removal of the cut section of pipeline to vessel for onshore disposal (**Figure 3-2F**).
- Installation of temporary debris caps on both the upstream and downstream ends of the pipeline at KP380 after the cut sections of pipeline have been removed.
- Replacement of the temporary debris caps on the upstream end of the pipeline with a mechanical connector and either an end cap or a upstream skid/PLR to provide longer term isolation of the pipeline internals from the marine environment (**Figure 3-2G** and **Figure 3-2H**).
- In the event of a split campaign, a mechanical connector and end cap will also be installed on the downstream end of the cut pipeline. A split campaign would see separate campaigns for the initial isolation and cutting of the pipeline and a second campaign to install the downstream tie-in valve skid which is outside the scope of this EP.

Note: Residual production gas in the upstream KP0 – KP380 pipeline section from the local line stops isolation method will be sent to the Bayu-Undan platform flare from KP380 by a seawater pushed pig using the upstream skid/PLR. The emissions associated with flaring of this residual gas will occur from a facility in a different jurisdiction and is outside the scope of this EP. The pipeline from KP0 to KP380 will have been gas freed during deployment of the platform launched HPIT isolation method.

- Leaving the isolated, water-filled and capped pipeline section KP0 to KP380 in place on the seabed pending final decommissioning authorisation.

Subsequent activities at the downstream end of the cut pipeline will be addressed in a separate EP. Activities associated with final decommissioning of the pipeline section KP0 to KP380 will also be addressed in a separate EP.



A – Sediment displacement
B – Gas venting (local line stops only)
C – HPIT set in pipeline
D – Local line stop tool
E – Pipeline cutting
F – Pipeline section removal
G – Upstream skid/PLR
H – Mechanical connector and end cap

Figure 3-2: Representation of pipeline preparation, isolation, cutting, mechanical connector with end cap and upstream skid/PLR

3.5 INSPECTION, MAINTENANCE AND REPAIR ACTIVITIES

Once isolated, hydrocarbon free, seawater-filled and capped at KP380, there are no plans for inspection, maintenance and repair activities within the scope of this EP.

3.6 CHEMICAL SELECTION AND USE

For the platform launched HPIT isolation method, an approximately 2 km section of the seawater push immediately upstream of the HPIT will be treated with biocide (500 ppm), corrosion inhibitor (200 ppm) and oxygen scavenger (250 ppm) to preserve the downstream section of the pipeline between the cut location and the HPIT.

The chemicals required for this activity will be subject to the chemical selection process below before being permitted for use.

Subsea chemicals will, at a minimum, be assessed in accordance with the United Kingdom Offshore Chemical Notification Scheme (OCNS) Ranked List of Notified Chemicals. The Chemical Hazard and Risk Management (CHARM) model, under the OCNS, is the primary tool to rank offshore chemicals based on assessment of toxicity, biodegradation and bioaccumulation data provided by the chemical supplier. The CHARM model calculates the ratio of predicted effect concentration (PEC) against the predicted no effect concentration (PNEC) (i.e. the PEC:PNEC ratio) and expresses this as a Hazard Quotient (HQ), which is then used to rank the product (**Table 3-3**). The HQ is converted to a colour banding. Products not applicable to the CHARM model (i.e. inorganic substances, hydraulic fluids) are assigned an OCNS grouping (**Table 3-4**). The overall ranking is determined by that substance having the worst case OCNS ranking scheme assignment in terms of biodegradability and bioaccumulation criteria. Group A includes products considered to have the greatest potential environmental hazard and Group E the least. Chemical products within Group D or E are considered inherently biodegradable and not bioaccumulative.

Table 3-3: OCNS CHARM HQ and ranking

Minimum HQ value	Maximum HQ value	Colour banding	Hazard
>0	<1	Gold	Lowest
≥1	<30	Silver	
≥30	<100	White	
≥100	<300	Blue	
≥300	<1000	Orange	
≥1000		Purple	Highest

Table 3-4: OCNS groupings

OCNS grouping	Aquatic toxicity (LC50) (mg/L)	Sediment Toxicity (LC50) (mg/L)	Hazard
A	<1	<10	Highest
B	>1-10	>10-100	
C	>10-100	>100-1000	
D	>100-1000	>1000-10,000	
E	>1000	>10,000	Lowest

Subsea chemicals for which the chemical products meet at least one of the following environmental criteria are considered suitable for use and can be discharged to the marine environment:

- rated as Gold or Silver under OCNS CHARM model, and
- if not rated under the CHARM model, has an OCNS group rating of D or E.

The use of non-rated subsea chemicals will only be considered following approval from the Lead Pipeline Engineer, in consultation with the ConocoPhillips Environmental Specialist, after the completion of an environmental risk assessment. The environmental risk assessment will include the following:

- technical justification for the usage,
- consideration of additional controls,
- how each chemical may be used, and
- quantity to be used.

The environmental risk assessment will develop a residual risk rating based on:

- evaluation of the receiving marine environmental characteristics, values and sensitivities, with respect to the nature and scale of the proposed chemical product to be discharged,
- review of alternative chemical products that are equivalent in meeting the technical requirements of the scope of work and selection of the least hazardous chemical,
- evaluation of ecotoxicity thresholds and application of OCNS ratings which may include:
  - establishment of an alternative 'pseudo' rating that can be applied to the chemical in accordance with international standard protocols or guidelines (e.g. International Organization for Standardization test guidelines, Organisation for Economic Cooperation and Development test guidelines, and OSPAR guidelines), or
  - use of alternative similar toxicity data if insufficient toxicity information is available on the non-rated chemicals.

ConocoPhillips will use chemical products considered to be ALARP following the risk assessment.

3.7 VESSEL ACTIVITIES

Vessel activities will include:

- Pipeline pre-works (sediment displacement, seabed and pipeline preparation) at KP380,
- Pipeline line stops assembly and installation (for the local line stops isolation method),
- Pipeline venting / flushing operations (for the local line stops insolation method,
- Pipeline section cutting and recovery operations at KP380,
- Installation of temporary debris caps on both the upstream and downstream ends of the pipeline at KP380 once the cut sections have been removed,
- Installation of a mechanical connector and end cap or upstream skid/PLR on the upstream end of the cut Pipeline at KP380 after debris cap removal,
- Post-isolation and cutting works (installation of stabilisation mattresses, scour protection and free span supports as required) at KP380, and
- Sending a seawater pushed pig from KP380 using the upstream skid/PLR to Bayu-Undan platform to degas the KP0 to KP380 section (for the local line stops isolation method only).

The vessels will use Group II hydrocarbon fuels such as marine gas oil (diesel).

3.8 DURATION

The EP covers GEP Production Cessation activities for the pipeline section KP0 – KP380 which will occur after the end of Bayu-Undan field life until final decommissioning. End of field life is

predicted to occur in 2022 but may occur as early as 2021 or as late as 2023.

It is anticipated that this production cessation activity will take place as an approximately 4 – 6 week component of an approximately 12-week campaign or as the initial 4 – 6 week phase of a split 12 week campaign.

3.8.1 Related Activities Beyond the Scope of this EP

This EP does not include other activities which will occur during the remainder of the approximately 12 week campaign or as the second phase of the 12 week split campaign. In general terms, these activities are expected to include:

- Seabed preparation, excavation and rectification on the downstream section of the isolated and cut pipeline at KP380.
- Then either (if the platform launch HPIT isolation method was used):
  - installation of the full-bore tie-in subsea architecture, including a mechanical end connector on the downstream end of the cut and isolated Pipeline, valve skid assembly and installation, protection structure installation, installation of pipeline stabilisation mattresses, scour protection and free span supports as required; and
  - installation of a temporary PLR and recovery of the platform launched HPIT.
- Or (if the local line stops isolation method was used):
  - installation of a temporary PLR and mechanical connector onto the downstream end of the isolated and cut pipeline at KP380 and local launch of an HPIT to establish an isolation approximately 100m further downstream.
  - cutting of intervening downstream Pipeline sections, including removal of the downstream line stop tool and temporary PLR and mechanical connector.
  - installation of the full-bore tie-in subsea architecture, including a permanent mechanical end connector on the downstream end of the cut and isolated pipeline, installation of a valve skid structure and associated protection structure installation, in addition to installation of pipeline stabilisation mattresses, scour protection and free span supports as required.
  - installation of a temporary PLR and recovery of the locally launched HPIT.

Activities common to both isolation methods identified above comprise:

- subsea leak testing.
- pipeline venting and flushing operations.
- associated marine vessel activities.

The activities noted in this section are out of scope for this EP and will be covered by a separate EP which will be submitted to NOPSEMA at a later date.

In addition, the activities associated with the connection of the upstream gas supplier to the full-bore tie-in subsea infrastructure at KP380 are out of scope for this EP and will be the subject of a separate EP which will be submitted to NOPSEMA at a later date.

4. DESCRIPTION OF THE ENVIRONMENT

In accordance with regulations 13(2) and 13(3) of the OPGGS(E) Regulations 2009, a description of the environment that may be affected (EMBA) by both routine/planned and non-routine/unplanned activities undertaken during the production cessation of the Pipeline is presented in this section. The description includes relevant physical, biological, socio-economic and cultural values and sensitivities (also referred to in the EP as receptors). The information contained in this section has been used to inform the assessment of environmental impacts and risks presented in **Section 5**.

The EMBA encompasses the environment that may be affected by sources of risk from both routine/non-routine planned and unplanned activities in Commonwealth waters. The EMBA is comprised of two elements (**Figure 4-1**):

- the Operational Area surrounding the Pipeline between KP0 and KP380; and
- the area potentially impacted by the worst-case credible hydrocarbon spill scenarios that may credibly arise (refer to **Sections 5.4.5** and **5.4.6**), referred to as the Moderate Exposure Zone.

The Operational Area is based on a 500 m buffer around the Pipeline (refer to **Section 3.1**). Given the production cessation activities within the scope of this EP will occur at KP380, much of the petroleum activity within the Operational Area consists of retaining the Pipeline on the seabed to await decommissioning (i.e. vessel-based activities will only occur around KP380).

The Moderate Exposure Zone was determined by numerical modelling studies. Specifically, the moderate exposure dissolved, entrained, floating and shoreline accumulation thresholds for hydrocarbons determined by stochastic modelling studies of a 700 m^3 release of marine diesel oil (MDO) at KP380 were used, in conjunction with the Operational Area, to determine the EMBA. Refer to **Section 5.4.5** for additional information on hydrocarbon spill modelling.

The existing environment described in this section is based on a review of scientific information literature (e.g. scientific journal articles) and material provided by the Department of Environment and Energy (DoEE) (e.g. EPBC Protected Matters Search tool (PMST), species profile and threats (SPRAT) database and the Conservation Values Atlas). A description of the regional environment is also included to provide context for the characteristics of the existing environment values and sensitivities within the Operational Area and EMBA.

The EPBC Act PMST was used to identify environmental receptors protected under the Act. Two EPBC Act Protected Matters Search Tool reports were generated; one based on the Operational Area and one based on Moderate Exposure Zone. PMST Reports for both the Operational Area and Moderate Exposure Zone are provided in **Appendix B**.

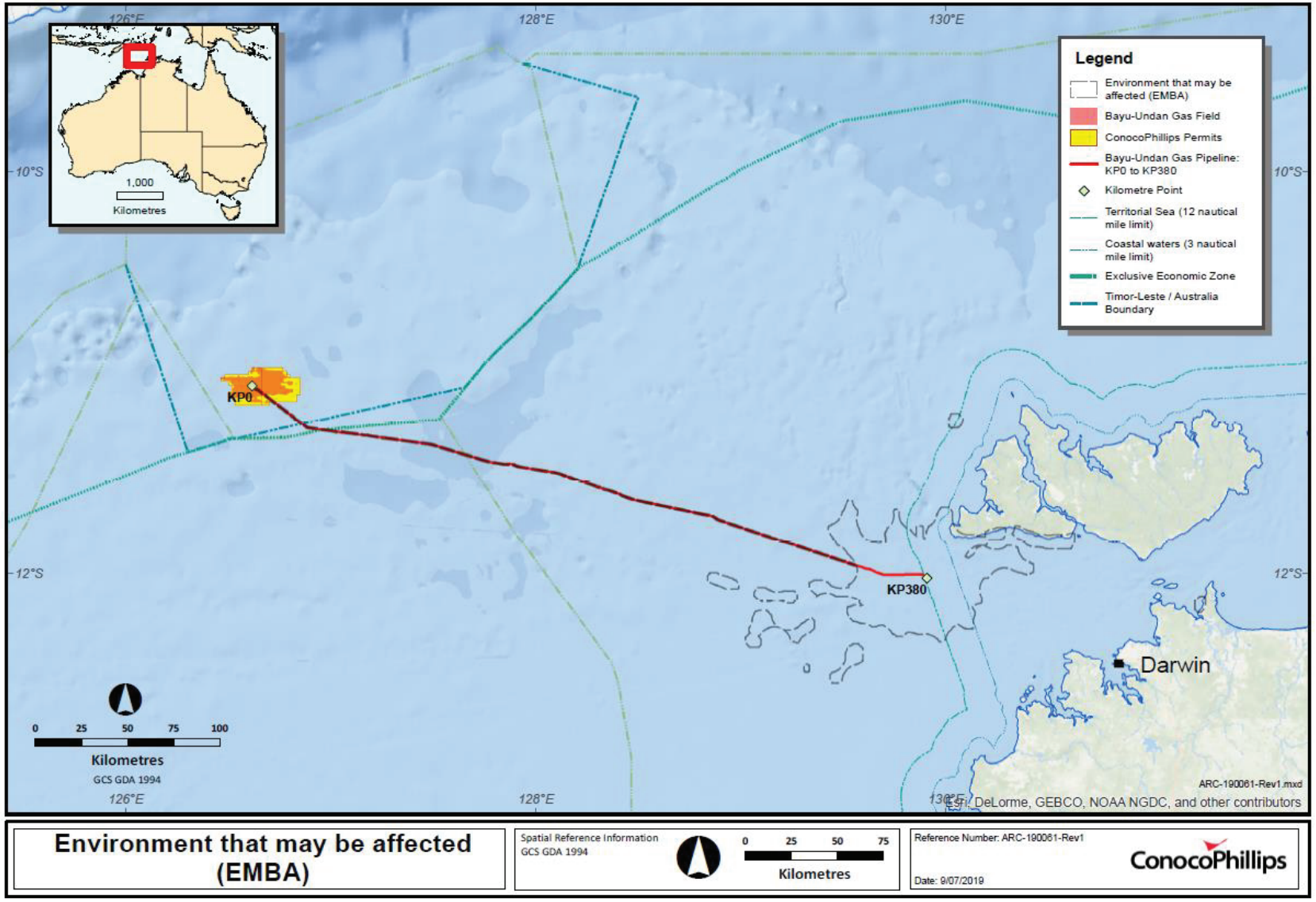


Figure 4-1: The EMBA from routine/non-routine planned and unplanned activities (including the worst-case credible hydrocarbon spill scenario)

4.1 REGIONAL SETTING

The EMBA lies within Commonwealth Waters and Timor-Leste waters. Most of the Operational Area in Australian Waters is located within Commonwealth waters in the North Marine Region (NMR), with ap,689 km^2, within Commonwealth waters from the western side of Cape York in the east, to the WA–NT border in the west. The NMR encompasses several regionally important marine communities and habitats which support a high biodiversity of marine life and feeding and breeding aggregations.

The key physical characteristics of the NMR include (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2012a):

- a wide continental shelf, with water depths averaging less than 70 m;
- the van Diemen Rise, which provides an important link between the Joseph Bonaparte Gulf and the Timor Trough. This feature includes a range of geomorphological features, such as shelves, shoals, banks, terraces and valleys;
- a series of shallow calcium carbonate-based canyons (approximately 80 m – 100 m deep and 20 km wide) in the northern section of the region;
- numerous limestone pinnacles within the Bonaparte Basin that can extend up to tens of kilometres in length and width;
- the Arafura Shelf, which is up to 350 km wide and has an average water depth of 50 m – 80 m. The shelf is characterised by features such as canyons and terraces;
- reefs around the perimeter of the Gulf of Carpentaria;
- the Gulf of Carpentaria coastal zone, which is characterised by comparatively high levels of productivity and biodiversity; and
- currents driven predominantly by strong winds and tides.

4.1.1 Bioregions

The Pipeline within Commonwealth waters lies entirely within the Northwest Shelf Transition provincial-scale bioregion, which covers an area of 305,463 km^2. The bioregion extends from the Tiwi Islands to Cape Leveque with most of the area located over the continental shelf. The oceanographic environment in the Northwest Shelf Transition is mainly influenced by the Indonesian Throughflow (ITF) current, which varies in strength seasonally (Department of the Environment, Water, Heritage and the Arts (DEWHA) 2008). Water depths average between 10 to 100 m, with a max depth of 330 m.

Topography of the Northwest Shelf Transition is considered complex and comprises a diversity of features, including submerged terraces, carbonate banks, pinnacles, reefs and sand banks (DEWHA 2008). Key Ecological Features (KEFs) within the bioregion, such as the Carbonate Banks and Pinnacles of the Joseph Bonaparte Gulf, are considered distinct features of the Northwest Shelf Transition and likely support higher diversity of marine species compared to the surrounding seabed. Sections of these KEFs overlap the EMBA and are discussed in greater detail in **Section 4.3.5.1**. Species occurring within the Northwest Shelf Transition are typical of Indo-west Pacific tropical flora and fauna (DEWHA 2008), and the region includes a number of BIAs for marine turtles and dolphins. BIAs overlapping the Operational Area and EMBA are outlined in **Section 4.3.4**.

Within the Northwest Shelf Transition, the EMBA overlaps four distinct meso-scale bioregions (**Figure 4-1**):

- Oceanic Shoals;
- Bonaparte Gulf;
- Anson-Beagle; and
- the Tiwi Island bioregions.

The Oceanic Shoals meso-scale bioregion is relatively large and overlaps much of the outer continental shelf in the North marine region. This relatively large bioregion includes several oceanic shoals and banks that host diverse biological communities, however all the shoals and banks in this bioregion lie beyond the EMBA. The two KEFs that overlap the EMBA are mostly located within this bioregion. Much of this bioregion is overlapped by the Oceanic Shoals AMP (**Section 4.4.2.1**). Approximately 279 km (73%) of the Pipeline between KP0 and KP380 lies within this mesoscale bioregion.

The Bonaparte Gulf meso-scale bioregion is relatively flat and featureless compared to the Oceanic Shoals meso-scale bioregion. It consists of mid- and inner- continental shelf waters, which are typically more turbid. Approximately 58.4 km (15%) of the Pipeline between KP0 and KP380 lies within this mesoscale bioregion.

The Tiwi and Anson-Beagle meso-scale bioregions do not overlap the Pipeline but lie within the EMBA determined by the hydrocarbon spill modelling. These two bioregions contain nearshore waters and coastal habitats such as mangroves and beaches.

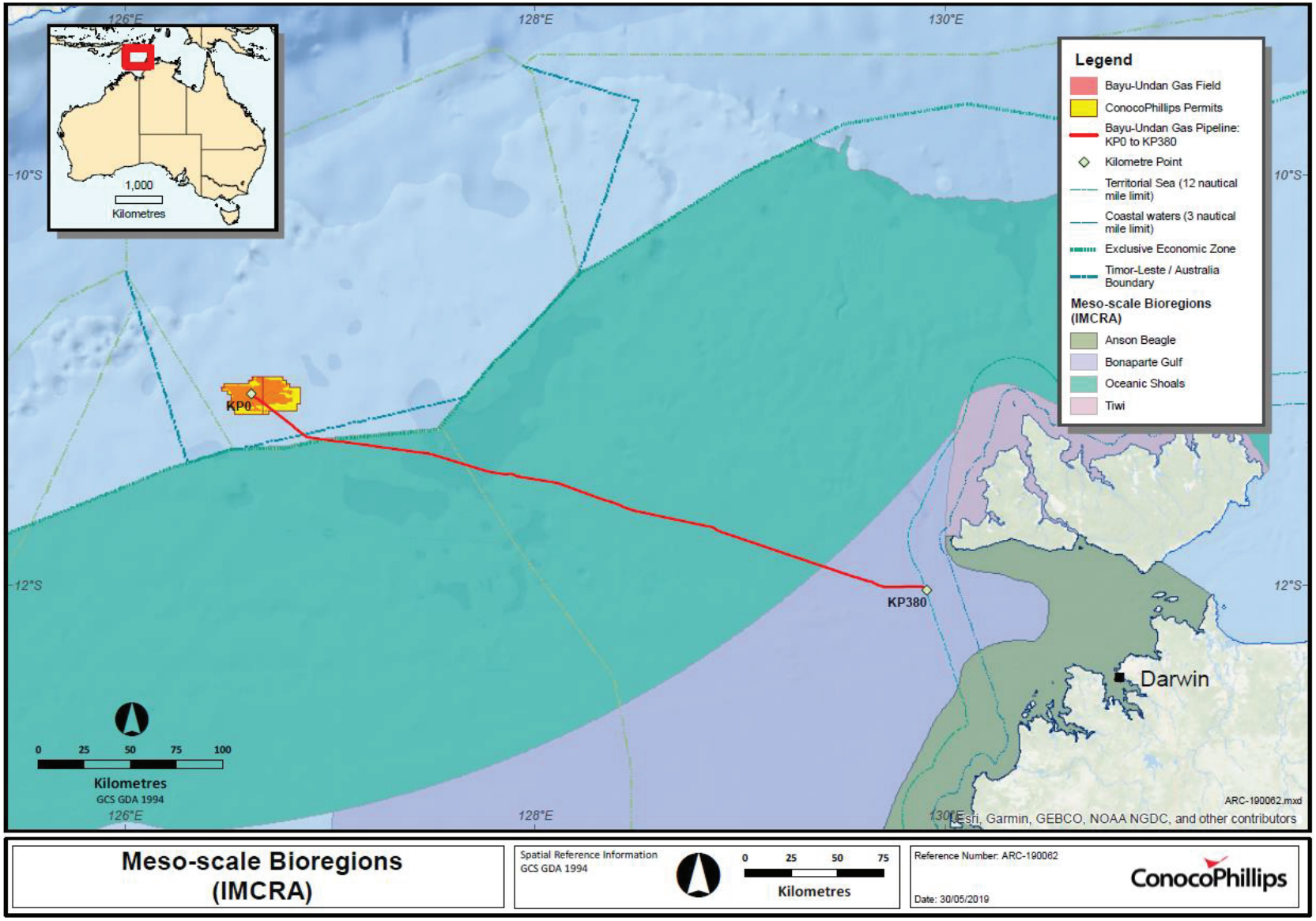


Figure 4-2: Meso-scale bioregions

4.2 PHYSICAL ENVIRONMENT

4.2.1 Climate

The NMR experiences a tropical climate and a distinct summer monsoonal wet season from December to March followed by a typically cooler winter dry season from April to September. During the wet season the south-westerly winds can generate thunderstorm activity, high rainfall and cyclones, while in the dry season the easterly winds result in dry and warm conditions with very little rainfall. In addition, the region may also be subject to tropical squalls which are characterised by very high short period wind gusts.

The variation in seasonal air temperatures in the region is small. The mean maximum summer and winter air temperatures recorded at Point Fawcett, Melville Island (the closest meteorological station to the majority of the EMBA) range between 32.2 °C in November to 29.9 °C in June. The annual mean maximum temperature is 31.7 °C and the mean minimum temperature 22.7 °C.

4.2.2 Oceanography

4.2.2.1 Currents and tides

The large-scale currents of the Timor Sea are dominated by the ITF current system. This current is generally strongest during the south-east monsoon season (DEWHA 2008). The ITF brings warm, low salinity, oligotrophic (low in nutrients) waters through a complex system of currents, linking the Pacific and Indian Ocean via the Indonesian Archipelago (DEWHA 2008). The strength of the ITF fluctuates seasonally, reaching maximum strength during the south-east monsoon, and weakening during the north-west monsoon. The Holloway Current, a relatively narrow boundary current that flows along the north-west shelf of Australia between 100 m – 200 m depth, also influences the seas in the area (DEWHA 2008). The direction of the current changes seasonally with the monsoon, flowing towards the north-east in summer and the south-west in winter (DEWHA 2008).

Water movement in the NMR is influenced primarily by wind and tidal activity and less by ocean currents. Surface currents reflect seasonal wind activity, flowing easterly to north-easterly during the wet season and west to south-westerly during the dry season (Heyward et al. 1997). Local wind driven surface currents can reach speeds of 0.6 m/s during monsoonal wind surges, however, more typical speeds are in the range of 0.2 to 0.3 m/s (Heyward et al. 1997).

Currents measured in offshore waters within the region are typically 0.2 m/s (0.7 km/hr) and up to 0.6 m/s (2.2 km/hr). Tidal currents dominate flow in continental shelf waters in the region, with maximum spring tidal current velocities of up to 1.0 m/s (3.6 km/hr) and neap tidal currents of 0.4 m/s (1.4 km/hr).

Tides in the EMBA are typically semi-diurnal, with two high and low tides each day; diurnal tides occur during a relatively small portion of the moon phase. Tides within the Oceanic Shoals bioregion are macrotidal (4 – 6 m) and range from 2 – 3 m within offshore areas and 3 – 4 m within the Bonaparte Gulf bioregion.

Although the offshore currents are predominantly tidal, there is a pronounced seasonal cycle of drift currents present. During the northwest monsoon the flow weakens and even reverses direction over the inshore part of the shelf. Drift current speeds vary between 0.1 and 0.3 m/s (0.4-1 km/hr) with a mean yearly current of less than 0.05 m/s (0.2 km/hr) tending to the southwest.

4.2.2.2 Waves

In general, significant wave heights in the NMR are low. Approximately 67% of the significant wave height records are less than 1 m, and less than 3% exceed 2 m. The calmest months are March, April, and September to November. Significant wave heights above 2 m are most common in December to February, particularly during monsoon conditions, and in May to July. Swells are generally low and from the west (originating in the Indian Ocean) but can enter the area from the east following cyclonic development in the Arafura Sea. The passage of cyclones

results in increased wave heights and increased barometric tides due to the low atmospheric pressure.

4.2.2.3 Temperature

The sea surface temperature in the region does not vary significantly during the year and typically ranges from approximately 26 °C to 27 °C. This temperature is characteristic for the top 50 m of the water column. Beneath that layer, there is typically a steady decrease in temperature with depth to about 23 °C at 110 m depth

4.2.3 Bathymetry and Seabed Features

The Pipeline between KP0 and KP380 has an average depth of approximately 74 m, with maximum and minimum depths between 134 m and 13 m respectively (**Figure 4-3**). From the north-western end (within Commonwealth waters of the Oceanic Shoals bioregion), the EMBA initially descends a slope from 60 to 100 m before reaching a maximum water depth of 134 m. The seabed then becomes shallower, with much of the Pipeline between KP180 and KP380 in approximately 100 m of water. One named shoal, Newby Shoal, is apparent on the Pipeline depth profile near KP380 and several other names shoals and banks occur within the EMBA (**Figure 4-4**).

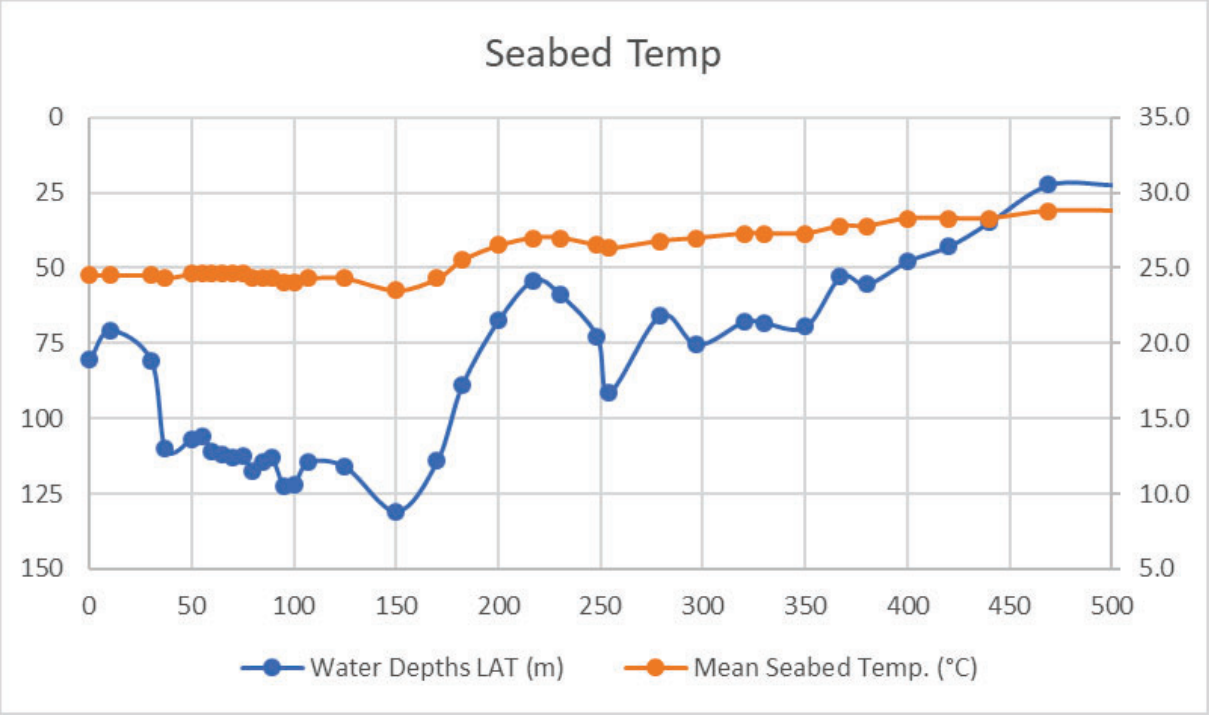


Figure 4-3: Depth profile and seabed temperature of the entire Pipeline

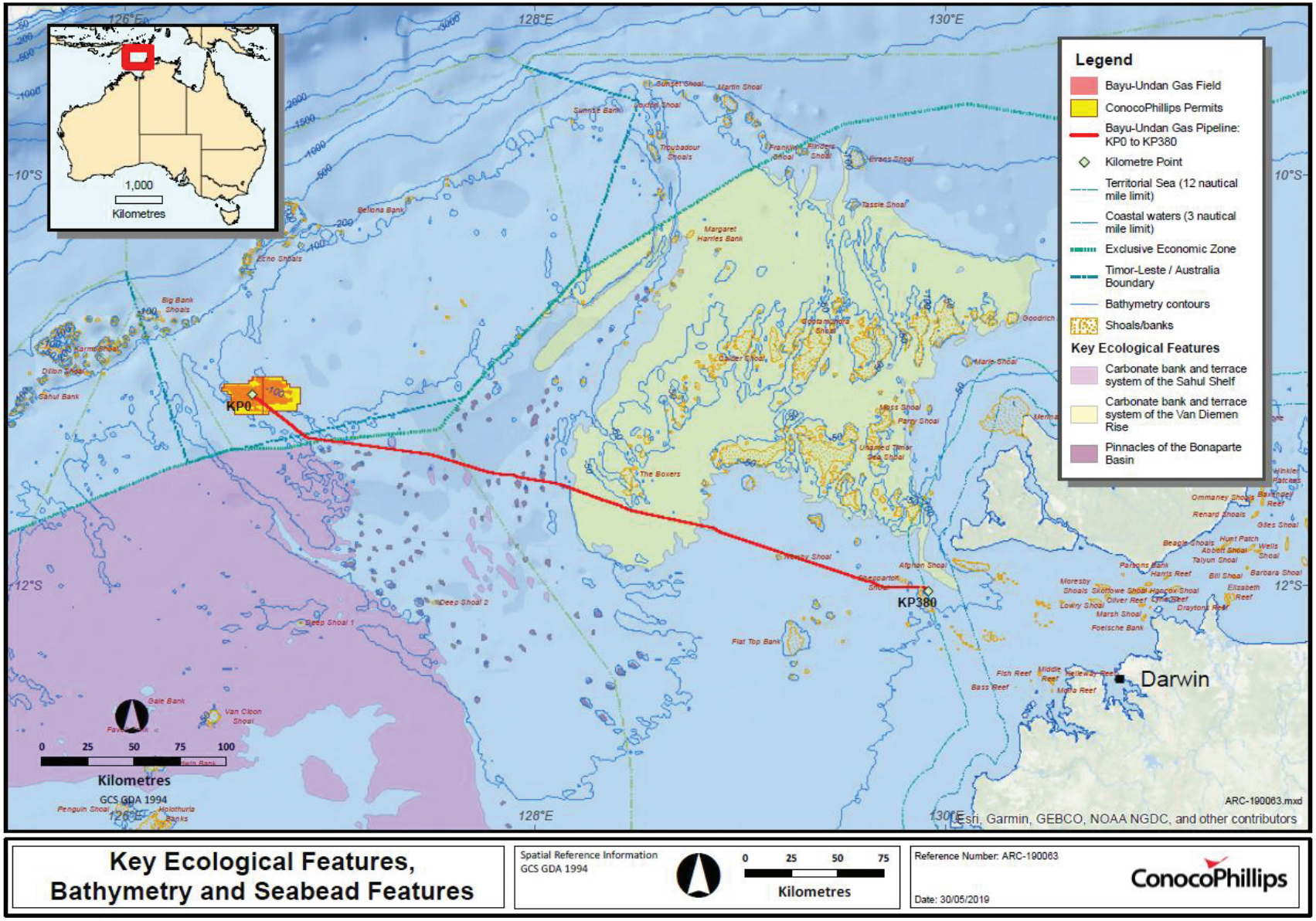


Figure 4-4: Bathymetry, KEFs and seabed features

4.2.3.1 Key Ecological Features

KEFs are of regional importance for either the marine region's biodiversity or ecosystem function and integrity. A search was conducted of the DoEE Conservation Values Atlas to identify the KEFs that occur within the EMBA (**Figure 4-4**). The Operational Area overlaps three KEFs, each is described in **Table 4-8**. None of these KEFs overlap KP380, which is the location of planned seabed disturbance.

Table 4-1: KEFs overlapping the EMBA

KEF	Area of EMBA within KEF (km^2)	Description
Carbonate bank and terrace system of the Sahul Shelf	6.04 (0.01% of the total KEF area)	*Unique seafloor feature with ecological properties of regional significance* While there is limited scientific information available on the bank and terrace system of the Sahul Shelf, it is considered regionally important because of its likely ecological role in enhancing biodiversity and local productivity relative to its surrounds. The banks are characterised by hard substrate and flat tops with each bank generally being < 10 km^2 in area and separated from each other by narrow meandering channels which are up to 150 m deep. The banks are thought to support a high diversity of organisms including reef fish, sponges, soft and hard corals, gorgonians, bryozoans, ascidians and other filter feeders. The banks are known to provide foraging areas for loggerhead, olive ridley and flatback turtles, with cetaceans and green and largetooth sawfish likely to occur in the area also.
Carbonate bank and terrace system of the Van Diemen Rise	274.20 (0.88% of the total KEF area)	*Unique seafloor feature with ecological properties of regional significance* The bank and terrace system of the Van Diemen Rise covers approximately 31,278 km^2 and forms part of the larger system associated with the Sahul Banks to the north and Londonderry Rise to the east. The feature is characterised by terrace, banks, channels and valleys, with variability in water depth and substrate composition considered to contribute to the presence of unique ecosystems in the channels. The feature provides habitat for sponges, soft corals and other sessile filter feeders; epifauna and infauna such as polychaetes and ascidians; and olive ridley turtles, sea snakes and sharks.
Pinnacles of the Bonaparte Basin	0.01 (0.01% of the total KEF area)	*Unique seafloor feature with ecological properties of regional significance* The pinnacles of the Bonaparte Basin cover more than 520 km^2 and are thought to be the eroded remnants of underlying strata. These vertical walls of the pinnacles are considered to generate local upwelling of nutrient-rich water, leading to phytoplankton productivity that attracts aggregations of planktivorous and predatory fish, seabirds and foraging turtles. The pinnacles also provide areas of hard substrate in an otherwise relatively featureless environment and are therefore considered likely to support a high number of species, although further scientific information is required.

4.2.4 Water Quality

Water quality in the Northwest Shelf Transition is influenced predominately by the ITF, which brings warm, low salinity, oligotrophic (low in nutrients) waters into the region from Indonesia (DEWHA 2008). Environmental monitoring at the Bayu-Undan field showed surface water quality is generally high, with low levels of contaminants and turbidity. Water quality changes along the Pipeline as it crosses the continental shelf, becoming considerably more turbid as the Pipeline approaches coastal waters. The increased turbidity is the result of strong tidal currents on the mid- and inner continental shelf within the Joseph Bonaparte Gulf region of the Northwest Shelf Transition, particularly in coastal areas (Przeslawski et al. 2011).

4.2.5 Sediment Quality

The dominant sediments within the EMBA in Commonwealth waters are very soft to soft silts, sandy silts and very loose to loose silty sands with variable shell content and sand fraction

ranging from fine to coarse. Sediment quality in the region is typically high, with low levels of contaminants. Sediment monitoring results from the Bayu-Undan facility and within the Barossa development area indicated most potential contaminants, such as metals and hydrocarbons, were below the interim sediment quality guidelines low trigger values (Jacobs 2016, URS 2015).

4.2.6 Air Quality

Air quality within the EMBA is expected to be of very high, with only localised anthropogenic influences. Emissions from the Bayu-Undan Field (e.g. fugitive, combustion engine and flaring emissions) are the only point source atmospheric emissions within the offshore and remote areas of the EMBA.

4.3 BIOLOGICAL ENVIRONMENT

4.3.1 EPBC Matters of National Environmental Significance

MNES within the EMBA (i.e. the Operational Area and the Moderate Exposure Zone) were identified using the PMST. Two PMST reports were generated; one based on the Operational Area and one based on the Moderate Exposure Zone. Both reports are provided in **Appendix B**. Note that several MNES that will not credibly be impacted by the petroleum activity were identified by the PMST Report for the Moderate Exposure Zone (e.g. obligate terrestrial species). These have been excluded from further consideration as they are an artefact of the method used to drive the spatial extent of the Moderate Exposure Zone.

Table 4-2: Summary of MNES identified by PMST reports within the EMBA

MNES Categories	Number of MNES
World Heritage Places	0
National Heritage Places	0
Wetlands of International Importance (Ramsar wetlands)	0
Listed threatened ecological communities	0
Listed threatened species	21 (18 of which are also migratory)
Listed migratory species	43 (18 of which are also threatened)

4.3.2 Habitats and Communities

4.3.2.1 Threatened Ecological Communities

No threatened ecological communities listed under the EPBC Act were identified within the EMBA.

4.3.2.1 Ramsar Wetlands

There are no Ramsar wetlands within the EMBA. The nearest Ramsar wetland, Cobourg Peninsula, lies approximately 135 km from the Moderate Exposure Zone at the closest point.

4.3.2.2 Intertidal and Benthic Primary Producers

Coral Reef

Coral reefs provide habitat for a range of marine fauna and are associated with high levels of biodiversity. Coral reefs in the Oceanic Shoals bioregion are typically associated with shallow features in clear offshore waters, such as the shoals and banks on the outer continental shelf (beyond the EMBA). Shoals and banks are uncommon within the EMBA, with only two named shoals (Newby Shoal and Shepparton Shoal) within the EMBA. Habitat modelling and mapping suggests neither of these features hosts coral habitat (Heyward et al. 2017, Radford et al. 2018), likely to be due to the high levels of turbidity resulting in insufficient light reaching the seabed to support zooxanthellate coral growth.

Seagrass/Macroalgae

Seagrass and macroalgae communities provide important habitat for various marine species. Like coral reefs, these communities are light restricted and generally occur only within shallow coastal areas. Relatively high levels of turbidity, combined with deep water, result in the Operational Area and much of the Moderate Exposure Zone being unsuitable for seagrass and macroalgae growth. Extensive seagrass and macroalgae communities are unlikely to occur within the EMBA; however, small discrete patches of seagrass may be present near Bathurst Island.

Mangroves/Saltmarshes

Mangroves and saltmarshes are confined to shoreline habitats, none of these occur within the EMBA.

4.3.2.3 Other Benthic Communities

Based on habitat modelling by the Australian Institute of Marine Science (AIMS) (Heyward et al. 2017), the majority of the benthic habitats with the Operational Area are bare sediments (78%), with burrowers / crinoids and filter feeders comprising 21% and 1% respectively (**Figure 4-5**). Benthic habitats below the Pipeline around KP380, where planned seabed disturbance will occur, are bare sediments. These habitats are very widely represented within the region and are not considered to be particularly sensitive or of high conservation value.

The benthic habitat model by AIMS partially overlaps the Moderate Exposure Zone. Modelled benthic habitats within the Moderate Exposure Zone include bare sediments (71%), Burrowers / crinoids (21%) and filter feeders (8%). The remaining 1% of modelled habitats comprise hard corals, macroalgae, *Halimeda* and alcyon (**Figure 4-5**).

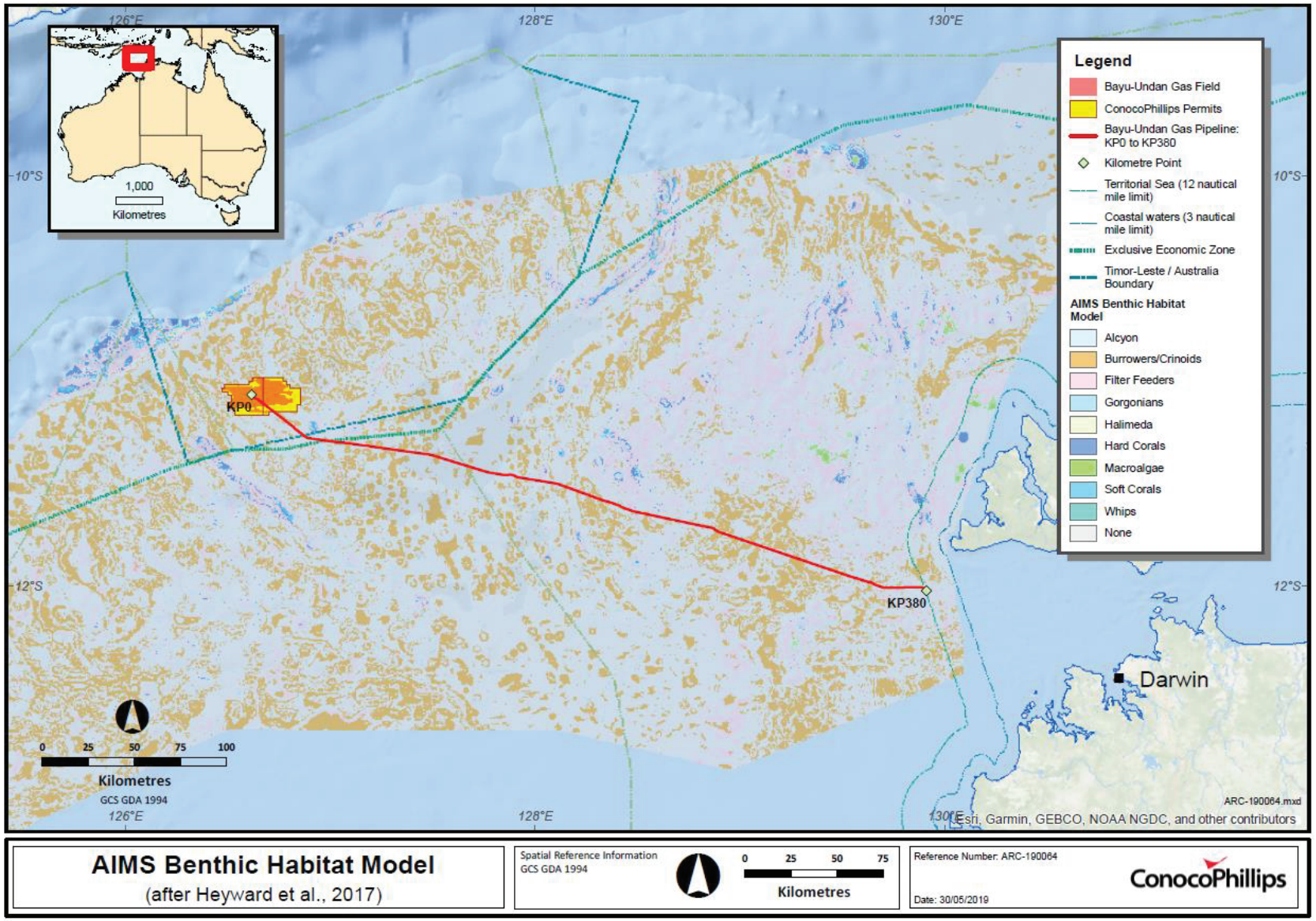


Figure 4-5: Benthic habitat mapping (after Heyward et al. 2017)

4.3.2.4 Plankton

In offshore Commonwealth waters of the NMR (deeper than 50 m), plankton communities are dominated by dinoflagellates *Dinophysis*, *Ceratium*, *Prorocentrum* and *Caratocorys*. Shallower offshore waters support cyanobacterium *Trichodesmium* and the diatoms *Rhizosolenia* and *Thalassonema* and inshore waters support diatoms *Rhizosolenia* and *Thalassonema* (DEWHA 2008).

4.3.2.5 Pelagic and Demersal Fish Communities

Given the widespread tropical open water habitat throughout the region, pelagic fish within the EMBA are expected to be tropical species that are broadly distributed in the Timor Sea and Indo-Pacific region. Several pelagic fish that occur in the region, such as marlin and mackerel, are important for commercial and recreational fisheries, although fishing effort in the EMBA is very low (**Section 4.4.3**). Several pelagic sharks listed as migratory may occur within the EMBA, such as makos, whale sharks and manta rays; refer to **Section 4.3.3.7** for further information.

Demersal fish assemblages are typically associated with benthic habitat types. As bare sands and, to a lesser extent, burrowers / crinoids, comprise the main habitat types within the EMBA, the demersal fish assemblages will include species that are not typically site-attached, such as some species of shark, tropical snappers (Lutjanidae) and cod (*Epinephelus* spp.) (Radford et al. 2018). Several demersal fish species are targeted by commercial and recreational fishers (**Section 4.4.3**). The presence of the Pipeline is likely to provide artificial reef habitat that hosts fish assemblages distinct from the surrounding bare sediment habitat. Studies of fish assemblages associated with pipelines on the North West Shelf have shown significantly higher species richness and relative abundance compared to the surrounding habitat (Bond et al. 2018).

4.3.3 Marine Fauna of Conservation Significance

Two EPBC Act PMST database searches were conducted, one for the Operational Area and one for the EMBA (spill extent) to identify threatened or migratory species occurring within the Operational Area and EMBA. The PMST reports are included in **Appendix B**, including type of presence expected for both searches.

A total of 46[4] threatened or migratory species considered to be MNES (3 listed as threatened, 25 listed as migratory and 18 listed as both threatened and migratory) were identified as potentially occurring within the Operational Area and EMBA (**Table 4-3**). The full list of marine species identified from the protected matters search is provided in **Appendix B**.

Table 4-3: EPBC listed threatened and listed migratory species potentially occurring within the Operational Area and EMBA

Species Name	Common Name	Threatened Status	Migratory Status	Operational Area / Moderate Exposure Zone
Mammals				
Balaenoptera borealis	Sei Whale	Vulnerable	Migratory	Ops Area & EMBA
Balaenoptera edeni	Bryde's Whale	N/A	Migratory	
Balaenoptera musculus	Blue Whale	Endangered	Migratory	
Balaenoptera physalus	Fin Whale	Vulnerable	Migratory	
Megaptera novaeangliae	Humpback Whale	Vulnerable	Migratory	

[4] The PMST reports identified ten threatened or migratory species that are obligate terrestrial species. These will not credibly be impacted by the activities within the scope of this EP, including unplanned events such as hydrocarbon spills. Their identification within the PMST reports is considered to be an artefact of the method by which the EMBA boundaries are generated for the PMST query, which results in some minor overlap of onshore areas that are not credibly impacted. These obligate terrestrial species are not considered in this EP.

Species Name	Common Name	Threatened Status	Migratory Status	Operational Area / Moderate Exposure Zone
Orcinus orca	Killer Whale, Orca	N/A	Migratory	
Sousa chinensis	Indo-Pacific Humpback Dolphin	N/A	Migratory	
Tursiops aduncus (Arafura/Timor Sea populations)	Spotted Bottlenose Dolphin (Arafura/Timor Sea populations)	N/A	Migratory	
Dugong dugon	Dugong	N/A	Migratory	EMBA only
Orcaella heinsohni	Australian Snubfin Dolphin	N/A	Migratory	
Reptiles				
Caretta caretta	Loggerhead Turtle	Endangered	Migratory	Ops Area & EMBA
Chelonia mydas	Green Turtle	Vulnerable	Migratory	
Crocodylus porosus	Salt-water Crocodile, Estuarine Crocodile	N/A	Migratory	
Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth	Endangered	Migratory	
Eretmochelys imbricata	Hawksbill Turtle	Vulnerable	Migratory	
Lepidochelys olivacea	Olive Ridley Turtle, Pacific Ridley Turtle	Endangered	Migratory	
Natator depressus	Flatback Turtle	Vulnerable	Migratory	
Sharks and Rays				
Anoxypristis cuspidata	Narrow Sawfish, Knifetooth Sawfish	N/A	Migratory	Ops Area & EMBA
Carcharodon carcharias	White Shark, Great White Shark	Vulnerable	Migratory	
Glyphis garricki	Northern River Shark, New Guinea River Shark	Endangered	N/A	
Glyphis	Speartooth Shark	Critically endangered	N/A	
Isurus oxyrinchus	Shortfin Mako, Mako Shark	N/A	Migratory	
Isurus paucus	Longfin Mako	N/A	Migratory	
Manta alfredi	Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray	N/A	Migratory	
Manta birostris	Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray	N/A	Migratory	
Pristis clavata	Dwarf Sawfish, Queensland Sawfish	Vulnerable	Migratory	
Pristis pristis	Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish	Vulnerable	Migratory	
Pristis zijsron	Green Sawfish, Dindagubba, Narrowsnout Sawfish	Vulnerable	Migratory	

Species Name	Common Name	Threatened Status	Migratory Status	Operational Area / Moderate Exposure Zone
Rhincodon typus	Whale Shark	Vulnerable	Migratory	
Birds				
Actitis hypoleucos	Common Sandpiper	N/A	Migratory	Ops Area & EMBA
Anous stolidus	Common Noddy	N/A	Migratory	
Calidris acuminata	Sharp-tailed Sandpiper	N/A	Migratory	
Calidris canutus	Red Knot, Knot	Endangered	Migratory	
Calidris ferruginea	Curlew Sandpiper	Critically endangered	Migratory	
Calidris melanotos	Pectoral Sandpiper	N/A	Migratory	
Calonectris leucomelas	Streaked Shearwater	N/A	Migratory	
Fregata ariel	Lesser Frigatebird, Least Frigatebird	N/A	Migratory	
Fregata minor	Great Frigatebird, Greater Frigatebird	N/A	Migratory	
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically endangered	Migratory	
Acrocephalus orientalis	Oriental Reed-Warbler	N/A	Migratory	EMBA only
Apus pacificus	Fork-tailed Swift	N/A	Migratory	
Charadrius veredus	Oriental Plover, Oriental Dotterel	N/A	Migratory	
Glareola maldivarum	Oriental Pratincole	N/A	Migratory	
Limosa lapponica	Bar-tailed Godwit	N/A	Migratory	
Limosa lapponica baueri	Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit	Vulnerable	N/A	
Pandion haliaetus	Osprey	N/A	Migratory	Ops Area only

4.3.3.1 Listed Threatened Species Recovery Plans

The DoEE publishes recovery plans and conservation advice for a number of species listed as threatened under the EPBC Act. These documents are intended to assist in preventing the decline, and enhance the recovery, of threatened species. The requirements of the species recovery plans and conservation advice (**Table 4-4**) for threatened species identified within the EMBA were considered to identify any aspects that may be applicable to the risk assessment (**Section 5**).

Table 4-4: Summary of EPBC recovery plans relevant to operation and maintenance of the Pipeline

Species	EPBC Recovery plan/conservation advice (date issued)	Key threats identified in the recovery plan/conservation advice	EP risk assessment section
Mammals			
Sei whale	Conservation Advice for *Balaenoptera borealis* (sei whale)	Noise interference	Acoustic emissions: Noise from vessels and activities (**Section 5.3.10**)
		Vessel disturbance (i.e. vessel presence or collision)	Physical presence: Collision with marine fauna (**Section 5.4.3**)

Species	EPBC Recovery plan/conservation advice (date issued)	Key threats identified in the recovery plan/conservation advice	EP risk assessment section
Blue whale	Conservation Management Plan for the Blue Whale	Noise interference	Acoustic emissions: Noise from vessels and activities (**Section 5.3.10**)
		Vessel disturbance	Physical presence: Collision with marine fauna (**Section 5.4.3**)
Fin whale	Conservation Advice for *Balaenoptera physalus* (fin whale)	Noise interference	Acoustic emissions: Noise from vessels and activities (**Section 5.3.10**)
		Vessel disturbance	Physical presence: Collision with marine fauna (**Section 5.4.3**)
Humpback whale	Conservation Advice for *Megaptera novaeangliae* (humpback whale)	Noise interference	Acoustic emissions: Noise from vessels and activities (**Section 5.3.10**)
		Vessel disturbance	Physical presence: Collision with marine fauna (**Section 5.4.3**)
Reptiles			
Leatherback turtle	Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle)	Vessel disturbance	Physical presence: Collision with marine fauna (**Section 5.4.3**)
Loggerhead turtle Green turtle Hawksbill turtle Flatback turtle Olive ridley turtle	Recovery Plan for Marine Turtles in Australia	Vessel disturbance	Physical presence: Collision with marine fauna (**Section 5.4.3**)
		Light pollution	Light emissions: Artificial light on vessels and ROVs (**Section 5.3.9**)
		Acute chemical discharge	Discharges: MDO release from vessel collision (**Section 5.4.5**) Discharges: MDO release from bunkering incident (**Section 5.4.6**)
Sharks and Rays			
Whale shark	Conservation advice for *Rhincodon typus* (whale shark)	Vessel disturbance	Physical presence: Collision with marine fauna (**Section 5.4.3**)
Great white shark	Recovery Plan for the White Shark (*Carcharodon carcharias*)	No relevant threats identified (ex. marine debris)	n/a – the key threats are outside the scope of this EP
Dwarf sawfish Green sawfish Freshwater sawfish Northern river shark Speartooth shark	Sawfish and River Sharks Multispecies Recovery Plan (November 2015) Conservation Advice: for dwarf sawfish (October 2009), green sawfish (2008), *Pristis pristis* (freshwater sawfish) (April 2014), speartooth shark (April 2014), and northern river shark (April 2014)	Marine debris (potential threat)	n/a – the key threats are outside the scope of this EP
Birds			

Species	EPBC Recovery plan/conservation advice (date issued)	Key threats identified in the recovery plan/conservation advice	EP risk assessment section
Red Knot	Conservation Advice for *Calidris canutus* (red knot) (May 2016)	Habitat degradation / modification (oil pollution)	Discharges: MDO release from vessel collision (**Section 5.4.5**) Discharges: MDO release from bunkering incident (**Section 5.4.6**)
Curlew Sandpiper	Conservation Advice for *Calidris ferruginea* (curlew sandpiper) (May 2015)		
Eastern Curlew	Conservation Advice for *Numenius madagascariensis* (eastern curlew) (May 2015)		
Western Alaskan Bar-tailed Godwit	Conservation Advice for *Limosa lapponica baueri* (bar-tailed godwit - western Alaskan) (May 2016)		
Sharp-Tailed Sandpiper, Pectoral Sandpiper, Common Sandpiper, Red Knot, Oriental Plover, Oriental Pratincole, Bar-tailed Godwit	Wildlife conservation plan for migratory shorebirds (January 2016)		

4.3.3.2 Biologically Important Areas

The DoEE has established a series of biologically important areas (BIAs) for regionally significant marine species (which are typically listed as threatened under the EPBC Act). BIAs identify areas where biologically significant behaviours may occur, such as nesting, breeding, migrating, foraging or resting. The collection of BIAs was developed by the DoEE during the development of bioregional plans utilising a range of data, such as expert advice and published literature. BIAs are intended to assist decision-making under the EPBC Act.

BIAs overlapping the Operational Area and EMBA:

- Inter-nesting BIA for flatback turtles around Melville Island and the Cobourg Peninsula (overlaps the Operational Area).
- foraging BIA for olive ridley turtles in the Northern Joseph Bonaparte Gulf (overlaps the Operational Area); and
- inter-nesting BIA for olive ridley turtles on the north-west of the Tiwi Islands (approximately 82 km north-east the Operational Area, within the EMBA).

The identified BIAs are discussed under the relevant species sections below.

4.3.3.3 Habitat Critical to the Survival of a Species

Habitats critical for the survival of several species of marine turtles were identified in the *Recovery Plan for Marine Turtles in Australia 2017-2027* (Commonwealth of Australia 2017). Like BIAs, these critical habitats identify areas where biologically significant behaviours may occur. Unlikely BIAs, habitats critical for the survival of a species receive specific protection under the EPBC Act. While BIAs do not receive specific protection under the EPBC Act, the

threatened and migratory species associated with them are MNES and are protected under the EPBC Act.

Three habitats critical for the survival of marine turtles within the Operational Area and EMBA are (**Figure 4-3**):

- Flatback turtle nesting from Brace Point to One Tree Point, including all offshore islands (overlaps the Operational Area);
- Olive ridley turtle nesting from Brace Point to One Tree Point, including all offshore islands (approximately 6 km from the Operational Area, but within the EMBA); and
- Flatback turtle nesting from Waigait Beach to south of Point Blaze, including all offshore islands (approximately 24 km from the Operational Area, but within the EMBA).

The identified habitat critical to the survival of a species are discussed under the relevant species sections below.

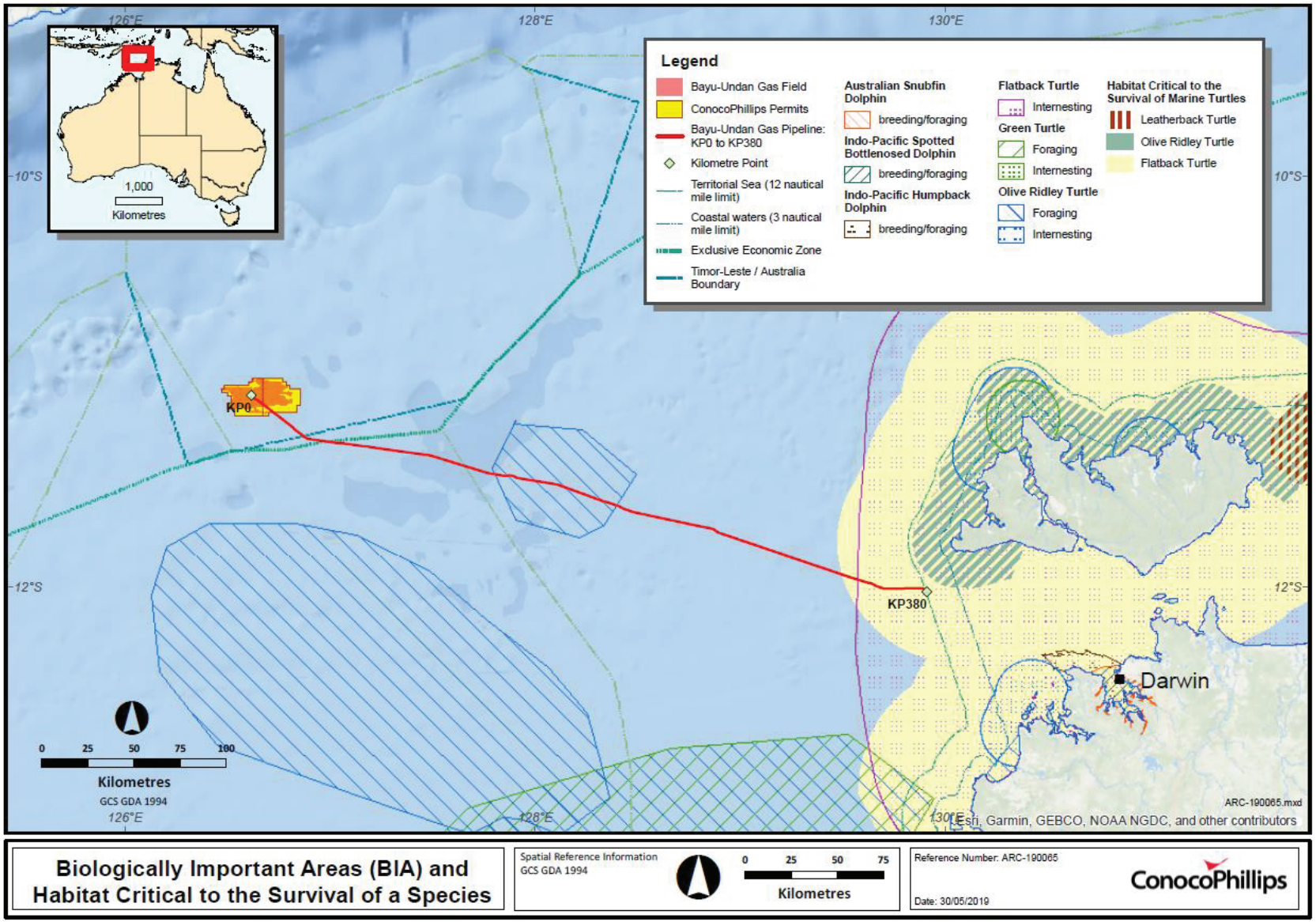


Figure 4-6: BIAs and habitat critical to the survival of a species

4.3.3.4 Seasonality

The presence of a number of animals identified within the Operational Area and EMBA is seasonal in nature. The timing of seasonally present EPBC Act listed threatened and/or migratory species potentially occurring within the Operational Area or EMBA are provided in **Table 4-5**.

Table 4-5: Seasonal presence of EPBC Act listed threatened and/or migratory species within the EMBA

Species	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flatback turtles (presence, nesting/breeding)												
Olive ridley turtles (presence, nesting/breeding)												
Green turtles (presence, nesting/breeding)												
Hawksbill turtles (presence)												
Leatherback turtles (presence)												
Streaked shearwater												
Migratory shorebirds (aggregation, breeding)												
Legend												
	Peak presence/occurrence (presence of animals reliable and predictable each year)											
	Species likely to be present in the region											

4.3.3.5 Marine Mammals

The EPBC Act PMST reports identified 10 species of marine mammal that may occur within the Operational Area and the EMBA (**Table 4-3**). The Operational Area and EMBA is not known to include any critical habitat or BIAs (i.e. foraging, breeding/calving, resting or restricted migratory pathway) for any of the identified mammal species.

Sei Whale

Sei whales have a worldwide oceanic distribution but have only been infrequently recorded in Australian waters (Bannister et al. 1996). Sei whales are expected to undertake seasonal migrations between low latitude wintering areas and high latitude summer feeding grounds (Bannister et al. 1996, Prieto et al. 2012); however, their distributional limits in Australia are uncertain. This is largely due to the rare occurrence of sightings, and their similar appearance to Bryde's whales leading to them often being incorrectly identified, particularly in higher latitudes (Bannister et al. 1996).

The species prefers deep waters, further offshore than other species of large whales, and typically occurs in oceanic basins and continental slopes (Prieto et al. 2012). Records of the species occurring on the continental shelf (< 200 m water depth) are uncommon in all Australian

waters (Bannister et al. 1996).

There are no known mating or calving areas, or other EPBC listed critical habitat or BIAs for sei whales in Australian waters. Given the rare occurrence of sightings in the NMR and NWMR, sei whales are unlikely to occur within the Operational Area or EMBA.

Bryde's Whale

Bryde's whales occur in temperate to tropical waters, between 40 °S and 40 °N year round (Bannister et al. 1996). The population of Bryde's whales appears to be split into coastal and offshore subpopulations. The offshore form is found in water depths between 500 and 1,000 m, while the coastal form appears to remain within the 200 m depth isobar where individuals move along the coast based on the availability of suitable prey. Little is known about the population abundance of Bryde's whale and there are no estimates of the exact breeding and calving grounds.

A few individuals of Bryde's whale were detected in the Barossa marine studies program from January to early October (approximately 200 km north-east of the EMBA at its closest point) (McPherson et al. 2016). McPherson et al. (2016) commented that the presence of Bryde's whales would be expected based on the findings of several studies which noted the species' occurrence in the Timor Sea and surrounding waters. As the Barossa study area is in water depths between 120 and 350 m, it is likely these records were from the inshore form of the species. As such, it is possible the coastal form of Bryde's whales may also occasionally transit through the Operational Area and EMBA; however, they are not expected to be present in significant numbers.

Pygmy Blue Whale

In the Southern Hemisphere, the blue whale has two distinct sub-species, the southern (or 'true') blue whale and the pygmy blue whale (Commonwealth of Australia 2015a). As southern blue whales are thought to only occur in waters south of 60 °S and pygmy blue whales distributed north of 55 °S, nearly all blue whales recorded in the NWMR and NMR are likely to be pygmy blue whales.

Recent tagging studies (Double et al. 2014) indicate the general migration pattern, timing and key areas for pygmy blue whales in Commonwealth waters are the Perth Canyon/Naturaliste Plateau and Ningaloo Reef/North West Cape (beyond the Operational Area and EMBA). Satellite tagging of pygmy blue whales off the Perth Canyon confirmed the general distribution of migrating pygmy blue whales was offshore in water depths over 200 m and commonly over 1,000 m (Double et al. 2012). These data showed that whales tagged during March and April migrated northwards post tag deployment. The tagged whales travelled relatively near to the Australian coastline (100 ± 2 km) until reaching North West Cape after which they travelled offshore (238 ± 14 km). Whales reached the northern terminus of their migration and potential breeding grounds in Indonesian waters by June (Double et al. 2014). The southbound migration is thought to terminate in the Southern Ocean, where the species feeds.

A noise monitoring study conducted as part of the Barossa marine studies program (approximately 200 km north-east of the EMBA at its closest point) recorded pygmy blue whales moving in a northward direction in August 2014 and between late-May to early July 2015 (McPherson et al. 2016). No detections of the species were made during the period of their southward migration, indicating that they may utilise a different migration path.

No BIAs or critical habitats for pygmy blue whales occur within the Operational Area or EMBA. Given pygmy blue whales are known to travel in waters beyond the depth profile and further west and north of the Operational Area, it is unlikely that they will occur within the Operational Area or EMBA.

Fin Whale

Fin whales are widely distributed from polar to tropical waters and have been recorded in all Australian states, other than New South Wales and the NT (Bannister et al. 1996).

Fin whales are rarely observed in inshore waters and displays migratory movements (essentially north-south) between polar, temperate and tropical waters (Bannister et al. 1996). Migration within Australian waters does not appear to follow a clear route and is thought to occur in

summer and autumn. Breeding in the Southern hemisphere occurs in tropical and sub-tropical latitudes between May and July.

Fin whales feed on planktonic crustacea, such as Antarctic krill, and primarily forage in high latitudes (Bannister et al. 1996). Within Australian waters, Antarctic waters and the Bonney Upwelling are thought to be important foraging grounds for this species.

There are no recognised BIAs or critical habitats for fin whales within the Operational Area or EMBA. The species is unlikely to occur within the Operational Area or EMBA.

Humpback Whale

Humpback whales have a wide distribution, with recordings throughout Australian Antarctic waters and offshore from all Australian states/territories (Bannister et al. 1996). They occur throughout Australian waters, as two genetically distinct, east and west populations. Both populations' distributions are influenced by migratory pathways and aggregation areas for resting, breeding and calving. In the west, humpback whales migrate north to breeding grounds in Camden Sound of the west Kimberley between May and November, with a peak period between late July and early August, after feeding in Antarctic waters during the summer months (Jenner et al. 2001).

No BIAs for humpback whales occur within the NMR and relatively few humpback whales have been known to travel north of their calving grounds in Camden Sound (Jenner et al. 2001). No humpback whales were recorded during the 12 months of noise monitoring undertaken as part of the Barossa marine studies program (approximately 200 km north-east of the EMBA at its closest point) (McPherson et al. 2016). Given this, the species is highly unlikely to occur within the Operational Area or the EMBA.

Killer Whale

Killer whales have a global distribution and utilise a wide range of habitats. However, they appear to be primarily concentrated in temperate coastal waters and cooler regions of high productivity (Bannister et al. 1996).

This species is distributed throughout Australian waters, particularly in Tasmanian waters and the waters surrounding Macquarie Island (1,500 km south-south-east of Tasmania) (Bannister et al. 1996). Off Australia, the species is typically observed moving along the continental slope and shelf, and near seal colonies (Bannister et al. 1996). There are no key localities identified within continental Australian waters for this species. Globally killer whales are known to migrate; however, specific routes and seasonal movement patterns are not known in detail and are thought to relate to prey availability (Bannister et al. 1996).

Based on their known distribution and movements, killer whales are unlikely to be encountered in within the Operational Area or the EMBA.

Indo-Pacific (Australian) Humpback Dolphin

The Indo-Pacific humpback dolphin has been recognised as two distinct species; the Indo-Pacific humpback dolphin (*Sousa chinensis*) and the Australian humpback dolphin (*S. sahulensis*) (Jefferson and Rosenbaum 2014). Only the Australian humpback dolphin is considered here. Humpback dolphins inhabit shallow coastal, estuarine habitats in tropical and subtropical regions generally in depths of less than 20 m (Corkeron et al. 1997, Jefferson 2000, Jefferson and Rosenbaum 2014).

The Australian humpback dolphin occurs along the northern Australian coastline from Exmouth in WA to the Queensland/New South Wales border (Bannister et al. 1996). The species' preferred habitat is shallow (generally < 20 m in depth) coastal, estuarine and riverine (occasional) waters. However, individuals have been observed in shallow waters up to 55 km offshore (Bannister et al. 1996).

Given the species' preferred habitat is relatively shallow coastal waters, Australian humpback dolphins are very unlikely to occur in the Operational Area but may be present in coastal areas of the EMBA.

Spotted Bottlenose Dolphin

There are four known subpopulations of spotted bottlenose dolphins, of which the Arafura/Timor Seas population was identified as potentially occurring within the Operational Area and EMBA. The species occurs in open coastal waters, primarily within the continental shelf, and in waters surrounding offshore islands. The species forages in a wider range of habitats and in deeper waters than most dolphin species, but is generally restricted to water depths of less than 200 m. The Arafura/Timor Sea spotted bottlenose population is considered migratory; however, their movement patterns are considered highly variable, with some individuals displaying year-round residency to a small area and other undertaking long-range movements and migrations.

Given the species' utilisation of relatively deeper waters and the potential for long-range migratory movements, it is likely this species will occasionally transit the Operational Area and EMBA.

Dugongs

Dugongs occur in tropical and sub-tropical waters broadly coincident with the distribution of seagrasses (Marsh et al. 2002), which typically occur in shallow intertidal zone areas to water depths of around 25 m. Dugong feeding aggregations tend to occur in large seagrass meadows within wide shallow protected bays, shallow mangrove channels and in the lee of large inshore islands. The movements of most individuals are limited to within tens of kilometres within the vicinity of seagrass beds. However, some individuals have been observed to travel large distances of up to 600 km over a few days (Marsh et al. 2002).

Dugongs and areas of potential dugong habitat exist along the majority of northern Australian coastline from Shark Bay in WA to Moreton Bay in Queensland. Except for a small population of approximately 50 individuals exists at Ashmore Reef (beyond the Operational Area and EMBA), all are associated with shallow coastal waters hosting seagrass meadows.

Considering the habitat preference of the species, dugongs are very unlikely to occur within the Operational Area but may occur in coastal waters within the EMBA.

Australian Snubfin Dolphin (also referred to as Irrawaddy Dolphin)

The Australian snubfin dolphin (*Orcaella heinsohni*, also known as the Irrawaddy dolphin, *O. brevirostris*) shares similar habitat preferences with the Indo-Pacific humpback dolphin, occurring in shallow coastal and estuarine waters (typically less than 20 m deep). However, as with the Indo-pacific humpback dolphin, the species has also been recorded up to 23 km offshore. In Australia, the species distribution covers the coastal waters of Queensland, the NT and northern WA. The population in Australian waters is thought to be continuous with the Papua New Guinea species but separate from populations in Asia.

This species is not expected to occur within the Operational Area due to its preference for coastal habitats but may be present in coastal areas of the EMBA.

4.3.3.6 Marine Reptiles

Loggerhead Turtle

The loggerhead turtle (*Caretta caretta*) is distributed throughout tropical and sub-tropical and temperate waters in all ocean basins. In Australia, the species ranges along most of the coastline, but is rare in temperate waters (Commonwealth of Australia 2017). Nesting in Australia is concentrated in southern Queensland and from Shark Bar to the North West Cape in WA. Foraging areas are more widely distributed with the WA stock foraging from Shark Bar through to Arnhem Land, Gove and into the Java Sea of Indonesia (Limpus 2008a). Loggerhead turtles are carnivorous and mainly feed on benthic invertebrates in a wide range of habitats ranging from nearshore to 55 m in depth (Commonwealth of Australia 2017).

Loggerhead turtles may occur within the EMBA, but there are no known nesting beaches in the vicinity of the EMBA. No BIAs or habitat critical for the survival of loggerhead turtles identified in the *Recovery plan for marine turtles in Australia 2017-2027* (Commonwealth of Australia 2017) occurs within the EMBA.

Green Turtle

The green turtle (*Chelonia mydas*) is distributed in tropical and sub-tropical waters in the Pacific, Atlantic and Indian oceans. Within Australian waters, the species is predominately found off the WA, NT and Queensland coastlines (Commonwealth of Australia 2017).

The species is primarily herbivorous and forages on algae, seagrass and mangroves, including where these habitats exist at offshore coral reef habitats (Commonwealth of Australia 2017). Tagging studies have shown that green turtles can move considerable distances between nesting, with movements of 100's to 1,000's of kilometres recorded (Limpus 2008b).

Green turtles may occur throughout the EMBA but would only be expected to occur in low numbers due to the absence of foraging or inter-nesting habitat. No significant green turtle nesting occurs around the Tiwi Islands. No BIAs or habitats critical for the survival of green turtles overlap the EMBA.

Salt-water Crocodile

The salt-water crocodile occurs within the nearshore marine and estuarine waters throughout southern Asia and Northern Australia. Large populations within the major river systems of the Kimberley and NT. There are no BIAs for the species within the EMBA. Saltwater crocodiles are unlikely to occur within the EMBA.

Leatherback Turtle

The leatherback turtle (*Dermochelys coriacea*) is distributed in tropical and temperate oceans worldwide. The species is known to forage and migrate throughout the open offshore waters of Australia, with a distribution that extends further south into temperate waters than other marine turtle species (Limpus 2009a). Leatherback turtles eat almost exclusively jellyfish and are pelagic throughout their life in oceanic waters around Australia (Limpus 2009a). Records of leatherback turtle nesting in Australia are sparse and limited to the Cobourg Peninsula and Queensland coast (Limpus 2009a).

There are no BIAs or habitats critical for the survival of leatherback turtles within the EMBA. Leatherback turtles may occur within the EMBA in low numbers.

Hawksbill Turtle

The hawksbill turtle (*Eretmochelys imbricata*) has a worldwide distribution in tropical and sub-tropical waters. In Australia, hawksbill turtles predominately occur along the northern WA, NT and northern Queensland coastlines (Limpus 2009b). Hawksbill turtles are omnivorous and feed on algae, sponges, soft corals and soft bodied invertebrates. This species is typically associated with rocky and coral reef habitats. There is evidence of year-round breeding and nesting in the NT (Limpus 2009b).

There are no critical habitats or BIAs for hawksbill turtles within the EMBA. Hawksbill turtles may occur throughout the EMBA but would only be expected to occur in low numbers due to the absence of foraging or nesting habitat.

Olive Ridley Turtle

The olive ridley turtle (*Lepidochelys olivacea*) has a global distribution in tropical distribution In Australia, the species primarily occurs primary in the NT and Queensland (Limpus 2008c). The olive ridley turtle is primarily carnivorous and feed predominantly on soft-bodied invertebrates (Commonwealth of Australia 2017). The species is known to feed in water depths between 15 m and 200 m, and may make movements > 1,000 km between their nesting and foraging grounds (Whiting et al. 2007).

Nesting is known to occur in the NT and on western Cape York (Queensland) (Commonwealth of Australia 2017, Limpus 2008c); low density nesting has also been described on the Kimberley coast (Limpus 2008c). Nesting around the Tiwi Islands is concentrated on the western and northern coastlines; nesting on the southern coast of Bathurst Island is relatively low (Chatto and Baker 2008). Nesting activity around the Tiwi Islands occurs year-round, with a peak from April to June **Table 4-5**.

Two BIAs for olive ridley turtles occur within the EMBA (**Figure 4-6**):

- A foraging BIA in the northern Bonaparte Gulf that overlaps the Operational approximately halfway between KP0 and KP380; and
- An inter-nesting BIA around the northern coasts of Bathurst and Melville Islands, which lies approximately 82 km from the Operational Area.

One habitat critical for the survival of olive ridley turtles occurs within the EMBA – this is the inter-nesting habitat around the northern and western coasts of Bathurst and Melville Islands. This critical habitat lies approximately 6 km from the Operational Area. Olive ridley turtles are expected to occur within the EMBA throughout the year.

Flatback Turtle

The flatback turtle (*Natator depressus*) is known to occur along the WA, NT and Queensland coastlines, and forages widely across the Australian continental shelf and into the continental waters off Indonesia and Papua New Guinea (Commonwealth of Australia 2017). Unlike other species of marine turtle, the flatback turtle does not have a global tropical distribution, with all recorded nesting beaches within Australian waters (Limpus 2007).

Flatback turtles nest throughout tropical Australia, although there are several distinct populations (Limpus 2007). The northerly populations in Queensland and the NT nest year-round with a peak during winter months. Populations at higher latitudes off central Queensland and WA's Pilbara coast tend to have a nesting peak in summer (Limpus 2007). Inter-nesting flatback turtles have been recorded travelling further from nesting beaches between laying clutches of eggs (Waayers et al. 2011, Whittock et al. 2014).

Flatback turtles are primarily carnivorous and feed predominantly on soft-bodied invertebrates in relatively shallow waters (Limpus 2007). Their distribution is largely restricted to continental shelf waters (< 200 m).

One BIA for flatback turtles occurs within the EMBA – an inter-nesting buffer around the islands and coastline of the NT. This BIA overlaps the Operational Area. This inter-nesting habitat is also recognised as habitat critical for the survival of flatback turtles (**Figure 4-6**).

4.3.3.7 Sharks and Rays

Narrow Sawfish

The narrow sawfish is widely distributed throughout the Indo-Pacific region, with records spanning from the Arabian Gulf to Japan. In Australia, the species may have a broad tropical distribution from approximately North West Cape in WA to southern Queensland. Like other sawfish species, the narrow sawfish has experienced considerable decline in numbers due to human activities, including fishing and habitat loss / damage (Cavanagh et al. 2003).

Like other sawfish in the family Pristidae, the narrow sawfish prefers shallow coastal, estuarine and riverine habitats, although may occur in waters up to 40 m deep (D'Anastasi et al. 2013). Given the water depth and distance from preferred habitats, narrow sawfish are not expected to occur within the Operational Area in significant numbers. However, the species is likely be found in shallow coastal waters and estuaries within the EMBA.

White Shark

The white shark (*Carcharodon carcharias*) has a circum-global distribution primarily in temperate waters. In Australian waters, the species typically occurs in temperate and sub-tropical waters between the shore and the 100 m depth contour; however, adults and juveniles have been recorded diving to depths of 1,000 m (Bruce 2008, Bruce et al. 2006). Tagging studies indicate white sharks may move as far north as Rockhampton on the Queensland coast, however they are thought to be very uncommon in tropical waters (Bruce et al. 2006), such as the Timor Sea.

There are no BIAs for white sharks within the EMBA; given the anti-tropical distribution of this species, white sharks are unlikely to occur within the EMBA.

Northern River Shark

The northern river shark (*Glyphis garricki*) is a medium-sized shark which can tolerate both marine and freshwater. The species has a tropical distribution and is believed to be endemic to

northern Australia and southern New Guinea (Stevens et al. 2005). The species is most commonly encountered in tidal creeks and estuaries (Morgan et al. 2010), hence it is unlikely to occur within the Operational Area in significant numbers but may be present in coastal waters in the EMBA.

Speartooth Shark

The speartooth shark is thought to utilise riverine, estuarine and coastal habitats, with river systems being used as pupping and nursery habitats (Stevens et al. 2005). Only adults of both species have been sighted in offshore waters (DEWHA 2008).

Based on the habitat preferences of the speartooth shark, the species may occur within the EMBA but is unlikely to be present in significant numbers.

Shortfin Mako

The shortfin mako shark is a pelagic species with a circum-global, wide-ranging oceanic distribution in tropical and temperate seas (Mollet et al. 2000). The shortfin mako is commonly found in water with temperatures greater than 16 °C. Tagging studies indicate shortfin makos spend most of their time in water less than 50 m deep but with occasional dives up to 880 m (Abascal et al. 2011, Stevens et al. 2010).

The species can grow to almost 4 m in length. Females mature later (19 to 21 years) than males (7 to 9 years) and adults have moderate longevity estimates of 28 to 29 years (Bishop et al. 2006).

The shortfin mako shark is an apex and generalist predator that feeds on a variety of prey, such as teleost fish, other sharks, marine mammals and marine turtles (Campana et al. 2005). Little is known about the population size and distribution of shortfin mako sharks in Australia; they may occur within the EMBA.

Longfin Mako

The longfin mako is a widely distributed, but rarely encountered, oceanic shark species. The species can grow to just over 4 m long and is found in northern Australian waters, from Geraldton in WA to at least Port Stephens in New South Wales and is uncommon in Australian waters relative to the shortfin mako (Bruce 2013, DEWHA 2010).

There is very little information about these sharks in Australia, with no available population estimates or distribution trends. A study from southern California documented juvenile longfin mako sharks remaining near surface waters, while larger adults were frequently observed at greater maximum depths of about 200 m (Sepulveda et al. 2004).

Longfin mako may occur within the EMBA but given their widespread distribution and apparent low density they are likely to be uncommon.

Reef Manta Ray

The taxonomy of the reef manta ray (*Manta alfredi*) was revised relatively recently, with this species being recognised as distinct from the giant manta ray (*M. birostris*) (Marshall et al. 2009). The species is occurs in inshore waters, but also found around offshore coral reefs, rocky reefs and seamounts (Marshall et al. 2009). In contrast to the giant manta ray, long-term sighting records of the reef manta ray at established aggregation sites suggest that this species is more resident in tropical waters and may exhibit smaller home ranges, philopatric movement patterns and shorter seasonal migrations than the giant manta ray (Deakos et al. 2011, Marshall et al. 2009). A resident population of reef manta rays has been recorded at Ningaloo Reef, and the species has been shown to have both resident and migratory tendencies in eastern Australia (Couturier et al. 2011).

Reef manta rays may occur in the EMBA but only in low numbers.

Giant Manta Ray

The giant manta ray is broadly distributed in tropical waters of Australia. The species primarily inhabits near-shore environments along productive coastlines with regular upwelling, but they appear to be seasonal visitors to coastal or offshore sites including offshore island groups, offshore pinnacles and seamounts (Marshall et al. 2011).

The EMBA is not located in, or adjacent to, any known aggregation areas for the species (e.g. feeding or breeding). Occurrence of giant manta rays within the EMBA is likely to be infrequent and restricted to individuals transiting the area.

Dwarf Sawfish

The dwarf sawfish (*Pristis clavata*) is found in Australian coastal waters extending north from Cairns around the Cape York Peninsula in Queensland to the Pilbara coast (Kyne et al. 2013).

Dwarf sawfish typically inhabit shallow (2 to 3 m) silty coastal waters and estuarine habitats, occupying relatively restricted areas and moving only small distances (Stevens et al. 2008). Juvenile dwarf sawfish utilise estuarine habitats as nursery areas and migrate to deeper waters as adults (Thorburn et al. 2008, Threatened Species Scientific Committee 2009).

Dwarf sawfish are unlikely to occur within the Operational Area in significant numbers but may be present in coastal waters within the EMBA.

Freshwater Sawfish

The freshwater sawfish (*Pristis pristis*) inhabits both riverine and marine environments in northern Australia. While primarily associated with rivers, tidal creeks and estuaries, the largetooth sawfish has been recorded up to 100 km offshore (Commonwealth of Australia 2015b).

The freshwater sawfish is unlikely to occur within the Operational Area in significant numbers but may occur in coastal waters within the EMBA.

Green Sawfish

The green sawfish (*Pristis zijsron*) were once widely distributed in coastal waters along the northern Indian Ocean, although it is believed that northern Australia may be the last region where significant populations exist (Stevens et al. 2005). Within Australia, green sawfish are currently distributed from about the Cairns in Queensland across northern Australian waters to Broome in WA (Threatened Species Scientific Committee 2008).

Despite records of the species in deeper offshore waters, green sawfish typically occur in the inshore fringe with a strong associated with mangroves and adjacent mudflat habitats (Commonwealth of Australia 2015b, Stevens et al. 2005). Movements within these preferred habitats is correlated with tidal movements (Stevens et al. 2008).

Given the habitat preferences of the green sawfish, the species is unlikely to occur within the Operational Area in significant numbers but may occur in nearshore waters in the EMBA.

Whale Shark

The whale shark (*Rhincodon typus*) is globally distributed in tropical and warm temperate waters, and it is thought individuals form a single genetic population (Castro et al. 2007). The species is an epipelagic filter feeder; their diet typically consists of planktonic and nektonic species, including small crustaceans and smaller schooling fish species.

Key areas of concentration within Australian waters include the Ningaloo coast (March – July), Christmas Island (December – January) and the Coral Sea (November – December), with the timing of the aggregations thought to be linked to seasonal fluctuations in prey abundance (Threatened Species Scientific Committee 2015). Tagging, aerial and vessel surveys of whale sharks aggregating off the Ningaloo Coast suggest that the group disperses widely. Satellite tracking has shown that the sharks may follow three migration routes from Ningaloo (Meekan and Radford 2010, Wilson et al. 2006):

- north-west, into the Indian Ocean;
- directly north, towards Sumatra and Java; and
- north-east, passing through the NWS Province traveling along the shelf break and continental slope.

These large-scale movements are consistent with observations in other parts of the world. Tagging studies in other parts of the world have recorded whale shark movements > 13,000 km (Eckert and Stewart 2001). None of these migration routes overlap the EMBA. Whale sharks

may occur within the EMBA, but their presence is expected to be limited to individual animals moving through the area.

4.3.3.8 Birds

Common Sandpiper

The common sandpiper is a small, migratory sandpiper with a very large range through which is undertakes annual migrations between breeding grounds in the northern hemisphere (Europe and Asia) and non-breeding areas in the Asia-Pacific region (Bamford et al. 2008). The species congregates in large flocks and forages in shallow waters and tidal flats between spring and autumn. Specific critical habitat in Australia has not been identified due to the species' broad distribution (Bamford et al. 2008).

Given the species' preferred habitat, its presence within the EMBA is likely to be restricted to birds flying passing through during their migration.

Common Noddy

The common noddy is the largest species of noddy found in Australian waters. The species is widespread in tropical and subtropical areas beyond Australia. This seabird typically forages in coastal waters around nesting sites, taking prey such as small fish, but may occur longer distances out to sea. Nesting occurs broadly across tropical and subtropical Australia in coastal areas, particularly on islands such as the Houtman Abrolhos island group (Burbidge and Fuller 1989).

The common noddy is thought to undertake seasonal movements, with some nesting sites abandoned during the non-breeding season (which is protracted between spring and autumn). The species may occur within the EMBA in low numbers.

Sharp-tailed Sandpiper

Like other species of sandpiper, the sharp-tailed sandpiper is a migratory wading shorebird and undertakes long distance seasonal migrations between breeding grounds in the northern hemisphere and over-wintering areas in the southern hemisphere (Bamford et al. 2008). The species may occur in Australian between spring and autumn. The species is unlikely to occur within the EMBA due to the lack of suitable habitat.

Red Knot

The species undertakes long distance migrations from breeding grounds in high northern latitudes, where it breeds during the boreal summer, to the southern hemisphere during the austral summer. Both Australia and New Zealand host significant numbers of red knots during their non-breeding period (Bamford et al. 2008). As with other migratory shorebirds, the species is unlikely to occur in the EMBA due to the lack of suitable habitat.

Curlew Sandpiper

The curlew sandpiper breeds in northern Siberia but has a non-breeding range that extends from western Africa to Australia, with small numbers reaching New Zealand (Bamford et al. 2008). In Australia, curlew sandpipers occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period and also during the breeding season when many non-breeding one-year old birds remain in Australia rather than migrating north. As with other migratory shorebirds, the species is unlikely to occur in the EMBA due to the lack of suitable habitat.

Pectoral Sandpiper

The pectoral sandpiper is a small-medium sandpiper that is seasonally widespread in Australia. As with other species of sandpiper, the pectoral sandpiper breeds in the northern hemisphere during the boreal summer, before undertaking long distance migrations to feeding grounds in the southern hemisphere. The species occurs throughout mainland Australia between spring and autumn. The pectoral sandpiper prefers coastal and near-coastal environments such as wetlands, estuaries and mudflats. Given the species' preferred habitat the pectoral sand piper is not expected to occur within the EMBA.

Streaked Shearwater

The streaked shearwater occurs frequently in northern Australia, with records from central WA, around the north coast, and south to central New South Wales (DSEWPaC 2012b).

In northern Australia, the streaked shearwater is usually found in offshore waters, where it forages mainly for fish and squid caught by surface-seizing or by shallow plunges. Off the NT coast, the species is common in the Arafura Sea during summer. Although the streaked shearwater does not breed in Australia, the species is recorded regularly in northern Australia from October to March, with some records as early as August and as late as May (DSEWPaC 2012b).

The species may occur within the EMBA in low numbers throughout the year.

Lesser Frigatebird

The lesser frigatebird is the most widely distributed frigatebird in Australian tropical seas and is the smallest species of frigatebird. The species is well-adapted for an aerial existence and may range considerable distances from land. Food consists largely of fish taken at the sea surface or stolen from other birds. Beyond Australia, the lesser frigatebird occurs throughout the tropical Indian Ocean, the western tropical Pacific Ocean, and the south-western tropical Atlantic Ocean. The lesser frigate bird may occur within the EMBA.

Great Frigatebird

The great frigatebird is widespread and breeds on tropical islands in the Indo-Pacific region. The great frigatebird forages far from sea, although breeding birds probably forage within 100–200 kilometres of the colony during the early stages of the breeding season. The diet consists mainly of flying fish with some cephalopods. The foraging great frigatebird may occur within the EMBA in low numbers, however there are no known nesting colonies in the vicinity of the EMBA.

Eastern Curlew

The eastern curlew takes an annual migratory flight to Russia and north-eastern China to breed, arriving back home to Australia in August to feed on crabs and molluscs in intertidal mud flats (Bamford et al. 2008). The species has a number of important sites in Australia, primarily along the eastern coastline (Bamford et al. 2008). No BIAs or critical habitats for the eastern curlew have been identified in the Operational Area.

Oriental Reed-warbler

The oriental reed-warbler is a small passerine bird that undertakes migrations between breeding northern hemisphere breeding grounds and feeding areas in the southern hemisphere, mainly south-east Asia. The species forages in marshes, grasslands and scrub; hence, it is unlikely to be present in the EMBA.

Fork-tailed Swift

The forked-tailed swift is a small bird that undertakes migrations between breeding northern hemisphere breeding grounds and feeding areas in the southern hemisphere and is seasonally present throughout much of Australia. The species mainly eats flying insects, which are hunted and consumed in flight. Fork-tailed swifts spend most of their time in flight. The species is unlikely to occur within the EMBA in appreciable numbers.

Oriental Plover

The oriental plover is a migratory shorebird that undertakes seasonal migrations between breeding grounds in the northern hemisphere and feeding areas in the southern hemisphere. It is seasonally present in coastal and inland areas throughout much of Australia. Significant foraging areas in Australia include large tidal flats, such as those found at Eighty Mile Beach and Roebuck Bay. The species is unlikely to be present in the EMBA in significant numbers due to the absence of preferred habitat.

Oriental Pratincole

The oriental pratincole is a migratory bird that is seasonally present in warmer parts of Australia. The species is somewhat unusual in that is classed as a wading bird, but also hunts insects in

the air. Important habitat within Australia includes Ramsar wetlands such as Eighty Mile Beach. Given the lack of suitable habitat, this species is unlikely to occur within the EMBA.

Bar-tailed Godwit (including baueri subspecies)

The bar-tailed godwit (including the baueri subspecies) is a migratory wading shorebird. It undertakes the longest know migration flight of any bird species, moving from breeding grounds in the Arctic and tundra in the northern hemisphere to temperate and tropical feeding grounds in the southern hemisphere. It typically forages in mudflats and marshlands; as such, it is unlikely to occur within the EMBA due to the lack of preferred habitat.

Osprey

The osprey is a medium-sized raptor (length 50–65 cm; wingspan 145–170 cm) that is widely distributed around Australia in coastal and wetland habitats. The species also occurs throughout south-eastern Asia (Indonesia, Philippines, Palau Islands, New Guinea, Solomon Islands and New Caledonia). Ospreys feed almost exclusively on fish, typically capturing prey observed while flying by plunging feet first into the water (Clancy 2005). While listed as migratory, adults are generally restricted to a foraging area surrounding their nests.

Egg laying in Australia is protracted between April and February, which may be due to the extended geographic range of the species within Australia and discrete genetic populations that may constitute subspecies (Olsen and Marples 1993, Wink et al. 2004). Given the species' preference for coastal and wetland environments, it is unlikely to occur within the Operational Area, but may occur within coastal waters in the EMBA.

4.4 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

4.4.1 Heritage

4.4.1.1 World Heritage Properties

There are no World Heritage Properties within the EMBA. The nearest World Heritage Property is the Kakadu National Park, over 150 km from the EMBA at the closest point.

4.4.1.2 National Heritage Properties

There are no National Heritage Properties within the EMBA. The nearest National Heritage Property is the Kakadu National Park, over 150 km from the EMBA at the closest point.

4.4.1.3 Indigenous Heritage

There are no recorded Indigenous heritage sites within the EMBA. The Tiwi Islands are a declared Aboriginal reserve and comprise a number of protected sacred sites under the NT Aboriginal Sacred Sites Act. Traditional practices, including fishing continue to take place on the islands.

4.4.1.4 European Heritage

There are no European heritage values within the EMBA. The nearest Commonwealth Heritage Properties are in the city of Darwin (e.g. the Larrakeyah Barracks Headquarters Building), over 60 km from the EMBA.

4.4.1.5 Historic Shipwrecks

One historic shipwreck occurs within the EMBA – the wreck of the Japanese submarine 1-124. The I-124 was sunk in 1942 during mine-laying operations off northern Australia with the loss of the entire crew. The wreck lies beyond the Operational Area (approximately 24 km from KP380), but within the Moderate Exposure Zone.

4.4.2 Marine Protected Areas

4.4.2.1 Australian Marine Parks

One AMP, the Oceanic Shoals AMP, overlaps the Operational Area and EMBA within Commonwealth waters (**Figure 4-5**The Oceanic Shoals AMP is a Commonwealth reserve proclaimed under the EPBC Act and is managed under the *Australian Marine Parks - North Marine Parks Network Management Plan 2018* (Director of National Parks 2018)The Oceanic Shoals AMP has several conservation values, including:, including:

- important inter-nesting area for the flatback and olive ridley turtles;
- an important foraging area for loggerhead and olive ridley turtles; and
- examples of the ecosystems of both the Northwest Shelf Transition and Timor Transition provinces.

Four KEFs are also represented within the AMP, two of which overlap the EMBA (**Section 4.2.3.1**).

The Operational Area overlaps a multiple us zone and a special purpose zone (trawl) within the Oceanic Shoals AMP, both of which are classified as IUCN Category VI. The managed area overlapped by the Operational Area is entirely Multiple Use Zone (IUCN Category VI). Stated reserve management principles for IUCN Category VI areas are:

- The reserve or zone should be managed mainly for the sustainable use of natural ecosystems based on the following principles.
- The biological diversity and other natural values of the reserve or zone should be protected and maintained in the long term.
- Management practices should be applied to ensure ecologically sustainable use of the reserve or zone.
- Management of the reserve or zone should contribute to regional and national development to the extent that this is consistent with these principles.

A class approval covering the construction, operation and decommissioning of the Pipeline within the IUCN Category VI zones of the Oceanic Shoals AMP is in place; refer to **Section 2.1.3.1** for further information on the class approval and associated conditions.

4.4.2.2 Territory Reef Protection Areas

No Reef Protection Areas lie within the Operational Area or the Moderate Exposure Zone. The nearest Reef Protection Area, The Bathurst Island Reef Protection Area, lies approximately 4 km north of the EMBA at the closest point.

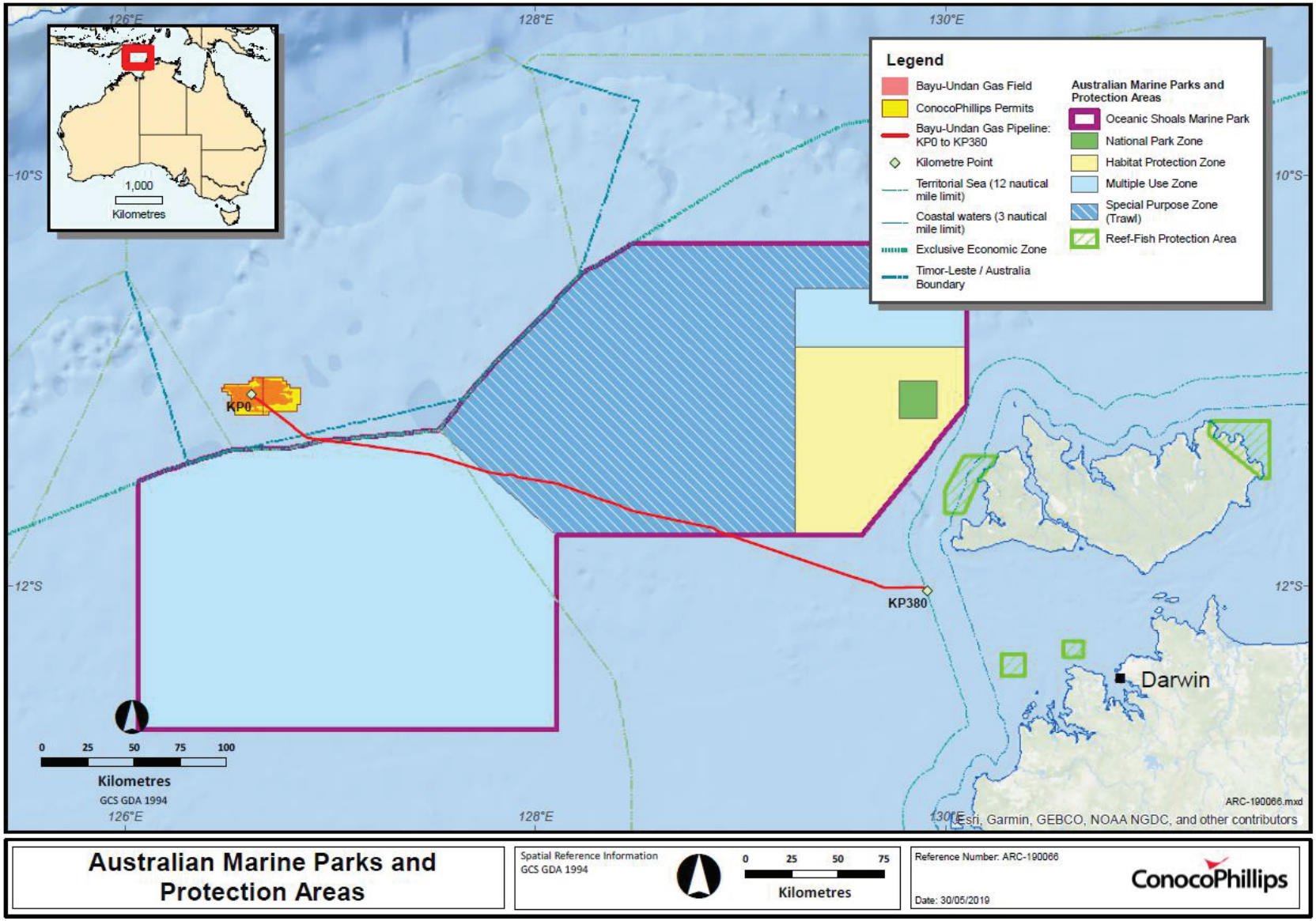


Figure 4-7: AMPs and Protected Areas

4.4.3 Fishing

4.4.3.1 Commercial Fisheries

Commonwealth and NT managed commercial fisheries that were identified as potentially being active within the EMBA are described in **Table 4-6** and shown in **Figure 4-8** and **Figure 4-9**. While a small part of the Operational Area associated with WA-8-PL overlaps several WA managed fisheries, none are active within the Operational Area. These WA managed fisheries have not been considered further.

Table 4-6: Commercial fisheries overlapping the EMBA

Commercial Fishery	Description
Commonwealth Managed Fisheries	
Northern Prawn Fishery	The Northern Prawn Fishery management area extends over the Australia's northern coast, between Cape York in Queensland and Cape Londonderry in WA, from the low water mark to the outer edge of the Australian Fishing Zone (AFZ). The majority of the fishing effort within the Northern Prawn Fishery occurs in the area of the Gulf of Carpentaria, Joseph Bonaparte Gulf and along the Arnhem Land coast (Larcombe et al. 2018), beyond the EMBA. The highest catches come from offshore mangrove forests and coastal seagrass beds, which are juvenile nursery areas for target species of the fishery. The key target species are banana prawns, tiger prawns and endeavour prawns. Data from the most recent fishing season recorded a very low fishing effort within the EMBA and Operational Area (Larcombe et al. 2018).
NT Managed Fisheries	
Demersal Fishery	The Demersal Fishery boundary extends from 15 nautical miles (NM) from the NT coastal waters mark to the outer limit of the AFZ, excluding the area of the Timor Reef Fishery. The fishery employs trawl, hand and drop lines, and trap fishing methods. The main target species of the fishery are red snappers, goldband snappers, saddletail, and crimson snapper. There are currently 18 licences issued for the fishery (NT Government 2017). The majority of the fishing effort occurs in relatively deep offshore water; most effort occurs east of the EMBA (NT Government 2017).
Coastal Line Fishery	The Coastal Line fishery extends 15 NM from the low water mark around the entire NT coastline. The fishery is divided into two zones, which divide the coastline at Vashon Head on the Cobourg Peninsula (NT Government 2017). The majority of fishing effort is focused around rocky reefs within 150 km of Darwin where Black Jewfish are targeted using mainly hook and line gear (NT Government 2017). Fish traps and droplines are also permitted beyond 2 NM from the coastline in the Eastern Zone of the fishery, and gillnets with a maximum drop of 5 m are also permitted (NT Government 2017). Catch from droplines and traps account for less than 7% of the total reported catch (NT Government 2017). Given activity within the Coastal Line Fishery is concentrated in nearshore water, the potential for fishing activity in the EMBA is very low.
Offshore Net and Line Fishery	The Offshore Net and Line Fishery covers an area of over 522,000 km^2 and extends from the NT high water mark to the boundary of the AFZ (NT Government 2017). The fishery permits both pelagic gillnets and longline gear and targets Australian and common blacktip sharks, spottail sharks and grey mackerel; however, longlines have not been used since 2013 due to a drop in shark fin price (NT Government 2017). The majority of the fishing effort is in the coastal zone (within 12 NM of the coast) and immediately offshore in the Gulf of Carpentaria (NT Government 2017). Effort beyond 12 NM from shore is typically very low The number of licences for the fishery is restricted to 17 and generally 11 licences are active in any given year (NT Government 2017). In 2015 there were 588 boat-days of fishing recorded, a significant decrease from 861 boat-days in 2012 and the peak of 1,538 in 2003 (i.e. prior to the introduction of precautionary fishing measures) (NT

Commercial Fishery	Description
	Government 2017). Participants in the fishery may fish within the EMBA; however, as most effort is located within 12 NM of the shore, fishing with the EMBA is unlikely.
Spanish Mackerel Fishery	The fishery extends from the NT high water mark to the outer limit of the AFZ (NT Government 2017). The fishery employs troll lines, floating handlines and rods. The majority of the fishing effort occurs in the vicinity of reefs, headlands and shoals and includes waters near Bathurst Island, New Year Island, the Wessel Islands around to Groote Eylandt and the Sir Edward Pellew Group of islands (NT Government 2017). The target species of the fishery is the narrow-barred Spanish mackerel, however a small number of other mackerels are also taken. In 2012, there were 16 fishery licences of which 12 were actively operating. The 2012 fishing effort was 719 boat-days; a decrease from 813 boat-days in 2011 but an increase from the 672 boat-days in 2010. Currently the fishery is restricted to 15 licences (NT Government 2017), and boat-days and spatial fishing intensity data have not been reported for recent years. Given most of fishing takes place to the east of the EMBA, there is only low potential for fishing to occur within the EMBA.

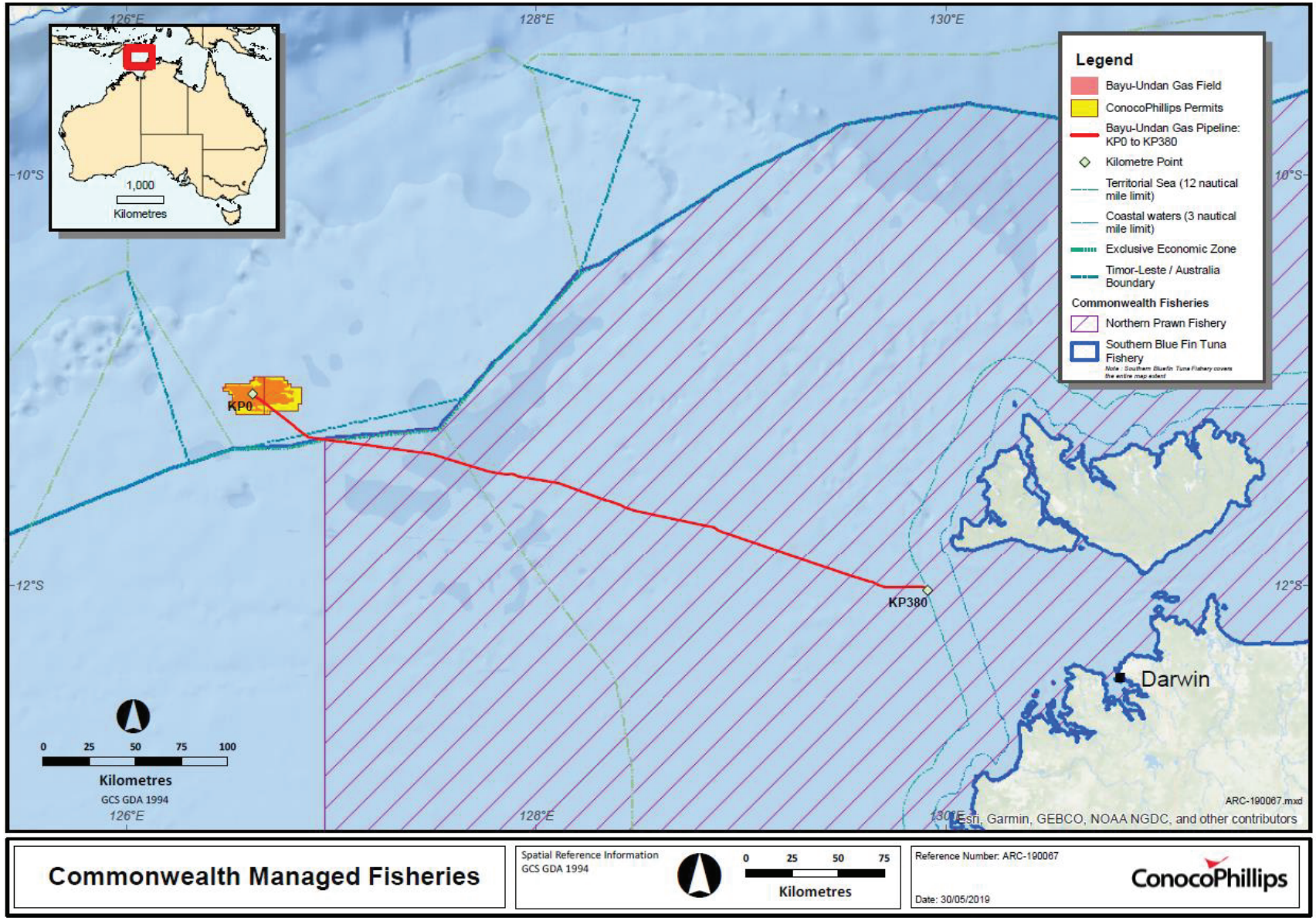


Figure 4-8: Commonwealth managed fisheries

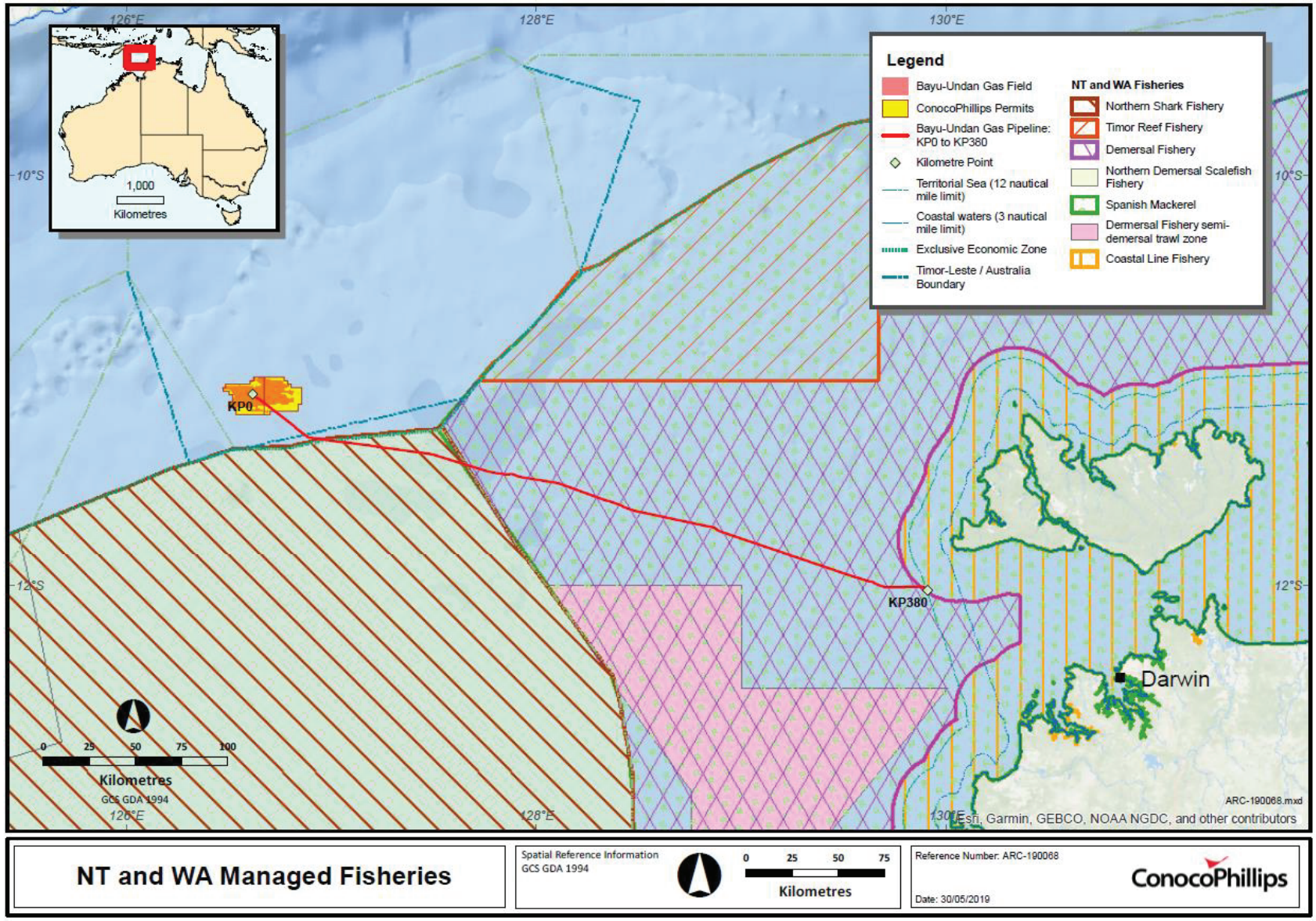


Figure 4-9: NT managed fisheries

4.4.3.2 Traditional Fishing

Traditional fishing in NT waters predominately occurs within inshore coastal waters. Approximately 85% of NT's inter-tidal zone is recognised as Aboriginal land under the *Aboriginal Land Rights (Northern Territory) Act*. Almost all Indigenous fishing effort is concentrated within the 3 NM NT coastal waters boundary, with fishing effort spanning the entire coastline (NT Government 2017). Indigenous fishing is very unlikely to occur within the Operational Area but may occur within coastal areas within the Moderate Exposure Zone, particularly around the Tiwi Islands.

4.4.3.3 Recreational Fishing

Like traditional fishing, recreational fishing in NT waters is predominantly in coastal waters, either from shore or in recreational fishing boats. Eighty-one per cent of recreational fishing occurs in marine waters, with the majority taking place in estuaries (54%), followed by inshore (22%) and offshore regions (15%) (West et al. 2012). Recreational catch is predominately mud crabs, barramundi and saddletail/crimson snapper (West et al. 2012).

Recreational fishing activity is typically concentrated around access nodes, such as boat ramps in Darwin Harbour. Given the distance from shore and absence of habitat supporting high value species (e.g. reefs, banks and shoals), recreational fishing is very unlikely to occur within the Operational Area but may occur within the Moderate Exposure Zone.

4.4.3.4 Aquaculture

There are no known open-water aquaculture activities occurring within the EMBA.

4.4.4 Tourism

Tourism is unlikely to occur within the Operational Area due to the absence of nature-based or cultural attractions. Some tourism activities, such as guided fishing tours, may occur within the coastal waters of the Moderate Exposure Zone.

4.4.5 Ports and Commercial Shipping

Darwin Port (beyond the EMBA) is the only major shipping port in the region. A range of materials are imported and exported from the port and surrounding industrial facilities, including general cargo, livestock and LNG.

Shipping activity within the EMBA is concentrated around the south-western tip of Bathurst Island (Cape Fourcroy), much of which appears to consist of vessels transiting to and from Darwin Harbour (**Figure 4-10**).

4.4.6 Offshore Petroleum Exploration and Operations

The Bayu-Undan Field, operated by ConocoPhillips Australia, is the only active petroleum production facility within the EMBA. A tie-in by an upstream party is planned at KP380; i.e. downstream of the Pipeline isolation and section removal included within the production cessation activities described in this EP. The activities associated with the tie-in will be the subject of a separate EP.

Petroleum exploration, including seismic surveys and drilling activities, occur within the Timor Sea. COPPA is not aware of any such planned activities within the EMBA.

4.4.7 Defence Activities

The EMBA intersects a practice and training areas of the North Australian Exercise Area (NAXA), a maritime military zone administered by the Department of Defence (**Figure 4-11**). The NAXA comprises practice and training areas and extends approximately 300 km north and west from just east of Darwin into the Arafura Sea in both Commonwealth and NT coastal waters. The

area is used for offshore naval exercises and onshore weapon-firing training.

Consultation with the Department of Defence indicated that the Operational Area is near current and historical training areas and that unexploded ordinance may be present in the Operational Area.

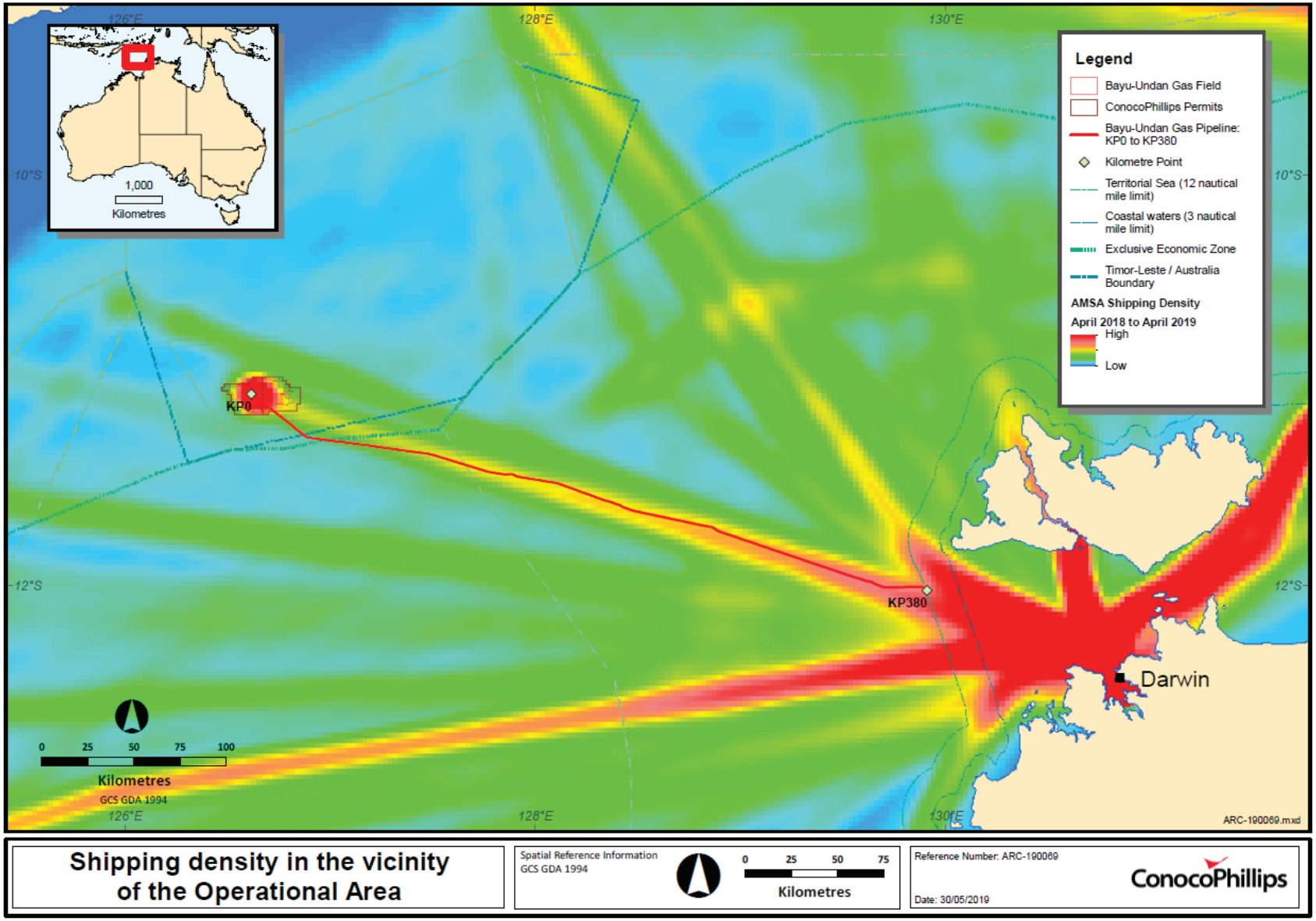


Figure 4-10: Shipping density in the vicinity of the Operational Area

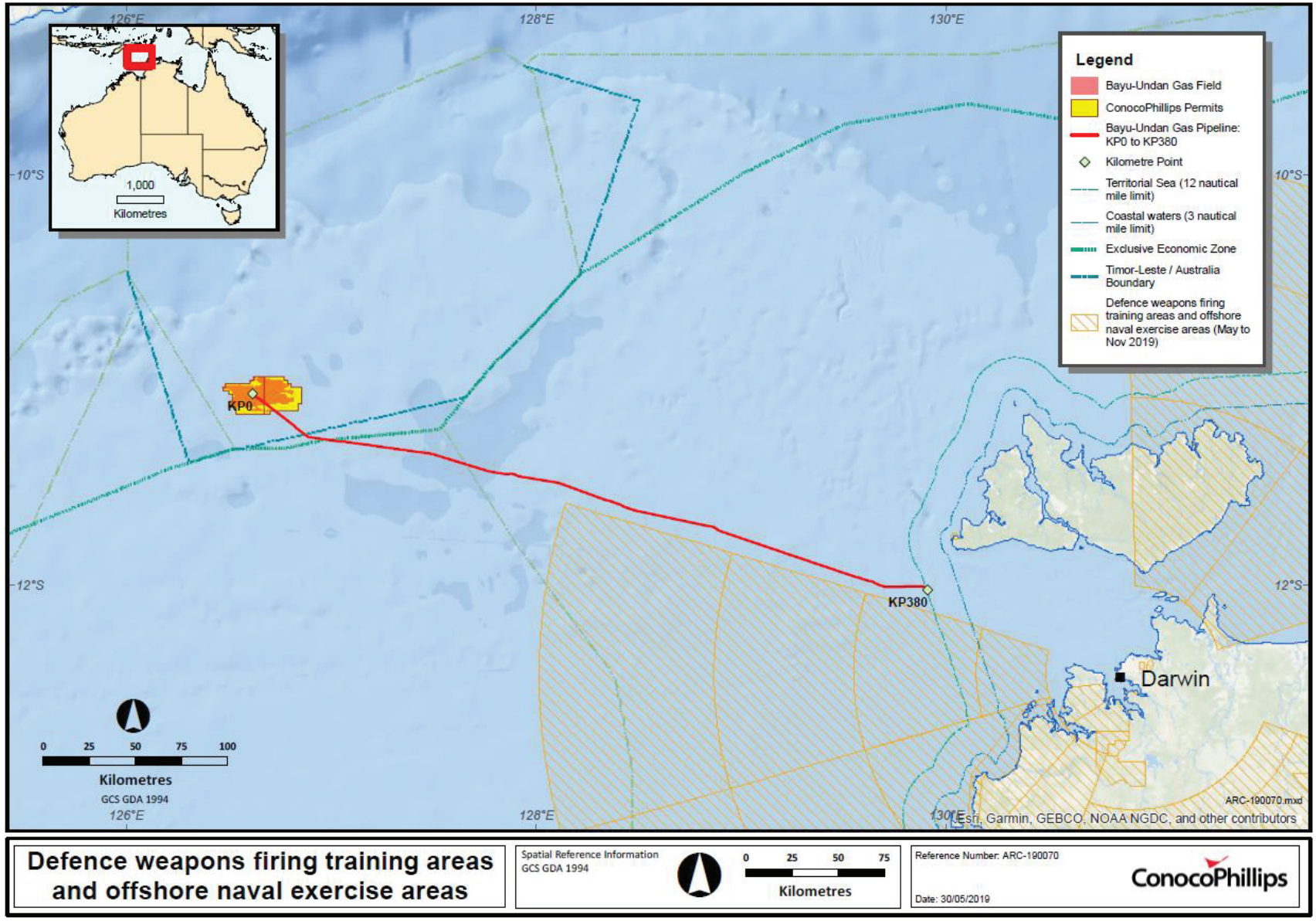


Figure 4-11: Defence weapons firing training areas and offshore naval exercise areas

5. DESCRIPTION OF ENVIRONMENTAL RISKS AND IMPACTS

In accordance with regulations 13(5) and 13(6) of the OPGGS(E) Regulations 2009, this section identifies and evaluates the risks and potential environmental impacts associated with the activity (including potential emergency situations), as appropriate to the nature and scale of each impact and risk. The risk assessment, evaluation and management process applied, as described below, provides a framework to demonstrate that environmental impacts and risks are reduced to ALARP and acceptable levels, as required by Regulation 10A(b) and 10A(c) of the OPGGS(E) Regulations 2009.

5.1 OVERVIEW

COPPA seeks to minimise environmental impact through the active and progressive elimination of hazards and the reduction of risk. This objective is achieved through a systematic and integrated approach to risk management to reduce risks to a level that is ALARP.

Environmental management is implemented through a hierarchy of policies and procedures that cascade from the ConocoPhillips corporate level through to the regional Business Units and their individual operating assets and projects. These policies/procedures are framed and implemented within the ConocoPhillips HSEMS; refer to the Implementation Strategy in **Section 7** for additional information on the HSEMS.

The following steps outline the environmental and risk management framework for the operation of the Pipeline, which are developed in accordance with the ABU-W HSEMS:

- Establish the context, with regard to:
  - the principles of environmentally sustainable development (ESD), as defined in Section 3A of the EPBC Act
  - relevant legislation/guidance (**Section 2** and **Appendix A**);
  - COPPA and Contractor management systems (**Section 7.2**);
  - The existing environment (**Section 4**); and
  - Relevant stakeholder values and feedback (**Section 8**).
- Identify hazards, by:
  - considering the aspects, hazards, impacts and risks associated with the activity, with regard to:
    - COPPA's operational experience gained during the operation of the Pipeline;
    - the potential activities that may occur during the in-force period of the EP;
    - the existing environment that may credibly be affected by the petroleum activity (both planned and unplanned events); and
    - relevant stakeholder context.
  - define the credible impacts and risk scenarios and the existing control measures associated with each aspect.
- Inherent risk analysis, by:
  - assessing the impact or risk associated with each hazard and the existing control measures in place to determine the inherent risk.
- Residual risk analysis, by:
  - identifying and considering potential additional control measures to reduce the risk to a level that is ALARP and acceptable.

- Risk evaluation, by:
  - assess the risk with any additional control measures in place to determine the residual risk and evaluate if the risk has been reduced to ALARP and is acceptable; and
  - if not ALARP, consider potential additional control measures until the risk has been reduced to ALARP and is acceptable.
- Risk treatment:
  - Define EPOs, EPSs and MCs for the risk sources;
  - Determine measurement, monitoring and reporting requirements, and
  - Define roles and responsibilities for implementation of EPSs.

This EP demonstrates risk assessment and risk mitigation and provides discussion of various control measures and management systems that can be used to reduce the environmental impact and risk of the activity to ALARP and an acceptable level. The risk assessment process applied for this EP was based on the ConocoPhillips corporate risk assessment process as outlined in the ABU-W Risk Management Procedure (ALL/HSE/PRO/040). This risk assessment process is consistent with the AS/NZS ISO 31000:2009: Risk Management – Principles and Guidelines and Handbook (HB) 203:2006 Environmental risk management – Principles and process (Guide) (AS/NZS 2006). The core steps of COPPA's risk assessment process are summarised in **Figure 5-1**.

Table 5-1 provides definitions that are commonly used environmental risk assessment terminology.

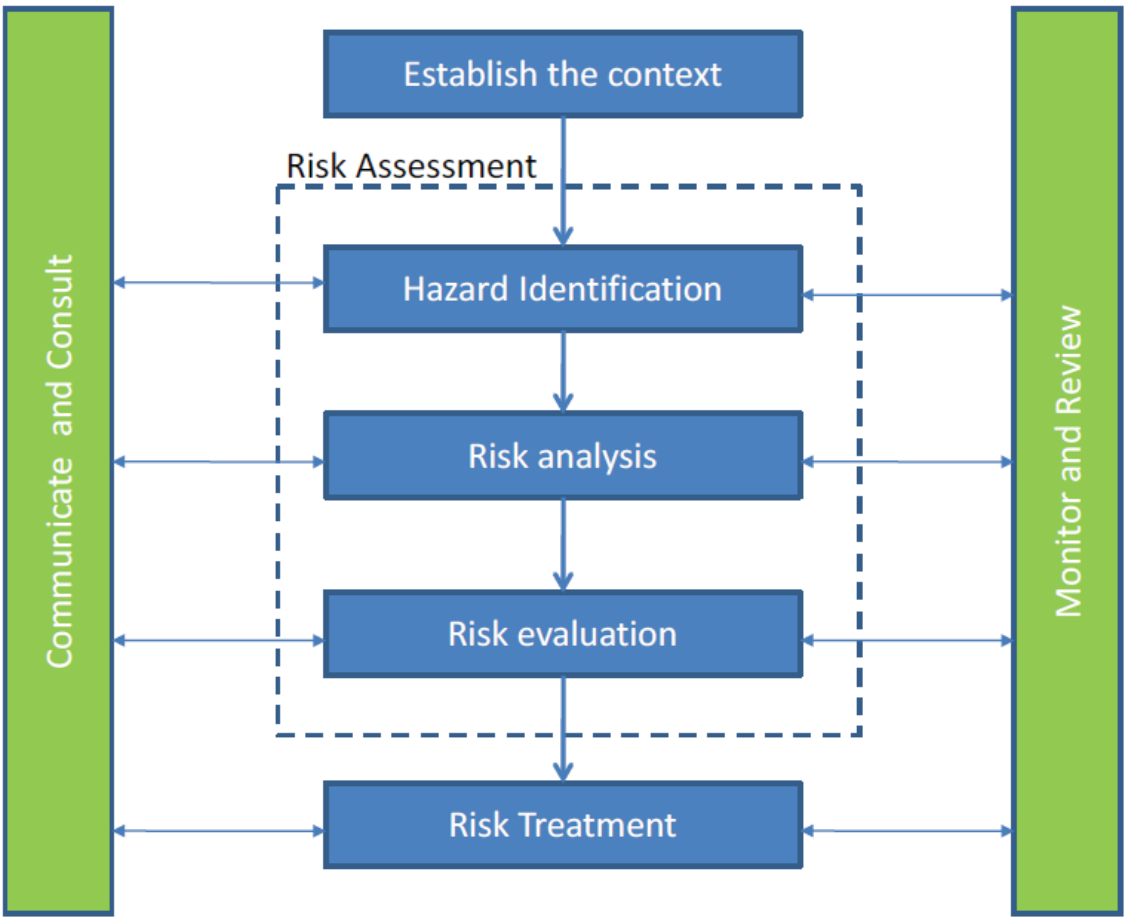


Figure 5-1: ConocoPhillips environmental risk assessment process

Table 5-1: Risk assessment terminology and definitions

Term	Definition
Activity	Components or elements of work associated with operation and maintenance of the Pipeline
ALARP	ALARP is defined in ConocoPhillips' ABU-W Risk Management Procedure (ALL-HSE-PRO-040) as follows: "*ALARP is a level of risk that cannot be reduced further without the expenditure of effort or capital cost which is disproportionate to the benefit gained. In relation to HSE, determination of whether a risk reduction measure is practicable needs to consider the following key factors:* • *The severity of any injury, harm to health and/or impact to environmental/ecologically sustainable development that may occur from an event;* • *The likelihood of that injury, harm to health and/or impact to environmental/ecologically sustainable development occurring;* • *How much is known about the hazard and the ways of eliminating, reducing or controlling the hazard; and* • *The availability, suitability and cost of safeguards."*
Aspect	Elements of COPPA's activities or products or services that can interact with the environment. These include routine/non-routine planned and unplanned (including those associated with emergency conditions) activities.
Receptor	Relevant natural, socio-economic and cultural features of the environment
Potential impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from a proponent's environmental aspects
Event	An event is an occurrence of a particular set of circumstances. An event can be one or more occurrences and can have several causes.
Hazard	A hazard is defined as the ability of a substance, situation, process or activity to cause harm to the environment
Control	A control is a measure which mitigates risk through the reduction of the likelihood for a consequence to occur. Controls include 'existing controls' (i.e. industry standards) or 'additional controls' (i.e. key COPPA's management controls or additional measures identified during the risk assessment processes)
Consequence	A consequence is the outcome of an event. An event can lead to a range of consequences. A consequence can be certain or uncertain and can have positive or negative effects. Consequences can be expressed qualitatively or quantitatively. For risk assessment purposes, the consequence typically remains unchanged since it is determined without controls in place.
Likelihood	Description of probability or frequency of a consequence occurring.
Inherent risk	The level of risk (with existing controls in place) before application of additional risk controls arising from risk assessment processes
Residual risk	The level of risk remaining after risk treatment (i.e. application of additional controls) inclusive of unidentified risk

5.2 RISK ASSESSMENT

5.2.1 Risk Identification

A review of the activity was completed to identify potential aspects of production cessation that may result in environmental impacts or risks. These aspects were then assessed to determine which constituted hazards (i.e. may credibly result in environmental impacts and / or risks). Each hazard was then assessed to identify the impact and risks to environmental receptors described in **Section 4**. Both planned and unplanned events that could occur during production cessation activities were considered.

Identification of the aspects, receptors, and the potential impacts and / or risks was conducted through:

- a review of the activities to be undertaken during the campaign and activity specific documentation (**Section 3**);
- knowledge developed by COPPA from extensive prior experience in Pipeline operations;
- a review of the existing environment (physical, biological, socio-economic and cultural; **Section 4**), including information gained through stakeholder consultation (**Section 8**); and
- the environmental hazard identification and risk assessment (ENVID) workshop.

The ENVID workshop was undertaken in March 2019 in accordance with the ConocoPhillips ABU-W Risk Management Procedure (ALL/HSE/PRO/040). This workshop aimed to identify and assess the impacts and risks associated with production cessation activities. The ENVID workshop was aligned with NOPSEMAs Hazard Identification and Risk Assessment Guidance Note[5] (N-04600-GN1613) and attended by representatives from ConocoPhillips's ABU-W Bayu-Undan Decommissioning Project (Project engineering and HSE), BU facility operations, subsea engineering, Darwin LNG Life Extension Project (Subsea engineering and HSE), marine, and emergency response teams. The team of ENVID participants had sufficient knowledge, training and experience to reasonably assure that all credible impacts and risks were identified and assessed. The workshop was informed by:

- a detailed understanding of the environmental and socio-economic setting of the petroleum activity, as described in **Section 4**;
- a review of aspects and associated hazards from production cessation activities;
- the knowledge, training and experiences of workshop participants.

The outputs of the ENVID are incorporated into **Sections 5.3** and **5.4**.

A separate oil spill response assessment, the outcomes of which are documented in the OPEP (DCOM-652-EN-OPE-00001), was undertaken to identify relevant spill response strategies and assess the potential impacts and ALARP considerations associated with the implementation of response strategies.

5.2.2 Risk Analysis

The environmental risk assessment process is a qualitative risk-screening tool for evaluating the environmental risk posed by production cessation. COPPA assess the risk in two key stages:

- inherent risk analysis – assessment of the potential environment, socio-economic and cultural consequences and the likelihood of that consequence occurring with the application of existing control measures (e.g. relevant legislation, COPPA and contractor procedures/standards etc.) for each credible risk source scenarios

[5] ConocoPhillips acknowledges this Guidance Note is a component of the suite of material provided by NOPSEMA to assist in well integrity management. Risk management concepts described in the Guidance Note are applicable to the management of environmental impacts and risks.

- residual risk analysis – reassessment of the inherent risk following the application of additional controls/mitigation measures. The residual risk is an indication of the significance of an environmental, socio-economic or cultural impact, considering the management approach expected to be applied throughout the activity to achieve acceptable outcomes.

Two key factors underpin the environmental risk assessment:

- the severity of the consequences if impact does occur; and
- the likelihood of receptors at risk being impacted.

Risk analysis frames the assessment of controls that could be applied during execution of activities that pose a potential hazard to receptors. It also provides a framework to identify the measures to mitigate the severity of the impact arising from either planned or unplanned events. The process provides essential input into the assessment of controls and mitigation measures that ensures that the level of risk posed by an activity to a sensitive receptor is reduced to ALARP and is acceptable.

COPPA applies the hierarchy of controls as part of the risk assessment process to identify any additional/alternative measures to reduce the risk to ALARP. The general hierarchy of control applied, in the order of priority, is as follows:

- elimination (of the hazard) - Note that elimination of a hazard precludes further risk analysis for the particular hazard; risks and impacts will no longer credibly occur once the hazard is eliminated. Where applicable, COPPA has documented where hazards have been eliminated during the risk management process to demonstrate the risk management process;
- substitution (e.g. using a less hazardous process);
- engineering (e.g. screens on cooling water intake);
- administrative (e.g. using procedures); and
- personal protective equipment (PPE). Use of PPE is always viewed as the last line of defence or as a supplement to other controls.

The level of risk is determined by establishing the potential consequence of an impact on an environmental, socio-economic or cultural receptor resulting from an aspect of the activities associated with operation and maintenance of the Pipeline. Following the determination of the level of risk, the likelihood of the consequence occurring is then assigned. The assigned consequence and likelihood are mapped on the risk matrix to determine the level of risk, as illustrated in **Table 5-2**.

Table 5-2: ConocoPhillips ABU-W risk matrix

Risk Matrix					
Likelihood	***Consequence***				
	Level 1	***Level 2***	***Level 3***	***Level 4***	***Level5***
Frequent (5)	RRII	RRII	RRIII	RRIV	RRIV
Probable (4)	RRI	RRII	RRIII	RRIII	RRIV
Rare (3)	RRI	RRII	RRII	RRIII	RRIII
Remote (2)	RRI	RRI	RRII	RRII	RRII
Improbable (1)	RRI	RRI	RRI	RRI	RRII

Risk Rating		
Risk score	***Risk rating***	***Description of risk level***
RRIV	High	Manage risk using additional or improved risk-reducing measures with priority. Inform appropriate management level with risk assessment detail and obtain appropriate approvals per the business unit's requirements.
RRIII	Significant	Manage risk using additional or improved risk-reducing measures with priority. Inform appropriate management level with risk assessment detail and obtain appropriate approvals per the business unit's requirements.
RRII	Medium	No additional risk-reducing measures required where controls can be verified as functional. Improvements based on lessons learned are encouraged.
RRI	Low	No additional risk-reducing measures required. Improvements based on lessons learned are encouraged.

5.2.2.1 Assessment of Consequence of Potential Impacts

In evaluating the level of consequence of a potential event, the following factors have been considered:

- extent of impacts – whether the impact affects the local or wider regional environment;
- duration of the impact – how long it will interact with the receiving environment;
- sensitivity of the receiving environment (including seasonal sensitivities) – nature, importance (local, national or international significance) and the sensitivity or resilience to change of the receptor that could be affected. This also considers any relevant laws, regulations or standards aimed at protecting the receiving environment, including the EPBC Act.

The potential impacts which have been considered in relation to each of the aspects of the activity are shown in the aspect and receptor interaction matrix provided in **Table 5-6**. The interaction matrix was informed by detailed consideration of the nature and scale of the activity (**Section 3**) and comprehensive understanding of the existing environment (**Section 4**).

The consequence definitions in the ABU-W Risk Management Procedure (ALL/HSE/PRO/040) have been applied to this risk assessment, as shown in **Table 5-3**. While the risk assessment process was undertaken with a primarily environmental focus, other potential cultural, socio-economic and business impacts were also considered in determining the consequence rating. The consequence rating is based on a consequence when no safeguards are in place. As a conservative approach, the consequence that results in the highest risk consequence rating by these definitions is carried through for each potential impact.

Table 5-3: Risk assessment consequence definitions (from ABU-W Risk Management Procedure (ALL/HSE/PRO/040))

Consequence severity description			
Rating	***Biodiversity***	***Socio-cultural and economic***	***Business impact***
5	Catastrophic permanent loss/extinction (100%) of species, habitat or ecosystem. Irrevocable loss, no mitigation possible.	Permanent lost access or use of area with permanent reduction in community or tribal quality of life; major economic impact to surrounding community; irrevocable loss of culture resources. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs will probably exceed $25 million.	Complete area evacuation. and/or National and global negative media exposure and/or Business interruption costs likely to exceed $25 million.
4	Serious loss or migration (> 50%) of species population, habitat or ecosystem. Partial mitigation only possible through prolonged and resource intensive effort (greater than 50 years).	Permanent partial restriction on access or use, or use, or total restriction > 10 years in duration; temporary reduction in quality of life > 10 years' duration; harm to cultural resources requiring major mitigation. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $2.5 million and $25 million.	Selected areas require evacuation. and/or Regional Asia-pacific and national negative media exposure and/or Business interruption costs likely to be between $2.5 million and $25 million.
3	Temporary, but reversible loss/migration of species population (< 25%), habitat or ecosystem. Moderate mitigation efforts required for total reversal.	Temporary restriction < 10 years in duration with a moderate reduction in usage levels or quality of life; harm to cultural resources recoverable through moderate mitigation efforts. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $250,000 and $2.5 million.	Shelters in place but evacuation not mandatory. and/or Regional negative media exposure and/or Business interruption costs likely to be between $250,000 and $2.5 million.
2	Brief, but reversible loss/migration of species population (< 15%), habitat or ecosystem. Minor mitigation efforts required for total reversal.	Brief restriction < 5 years in duration with a minor reduction in usage levels or quality of life; minor harm to cultural resources that are recoverable through minor mitigation efforts. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $25,000 and $250,000.	Local notification only (selected phone calls, letter notification). and/or State and local negative media exposure and/or Business interruption costs likely to be between $25,000 and $250,000.
1	Some minor loss/migration of species population (<10%) habitat or ecosystem that are short term and immediately and completely reversible.	Restrictions on access without loss of resources; temporary but fully reversible impacts on quality of life; minor impact on cultural resources, landscapes, traditions that are fully reversible without lost value. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $0 and $25,000.	No communication to the public. and/or No media exposure and/or Business interruption costs likely to be between $0 and $25,000.

5.2.2.2 Likelihood of Impact Occurrence

The likelihood of an impact occurring considers the effective implementation of industry standard mitigation measures. The likelihood of the event occurring that could give rise to the impact is based on industry experience.

The likelihood selection is based on the likelihood of a consequence occurring with safeguards in place; it is not based on how often the cause occurs.

Table 5-4 provides the likelihood descriptions that have been used for the risk review, which are based on the ConocoPhillips' ABU-W Risk Management Procedure (ALL/HSE/PRO/040). As outlined above, this process reflects the risk management process detailed within AS/NZS ISO 31000:2009 (AS/NZS 2009) and HB 203:2006 (AS/NZS 2006).

Table 5-4: Risk assessment likelihood definitions

Level	Descriptor	Description	Enhanced description
1	Improbable	Virtually improbable and unrealistic	Unheard of in the industry
2	Remote	Not expected nor anticipated to occur	Has occurred once or twice in the industry
3	Rare	Occurrence considered rare	Has occurred many times in the industry but not in the company
4	Probable	Expected to occur at least once in 10 years	Has occurred once or twice in the company
5	Frequent	Likely to occur several times a year	Has occurred several times on the location

* The values in the quantitative range should be used as guidance in selecting the appropriate likelihood category. These values should not be used in the risk calculation.

5.2.3 Risk Evaluation

The evaluation of the environmental risks was undertaken in the context of ALARP and acceptability, which are described in detail below.

5.2.3.1 Demonstration of risk reduction to ALARP

COPPA demonstrates risks are reduced to ALARP when the cost and effort required to further reduce risk is grossly disproportionate to the risk benefit gained. This demonstration shall include the following:

- compliance with relevant legislation, accepted industry codes and standards, including standard industry practice and guidelines;
- implementation of effective management system controls;
- incorporation of barriers/control measures commensurate with the potential impact and risk from the activity;
- confirmation that the cost/benefit/sacrifice and effort of adding further barriers/control measures is grossly disproportionate to the potential reduction in risk. This is achieved through the identification and evaluation of further measures to determine those appropriate for implementation (i.e. practicable).

For inherently significant and high-risk activities, significant effort is made to assess and implement risk reduction opportunities such as quantitative studies and cost benefit analyses and undertaking detailed review of the risk in consultation with management. For inherently low or medium risk activities, further controls are assessed qualitatively/semi-quantitatively (as per ConocoPhillips' ABU-W Risk Management Procedure (ALL/HSE/PRO/040)) based on the nature and scale of the risk and taking into consideration regulator expectations. All assessments are recorded for demonstration purposes.

5.2.3.2 Demonstration of Acceptability

COPPA considers an activity to be acceptable when the level of impact and risk to the environment may be considered broadly acceptable regarding all relevant considerations including:

- the principles of ESD;
- relevant environmental legislation (including conservation advice and recovery plans for MNES, international agreements and conventions, guidelines and codes of practice;
- internal context - alignment with ConocoPhillips ABU-W HSEMS, ABU-W HSE and Sustainable Development (HSE&SD) Policy, culture and company standards and systems; and
- external context - potential environmental consequence and stakeholder expectations (**Section 8**).

The linkage of the COPPA residual risk rankings and the demonstration of acceptability is outlined in **Table 5-5**.

Table 5-5: Residual risk ranking and acceptability

COPPA Residual Risk Ranking	Acceptability
Low	***Broadly acceptable*** Alignment with COPPA HSEMS and company standards/systems. Relevant environmental legislation and standard industry practice will be applied to manage the risk and address reasonable regulator and stakeholder expectations. Management controls have been implemented to address the acceptability considerations
Medium	***Acceptable*** If risks have been reduced to ALARP and management controls have been implemented to address the acceptability considerations, a medium residual risk ranking can be considered acceptable.
Significant and High	***Unacceptable*** The activity (or element of) should not be undertaken as the risk is intolerable and does not meet the principles of ESD, legal requirements, COPPA's requirements or regulator and stakeholder expectations. The activity requires further assessment to reduce the risk to an acceptable level. If the residual risk is unable to be lowered to a more acceptable level, managerial review and approval is required.

5.2.4 Presentation in the EP

A summary of the risk identification and analysis process is provided in **Table 5-6**. This provides a summary of:

- the sources of risk associated with routine/non-routine planned and unplanned activities that may have an impact or risk on the identified receptors;
- the identified environmental, socio-economic and cultural receptors; and
- the inherent and residual risk ranking for interaction between the activities and the receptors as determined through the risk assessment process.

The aspect-receptor cross references given in Table 5-6 link to each of the hazards discussed in Sections 5.3 and 5.4.

The outputs of the risk identification, analysis and evaluation (including evaluation of controls, statements of ALARP and acceptability) process are presented in a summarised tabular form in the following sections. An example table describing the purpose of the key components of the summary tables (i.e. italicised text), with reference to the relevant sections of this EP, is provided in **Table 5-7**. Further detailed impact assessment and risk evaluation discussion is provided

below each of the summary tables.

Table 5-6: Activity aspect and receptor interaction matrix

Aspects and Sources of Risk		Physical Environment					Biological Environment										Socio-economic and Cultural Environment						
		Bathymetry and Seabed Features	Key Ecological Features	Water Quality	Sediment Quality	Air Quality	Threatened Ecological Communites	Ramsar Wetlands	Intertidal and Benthic Primary Producer Habitat	Other Benthic Communities	Plankton	Pelagic and Demersal Fish Communities	Marine Mammals	Marine Reptiles	Sharks and Rays	Birds	Heritage	Marine Protected Areas	Fishing	Tourism	Ports and Commercial Shipping	Offshore Petroleum Exploration and Operations	Defence Activities
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Routine/Non-routine Planned Activities																							
Physical Presence																							
1	Pipeline and upstream skid/PLR		1B							1I								1Q	1R				
2	Vessels																		2R		2T		
Seabed Disturbance																							
3	Pipeline cutting and upstream skid/PLR installation	3A		3C	3D					3I		3K											
Discharges																							
4	Vessel utility discharges			4C							4J												
5	Pipeline exposure				5D							5K											
6	Gas venting			6C		6E																	
7	Treated seawater			7C	7D					7I	7J	7K											
Atmospheric Emissions																							
8	Combustion engine exhaust					8E																	
Light Emissions																							
9	Artificial light on vessels and ROVs											9K		9M		9O							
Acoustic Emissions																							
10	Noise from vessels, helicopters and pipeline cutting											10K	10L	10M	10N								
Unplanned Activities																							
11	Dropped objects									11I													
12	Introduction of invasive marine species									12I													
13	Collision with marine fauna												13L	13M	13N								
14	Implementation of spill response												14L	14M		14O							
15	MDO release from vessel collision		15B	15C						15I	15J	15K	15L	15M	15N	15O		15Q	15R				
16	MDO release from bunkering incident			16C							16J	16K	16L	16M	16N	16O		16Q					
17	Incidental spills of hydrocarbons and chemicals			17C																			
18	Loss of waste overboard												18L	18M	18N	18O							
19	Dry natural gas release from pipeline loss of containment					19E												19Q					

Key	
	Interaction reasonably possible – low residual risk
	Interaction reasonably possible – medium residual risk
	Interaction reasonably possible – significant residual risk
	Interaction reasonably possible – high residual risk
	Interaction not reasonably expected

Table 5-7: Example risk assessment table

Risk	Description of the risk (or source) that has the potential to result in impacts to the environment.
Aspect-receptor Reference (Table 5-6)	Cross-reference to the interactions between environmental, socio-economic and cultural receptors and aspects of the seismic survey that are considered reasonably possible, as presented in **Table 5-6**.

Description of the Source of Risk
Brief description on the source of risk associated with a hazard (i.e. the activity), including context around the nature and scale of the risk to adequately inform potential impacts
Potential Impacts
Brief description of the key potential impacts (i.e. focus on relevant values and sensitivities) that may occur because of the risk being realised, as informed by a detailed understanding of the existing environment (**Section 4**). Note, a more detailed impact assessment and risk evaluation discussion is provided below each of the risk assessment summary tables.
Risk Assessment Presents the consequence, likelihood and overall risk ratings determined from the COPPA risk assessment process and ENVID workshop. As noted in **Section 5.2.2**, the inherent risk assumes existing standard controls are in place. The residual risk relates to the level of risk following risk treatment, such as the application of additional controls.

	Consequence	***Likelihood***	***Risk rating***
Inherent risk			
Residual risk			

Controls and Demonstration of ALARP Identifies and details the appropriate existing management controls that will be implemented to reduce potential impacts and risks to ALARP. Considers the effectiveness of the control in reducing the risk (i.e. by reducing likelihood and/or consequence). Provides an Environmental Performance Standard (EPS), which states the required level of performance of the control.
Existing Controls

Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***

Assessment of additional controls

Identifies the additional management controls that were considered, indicates whether they will be implemented or no, and provides a justification if they are not going to be applied. The controls are grouped based on the hierarchy of controls. Where an additional control is selected to be implemented, an EPS is provided.

Additional Control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Eliminate				
Substitute				
Engineering				
Administrative				

ALARP Statement
*Summary statement of whether the potential risks and impacts are considered ALARP. This statement is based on the outcomes of the environmental risk assessment, as outlined in **Section 5.2.3.1**.*
Acceptability
*Statement of the acceptability of the risk / impact following the application of selected controls based on the criteria outlined in **Section 5.2.3.2**.*
EPOs (Table 6-1)
*A measurable level of environmental performance in relation to the environmental receptors that may be impacted / at risk. Verification of EPOs is used to confirm environmental impacts and risks are managed to a level that is ALARP and acceptable. EPOs, along with EPSs, set the level at which an incident becomes a "recordable incident' (i.e. a breach of an EPO is a recordable incident; refer to **Section 7.8**).*

5.2.5 Impact Assessment and Risk Evaluation

A summary of the risk identification and analysis process is provided in **Table 5-7**. This provides a summary of:

- the sources of risk associated with routine/non-routine planned and unplanned activities that may have an impact or risk on the identified receptors;
- the identified environmental, socio-economic and cultural receptors; and
- the inherent and residual risk ranking for interaction between the activities and the receptors as determined through the risk assessment process.

The aspect-receptor cross references given in **Table 5-6** link to each of the hazards discussed in **Sections 5.3** and **5.4**.

The outputs of the risk identification, analysis and evaluation (including ALARP evaluation of controls, statements of ALARP and acceptability) process are presented in a summarised tabular form in the following sections. Further detailed impact assessment and risk evaluation discussion is provided each of the summary tables.

5.3 ROUTINE/NON-ROUTINE PLANNED ACTIVITIES

5.3.1 Physical Presence: Pipeline and Upstream skid/PLR

Risk	• Physical presence of the Pipeline and upstream skid/PLR on the seabed	
Aspect-receptor Reference (Table 5-6)	1B – KEFs	1I – Other benthic communities
	1Q – Marine protected areas	1R – Fishing

Description of Source of Risk

The Pipeline commenced operating in 2005. The Pipeline was installed on the seabed but has become partially or completely buried in some locations. The Pipeline is inherently stable due to its concrete weight coating but has a design allowance for some lateral flexing.

A series of cuts are planned along an approximately 100 m section of the Pipeline, with the resulting sections of the cut Pipeline recovered to a vessel for onshore disposal.

An end cap or upstream skid/PLR will be installed on the upstream end following cutting of the Pipeline at KP380. Activities associated with installation of tie-in valve skid downstream of the cut Pipeline at KP380 will be addressed in a separate EP. Trawl protection studies have been undertaken for the upstream skid/PLR design, which have determined there is an inherently low risk of fishing trawl gear becoming snagged on the upstream skid/PLR.

Impacts from seabed disturbance from the cutting of the Pipeline and the installation of the upstream skid/PLR are considered in **Section 5.3.3**.

Potential Impacts

The presence of the Pipeline and the upstream skid/PLR on the seabed may result in changes to benthic communities and may also present an obstacle or snag risk to trawl fishers.

KEFs

As described in **Section 4.2.3.1**, the Pipeline EMBA overlaps three KEFs:

- Carbonate bank and terrace system of the Sahul Shelf;
- Carbonate bank and terrace system of the Van Diemen Rise; and
- Pinnacles of the Bonaparte Basin.

The upstream skid/PLR will not lie within a KEF.

Given the small proportion of relevant KEFs overlapping the Pipeline (detailed in **Table 4-1**), the seabed footprint impact from the presence of and/or localised movement of the Pipeline (which has been in place since 2005) would only occur to a very small portion of these features and will not cause a significant impact to the ecological values associated with the KEFs.

Other Benthic Communities

As outlined in **Section 4.3.2.3**, benthic habitat modelling and mapping indicated the majority of the Operational Area is classified as bare sand (78%), with small areas of burrowers / crinoids (21%) and filter feeders (1%). Previous inspections of the Pipeline did not record any significant or complex benthic habitats, which is consistent with the habitat modelling results. The nearest notable seabed feature is Shepparton Shoal, which lies beyond the Operational Area; Shepparton Shoal will not credibly be impacted by the physical presence of the Pipeline and upstream skid/PLR.

Benthic communities in the area have been found to be correlated with geomorphology and substrate type, with relatively featureless areas restricted to infauna communities with almost no visible presence of epifauna (Nichol et al. 2013). Higher density benthic communities are expected to be restricted to isolated geomorphic features, particularly banks / shoals (Przeslawski et al. 2011), which do not overlap the Operational Area. The Pipeline and upstream skid/PLR will support higher diversity and abundance of marine biota as it functions as an artificial reef compared to the surrounding bare sand habitat. This will include increased fish community richness and abundance (Bond et al. 2018, McLean et al. 2017).

Given most of the seabed within the Operational Area comprises bare sand and low diversity benthic communities, the potential impacts from the continued presence of the Pipeline and the presence of the upstream skid/PLR are expected to be restricted to ongoing, minor and localised disturbance to low sensitivity benthic habitat. The negative impacts are expected to be at least partially compensated for by the Pipeline acting as an artificial reef. Therefore, the consequence of potential impacts associated with seabed disturbance from the presence of the Pipeline and upstream skid/PLR are negligible.

Marine Protected Areas

Natural values of the Oceanic Shoals AMP include the KEFs (refer to discussion above) and examples of ecosystems representative of the Northwest Shelf Transition Provincial Bioregion. The Oceanic Shoals AMP also hosts threatened and migratory species, including BIAs and habitat critical for the survival of marine turtles. Given the Pipeline footprint is highly localised, and the Pipeline has become an artificial reef, production cessation activities within the AMP (i.e. retention of the Pipeline on the seabed) are not expected to result in impacts to the values of the Oceanic Shoals AMP.

The section of the Oceanic Shoals AMP within which the Pipeline exists is zoned entirely IUCN VI (Multiple Use Zone). Management principles for this zoning include:

- The biological diversity and other natural values of the reserve or zone should be protected and maintained in the long term;
- Management practices should be applied to ensure the ecologically sustainable use of the reserve or zone; and
- Management of the reserve or zone should contribute to regional and national development to the extent that this is consistent with these principles.

Production cessation of the Pipeline is consistent with these principles. It does not represent a threat to the protection and maintenance of biological diversity and other natural values, the environmental risks and impacts are managed, and the Pipeline contributes to the economic development of the region and nation.

Consultation with stakeholders did not indicate any claims or objections from relevant persons (**Section 8**).

Based on the information outlined above, the potential impacts to the Oceanic Shoals AMP from the physical presence of the Pipeline are negligible.

Fishing

The presence of the Pipeline and upstream skid/PLR on the seabed may present a hazard to commercial trawl fishers. Considering the Pipeline has been in operation since 2005 with no incidents from interaction between trawl fishing gear/vessels to date, it is considered highly unlikely that incidents will arise in the future given the existing controls in place. The only trawl fishery currently active within the EMBA that utilises trawl gear is the Northern Prawn Fishery, which has historically had very low activity within the EMBA. COPPA has provided information and opportunities for consultation with all relevant commercial fishers which have potential to fish within the EMBA. As such, potential impacts to commercial fishers are negligible.

Risk Assessment

Physical Presence of Pipeline and Upstream skid/PLR

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	3 Rare	RRI – Low
Residual risk	1 Negligible	3 Rare	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

Control	***Effectiveness***	Reference (***Table 6-1***)	***Environmental Performance Standard***
Undertake consultation with relevant persons (including applicable notifications) to support production cessation of the Pipeline	This control is effective for avoiding unplanned interactions with other vessels, such as fishers. Consultation with relevant persons allows all parties to be aware of the Pipeline and the upstream skid/PLR. This allows COPPA and other users to undertake activities in such a way to minimise the potential for adverse interactions.	**C 1.1**	**EPS 1.1.1** Develop and implement consultation plan to support production cessation of the Pipeline
Notify the Australian Hydrographic Office (AHO) prior to commencing activities	This control is effective in notifying the AHO of the location of the Pipeline. This allows the AHO to modify nautical charts and issue notices to mariners if required. These may assist other users in avoiding interactions with the Pipeline (e.g. trawl fishers may	**C 1.2**	**EPS 1.2.1** Notify AHO prior to commencement of production cessation activities.

	avoid dragging gear over the Pipeline and upstream skid/PLR to prevent snags)		
The upstream skid/PLR will be designed to have inherently low risk of snagging	This control is effective in preventing a trawl net from becoming snagged in the unlikely event fishing gear is dragged over the upstream skid/PLR. Design features that reduce the potential for snags, such as covers on valves, will be considered and incorporated into the design where deemed appropriate.	**C 1.3**	**EPS 1.3.1** Upstream skid/PLR design process to consider snag prevention measures and include these in the design where appropriate.

Assessment of Additional Controls

Additional control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Elimination				
No additional controls identified				
Substitution				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement

Based on the outcomes of the risk assessment and the implementation of controls throughout the activity, COPPA considers that the impacts to the KEFs, other benthic communities, marine protected areas and fishing from the physical presence of the Pipeline and upstream skid/PLR are reduced to ALARP.

Relevant legislative requirements and standard industry practices have been applied to control the impacts. The controls selected for implementation are effective in reducing the impacts to environmental receptors due to the physical presence of the Pipeline. COPPA considers the controls adopted are commensurate to the nature and scale of the potential impacts. No credible additional controls were identified.

Acceptability

The potential impacts to the seabed and other marine users due to the physical presence of the Pipeline are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**.

Relevant requirements have been met, including COPPA' internal processes, industry good practice (consultation) and standard maritime practices.

The management of the risks and impacts are consistent with the objectives of the IUCN Category VI and the Multiple Use Zone of the Oceanic Shoals AMP within which the Pipeline lies. The advice of the Director of National Parks (a relevant person, **Section 8**) in relation to the management of the Oceanic Shoals AMP has been considered; COPPA's management of environmental impacts from production cessation are consistent with this advice. No unacceptable impacts to the environmental values of the Oceanic Shoals AMP will credibly occur.

Consultation in support of the EP has identified other users that may potentially be affected and provided sufficient opportunity to provide feedback. No claims or objections were raised in relation to the physical presence of the Pipeline or upstream skid/PLR.

EPOs (Table 6-1)
EPO 1 No adverse interactions[6] between other marine users and the Pipeline or ancillary Pipeline infrastructure.

[6] Whether an interaction constitutes an adverse interaction is determined on a case by case basis. Examples of adverse interactions may include substantiated complaints by other marine users to ConocoPhillips or NOPSEMA. Interactions where other users have not taken reasonable measures to avoid the interaction (e.g. third-party vessel failing to observe nautical charts) are not considered to be adverse for the purpose of this EP.

5.3.2 Physical Presence: Vessels

Risk	• Physical presence of vessels undertaking production cessation activities	
Aspect-receptor Reference (Table 5-6)	1R –Fishing	1T – Ports and commercial shipping

Description of Source of Risk

Vessel-based activities are planned to occur during production cessation, namely cutting of the Pipeline and installation of the upstream skid/PLR. GEP Production Cessation activities are expected to take place as a 30 – 45 day subcomponent of a 12-week GEP Tie-in installation campaign; note the tie-in installation is beyond the scope of this EP. Vessel type and specifications will depend on availability and specific activity requirements. Vessels are expected to range between approximately 30 and 130 m length and use dynamic positioning (DP) systems to allow for manoeuvrability and to avoid anchoring.

Vessel-based activities within the scope of the EP will be around the KP380 section of the Pipeline, within the Operational Area (as described in **Section 3.1**). Most activities will occur within 200-300 m of the location of the Pipeline isolation and cut.

All contracted vessels are subject to the requirements under COPPA's Contractor HSE Management Process (ALL/HSE/PRO/016) and COPPA Marine Vessels Vetting Process (**Section 7.2.3**). These outline the minimum requirements that must be met and confirm that the vessels meet or exceed the standards and criteria set by industry practice, international regulations, and relevant authorities such as the Australian Maritime Safety Authority (AMSA).

Potential Impacts

During production cessation activities there is potential for interference with commercial fishers, shipping vessels and other marine users. Given the spatially restricted and short duration of production cessation activities, interactions with other marine users are considered remote.

Fishing

From review of available fishery data, it was determined that there is only a low potential for commercial, traditional and recreational fishing to be undertaken within the Operational Area, (**Section 4.4.3**). Any interactions with fishers are expected to be restricted to temporary avoidance and potential displacement of fishing effort, which will not significantly impact fishing activities. Consultation with fishing stakeholders did not raise any issues in relation to potential interactions with vessels undertaking the Petroleum Activity (**Section 8**).

Based on the considerations above, impacts to fishing activities will be negligible.

Ports and Commercial Shipping

The presence of vessels has the potential to cause temporary displacement of commercial shipping. However, as all shipping vessels are also required to comply with the Convention on the International Regulations for Preventing Collisions at Sea 1972 (COLREGS) (and associated Marine Orders in Australian waters), it is expected navigational and communicative aids are sufficient to preventing any negative interactions beyond basic avoidance during production cessation activities. Most vessel traffic within 20 km of the Operational Area comprises ships displacing less than 10,000 tonnes which allows for greater manoeuvrability and, therefore, greater ease when shipping vessels are required to avoid vessels.

The potential impacts of interactions between vessels undertaking production cessation activities and other marine traffic are no more than a temporary displacement of other users, which are considered to be negligible.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	3 Rare	RRI – Low
Residual risk	1 Negligible	3 Rare	RRI – Low

Controls and Demonstration of ALARP

Existing controls

Control	***Effectiveness***	Reference (***Table 6-1***)	***Environmental Performance Standard***

Vessel equipped and crewed in accordance with Australian maritime requirements	This control is effective in avoiding unplanned interactions with other marine users. Crew qualifications and experience, along with communication and navigation equipment, allows vessels to detect, communicate with, and avoid interaction with other marine users	**C 2.1**	**EPS 2.1.1** Vessels will be equipped and crewed in accordance with the *Navigation Act 2012* (as applicable for vessel size, type and class), including implementing: • Marine Order 21 (Safety of navigation and emergency procedures) 2012, which implements elements of Chapters III, V and VI of International Convention for the Safety of Life at Sea (SOLAS), including: - Design and maintenance of onboard safety critical equipment (e.g. navigation, bridge equipment etc.) and crew requirements as applicable to vessel class per the SOLAS convention. • Marine Order 27 (Radio Equipment) 2009, which implements Chapter IV of the SOLAS Convection, including: - Radio, vessel tracking and distress communications as applicable to vessel class per SOLAS requirements. • Marine Order 30 (Prevention of Collisions) 2009, which implements COLREGS, including: - Lights, shapes and sounds as applicable to vessel class per COLREGS requirements • Marine Order 71 (Masters and Deck Officers) 2014, which implements the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW Convention), including: - All master, mate and watchkeeper officer duties undertaken by crew certified as applicable to vessel class per STWC requirements.
Undertake consultation with relevant persons (including applicable notifications) to support production cessation of the Pipeline	This control is effective in avoiding unplanned interactions with other vessels. Consultation with relevant persons allows all parties to be aware of activities associated with the production cessation of the Pipeline. This allows COPPA and other users to undertake activities in such a way to minimise the potential for adverse interactions.	**C 1.1**	**EPS 1.2.1** Develop and implement consultation plan to support production cessation of the Pipeline **EPS 1.2.2** Notify AHO prior to commencement of production cessation activities.

Assessment of Additional Controls

Additional Control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Elimination				
No additional controls identified				

Substitution
No additional controls identified
Engineering
No additional controls identified
Administrative
No additional controls identified
ALARP Statement
Based on the outcomes of the risk assessment and the implementation of controls throughout the activity, COPPA considers that the impacts and risks to other marine users due to the physical presence of vessels are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. The controls selected for implementation are effective in reducing the risk of interactions between vessels and other marine users. COPPA considers the controls adopted are commensurate to the nature and scale of the potential impacts. No credible additional controls were identified.
Acceptability
The potential impacts from the physical present of vessels to other users are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes, COLREGS, SOLAS, STCW Convention and relevant Marine Orders. Consultation in support of the EP has identified other users that may potentially be affected and provided sufficient opportunity to provide feedback. No claims or objections were raised in relation to the physical presence of vessels.
EPOs (Table 6-1)
EPO 2 No adverse interactions[7] between other marine users and COPPA vessels during production cessation activities.

[7] Whether an interaction constitutes an adverse interaction is determined on a case by case basis. Examples of adverse interactions may include substantiated complaints by other marine users to ConocoPhillips or NOPSEMA, vessel collisions, or damage to unsupervised fishing equipment (e.g. traps). Interactions where other users have not taken reasonable measures to avoid the interaction (e.g. third-party vessel not adhering to standard maritime requirements) are not considered to be adverse for the purpose of this EP.

5.3.3 Seabed Disturbance: Pipeline Cutting and Upstream skid/PLR Installation

Risk	Disturbance to seabed from pipeline cutting: • Local seabed excavation at Pipeline cut locations • Pipeline coating removal • Pipeline cutting and cut section removal • End cap or upstream skid/PLR installation	
Aspect-receptor Reference (Table 5-6)	3A – Bathymetry and seabed features	3C – Water quality
	3D – Sediment quality	3I – Other benthic communities
	3K – Pelagic and demersal fish communities	

Description of Source of Risk

In order to cut the Pipeline, sediment will need to be moved from around the Pipeline to allow access to the Pipeline with the cutting tools. The area from which sediment will be moved will be approximately 100 m^2, with approximately 540 m^3 of material to be moved. The method that will be used to remove the sediment is yet to be confirmed but is likely to be an air lift. Air lifts use compressed air supplied to the air lift pipe to generate suction, which is used to move sediment. The sediment is discharged from the end of the air lift pipe (near the seabed), and then settles down current from the discharge location. Other sediment relocation methods that may be used are likely to be similar in nature and scale to the air lift.

The concrete weight coating will be removed from the Pipeline by making a series of cuts in the concrete to weaken it. High pressure water jetting will then be used to remove the cut sections of the concrete weight coating and expose the steel Pipeline. The removed concrete will be left in situ on the seabed. The length of Pipeline from which the concrete weight coating will be removed is approximately 100 m. The resulting concrete rubble will be a relatively small volume (< 5 m^3).

The Pipeline will be cut once the concrete weight coating has been removed. The cutting method is yet to be confirmed but is likely to be a diamond wire saw. The cutting tool will be secured to the Pipeline and the Pipeline will be cut. This will be repeated for each of the series of cuts required to section the Pipeline.

After the Pipeline has been isolated and cut at KP380 a mechanical connector and either an end cap or an upstream skid/PLR will be installed on the upstream end. The upstream skid/PLR will cover a footprint of approximately 1000 m^2 overlapping the seabed previously covered by the Pipeline. Scour protection may be installed around the upstream skid/PLR to reduce the risk of scour resulting in subsidence of the upstream skid/PLR. The end cap will fit directly onto the mechanical connector with no additional footprint disturbance.

Potential Impacts

Bathymetry and Seabed Features

The seabed in the vicinity of KP380 is relatively flat bare sediments. There are no seabed features, such as shoals or KEFs, within the footprint of the seabed disturbances associated with Pipeline cutting and upstream skid/PLR installation. Given the relatively small volume of sediment that will be moved, along with the relatively small footprint of the disturbance, activities associated with cutting the Pipeline and installing the end cap or the upstream skid/PLR will have a negligible impact on bathymetry and seabed features.

Water Quality

Movement of sediment from around the Pipeline will result in a temporary increase in turbidity in the vicinity of KP380 during sediment removal. Sediments around KP380 are characterised by sand-sized particles (between 63 µm and 2 mm), which typically have high settling velocities and are expected to be deposited rapidly (i.e. within 10's of metres). Hence any potential decreases in water quality from these activities will be temporary and highly localised.

Habitat modelling and mapping around KP380 has not indicated the presence of benthic communities (e.g. filter feeders) that may be impacted by the temporarily increased turbidity resulting from these activities. No benthic primary producer habitat (e.g. seagrasses, macroalgae and zooxanthellate corals) has been observed or predicted to occur around KP380. Resuspended sediments will not be advected to shallow or nearshore areas that may host benthic primary producer habitat at concentrations that will affect benthic primary producers.

Mobile marine fauna, such as turtles and fish, may temporarily move away from the area due to the temporary, localised increase in turbidity. However, similar habitat to the area potentially affected by any temporary turbidity plume is widespread throughout the region. Waters in the region are naturally turbid and frequently experience pulsed turbidity events (e.g. sediment resuspension due to cyclones and turbidity from discharges from tidal

creeks). Hence, biological receptors are adapted to intermittently high turbidity. On this basis, the potential impacts to biological receptors from increased turbidity due to sediment removal are negligible.

While sediment relocation is the activity expected to generate the greatest increase in turbidity, removal of the concrete weight coating, cutting of the Pipeline and installation of the upstream skid/PLR may also resuspend sediments. The amounts of sediment resuspended, and the resulting impacts to water quality, from these activities is negligible.

Other Benthic Communities

Benthic habitat modelling and mapping indicates habitat within the disturbance footprint from Pipeline cutting and end cap or upstream skid/PLR installation activities is entirely bare sediment. No other benthic communities are expected to occur within the disturbance footprint around KP380. Bare sediment habitat is very widely represented in the region and is not of high environmental value. Fauna associated with bare sediment habitat are widely represented and many mobile fauna species in this habitat type, such as fish, are not site-attached.

The Pipeline itself provides benthic habitat, including substrate for sessile benthic organisms (e.g. sponges and gorgonians). Cutting of the Pipeline and installation of the upstream skid/PLR is expected to result in the loss of any sessile organisms attached to the cut sections of the Pipeline. Given the length of Pipeline sections that will be cut, the impact from the loss of attached sessile fauna will be negligible.

Based on the points above, impacts to other benthic habitats and communities from seabed disturbance as a result of Pipeline cutting and installation on the upstream skid/PLR will be negligible.

Pelagic and Demersal Fish Communities

Fish associated with the structure provided by and/or habitat growing on the Pipeline are expected to move into nearby suitable habitat, such as the remaining upstream and downstream sections of the Pipeline or become resident around the upstream skid/PLR following installation. Impacts to fish communities from seabed disturbance as a result of Pipeline cutting and installation on the upstream skid/PLR will be negligible.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Pipeline Cutting			
Inherent risk	1 Negligible	3 Rare	RRI – Low
Residual risk	1 Negligible	3 Rare	RRI – Low
Weight Coating Removal			
Inherent risk	1 Negligible	3 Rare	RRI – Low
Residual risk	1 Negligible	3 Rare	RRI – Low
Upstream skid/PLR Installation			
Inherent risk	1 Negligible	3 Rare	RRI – Low
Residual risk	1 Negligible	3 Rare	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

Control	***Effectiveness***	Reference (***Table 6-1***)	***Environmental Performance Standard***
No existing controls identified.			

Assessment of Additional Controls

Additional control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Elimination				
No additional controls identified				
Substitution				
No additional controls identified				
Engineering				

No additional controls identified
Administrative
No additional controls identified
ALARP Statement
No existing or additional controls were identified during the assessment of impacts and risks from seabed disturbance due Pipeline cutting and installation of the upstream skid/PLR. COPPA has a good understanding of the EMBA and the nature and scale of the activity. This provides a high degree of confidence in the predicted impacts. Given the nature and scale of the activity and the environmental receptors that will credibly be impacted upon, COPPA considers that the impacts from seabed disturbance from Pipeline cutting and upstream skid/PLR installation are inherently ALARP.
Acceptability
The potential impacts to the seabed from production cessation activities are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes and standard industry practices during the design of the Pipeline cutting and upstream skid/PLR installation activities.
EPOs (Table 6-1)
EPO 3 No impacts to environmental receptors from seabed disturbance due to local seabed excavation at Pipeline cutting locations, Pipeline cutting operations and end cap or upstream skid/PLR installation on the upstream end of the cut Pipeline beyond the Operational Area around KP380.

5.3.4 Discharges: Vessel Utility Discharges

Risk	• Routine discharge of sewage, grey water, putrescible waste, deck drainage, and bilge water from vessels	
Aspect-receptor Reference (Table 5-6)	4C – Water quality	4J – Plankton

Description of Source of Risk

Vessels will be required to undertake the production cessation activities at KP380, namely cutting of the Pipeline and installation of the upstream skid/PLR (and associated activities). Vessels will generate a range of utility waste streams that will be discharged to the marine environment, including:

- Sewage;
- Grey water;
- Putrescible waste;
- Deck drainage; and
- Bilge water.

These may be generated intermittently or continuously during the production cessation campaign, which is expected to occur during 4 – 6 weeks of a 12-week campaign, or as the initial 4 – 6 week phase of a split 12 week campaign (other campaign activities are beyond the scope of this EP and will be addressed in a separate EP).. The crew size onboard vessels undertaking production cessation activities may include up to 100 persons onboard a vessel.

Potential Impacts

Water Quality

Impacts to water quality from vessel utility discharges may include:

- increases in nutrients;
- increased biochemical oxygen demand;
- increased turbidity;
- reduced visual amenity; and
- low concentrations of potential contaminants such as hydrocarbons and chemicals.

The open water environment receiving these utility discharges is expected to result in rapid mixing of utility discharges. As a result, the potential impacts to water quality will be highly localised and restricted to the immediate area (i.e. 10's to 100's of metres) around the discharge point. Given the length of vessel-based activities during production cessation (expected to be < 45 days) is relatively short, the associated highly localised impacts will also be of relatively short duration. On this basis, impacts to water quality from vessel utility discharges will be negligible.

Plankton

The increase in nutrients from sewage and putrescible waste discharges may lead to a temporary, localised increase in phytoplankton productivity. This will be of negligible environmental consequence given the small amounts of nutrients that are expected to be released and the well mixed open water environment around KP380.

As outlined above, some utility discharge streams may contain low concentrations of potential contaminants. These may result in highly localised, temporary impacts to phytoplankton and zooplankton; these impacts will be negligible.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	2 Remote	RRI – Low
Residual risk	1 Negligible	2 Remote	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

Control	*Effectiveness*	*Reference (Table 6-1)*	
Routine discharges of treated sewage, grey-water, putrescible waste, deck drainage, and bilge water in accordance with standard maritime practice	This control is consistent with standard maritime practices which have been developed through international consensus. The control is consistent with relevant requirements, including the International Convention for the Prevention of Pollution from Ships 1973/1978 convention (MARPOL) and Australian Marine Orders.	**C 4.1**	**EPS 4.1.1** Vessels shall be equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 91 (Marine Pollution Prevention – Oil), which implements Annex I of the MARPOL Convention, including (as required by vessel class): - Machinery space bilge/oily water shall have IMO approved oil filtering equipment (oil/water separator) with an on-line monitoring device to measure Oil in Water (OIW) content to be less than 15 ppm prior to discharge. - A deck drainage system capable of controlling the content of discharges for areas of high risk of fuel/oil/grease or hazardous chemical contamination. - Waste oil storage available - Valid International Oil Pollution Prevention (IOPP) Certificate. • Marine Order 95 (Marine Pollution Prevention – Garbage), which implements Annex V of the MARPOL Convention, including: - Putrescible waste and food scraps are passed through a macerator prior to discharge so that it can pass through a screen with no opening wider than 25 mm. - Garbage management plan in place. - Garbage record book maintained onboard. • Marine Order 96 (Marine Pollution Prevention – Sewage), which implements Annex IV of the MARPOL Convention, including (as required by vessel class): - a valid International Sewage Pollution Prevention (ISPP) Certificate; - an ASMA approved sewage treatment plant; - a sewage comminuting and disinfecting system; - a sewage holding tank sized appropriately to contain all generated waste (black and grey water);

			- discharge of sewage which is not comminuted or disinfected will only occur at a distance of more than 12 nm from the nearest land; - discharge of sewage which is comminuted or disinfected using a certified approved sewage treatment plant will only occur at a distance of more than 3 nm from the nearest land; - discharge of sewage will occur at a moderate rate while support vessel is proceeding (> 4 knots).

Assessment of Additional Controls				
Additional Control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Elimination				
No additional controls identified				
Substitution				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
Storage and transfer of food wastes onshore for treatment and disposal	No	No	The storage of food wastes onboard may present a waste management hazard given the length of time the production cessation campaign is expected to cover (4 – 6 weeks of a 12-week campaign, or as the initial 4 – 6 week phase of a split 12 week campaign; other campaign activities are beyond the scope of this EP and will be addressed in a separate EP). Given the negligible environmental impact that the discharge of putrescible waste presents, the cost of storing and transporting food wastes to shore is considered grossly disproportionate to the environmental benefit. Note that vessels may be required to store waste onboard if they do not meet MARPOL discharge requirements.	N/A

ALARP Statement
Based on the outcomes of the risk assessment and the implementation of the control throughout the activity, COPPA considers that the impacts and risks to water quality and plankton from vessel utility discharges are reduced to ALARP.

Relevant legislative requirements and standard industry practices have been applied to control the risk. An additional control was evaluated and rejected as the reduction in risks was considered to be grossly disproportionate to the cost of implementation. The control selected for implementation is effective in reducing the risk to water quality and plankton from vessel utility discharges. COPPA considers the control adopted is commensurate to the nature and scale of the potential impacts.
Acceptability
The potential impacts to water quality and plankton from vessel utility discharges are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes, MARPOL, and related Marine Orders.
EPOs (Table 6-1)
EPO 4 Environmental impacts from vessel utility discharges will be within acceptable levels by maintaining discharge streams in accordance with standard maritime practices.

5.3.5 Discharges: Pipeline Exposure

Risk	• exposure of residual pipeline contaminants to the marine environment.	
Aspect-receptor Reference (Table 5-6)	5D – Sediment quality	5K – Pelagic and demersal fish communities

Description of Source of Risk

Once isolated and cut, parts of the Pipeline will be temporarily exposed to the environment. The length of cut and removed Pipeline that will be exposed is approximately 100 m in length in addition to the exposed ends of the Pipeline. The length of time between cutting and removing sections of the Pipeline and installation of the temporary debris caps on the exposed ends of the Pipeline will be kept as short as practicable and will be completed within 7 days. Replacement of the upstream debris cap with the mechanical connector and end cap or upstream skid/PLR will occur within approximately four weeks after the cut. Treated seawater pressure within the exposed ends of the Pipeline will be at equilibrium with the ambient pressure at the seabed prior to any cut being made, limiting potential ingress and egress of water prior to the installation of the debris caps.

Analysis of the small quantities of iron dust recovered during pigging activities on the Pipeline have indicated there is the potential for presence of inorganic mercury (mercuric (II) sulphide). This mercury compound is bound to iron dust / rust particles located on the 50mm section of bare metal on either side of each girth weld (i.e., approximately 100mm per pipe joint on the interior pipeline surface) and is highly insoluble in seawater. Analysis of pigging waste indicated the concentrations of other contaminants, such as naturally occurring radioactive material and non-mercury metals, were relatively low.

Potential Impacts

Sediment Quality

There is limited potential for the ingress and egress of seawater within the exposed section of the Pipeline as the internal and external water pressures and densities will be approximately equal. As such, there is little potential for material within the Pipeline, such as dust or rust particles with bound inorganic mercury, to be transported from within the Pipeline and deposited in the local sediments.

Pelagic and Demersal Fish Communities

Mercury (in the organic form of methylmercury) has been shown to bioaccumulate within marine food chains, and consumption of seafood contaminated with methylmercury has been shown to result in instances of mercury poisoning in humans. Incorporation of mercury within the Pipeline into marine food chains at levels that may result in impacts is very unlikely based on the following:

- The form of the mercury is inorganic (i.e. non-methylmercury). Inorganic mercury is not water-soluble and does not bioaccumulate.
- The biochemical pathways to transform inorganic mercury to methylmercury (which does bioaccumulate) are not clearly known, but appears to be carried out primarily by anaerobic bacteria within sediments and potentially aerobic bacteria within the water column (King et al. 2001).
- The sections of the Pipeline upstream and downstream of the cuts will contained treated seawater, which includes a biocide that inhibits bacterial growth.
- Debris end caps will be installed on the exposed ends of the Pipeline to seal the Pipeline on a priority basis and within 7 days of completing the cut, which limits the duration of the potential exposure.
- A mechanical connector and end cap or skid/PLR will be installed on the upstream end of the Pipeline within four weeks to prevent exposure of residual pipeline contaminants for the duration of the production cessation period.

Based on the points above, the methylation of any inorganic mercury is expected to proceed slowly within the exposed section of the Pipeline due to the presence of biocide in the seawater, which inhibits anaerobic bacteria. Any synthesised methylated mercury within the exposed section of the Pipeline is very unlikely to be consumed by phytoplankton or detritivores, and hence is unlikely to be introduced into marine food webs and bioaccumulate in higher trophic levels such as fish. As such, the potential for the residual mercury within the Pipeline to become incorporated into marine food webs, including commercially exploited fish resources, is remote.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	2 Remote	RRI – Low
Residual risk	1 Negligible	2 Remote	RRI – Low

Controls and Demonstration of ALARP			
Existing Controls			
Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***
Reduce the time between cutting of the Pipeline and installation of the debris caps where practicable.	This control is effective in that it reduces the time during which the pathway between the Pipeline interior and the environment exists.	**C 5.1**	**EPS 5.1.1** Time period between Pipeline cutting and debris caps installation on the upstream and downstream exposed ends must be within 7 days.
Reduce the time between cutting of the Pipeline and installation of the upstream mechanical connector and end cap or upstream skid/PLR where practicable.	This control is effective in that it prevents the pathway between the Pipeline interior and the environment during the production cessation period.	**C 5.2**	**EPS 5.2.1** Time period between Pipeline cutting and upstream mechanical connector and end cap or upstream skid/PLR installation must be within 28 days.
Reduce the length of Pipeline exposed to the environment where practicable.	This control is effective in that it reduces the length of potentially contaminated Pipeline exposed to the environment. This reduces the exposure of potentially contaminated materials to the environment.	**C 5.3**	**EPS 5.3.1** Production cessation activities design process to ensure Pipeline cut is as close as practicable to the isolations at KP380.

Assessment of Additional Controls				
Additional Control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Elimination				
No additional controls identified.				
Substitution				
No additional controls identified.				
Engineering				
No additional controls identified.				
Administrative				
No additional controls identified.				

ALARP Statement

Based on the outcomes of the risk assessment and the implementation of the control throughout the activity, COPPA considers that the impacts from exposure of the internal wall of the Pipeline to the environment are reduced to ALARP.

Standard industry practices have been applied to control the risk. An additional control was evaluated and rejected as the reduction in risks was considered to be grossly disproportionate to the cost of implementation. The controls selected for implementation are effective in reducing the impacts from exposure of the internal wall of the Pipeline to the environment. COPPA considers the controls adopted are commensurate to the nature and scale of the impacts.

Acceptability
The potential impacts from exposure of the internal wall of the Pipeline to the environment are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes and standard industry practices during the design of the Pipeline cutting and end cap installation activities.
EPOs (Table 6-1)
EPO 5 Reduce likelihood of impacts from exposure of open sections of the Pipeline by limiting length and duration of exposure during Pipeline production cessation activities.

5.3.6 Discharges: Gas Venting

Risk	• Venting of dry production gas from the Pipeline between local line stops at KP380 (local line stops isolation method only)	
Aspect-receptor Reference (Table 5-6)	6C – Water quality	6E – Air quality

Description of Source of Risk

If the Pipeline isolation at KP380 is done using the local line stops method, there will be a residual production gas in the approximately 100 m isolated section between the two line stop tools. Residual production gas will be comprised largely of methane, with small quantities of other gasses such as ethane and carbon dioxide. This gas is planned to be vented to the environment at the seabed prior to cutting the Pipeline but could also be vented to the atmosphere if required by operational circumstances. The venting at the seabed will be done via a diffuser located on the seabed to the water column. If vented to the surface, the gas will be released directly to the atmosphere (e.g. not flared). The volume of dry production gas vented will be approximately 5,000 m^3.

No residual production gas venting is required if the platform -launched HPIT method is used to isolate the Pipeline at KP380.

Potential Impacts

Water Quality

The subsea venting of residual production gas between the local line stops will result in production gas (primarily methane) becoming dissolved in the water column. Methane occurs naturally in the marine environment (e.g. through biogenic production in sediment) and bacterial communities both generate and consume methane. Non-methane constituents of the residual gas (e.g. ethane, carbon dioxide etc.) are present in small quantities and will not credibly result in environmental impacts.

Aerobic bacterial decomposition of methane in the water column into water and carbon dioxide is expected to account for all of the methane released to the water column. This will result in a slight increase in BOD; this is expected to result in negligible environmental impacts.

Air Quality

While the base case for venting of residual production gas is to vent it at the seabed via a diffuser, venting to the atmosphere may be required in circumstances where seabed venting is not practicable. Venting at the surface would be done in such a way as to maintain a safe (i.e. non-explosive) working environment onboard the vessels undertaking the activity. Residual production gas released to the atmosphere will result in a short-term, localised decrease in air quality. Methane, the primary component of the residual production gas, is buoyant in the atmosphere at sea level. As such, the residual production gas released at the sea surface will move upwards into the atmosphere.

Methane is a potent greenhouse gas; however, given the relatively small volume of gas being vented, the increase in the atmospheric methane budget is not significant.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	2 Remote	RRI – Low
Residual risk	1 Negligible	2 Remote	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***
Reduce residual gas volume and pressure by setting local line stops as close as practicable	This control is effective in reducing the volume of gas that is required to be released to the environment.	**C 6.1**	**EPS 6.1.1** Local line stops method design and installation to set local line stops as close as practicable.

Use diffuser on residual gas vent	This control reduces the size of the residual gas bubbles, slowing their ascent through the water column and increasing the rate at which gas will be dissolved in seawater. This reduces the risk of bubbles reaching the surface, which may result in an explosive gas cloud.	**C 6.2**	**EPS 6.2.1** Diffuser to be installed on residual gas vent.

Assessment of Additional Controls

Additional control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Elimination				
No additional controls identified				
Substitution				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement

Based on the outcomes of the risk assessment and the implementation of the control throughout the activity, COPPA considers that the impacts to water and air quality from residual gas venting are reduced to ALARP.

Standard industry practices have been applied to control the risk. The controls selected for implementation are effective in reducing the impacts to water and air quality from residual gas venting. COPPA considers the controls adopted are commensurate to the nature and scale of the impacts.

Acceptability

The potential impacts to water and air quality from residual gas venting are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**.

The impacts are not inconsistent with the principles of ESD and COPPA's requirements.

Consultation in support of the EP has identified other users that may potentially be affected and provided sufficient opportunity to provide feedback. No claims or objections were raised in relation to venting of residual gas.

EPOs (Table 6-1)

EPO 6

Potential impacts to water and air quality from residual gas venting will be within acceptable levels and limited to a temporary, localised increase in dissolved gas in the water column or in the atmosphere.

5.3.7 Discharges: Treated Seawater Discharge

Risk	• Discharge of treated seawater at KP380 (HPIT method only)	
Aspect-receptor Reference (Table 5-6)	7C – Water Quality	7D – Sediment Quality
	7I – Other Benthic Communities	7J – Plankton
	7K – Pelagic and Demersal Fish Communities	

Description of Source of Risk

Treated seawater from the Pipeline will be potentially exposed to the environment at KP380 if the HPIT isolation method is used. The seawater will contain biocide, corrosion inhibitor and oxygen scavenger in the concentrations provided in **Section 3.6**. These chemicals are required to maintain the integrity of the section of pipeline between the downstream cut and the HPIT that will remain part of the future operating pipeline and cannot reasonably be eliminated.

The specific chemical products that will be used to treat the seawater have not yet been determined, however all chemicals will be subject to the chemical assessment process outlined in **Section 3.6**. This process preferences chemicals that have been shown to present an acceptable environmental risk under the OCNS, readily degrade in the environment, and have a low risk of bioaccumulation. The chemical dosages required will be sufficient to achieve the desired technical outcome (i.e. effective preservation of the Pipeline); over-dosage of chemicals beyond that required will be avoided.

The total volume of treated seawater in the 2 km section is approximately 600m^3. The treated seawater will be exposed when the Pipeline is cut, with the treated seawater within the section between the downstream cut and the HPIT (approximately 100 m of the Pipeline containing approximately 30 m^3 of treated seawater) will be entirely released to the environment. Treated seawater in the sections of the Pipeline upstream and downstream of the cut section will also be exposed to the environment between cutting and installation of the debris caps. Debris cap installation will occur on a priority basis (within 7 days) after completion of the cutting of the Pipeline, limiting the period during which the treated seawater within the Pipeline upstream and downstream from the cut section is exposed to the environment (refer to Section 5.3.5).

The treated seawater in the Pipeline will be at ambient pressure and of similar density to the surrounding seawater. There will not be a noticeable pressure gradient between the treated seawater and the water column outside the Pipeline at the time of release. As a result, the majority of the treated seawater within the sections upstream and downstream of the cut section of Pipeline is expected to remain within the Pipeline, with little egress of treated seater from these sections of the Pipeline. Following the installation of debris caps, this treated seawater will not be released to the environment for the duration of the activity covered by this EP.

Fate of Treated Seawater in the Environment

Once released into the environment, the plume of treated seawater is expected to mix in the surrounding water. As the treated seawater will have similar physical properties, there is not expected to be a density interface (e.g. halocline or thermocline) between the treated seawater and the surrounding water that would inhibit mixing. The discharge location is approximately 50 m water depth, which is well within the mixed zone of continental shelf waters under the influence of thermal (from diurnal heating and cooling), tidal and wind-driven mixing. Hence, the treated seawater plume is not expected to be trapped in the water column by a thermocline or halocline. Brownian motion will also result in mixing of the treated seawater at the molecular scale. These natural processes are expected to mix the treated seawater rapidly (within hours) following release.

The biocide will be the most toxic component of the treated seawater. While the treated seawater will be anoxic upon release and have a chemical oxygen demand due to the residual oxygen scavenger, the surrounding seawater is expected to be well oxygenated as the water column at the release location is well mixed through the entire depth range. As the treated seawater plume mixes, the residual oxygen scavenger will be consumed and oxygen levels within the plume will increase. Dissolved oxygen levels are expected to be within approximately 95% of natural levels within 100 dilutions. The number of dilutions at which dissolved oxygen levels are expected to be tolerated by benthic organisms are considerably lower than the number of dilutions at which the biocide will no longer be acutely toxic. As a result, the presence of biocides within the treated seawater plume is expected to have the greatest potential for impacts to benthic biota.

The specific biocide(s) that will be used to treat the seawater have not been finalised. An indicative quaternary ammonium-based biocide has been used to inform impact assessment (Roemex RX-5722), which comprises >90% by mass the biocide ingredient. This chemical is considered to be representative of the type of chemicals that may be used to treat the seawater that will be discharged. Ecotoxicity testing data for RX-5722 is provided in **Table 5-8**.

Table 5-8: Ecotoxicity testing summary for RX-5722 biocide

Test Biota	Test Type	Effect Concentration (mg/L)
Copepod (*Acartia tonsa*)	48 hr EC50*	0.032
Fish	96 hr LC50†	0.84
Microalgae (*Skeletonema costatum*)	72 hr EC50*	0.023

* Half maximal effective concentration – the continuous dose concentration point halfway between the baseline (i.e. no effect) and maximum effect of the chemical on test organisms within the test timeframe.

† Lethal concentration 50% – the continuous dose at which half of the test organisms die within the test timeframe.

Assuming the complete release of the treated seawater within the cut sections of the Pipeline, and the partial release of treated seawater upstream and downstream of the cut section prior to installation of the debris caps, up to 60 m^3 of treated seawater may be released to the environment. Based on an initial dose of 500 ppm (i.e. 500 mg/L) of RX-5722 (which is considered representative of the dosage that will be used to treat the seawater), approximately 600 dilutions will be required to reduce the concentration of the biocide to the 96 hr LC50 concentration. This number of dilutions is considered to be an environmentally conservative estimate based on the following points:

- the number of dilutions assumes no consumption of the biocide prior to or following release, and
- 96 hr laboratory test exposure duration is likely to be much longer than the exposure that will occur in the environment due to water movement and dilution of the treated seawater plume.

While COPPA has not undertaken discharge-specific modelling, the 1:600 dilution ratio is expected to be achieved within 1 km based on a review of existing modelling studies of similar discharges and simple Gaussian dispersion estimation.

Potential Impacts

Water Quality

The release of the treated seawater to the environment will result in an acute, temporary, localised decrease in water quality. The biocide and absence of oxygen within the treated seawater will result in mortality of marine biota exposed to high concentrations of the treated seawater plume. These effects are expected to be limited to < 1 km from the discharge location along the prevailing current vector. As the plume undergoes mixing through the oceanographic processes, the potential impacts will reduce as the treated seawater plume becomes diluted.

The potential for chronic impacts on water quality is not considered credible as the treated seawater discharge is a discrete, one-off release and the chemicals in the treated seawater are readily biodegradable and do not bioaccumulate.

Sediment Quality

The chemicals added to the treated seawater will not become bound to the sediments and will not bioaccumulate. As the discharge is not actively pumped into the environment, no scouring of sediments at the release location will occur. On this basis, no changes to sediment quality are expected to occur as a result of the discharge of treated seawater.

Other Benthic Communities

Habitat modelling indicates benthic habitats surrounding the treated seawater release location are largely bare sediments, with small areas of burrower / crinoid and filter feeder habitat. These habitats are widely represented in the region and are not considered to be of particularly high environmental value. Sessile epibenthic biota and infauna communities within the treated seawater plume near the release location are expected to experience mortality. These communities are expected to recover over time, with no persistent effects expected to occur.

The nearest potentially sensitive benthic habitat, Shepparton Shoal, lies approximately 5 km from the release location. No impacts to this shoal are expected to occur as the plume will not reach this receptor above concentrations that may result in impacts.

Plankton

Planktonic biota exposed to undiluted plume will experience mortality, with the potential for mortality decreasing as the plume becomes more diluted. Given the widespread nature and high turnover rates of planktonic communities, impacts from the discharge of treated seawater on planktonic communities are expected to be negligible. Recovery is expected to occur within days of the release.

Pelagic and Demersal Fish Communities

Fish are likely to be attracted to the Pipeline, as it provides habitat in an area that is largely devoid of rugose seabed features. Fish exposed to the undiluted plume are expected to be deterred by the presence of chemicals and move away from the release location. As the plume dilutes and water quality returns to the baseline condition, the displaced fish are expected to return and utilise the habitat created by the Pipeline again.

The mortality of benthic biota may result in a temporary reduction in the availability of prey for fish in the vicinity of the release location. Given the expected localised nature of this impact to benthic communities, the impacts to fish are expected to be negligible.

Risk Assessment

	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	3 - Rare	RRI – Low
Residual risk	1 Negligible	3 - Rare	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

Control	*Effectiveness*	*Reference (Table 6-1)*	*Environmental Performance Standard*
Implement chemical selection procedure for all chemicals planned to be released to the marine environment	This control is effective in reducing the consequence of chemical discharges, as the chemical selection procedure includes consideration of the environmental risks. The chemical selection process requires less environmentally harmful alternatives be used as substitutes for more harmful chemicals where practicable.	**C 7.1**	**EPS 7.1.1** All chemicals planned to be release to the marine environment will be assessed through the chemical selection procedure.
Monitor dosing of seawater treatment to prevent over-dosing	This control is effective in preventing high doses of chemicals (i.e. well above the dose required to achieve the intended effect) in the treated seawater.	**C 7.2**	**EPS 7.2.1** Dosing of chemicals to treat seawater will not exceed guidelines for use by manufacturers to achieve intended technical requirements.

Assessment of Additional Controls

Additional control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Elimination				
Do not use chemicals to treat seawater	No	No	The use of chemically treated seawater to preserve the Pipeline is required to maintain the integrity of the Pipeline section which will be used for the future tie-in.	N/A
Substitution				
No additional controls identified.				
Engineering				
No additional controls identified.				
Administrative				
No additional controls identified.				

ALARP Statement
Based on the outcomes of the risk assessment and the implementation of the selected controls, COPPA considers that the impacts and risks to water quality, other benthic communities, plankton and fish assemblages from the discharge of treated seawater are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. An additional control was evaluated and was rejected as the control posed an unacceptable risk to the integrity of the Pipeline and hence was not feasible. The controls selected for implementation are effective in reducing the impacts to water quality, other benthic communities, plankton and fish assemblages from the discharge of treated seawater. COPPA considers the controls adopted are commensurate to the nature and scale of the impacts.
Acceptability
The potential impacts to water quality, other benthic communities, plankton and fish assemblages from the discharge of treated seawater are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. The impacts are not inconsistent with the principles of ESD. Relevant requirements have been met, including COPPA's internal processes and standard industry practices.
EPOs (Table 6-1)
EPO 7 Impacts to water and sediment quality will be temporary and will recover completely within in a short time (several days) after cessation of the treated seawater discharge. Mortality of benthic biota from the treated seawater discharge will be limited to within 1 km of the release location.

5.3.8 Atmospheric Emissions: Combustion Engine Exhaust

Risk	• Atmospheric emissions from vessel combustion engines and incinerators
Aspect-receptor Reference (Table 5-6)	8E – Air quality

Description of Source of Risk

Emissions to the atmosphere from vessels during production cessation will be primarily from the combustion of fossil fuels, and potentially from the incineration of waste, onboard vessels. The main emissions identified include carbon dioxide, carbon monoxide, oxides of nitrogen, sulphur dioxide, particulate matter, non-methane volatile organic compounds and benzene, ethylbenzene, toluene and xylenes (collectively referred to as BTEX). Given the short duration of vessel activities during production cessation, atmospheric emissions will be limited. The actual expected volumes will be dependent on the size of vessel and the use of waste incinerators.

All vessels undertaking production cessation activities will run on MDO; no heavy or intermediate fuel oils will be used. This inherently reduces the potential pollutants such as particulates from exhaust emissions.

All atmospheric emissions from vessels will occur around the KP380 section of the pipeline, where vessel-based activities within the scope of this EP are constrained within the Operational Area (as described in **Section 3.1**).

Potential Impacts

Air Quality

The location where vessels will be operating within the scope of this EP is a remote offshore environment where there are very few sources of air pollution and the air quality is expected to be nearly pristine. Atmospheric emissions from vessels can result in a deterioration in local air quality, while emissions of greenhouse gas (GHG) can cause an incremental increase in global GHG concentrations. Given the short duration of the activities, both risks are considered to have a negligible impact on air quality in the Operational Area. This impact will only persist while vessels are within the Operational Area and will be highly localised.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	1 Improbable	RRI - Low
Residual risk	1 Negligible	1 Improbable	RRI - Low

Controls and Demonstration of ALARP

Existing Controls

Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***
Atmospheric emissions from combustion engines and incinerators in accordance with standard maritime practice	This control is consistent with standard maritime practices which have been developed through international consensus. The control is consistent with relevant requirements (including fuel sulphur content restrictions) and implements the MARPOL convention and Australian Marine Order 97.	**C 8.1**	**EPS 8.1.1** Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 97 (Marine Pollution Prevention – Air Pollution), which implements Annex VI of the MARPOL Convention, including (as required by vessel class): - a valid International Air Pollution Prevention (IAPP) Certificate and / or Engine International Air Pollution Prevention (EIAPP) Certificate and / or International Energy Efficiency (IEE) Certificate

			- Use of low sulphur fuel (as per MARPOL requirements); - Use of incinerators in accordance with Annex VI of the MARPOL Convention.

Assessment of Additional Controls				
Additional control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Elimination				
No additional controls identified				
Substitution				
Vessels use alternative fuels such as LNG	No	No	COPPA is aware of the use of LNG-powered vessels in other parts of Australia. LNG fuel results in fewer potentially harmful gas and particulate emissions compared to MDO. There are currently very few LNG-powered vessels that can reasonably undertake production cessation activities in the Asia-Pacific region, and there is currently no refuelling infrastructure at the port of Darwin to support LNG fuelled vessels. Given the lack of suitable vessel and supporting refuelling infrastructure, the use of an LNG-powered vessel to undertake production cessation activities is not considered practicable, particularly when considering the expected short duration of production cessation activities under this EP.	N/A
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement
Based on the outcomes of the risk assessment and the implementation of the control throughout the activity, COPPA considers that the impacts and risks to air quality from exhaust from combustion engines and incinerators are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. An additional control was evaluated and was rejected as the reduction in risks was considered to be grossly disproportionate to the cost of implementation. The control selected for implementation is effective in reducing the impacts to air quality from exhaust from combustion engines and incinerators. COPPA considers the control adopted is commensurate to the nature and scale of the impacts.
Acceptability
The potential impacts to air quality from combustion engine exhaust and incinerators are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**.

Relevant requirements have been met, including COPPA's internal processes, MARPOL, and Marine Order 97.
EPOs (Table 6-1)
EPO 8 Impacts from atmospheric emissions will be maintained within acceptable levels and limited to a temporary, localised decrease in air quality within the Operational Area.

5.3.9 Light Emissions: Artificial Light on Vessels and ROVs

Risk	• Light emissions from vessels and ROVs	
Aspect-receptor Reference (Table 5-6)	9K – Pelagic and demersal fish communities	9M – Marine reptiles
	9O – Birds	

Description of Source of Risk

Production Cessation activities will be undertaken by vessels, which will be within the Operational Area around KP380 for between 4 – 6 weeks during a 12 week campaign or for 4 – 6 weeks in the initial phase of a split campaign (note other campaign activities are beyond the scope of this EP and will be addressed in a separate EP), operating on a 24-hour basis. Lighting associated with vessels allows for safe operations, particularly during night operations, and is in accordance with safety and navigational requirements. Lighting on vessels is predominately facing away from the marine environment, directed to deck working areas, however, underwater lighting (i.e. ROV lights) may be required during some activities.

All artificial light from vessels and ROVs will occur around the KP380 section of the pipeline, where vessel-based activities within the scope of this EP are constrained within the Operational Area (as described in **Section 3.1**).

Lighting is required for the safe operation of vessels at sea, and vessel navigation lighting is mandated by the COLREGS and associated Australian Marine Orders. Lighting cannot be eliminated without incurring unacceptable safety risks.

Potential Impacts

Light emissions associated with activities involving vessels and ROVs may present a potential risk to marine fauna causing a temporary change in movement patterns and/or behaviour, such as attraction, displacement or disorientation. Artificial lighting can affect seabirds and migratory shorebirds, marine turtles, as well as sharks/rays and other fish.

Pelagic and Demersal Fish Communities

Fish, including sharks and rays, may exhibit behavioural disturbance in response to artificial lighting. Behavioural effects may include avoidance of, or attraction to, the light source. Effects may vary for individual species-based timing of the activity (i.e. during feeding, breeding or resting periods). Impacts to fish from artificial lighting is expected to cause only brief behavioural changes within a localised area and will not have any lasting effects to individuals. These impacts are considered to be negligible.

Marine Reptiles

Marine turtle hatchlings and nesting adults can become disorientated by coastal artificial lighting when moving towards the sea from nesting beaches(Salmon et al. 1995, Salmon and Witherington 1995), however, once reaching the water are primarily directed by water movements (Lohmann et al. 1990, Lohmann and Lohmann 1992). No activities within direct line of sight of turtle nesting beaches will occur, with all vessel activities constrained to the Operational Area around KP380. The nearest potential turtle nesting beach is approximately 27 km from KP380. Therefore, marine turtle hatchlings and nesting adults are not expected to be affected by artificial lighting associated with the activities.

Light is recognised as a threat to marine turtles in the *Recovery Plan for Marine Turtles in Australia 2017-2027* (Commonwealth of Australia 2017), particularly for stocks off Queensland and WA where there is coastal development near nesting beaches. Light is not recognised as a threat for the olive ridley and flatback turtle stocks in the NT. Given the short duration of the activity and the distance from the nearest turtle nesting beach, the production cessation activities are considered to be consistent with the objectives of the *Recovery Plan for Marine Turtles in Australia 2017-2027* (Commonwealth of Australia 2017).

Low numbers of marine turtles are likely to traverse through the area where artificial light associated with production cessation activities will occur. The potential impact to marine turtles is expected to be limited to minor and temporary behavioural disturbance, which is considered to be negligible.

Birds

Artificial lighting may result in behavioural disturbance of birds, such as attraction or mis-orientation (Poot et al. 2008). There are isolated incidents of bird mortality influenced by artificial light, however such reports typically occur during unusual meteorological conditions (e.g. fog) when light sources are in close proximity to high density areas of birds (e.g. roosting areas). The Operational Area is not known to host significant seabird or migratory shorebird assemblages, and any behavioural disturbance to birds would only affect a small number of individuals. Impacts to these individuals are likely to be limited to short-term attraction. This impact will cease upon completion of the vessel-based production cessation activities, and hence is considered to be negligible.

Risk Assessment			
	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	2 Remote	RRI – Low
Residual risk	1 Negligible	2 Remote	RRI – Low

Controls and Demonstration of ALARP
Existing Controls
No existing controls identified

Assessment of Additional Controls				
Additional control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Elimination				
No additional controls identified				
Substitution				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement
Based on the outcomes of the risk assessment, COPPA considers that the impacts to marine fauna from artificial light on vessels and ROVs are inherently ALARP. No existing or additional controls were identified that would reduce the environmental impacts or artificial lighting.

Acceptability
The potential impacts to marine fauna from artificial light on vessels and ROVs are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been considered, including relevant conservation advice and recovery plans that identify light as a threat to fauna. The potential impacts to marine fauna from artificial light on vessels and ROVs are consistent with the objectives and requirements of the conservation advice and recovery plans.

EPOs (Table 6-1)
EPO 9 Impacts from artificial light emissions will be maintained within acceptable levels and limited to a temporary, localised behavioural disturbance to fauna.

5.3.10 Acoustic Emissions: Noise from Vessels and Pipeline Cutting

Risk	• Underwater noise associated with production cessation vessels • Underwater noise associated with Pipeline cutting	
Aspect-receptor Reference (Table 5-6)	10K – Pelagic and demersal fish communities	10L – Marine mammals
	10M – Marine reptiles	10N – Sharks and rays

Description of Source of Risk

Noise associated with production cessation vessel activity that could impact marine fauna includes noise generated by vessel thrusters, engines and propellers, as well as noise emitted onboard which is converted to underwater noise through the hull (e.g. from heavy machinery). The main source of noise which will be emitted from vessels during production cessation activities will be from DP thrusters. Noise from DP systems is predominately generated from cavitation and typically ranges between 200 Hz and 1.2 kHz in frequency. Surveys measuring underwater noise from DP vessels holding station reported maximum source levels of approximately 182 dB re 1 µPa at 1 m (McCauley 1998). Levels emitted from vessels during production cessation activities are expected to be no higher than these reported levels.

Pipeline cutting may also generate underwater noise; however, this is expected to be much lower in intensity than DP thruster noise and of limited duration (e.g. several hours per cut) and hence has not been assessed.

Note that no low frequency, high intensity underwater noise sources (e.g. sub-bottom profilers) will be used during production cessation activities.

Potential Impacts

Pelagic and Demersal Fish Communities, Marine Mammals, Marine Reptiles and Sharks and Rays

Marine fauna that may be impacted by underwater noise from vessels and production cessation activities include marine mammals (cetaceans), reptiles, sharks/rays and other fish. Marine fauna use sound in a range of functions including social interaction, foraging and orientation. Marine fauna responds variably when exposed to underwater noise from anthropogenic sources, with effects dependent on a number of factors, including distance from the sound source, the animal's hearing sensitivity and audible frequency range, type and duration of sound exposure and the animal's activity at time of exposure. Broadly, the effects of sounds on marine fauna can be categorised as:

- behavioural response – behavioural changes vary significantly and may include temporary avoidance, increased vigilance, reduction in foraging and reduced vocalisations.
- acoustic masking – anthropogenic sounds may interfere, or mask, biological signals therefore reducing the communication and perceptual space of an individual.
- auditory threshold shift (temporary and permanent hearing loss) – marine fauna exposed to intense sound may experience a loss of hearing sensitivity. Hearing loss may be in the form of a temporary threshold shift (TTS) from which an animal recovers within minutes or hours, or a permanent threshold shift (PTS) from which the animal does not recover.
- non-auditory physiological effects – physiological injury or mortality.

Behavioural impacts will depend on the audible frequency range of each potential receptor in relation to the frequency of the noise, as well as the intensity of the noise. Physiological impacts, including TTS and PTS, are associated mainly with the intensity level of the noise source; however, audible frequency can be taken into consideration for some marine species through using developed M-weighted sound exposure metrics (Southall et al. 2007).

Based on the potential frequency spectrum and intensity, DP thruster noise has the potential to cause behavioural impacts to fish (including sharks and rays), cetaceans and marine turtles in close proximity to the noise source. The type of behavioural impacts to marine fauna will depend on the intensity of sound. **Table 5-10** summarises reported behavioural thresholds for potential physiological and behavioural impacts.

Table 5-9: Summary of marine fauna impact thresholds and predicted sound intensities from vessel and acoustic survey noise emissions, as derived in Southall et al. (2007), Popper et al. (2014) and (2019)

Potential Marine Fauna Receptor	Physiological Effects (Mortality and Injury)	Impairment			Behaviour
		PTS	TTS	Masking	
DP thrusters					

High frequency cetaceans	179 db re 1 μPa^{2}s weighted SEL	155 db re 1 μPa^{2}s weighted SEL	140 db re 1 μPa^{2}s weighted SEL	-	90-140 dB re 1 μPa rms SPL
Mid-frequency cetaceans*	198 db re 1 μPa^{2}s weighted SEL	185 db re 1 μPa^{2}s weighted SEL	170 db re 1 μPa^{2}s weighted SEL	-	90-170 dB re 1 μPa rms SPL
Low Frequency Cetaceans	192 db re 1 μPa^{2}s weighted SEL	183 db re 1 μPa^{2}s weighted SEL	168 db re 1 μPa^{2}s weighted SEL	-	120-160 dB re 1 μPa rms SPL
Marine Turtles	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) High (I) Moderate (F) Low
Fish: no swim bladder†	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: swim bladder no involved in hearing†	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: swim bladder involved in hearing†	(N) Low (I) Low (F) Low	170 dB rms SPL for 48 hrs	158 dB rms SPL for 12 hrs	(N) High (I) High (F) High	(N) High (I) Moderate (F) Low

Note: a range of sound units are provided in the table above, reflecting the range of studies from which these data have been derived. The difference in units presents difficulty in reliably comparing threshold values. Where practicable, the threshold values have been compared with indicative sound sources levels of the same sound unit types to facilitate comparison. The sound units provided in the table above include:

- *Weighted sound exposure level (SEL): a weighted sound metric that emphasises the audible frequency bands for the receptor groups – low, mid- and high frequency cetaceans. SEL units are time integrated and best suited for continuous noise sources, such as vessels holding station or continuous machinery noise.*
- *Root mean square (rms) sound pressure level (SPL): root mean square of time-series pressure level, useful for quantifying continuous noise sources (as per SEL point above).*
- *Relative risk (high, medium and low) is given for fish (all types), turtles and eggs and larvae at three distances from the source defined in relative terms as near (N), intermediate (I) and far (F) (after Popper et al. 2014).*

Noise is identified as a potential threat to marine turtles in the *Recovery Plan for Marine Turtles in Australia 2017-2027* (Commonwealth of Australia 2017), particularly high intensity, low frequency noise such as explosives and seismic survey air guns. Noise was not identified as a threat for the NT stocks, and the underwater noise that will credibly be generated during production cessation activities is not considered to be particularly harmful to marine turtles. On this basis, the production cessation activities are considered to be consistent with the objectives of the *Recovery Plan for Marine Turtles in Australia 2017-2027* (Commonwealth of Australia 2017).

Based on **Table 5-10**, vessel related noises at the source are not expected to have the intensity and characteristics likely to cause physiological injury to most marine fauna, with the exception to some high frequency marine cetaceans. As DP thruster noise has a low frequency component, it propagates well through water and is not well absorbed, meaning marine fauna may be exposed to relatively high levels of this noise at greater distances from the source than high frequency noise. Surveys which reported maximum source levels for DP vessels holding station (182 dB re 1 μPa at 1 m), found reduced levels of 137 dB re 1 μPa at 405 m away from the source (measured in strong currents) (McCauley 1998). Given most marine fauna will only be affected behaviourally, impacts from DP thruster noise are not expected to cause more than minor and temporary changes in behaviour such as avoidance of production cessation vessels. The location of KP380 does not represent an important habitat for any noise-sensitive marine fauna, and any behavioural disturbance to marine fauna will not preclude biologically important activities such as migration or nesting.

Risk Assessment			
Underwater noise associated with production cessation vessels and activities			
	Consequence	***Likelihood***	***Risk rating***

Inherent risk	1 Negligible	2 Remote	RRI – Low
Residual risk	1 Negligible	2 Remote	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

No existing controls identified. Note COPPA implements EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans (and applied for marine turtles) to reduce the risk of a collision with marine fauna (**Section 5.4.3**). This control may result in a minor ancillary reduction in the potential for noise impacts to cetaceans and turtles, however the control is considered ineffective in managing the risks and impacts of noise from production cessation vessels and activities to marine fauna.

Assessment of Additional Controls

Additional Control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Elimination				
No additional controls identified				
Substitution				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
Cease noise generating activities (e.g. DP) when near marine fauna	No	No	Ceasing activities that generate underwater noise when near sensitive fauna may reduce the potential for impacts. However, the potential for impacts beyond behavioural disturbance are very low. Engine / DP thruster noise cannot reliably be ceased due to the safety critical role of vessel propulsion. Additionally, noise sensitive fauna may be difficult to detect, which reduces the effectiveness of this control. Maintaining constant noise sources may act as a deterrent to sensitive fauna, encouraging them to move away from the noise source and hence reducing the potential for impact; ceasing noise generation may reduce or eliminate this effect. The source of risk in its inherent state is low, and the potential consequence is brief and reversible. The cost of implementing the control is considered to be grossly disproportionate to the reduction in risk. The control has not been adopted.	N/A

ALARP Statement
Based on the outcomes of the risk assessment, COPPA considers that the impacts and risks to marine fauna from noise from vessels and production cessation activities are inherently ALARP. An additional control has been evaluated; however, it was not deemed to be practicable and was not selected for implementation. Given the nature and scale of the risk, COPPA considers the risks and impacts from vessels and production cessation activities are inherently ALARP.
Acceptability
The potential impacts to marine fauna from noise from production cessation vessels and activities are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been considered, including relevant conservation advice and recovery plans that identify noise as a threat to fauna. The potential impacts to marine fauna from noise from production cessation vessels and activities are consistent with the objectives and requirements of the conservation advice and recovery plans (refer to **Table 4-5** for a list of conservation advice and recovery plans).
EPOs (Table 6-1)
EPO 10 Impacts from underwater noise emissions will be maintained within acceptable levels and limited to a temporary, localised behavioural disturbance to fauna.

5.4 UNPLANNED ACTIVITIES

5.4.1 Physical Presence: Dropped Objects

Risk	Accidental dropping of objects from vessels resulting from: • Loss of control of suspended loads • Loss of equipment off vessel deck
Aspect-receptor Reference (Table 5-6)	11I – Other benthic communities

Description of Source of Risk

There is potential for objects, such as PPE, small tools and unsecured deck equipment, to be accidentally lost overboard to the marine environment from vessels undertaking production cessation activities. Suspended loads (e.g. upstream skid/PLR) may also be accidentally dropped through operator error or mechanical failure. Given the expected short duration of vessel operations within the scope of this EP, the period of time during which an object may be dropped is short.

Dropped objects, particularly large objects, are an uncommon occurrence in COPPA's operational experience. Dropped objects from lifting operations represent a significant safety risk and considerable effort is applied to prevent their occurrence.

Considerable gas inventory may remain in the Pipeline between KP0 and KP380 if the local line stops isolation method is used. A dropped object (e.g. the upstream skid/PLR) has been identified as a top event that may result in a loss of containment leading to the release of this gas; refer to **Section 5.4.9** for further information.

Potential Impacts

Other Benthic Communities

Given all vessel-based activities will be constrained to the Operational Area around KP380, impacts from dropped objects within the scope of this EP cannot occur to distant receptors such as the Oceanic Shoals AMP, KEFs and benthic primary producer habitats.

If an object is dropped overboard, potential impacts would be limited to minor and localised disturbance of the seabed and benthic habitats near the dropped object. Benthic habitat modelling and mapping shows that habitats within the vicinity of KP380, the only location where a dropped object may occur, are bare sediments. These habitats are very widely represented throughout the region. The consequences from disturbance from a dropped object to other benthic communities is negligible.

Risk Assessment

	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	3 Rare	RRI – Low
Residual risk	1 Negligible	3 Rare	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

Control	*Effectiveness*	*Reference (Table 6-1)*	*Environmental Performance Standard*

Implement standards and procedures for lifting equipment	This control is effective in reducing the likelihood of a suspended load being dropped. Engineering standards for load-bearing lifting equipment are widely used in the offshore industry and well understood. Suitable lifting procedures consider a range of technical and environmental factors to reduce the risk of loss of control of a suspended load.	**C 11.1**	**EPS 11.1.1** COPPA will confirm the vessel procedures for lifting include • Lifting operations to be undertaken by competent personnel • Use of appropriate and certified lifting equipment and accessories • Preventative maintenance will be undertaken on the key lifting equipment as per manufacturer's specifications • Consideration of weather conditions (e.g. no heavy lifts undertaken in severe weather conditions
Dropped objects recovered where safe and practicable to do so	This control may reduce the potential for ongoing disturbance to benthic habitats from a dropped object. The effectiveness of this mitigation control will depend on the nature of the dropped object and the receiving environment.	**C 11.2**	**EPS 11.2.1** All dropped object incidents to be reviewed to assess the environmental risk and the potential to recover the object, and objects will be recovered where safe and practicable to do so.

Assessment of Additional Controls

Additional Control	*Practicable?*	*Will it be Applied?*	*Justification*	*Environmental Performance Standard*
Eliminate				
No additional controls identified				
Substitute				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement

Based on the outcomes of the risk assessment and through the implementation of controls throughout the activity, COPPA considers that the impacts and risks to benthic habitats from dropped objects are reduced to ALARP.

Standard industry practices have been applied to control the risk. The controls selected for implementation are effective in reducing the risks to benthic habitats from dropped objects. COPPA considers the controls adopted are commensurate to the nature and scale of the risk. No credible additional controls were identified.

Acceptability

The potential impacts to the benthic habitats from dropped objects are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.3.2**.

Relevant requirements have been met, including COPPA's internal processes and standard maritime practices.

EPOs (Table 6-1)

EPO 11

No loss of equipment/cargo overboard from production cessation vessels resulting in a Consequence Severity greater than Minor

5.4.2 Physical Presence: Introduction of Invasive Marine Species

Risk	Accidental introduction of invasive marine species (IMS) via: • Biofouling (e.g. on vessel hulls or submersible equipment) • Ballast water
Aspect-receptor Reference (Table 5-6)	12I – Other benthic communities

Description of Source of Risk

The establishment of IMS in an area production cessation requires the following:

- IMS to be present on a vector (vessel biofouling and ballast water identified as credible);
- IMS to be released from the vector; and
- IMS become established in the receiving environment.

Vessels moving between areas are the most common vector for the translocation of IMS. IMS may be present as biofouling on vessel hulls (e.g. adult sessile organisms) and in the ballast water (e.g. as larvae). Vessels contracted to undertake production cessation activities may be sourced from Australia or overseas, depending on operational requirements. The relatively short residence time of vessels undertaking production cessation activities at KP380 provides a relatively short opportunity for IMS present on vessels to be released to the environment.

IMS may also be present on submersible equipment; such equipment is cleaned and dried between uses which will kill any potential IMS that may be present on such equipment after use. The upstream skid/PLR will be newly built and hence free of potential IMS.

IMS require suitable habitat to become established in an area; many potential IMS are sessile benthic organisms (e.g. mussels). The habitat around KP380 is bare sediment and unsuitable for settlement of many sessile organisms, although the Pipeline itself provides hard substrate in areas where it is exposed. Many potential IMS are from coastal environment and hence may not survive in the relatively deep open water environment around KP380.

Potential Impacts

Other Benthic Habitats

The sequence of events required for an IMS to become established has a very low likelihood of occurring and is considered to be improbable. COPPA implements a risk-based approach to IMS risk management and requires all contracted vessels to comply with COPPA's requirements.

The introduction of IMS may result in environmental impacts through out-competing native species and modifying existing habitats. Such modifications may result in in significant environmental. Once established, IMS may be very difficult or impossible to eradicate. The consequence of an IMS establishment is considered to be moderate.

Risk Assessment

Introduction of IMS from Ballast Water			
	Consequence	***Likelihood***	***Risk rating***
Inherent risk	3 Moderate	1 Improbable	RRI - Low
Residual risk	3 Moderate	1 Improbable	RRI – Low
Introduction of IMS from Biofouling			
	Consequence	***Likelihood***	***Risk rating***
Inherent risk	3 Moderate	1 Improbable	RRI - Low
Residual risk	3 Moderate	1 Improbable	RRI – Low

Controls and Demonstration of ALARP

Existing controls

Control	***Effectiveness***	Reference (***Table 6-1)***	***Environmental Performance Standard***

Vessels equipped with effective anti-fouling coatings	This control is effective in reducing the potential for fouling organisms to become established on vessels. Fouling organisms are recognised as posing a biosecurity risk and is recognised by the IMO as a significant vector for the translocation of marine organisms.	**C 12.1**	**EPS 12.1.1** Vessels will have a suitable anti-fouling coating in accordance with the *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* (as applicable for vessel size, type and class), including: • Marine Order 98 (Marine Pollution – Anti-fouling Systems) 2013, which implements the International Convention on the Control of Harmful Anti-fouling Systems on Ships, including (as required by vessel class): - A valid International Anti-fouling System Certificate
Vessels undertake ballast water management or treatment to achieve low-risk ballast water	This control is effective in reducing the likelihood of ballast water hosting potential IMS. Like biofouling, the IMO recognises ballast water as a significant vector for the translocation of marine species.	**C 12.2**	**EPS 12.2.1** Ballast water discharges will comply with the requirements of the Australian Ballast Water Management Requirements, which implement the requirements of the *Biosecurity Act 2015* and the International Convention for the Control and Management of Ships' Ballast Water and Sediments (as appropriate for vessel class), including: • No discharge of high-risk ballast water within 12 nautical miles of coastlines, including any ports; • Maintain a ballast water record system to record the management of all ballast water taken up and discharged; • Implementation of approved methods of ballast water management (as detailed in the Requirements); • Vessel equipped with Ballast Water Management Plan; and • Vessels maintain a Ballast Water Recording System.
Apply risk-based IMS management for vessels	The translocation of IMS is best managed through the implementation of risk-based assessments which take into account the operational history of a vessel. The risk-based approach is effective in reducing the likelihood of IMS introduction by identifying relatively high-risk vessels and applying appropriate management. Risk-based IMS management is the current approach applied in Australian biosecurity legislation.	**C 12.3**	**EPS 12.3.1** Vessels will comply with IMO Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (2011) (as appropriate to class), including: • Vessels equipped with a Biofouling Management Plan; and • Vessels maintain a Biofouling Record Book. **EPS 12.3.2** Vessels mobilised from international waters will comply with the Australian National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Department of Agriculture, Fisheries and Forestry 2009): • Completion of IMS Risk Assessment • Implement mitigation measures commensurate with the level of risk

Assessment of Additional Controls				
Additional control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Eliminate				
No additional controls identified				
Substitute				
Use freshwater ballast	No	No	Substituting seawater ballast with freshwater considerably reduces the risk of IMS being present in ballast water. The requirement for freshwater ballast may considerably constrain vessel selection, which may impose additional costs, schedule constraints and operational restrictions. Following implementation of the selected existing and additional controls, the risk reduction associated with freshwater ballast is considered to be negligible. The cost of implementing the control is considered to be grossly disproportionate to the reduction in risk. The control has not been adopted. Sourcing vessels from within Australia may result in a reduced likelihood of the vessel hosting IMS, as Australian ports are generally considered to be relatively low risk.	N/A
Source vessels from within Australia	No	No	Production cessation activities may have specific requirements, which may constrain the selection of vessels that can successfully undertake the required activity. Such an increase in risk may be unacceptable to COPPA. Constraining vessel selection to Australian waters only may also result in increased costs and mobilisation times. Following implementation of the selected existing and additional controls, the risk reduction associated with sourcing vessels from beyond Australian waters is considered to be negligible. The cost of implementing the control is considered to be grossly disproportionate to the reduction in risk. The control has not been adopted.	N/A

Engineering				
No additional controls identified				
Administrative				
No discharge of ballast water	No	No	Ballast water is required for the safe operation of vessels and cannot be eliminated. Vessels will not routinely discharge ballast water during production cessation activities, and hence the risk of IMS introduction via ballast water is inherently low. While not expected to be required during production cessation activities, operational requirements may require intake or discharge of ballast water to maintain vessel stability. Hence, the discharge of ballast water cannot be eliminated without posing an unacceptable risk to vessel safety.	N/A
ALARP statement				
Based on the outcomes of the risk assessment and through the implementation of controls throughout the activity, COPPA considers that the risks of an introduction of invasive marine species are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. Additional controls have been evaluated and, where practicable, adopted. The controls selected for implementation are effective in reducing the risk of introduction of invasive marine species. COPPA considers the controls adopted are commensurate to the nature and scale of the potential impacts.				
Acceptability				
The risks from the introduction of IMS are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.3.2**. Relevant requirements have been met, including COPPA's internal processes, legislation and guidelines, and international conventions. Consultation in support of the EP has identified government agencies that are relevant persons for the management of biosecurity risks and provided sufficient opportunity to provide feedback. No claims or objections were raised in relation to the risk of IMS introduction.				
EPOs (Table 6-1)				
EPO 12 No introduction of IMS to the marine environment in the Operational Area as a result of production cessation activities.				

5.4.3 Physical Presence: Collision with Marine fauna

Risk	• Accidental collision between marine fauna (e.g. turtles and cetaceans) and vessels	
Aspect-receptor Reference (Table 5-6)	13L – Marine mammals	13M – Marine reptiles
	13N – Sharks and rays	

Description of Source of Risk

Vessels undertaking production cessation activities may present a hazard to marine fauna that occur at or near the water surface. Vessel movements within the Operational Area are typically low speed during production cessation activities (< 4 knots); vessels will be stationary the majority of the time they are within the Operational Area. Vessel-based activities will take place over 30 - 45 days as a subcomponent of a 12-week GEP Tie-in installation campaign; note the tie-in installation is beyond the scope of this EP.

Vessel movements may result in collisions with marine fauna such as cetaceans, turtles and whale sharks. Such collisions may result in injury to, or the death of, the fauna involved.

Potential Impacts

Marine Mammals

The likelihood of vessel/whale collision being lethal is influenced by vessel speed; the greater the speed at impact, the greater the risk of mortality (Jensen and Silber 2004, Laist et al. 2001). Vanderlaan and Taggart (2007) found that the chance of lethal injury to a large whale as a result of a vessel strike increases from about 20% at 8.6 knots to 80% at 15 knots. Given the relatively low speed (typically < 6 knots) of vessels undertaking production cessation activities within the Operational Area, the likelihood of a collision with a large whale resulting in injury is remote. Based on reported data contained in the US National Ocean and Atmospheric Administration database, there only two known instances of collisions when the vessel was travelling at less than 6 knots; both of these were from whale watching vessels that were deliberately placed amongst whales (Jensen and Silber 2004). There are no BIAs, critical habitats or known aggregations of whales overlapping KP380.

Collisions with smaller cetaceans, such as dolphins and porpoises, are very infrequent due to the mobility of these smaller cetaceans, which allows them to avoid vessels. Collisions between vessels undertaking production cessation activities and these dolphin species are considered improbable.

Marine Reptiles

Several species of marine turtle are known to occur in the vicinity of the Pipeline. The typical response from turtles on the surface to the presence of vessels is to dive (a potential “startle” response), which decreases the risk of collisions (Hazel et al. 2007). As with cetaceans, the risk of collisions between turtles and vessels increases with vessel speed (Hazel et al. 2007). Given the low speeds of vessels undertaking production cessation activities and typical turtle response behaviour, collisions between vessels and turtles are considered to be improbable.

Sharks and Rays

Whale sharks are at risk from vessel strikes when feeding at the surface, or in shallow waters (where there is limited option to dive). Whale sharks are not known to aggregate in the vicinity of the Pipeline, nor are there BIAs in the vicinity of the Pipeline. As such, collisions between vessels and whale sharks are considered improbable.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	2 Minor	2 Remote	RRI - Low
Residual risk	2 Minor	2 Remote	RRI - Low

Controls and Demonstration of ALARP

Existing Controls

Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***
Avoid operations near cetaceans and turtles.	This control is based on the requirements of the EPBC Regulations and is effective in reducing the potential for collisions and behavioural	**C 13.1**	**EPS 13.1.1**

	disturbance to cetaceans. COPPA also applies this control to marine turtles, while acknowledging that marine turtles are typically harder to detect at sea than cetaceans.		Vessels[8] will comply with EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans (and applied for marine turtles), specifically: • Apply the following Caution Zones, as per the meaning of Division 8.1 of the EPBC Regulations 2000: - 300 m for whales; - 150 m for dolphins; - 150 for turtles • When operating a vessel or equipment within a Caution Zone: - Operate the vessel or equipment at a constant speed of < 6 knots and minimise noise; - Make sure the vessel or equipment does not drift or approach closer than: o 100 m for whales; o 50 m for dolphins, turtles or whale sharks; - If the cetacean, turtle or whale shark shows signs of being disturbed, immediately withdraw (where safe to do so) from the Caution Zone at a constant speed of < 6 knots; • Post a lookout for cetaceans, turtles and whale sharks while within a Caution Zone; • Not approach, pursue or restrict the movement of cetaceans, turtles or whale sharks.

Assessment of Additional Controls

Additional control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Eliminate				
No additional controls identified				
Substitute				
Avoid production cessation activities when cetaceans, turtles or whale sharks are seasonally abundant.	No	No	Unlike other parts of Australia (e.g. southern right whale calving off southern Australia, humpback whale migration off eastern and western Australia) there are no discrete seasonal peaks in abundance of cetaceans or whale sharks in the vicinity of the Pipeline. Turtles are seasonally abundant around nesting beaches, typically over summer months, however, the combined nesting period	Following implementation of the selected existing controls, the risk reduction associated with avoiding seasonal peaks in fauna abundance is considered to be negligible. The cost of implementing the control is considered to be grossly disproportionate to the reduction in risk. The control has not been adopted.

[8] For the purposes of implementing the requirements of Division 8.1, ConocoPhillips does not consider any vessels and equipment (including ROVs) to be Prohibited Vessels.

			for all marine turtles in the region is protracted. Seasonality of nesting / inter-nesting varies between species (**Table 4-6**), but all marine turtle species may be present in the Operational Area year-round.	
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				
ALARP Statement				
Based on the outcomes of the risk assessment and the implementation of controls throughout the activity, COPPA considers that the risks and impacts of collision with marine fauna are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. An additional control has been evaluated; the additional control considered was rejected as the reduction in risk was considered to be grossly disproportionate to the cost of implementation. The control selected for implementation is effective in reducing the risk of collision with marine fauna. COPPA considers the control adopted is commensurate to the nature and scale of the potential impacts.				
Acceptability				
The risks and impacts of collisions with marine fauna are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including Australian legislation. Collisions between marine fauna and vessels is identified as a threat in conservation advice for several marine species that may occur in the Operational Area. COPPA considers the selected controls are effective in managing the risk to these species to a level that is acceptable. Consultation in support of the EP has identified relevant and interested persons, such as wildlife management agencies and non-government organisation, that may have functions, interests and activities that relate to marine fauna. No claims or objections were raised in relation to the risk of collision with marine fauna.				
EPOs (Table 6-1)				
EPO 13 No collisions between vessels and marine fauna.				

5.4.4 Physical Presence: Implementation of Spill Response

Risk	Implementation of inappropriate response strategies in response to a hydrocarbon spill requiring response strategy implementation	
Aspect-receptor Reference (Table 5-6)	14L – Marine mammals	14M – Marine reptiles
	14O – Birds	

Description of the Source of Risk

Accidents or emergencies during production cessation activities may warrant implementation of an emergency response. COPPA has identified the following risk events that may warrant implementation of the OPEP:

- hydrocarbon spill warranting the implementation of spill response tactics.

Further description of the hydrocarbon spill response is provided below. Refer to the OPEP (DCOM-652-EN-OPE-00001) for additional information on response options.

Hydrocarbon Spill Response Tactics

In the event of a hydrocarbon spill during production cessation activities, COPPA may implement a spill response to maintain situational awareness and reduce the potential impacts. Two credible worst-case spill scenarios were identified for the operation of the Pipeline:

- am MDO release from vessel collision, resulting in up to 700 m^2 released to the marine environment (**Section 5.4.5**); and
- an MDO release from a bunkering incident, resulting in up to 10 m^2 released to the marine environment (**Section 5.4.6**).

COPPA has undertaken a Net Environmental Benefit Analysis (NEBA) assessment of response options (**Appendix C**), which resulted in a suite of primary and secondary response options being selected for use in the OPEP. Primary response options are implemented for all scenarios triggering Tier 1 or greater incident response. Secondary response options may be implemented if determined to result in a net environmental benefit during the spill response. The suite of response options considered in the OPEP are:

- Primary response options:
  - Monitor and evaluate.
- Secondary response options:
  - Wildlife response – hazing; and
  - Pre-emptive capture/post-contact wildlife response;

All response options were assessed using a pre-operational NEBA. Given some response options have the potential to result in environmental damage, all secondary response options will be subject to an operational NEBA prior to implementation. Refer to the OPEP (DCOM-652-EN-OPE-00001) for additional information and **Table 7-8** for relevant EPOs, EPSs and MCs.

Potential Impacts

Monitor and Evaluate

The monitor and evaluate option for the credible spill scenarios during operation of the Pipeline will typically be conducted from deployment of oil spill tracking buoys and vessels. Aerial platforms may supplement observations from vessels. The environmental risks and impacts from vessel operations have been considered elsewhere in this EP. Vessels implementing the monitor and evaluate response option will comply with the requirements for vessels in this EP.

Wildlife Response – Hazing

Implementation of the wildlife hazing secondary response option relies on behavioural disturbance to encourage animals to avoid given areas where hydrocarbons above impact thresholds may be present. Methods used will depend on the fauna at risk (e.g. acoustic deterrents for birds). The behavioural disturbance may interfere with normal animal behaviours, such as foraging. MDO from the credible spill scenarios is expected to disperse rapidly in the marine environment, as such the window of opportunity for this response option is in the order of hours to days. As such, the potential behavioural impacts of this response option are temporary.

Pre-emptive Capture/Post-contact Wildlife Response

The capture of wildlife (either pre-emptive or post-contact) may result in considerable stress on animals, particularly when oiled animals are cleaned. MDO from the credible spill scenarios is expected to disperse rapidly in the marine environment, as such the window of opportunity for this response option is in the order of hours to days. Given the non-persistent nature of the hydrocarbon, the potential for oiled wildlife requiring cleaning is considered to be very low.

Cleaning of oiled wildlife will result in the generation of wastes which may be contaminated with hydrocarbons. Oily wastes may result in secondary contamination if not handled and disposed of effectively.

Risk Assessment

	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	1 Improbable	RRI - Low
Residual risk	1 Negligible	1 Improbable	RRI - Low

Controls and Demonstration of ALARP

Existing Controls

Control	*Effectiveness*	*Reference (Table 6-1)*	*Environmental Performance Standard*
Undertake operational NEBA during implementation of OPEP	This control is effective in reducing the potential of implementation of response options with no net environmental benefit. Several of the secondary response options may result in environmental impacts, which warrant consideration prior to implementation. The operational NEBA framework provides the IMT implementing the OPEP with the means to undertake as assessment of the environmental benefit of the secondary response options	**C 14.1**	**EPS 14.1.1** Incident Management Team (IMT) to undertake spill response (operational) NEBA to determine applicable response strategies, initiation and termination of response options

Assessment of Additional Controls

Additional control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Eliminate				
No additional controls identified				
Substitute				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement

Based on the outcomes of the risk assessment and through the implementation of controls throughout the activity, COPPA considers that the impacts and risks to the marine environment from emergency response to be ALARP.

Standard industry practices have been applied to control the risk. The control selected for implementation is effective in reducing the risks to the marine environment from emergency response. COPPA considers the control adopted is commensurate to the nature and scale of the risk. No additional controls were identified.

Acceptability

The risks and impacts of implementation of spill response are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**.

COPPA's management of the marine environment from emergency response is consistent with conservation advice and recovery plans for threatened fauna. Consultation in support of the EP has identified relevant and interested persons, such as wildlife management agencies and non-government organisation, that may have functions, interests and activities that relate to marine fauna. No claims or objections were raised in relation to the risk of emergency response options to marine fauna.
EPOs (Table 6-1)
EPO 14 In the event of a hydrocarbon spill, COPPA will manage the risks of implementing appropriate response strategies to reduce the potential impacts to the environment.

5.4.5 Discharges: MDO Release from Vessel Collision

Risk	• Loss of MDO containment resulting from vessel collision	
Aspect-receptor Reference (Table 5-6)	15B – Key Ecological Features	15C – Water quality
	15I – Other benthic communities	15J – Plankton
	15K – Pelagic and demersal fish communities	15L – Marine mammals
	15M – Marine reptiles	15N – Sharks and rays
	15O – Birds	15Q – Marine protected areas
	15R - Fishing	

Description of the Source of Risk

Vessels will be used to undertake production cessation activities around KP380. The specific vessels that will undertake the work are yet to be determined; indicative vessel specifications are provided in **Section 3.7**. A vessel collision with the potential to result in the release of MDO is considered credible within the Operational Area around KP380. The vessel-based production cessation activities around KP380 are expected to occur during 4 – 6 weeks of a 12-week campaign, or as the initial 4 – 6 week phase of a split 12 week campaign (other campaign activities are beyond the scope of this EP and will be addressed in a separate EP).

All vessels used to undertake activities within the scope of this EP will be fuelled using MDO. Heavier fuel types, such as intermediate fuel oil (IFO) or heavy fuel oil (HFO) will not be used.

MDO Release from Vessel Collision

A number of prerequisite conditions must exist for a vessel collision to result in the loss of fuel to the environment from a vessel undertaking production cessation activities:

- The vessel must be involved in a collision: Collisions involving offshore support vessels, comparable to those that may undertake production cessation activities, are very uncommon. Statistics compiled by the Australian Transport Safety Bureau indicated that offshore support vessels were involved in only one collision-related incident between 2005 and 2012, and no pollution-related incidents from offshore support vessels were recorded in the same time period.
- The collision must occur with sufficient force to rupture a fuel tank: fuel tanks are typically located at various positions around a vessel within the hull.
- The rupture must be of such a nature that the fuel can be released into the environment: A tank rupture must be above or near the fuel level within the tank to result in a loss of containment from the tank. Once lost from the tank, fuel may leak to the environment or drain into the vessel hull. Fuel from ruptured tanks may be transferred to other tanks onboard, reducing the volume in the ruptured tank.

A range of controls, based on international and Australian maritime requirements, are selected for implementation in this EP to reduce the potential for interactions with other marine users. These controls reduce the likelihood of a collision occurring (refer to **Section 5.3.2**). Additional controls that reduce the potential consequence of a vessel collision resulting in a release of MDO (as detailed in the OPEP (DCOM-652-EN-OPE-00001)).

Credible Spill Scenario

COPPA determined the worst-case credible spill scenario to inform the impact assessment of an MDO release from a vessel collision. This scenario consists of the release of 700 m^3 of MDO over a period of six hours. The location of the release was KP380. This release location was considered representative as vessel-based production cessation activities will be centred around this location. The release characteristics of the worst-case credible spill scenario are summarised in **Table 5-10**. The closest shoreline sensitivities to KP380 are on the south-western portion of Bathurst Island.

Table 5-10: Summary of characteristics of worst-case credible spill scenario from a vessel collision

Release Parameter	Parameter Characteristic	Justification
Hydrocarbon Type	MDO	MDO is the fuel type that vessels undertaking production cessation activities will be required to operate on.
Release Location	KP380 12.01995 °S	KP380 is the location that vessel activities will be centred around during production cessation.

(Decimal degrees)	129.90733 °E	
Release Volume (m^3)	700	Guidance from AMSA on spill contingency planning for vessel-based activities (AMSA 2013) suggests the complete loss of the volume of the single largest tank on a vessel is appropriate to inform the risk assessment of a MDO release from a vessel collision. COPPA has considered vessel specifications for offshore vessels that may credibly be used to undertake production cessation activities; no fuel tank onboard the vessels considered exceeded 700 m^3. Hence, this volume is considered suitable to inform the risk assessment.
Release Duration (hours)	6	This is considered a realistic timeframe over which the release may occur.
Release Timing	All seasons	Production cessation activities may credibly occur at any time of the year.

Hydrocarbon Spill Modelling

COPPA commissioned RPS to complete hydrocarbon spill modelling to determine the risk of exposure to the environment (RPS 2019). The below sections summarise the findings of the modelling.

Modelled Hydrocarbon Types

The hydrocarbon type used in this assessment is limited to MDO as this is the only credible hydrocarbon that could be released from a vessel collision related to the operation of the Pipeline. The MDO used in the modelling study was a medium grade non-persistent fuel used in the maritime industry. It has a low viscosity (4 cP), which indicates that this hydrocarbon will spread quickly when spilled at sea and thin to low thickness levels; increasing the rate of evaporation. This hydrocarbon only has 5% residual or persistent components when spilled into the marine environment. Characteristics of MDO used in the modelling studies are provided in **Table 5-11**. The wax content was 1% and the asphaltene content was negligible.

Table 5-11: Characteristics of MDO used in modelling study

Density at 25 °C ($kg/^3$)	API	Viscosity at 25 °C (cP)	Component Boiling Point (°C) % of Total			
			Volative (%) <180	Semi-volatile (%) 180-265	Low Volatility (%) 265-380	Residual (%) >380
829	37.6	4.0	6	35	54	5

Hydrocarbon Fate and Weathering

MDO is a mixture of volatile, semi-volatile and low volatility hydrocarbons (**Table 5-11**), approximately 60% to 80% of the MDO is predicted to evaporate within 24-48 hours, depending upon the prevailing conditions (**Figure 5-2**). Once released into the environment, MDO spreads rapidly due to its low viscosity and low pour point. In open waters, this will result in rapid formation of very large, thin films which will enhance evaporation, particularly at high wind speeds.

The heavier components of MDO tend to become entrained into the upper water column as oil droplets in the presence of waves but can re-float to the surface if wave energies abate. Typically, approximately 20% to 30% of hydrocarbons become entrained through the action of wind and waves (**Figure 5-2**). Entrained MDO is largely concentrated in surface waters (< 10 m).

The soluble hydrocarbon fraction of MDO is very small relative to non-soluble fractions and hence, this fate does not account for a significant portion of hydrocarbons.

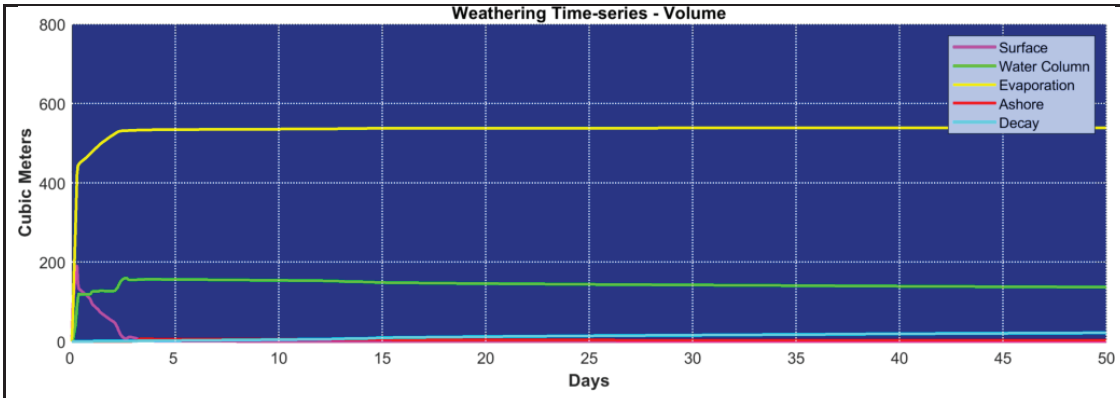


Figure 5-2: Weathering and fates graph, as a function of volume, for an instantaneous 10 m^3 surface release of MDO

Modelling Methods

The worst-case credible spill scenario, including hydrocarbon type, volume, location and release duration, outlined in **Table 5-10** was used as the basis for the modelled release.

The modelling study was carried out in several stages. Firstly, the tidal currents for the region were generated using RPS' ocean/coastal model, HYDROMAP. Secondly, large scale ocean currents were obtained from a large-scale ocean model for the same region and combined with tidal currents. The hybrid ocean/coastal model was used to describe the total water movement within the region. Finally, the currents and local winds were used as inputs in the oil spill model (SIMAP) to simulate the drift, spread, weathering and fate of the spilled hydrocarbon.

Exposure probabilities were determined using a stochastic modelling approach, which aggregates the behaviour of multiple random spill simulations undertaken for three representative seasons (summer, winter and a transitional period). Each of the simulated spills are started at a different time of day to ensure that the predicted transport and weathering of each spill trajectory was subjected to varying wind and current conditions. A total of 100 model runs were conducted for each season, with the total stochastic data set comprising 300 model runs. Each of the simulated spills was modelled for 50 days.

The model results were combined to provide a summary of each season and displayed as a graphical output. This output does not represent the potential behaviour of a single spill (which would have a much smaller area of effect) but provides an indication of the probability of any given area of the sea surface being contacted by hydrocarbons above impact thresholds (defined below in ***Hydrocarbon Exposure Thresholds***).

Hydrocarbon Exposure Thresholds

Sea surface, sub-surface (entrained and dissolved hydrocarbon) and shoreline accumulation thresholds were defined based on available scientific literature and applied to the hydrocarbon spill modelling to show the moderate exposure zone in the event of a spill (as denoted by the outer boundary of the moderate exposure zone for entrained hydrocarbons), both in terms of contact and impact. The thresholds for the surface and sub-surface hydrocarbons, and their correlation with the zones of exposure, are presented in **Table 5-12**.

Table 5-12: Sea surface and sub-surface thresholds and zones of exposure

Exposure Zone	Threshold	Justification
Sea Surface Film Threshold		
Low exposure (1 g/m^2–10 g/m^2)	1 g/m^2	The 1 g/m^2 threshold represents the practical limit of observing hydrocarbon sheens in the marine environment (AMSA 2013) and therefore has been used to define the outer boundary of the low exposure zone. This threshold is considered below levels which would cause environmental harm and is more indicative of the areas perceived to be affected due to its visibility on the sea surface (RPS 2019). This exposure zone is not considered to be of significant biological impact and is therefore outside the adverse exposure zone. This exposure zone represents the area contacted by the spill. This area does not define the moderate exposure zone as it is considered that there will be no effects.
Moderate exposure (10 g/m^2–25 g/m^2)	10 g/m^2	Ecological impact has been estimated to occur at 10 g/m^2 as this level of oiling has been observed to mortally impact birds and other wildlife associated with the water surface (French et al. 1996, French-McCay 2009).

		The 10 g/m^2 threshold has been selected to define the moderate exposure zone and outer boundary for the adverse exposure zone. Contact within this exposure zone may result in impacts to the marine environment. The moderate exposure zone for surface hydrocarbon slicks has been used to define the moderate exposure zone.
High exposure (>25 g/m^2)	25 g/m^2	The 25 g/m^2 threshold is above the minimum threshold observed to cause ecological impact. Studies have indicated that a concentration of surface hydrocarbons 25 g/m^2 or greater would be harmful for the majority of birds that contact the hydrocarbon at this concentration (Koops et al. 2004, Scholten et al. 1996). Exposure above this threshold is used to define the high exposure zone and is within the adverse exposure zone.
Entrained Hydrocarbon Threshold		
Low exposure (10 ppb–100 ppb)	10 ppb	The 10 ppb threshold represents the lowest concentration and corresponds generally with the lowest trigger levels for chronic exposure for entrained hydrocarbons in the ANZECC & ARMCANZ (2000) water quality guidelines. Due to the requirement for relatively long exposure times (> 24 hours) for these concentrations to be significant, they are likely to be more meaningful for juvenile fish, larvae and planktonic organisms that might be entrained (or otherwise moving) within the entrained plumes, or when entrained hydrocarbons adhere to organisms or is trapped against a shoreline for periods of several days or more (RPS 2019). This exposure zone is not considered to be of significant biological impact and is therefore outside the adverse exposure zone. This exposure zone represents the area contacted by the spill. This area does not define the moderate exposure as it is considered that there will be no effects.
Moderate exposure (100 ppb–500 ppb)	100 ppb	The 100 ppb threshold is considered conservative in terms of potential for toxic effects leading to mortality for sensitive mature individuals and early life stages of species. This threshold has been defined to indicate a potential zone of acute exposure, which is more meaningful over shorter exposure durations (RPS 2019). The 100 ppb threshold has been selected to define the moderate exposure zone and outer boundary for the adverse exposure zone. Contact within this exposure zone may result in impacts to the marine environment. The moderate exposure for entrained hydrocarbons has been used to define the moderate exposure zone.
High exposure (> 500 ppb)	500 ppb	The 500 ppb threshold is considered conservative high exposure level in terms of potential for toxic effects leading to mortality for more tolerant species or habitats. As discussed above, this threshold has been defined to indicate a potential zone of acute exposure, which is more meaningful over shorter exposure durations (RPS 2019). The 500 ppb threshold has been selected to define the high exposure zone and is within the adverse exposure zone.
Dissolved Aromatic Hydrocarbon Threshold		
Low exposure (6 ppb–50 ppb)	6 ppb	The threshold value for species toxicity in the water column is based on global data from French et al. (1999) and French-McCay (2003, 2002), which showed that species sensitivity (fish and invertebrates) to dissolved aromatics exposure >4 days (96-hour LC50) under different environmental conditions varied from 6 ppb–400 ppb, with an average of 50 ppb. This range covered 95% of aquatic organisms tested, which included species during sensitive life stages (eggs and larvae). Based on scientific literature, a minimum threshold of 6 ppb used to define the low exposure zones (Clark 1984, Engelhardt 1983, Geraci and St Aubin 1988, Jenssen 1994, Tsvetnenko 1998). This exposure zone is not considered to be of significant biological impact and is therefore outside the adverse exposure zone. This exposure zone represents the area contacted by the spill. This area

		does not define the moderate exposure zone as it is considered that there will be no effects.
Moderate exposure (50 ppb–100 ppb)	50 ppb	A conservative threshold of 50 ppb was chosen as it is more likely to be indicative of potentially harmful exposure to fixed habitats over short exposure durations. French-McCay (2002) indicates that an average 96-hour LC50 of 50 ppb could serve as an acute lethal threshold to 5% of biota. The 50 ppb threshold has been selected to define the moderate exposure zone and outer boundary for the adverse exposure zone. Contact within this exposure zone may result in impacts to the marine environment.
High exposure (>400 ppb)	400 ppb	A threshold of 400 ppb was chosen as it is more likely to be indicative of potentially harmful exposure to fixed habitats over short exposure durations (French-McCay 2002). The 400 ppb threshold has been selected to define the high exposure zone and is within the adverse exposure zone.
Shoreline Accumulation Threshold		
Low accumulation (10-100 g/m^2)	10 g/m^2	Accumulated hydrocarbons between 10 and 100 g/m^2 may result in visual impact. Clean-up of beaches and natural areas are best left to natural coastal processes alone. The potential for biological impacts at accumulations < 10 g/m^2 is considered to be very low.
Moderate accumulation (100-1,000 g/m^2)	100 g/m^2	Accumulated hydrocarbons above 100 g/m^2 may coat an animal in the intertidal range and likely impact its survival and reproductive ability (including invertebrates, furbearing aquatic mammals, marine reptiles and shorebirds). This threshold is the minimum thickness that can be cleaned up, which does not inhibit the potential for recovery. The 100 g/m^2 threshold has been selected to define the moderate accumulation zone and threshold for adverse shoreline accumulation. Accumulation on shorelines above this threshold may result in impacts to the marine environment.
High accumulation (> 1,000 g/m^2)	1,000 g/m^2	Accumulated hydrocarbons above 1000 g/m^2 have the potential for significant impacts to marsh plants and mangroves. Accumulations above this threshold are likely to result in higher environmental consequences.

Modelling Results

The surface and entrained moderate exposure zones for the annualised modelling results for the worst case credible vessel release scenario are shown in **Figure 5-3**.

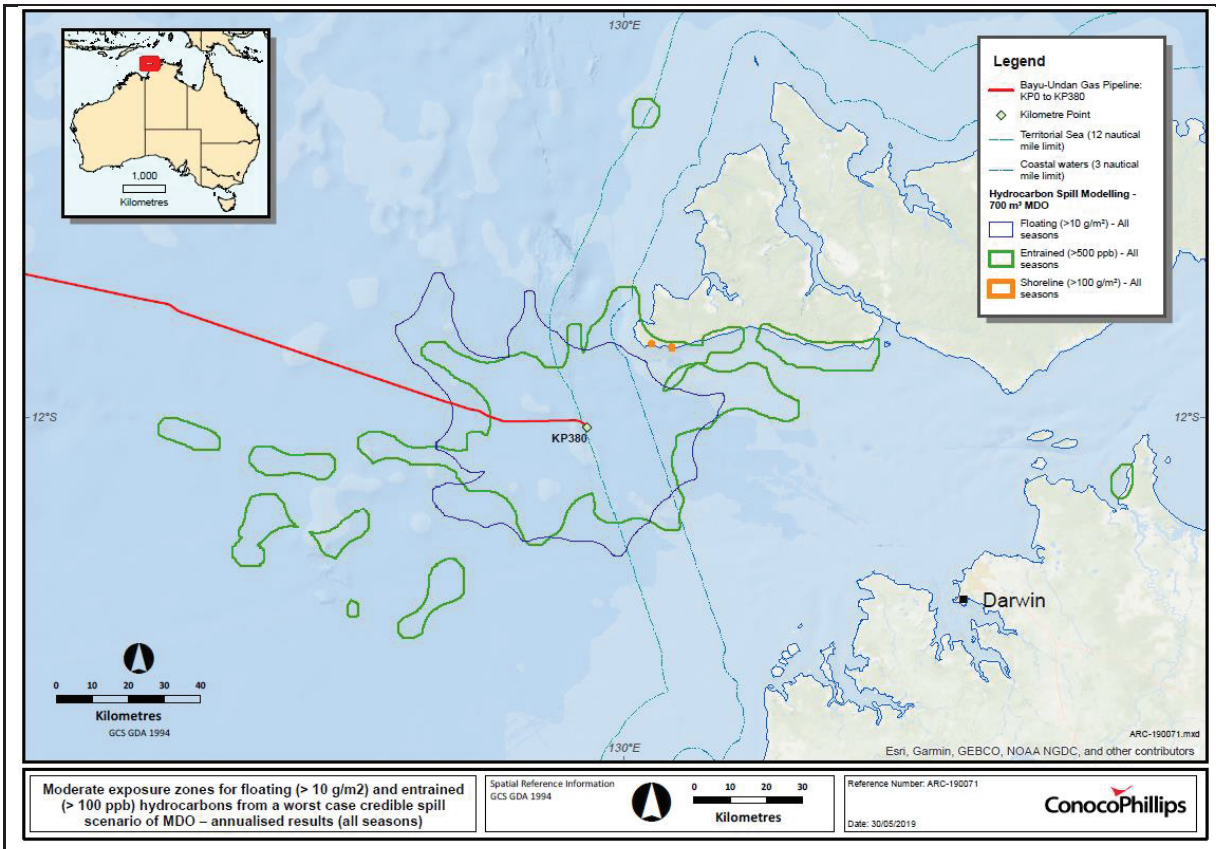


Figure 5-3: Moderate exposure zones for floating (> 10 g/m^2) and entrained (> 100 ppb) hydrocarbons from a worst case credible spill scenario of MDO – annualised results (all seasons)

Table 5-13 summarises the maximum distance and direction of sea surface hydrocarbon exposure at each surface threshold for low (1 – 10 g/m^2), moderate (10 – 25 g/m^2) and high (>25 g/m^2) exposure thresholds.

Table 5-13: Summary of the maximum distance and direction of sea surface hydrocarbon exposure at each surface threshold during summer, transitional and winter conditions for the spill modelling results for the vessel collision scenario

Season	Distance & Direction of Moderate Exposure Zone relative to Release Location	Exposure to the Sea Surface		
		Low (1–10 g/m^2)	Moderate (10–25 g/m^2)	High (>25 g/m^2)
Summer	Max. distance (km)	150.1	45.0	28.3
	Direction	East	West-southwest	West-southwest
Transitional	Max. distance (km)	284.1	39.0	29.5
	Direction	West-southwest	North-northwest	South-southwest
Winter	Max. distance (km)	579.1	57.4	25.8
	Direction	West-northwest	Northwest	North-northwest

Table 5-14 and **Table 5-15** detail the predicted probability of hydrocarbon contact to shorelines and considers the time, volume and length for the three distinct seasons. Modelling results indicated shoreline contact was very unlikely to occur, with only one of the 300 modelling runs resulting in shoreline contact above the moderate shoreline impact threshold (100 g/m^2). The contacted locations were on the southern coast of Bathurst Island, which are sandy beaches. The shortest time to shoreline contact was 2.9 days (allowing considerable weathering to take place) and the maximum volume ashore was 5.8 m^3.

Table 5-14: Summary of predicted hydrocarbon contact to shoreline receptors above moderate threshold (100 g/m^2)

Shoreline statistics	Summer	Transitional	Winter
Probability of contact to any shoreline (%)	1	-	-
Absolute minimum time to shore (days)	2.9	-	-
Maximum volume of hydrocarbon ashore (m^3)	5.8	-	-

Table 5-15: Predicted length of shoreline exposed by a single hydrocarbon spill trajectory (above 10 g/m^2) during summer, transitional and winter conditions for the spill modelling results for the vessel collision scenario

Shoreline statistics	Summer	Transitional	Winter
Maximum shoreline length (km) with stranded hydrocarbon concentration >10 g/m^2 accumulation threshold	8	-	-

Potential Impacts

Key Ecological Features

While the Carbonate bank and terrace system of the Van Diemen Rise lies within the moderate exposure zone, the ecological function of the KEF will not be impacted given hydrocarbons from a surface release of MDO will remain concentrated at the sea surface. Biological receptors associated with the KEF may be impacted; refer to the discussion below for an assessment of the potential impacts to biological receptors from a worst-case credible MDO release from a vessel collision.

Water Quality

Water quality will be reduced at the location of the spill due to hydrocarbon contamination. This contamination will be temporary and highly localised in nature due to the small spill volume and rapid weathering of the released MDO. Impacts to water quality from hydrocarbon contamination may result in acute and chronic impacts to marine organisms; refer to the discussion below for an assessment of the potential impacts to biological receptors from a worst-case credible MDO release from a vessel collision.

Other Benthic Communities

There are several benthic communities identified by habitat modelling and mapping that occur within the moderate exposure zone, the majority of which (78%) are bare sediments (**Section 4.3.2.3**). Modelling by RPS (2019) indicated that there are very few dissolved hydrocarbons and entrained hydrocarbons are likely to remain in surface waters (< 10 m water depth), which is shallower than the majority of the seabed in the moderate exposure zone (**Figure 4-4**). MDO is unlikely to persist and become deposited in sediments. As such, direct impacts to benthic habitats in much of the moderate exposure zone are not expected to occur.

An exception are the relatively shallow coastal habitats around the southern coast of Bathurst Island, where some shoreline contact was predicted by the model at very low likelihoods (i.e. 1 mode run out of the 300 runs undertaken). The shoreline in this area is fine-grained sandy beach and the nearshore environment is expected to be bare sediments. No benthic primary producer habitat, such as mangroves, coral reefs or seagrasses occur off this coastline. Relatively low intensity flatback turtle nesting occurs along these beaches; refer to ***Marine Reptiles*** below for discussion.

Plankton

Plankton communities may be impacted in the event of a hydrocarbon spill, particularly dissolved and entrained fractions. Toxic effects from exposure to dissolved hydrocarbons may result in mortality of planktonic organisms, and entrained hydrocarbons may cause impacts such as blocked filter feeding organs and impacts resulting from ingestion of hydrocarbons. Given the high productivity of planktonic communities and the nature and scale of the credible spill, these impacts are expected to be highly localised to the release location and temporary in nature.

Pelagic and Demersal Fish Communities, Sharks and Rays

Fish mortalities are rarely observed to occur as a result of hydrocarbon spills (International Tanker Owners Pollution Federation 2011). This has generally been attributed to the possibility that pelagic fish are able to detect and avoid surface waters underneath hydrocarbon spills by swimming into deeper water or away from the affected areas. Fish that have been exposed to dissolved aromatic hydrocarbons are capable of eliminating the toxicants once placed in clean water, hence, individuals exposed to a spill are likely to recover (King et al. 1996). Where fish mortalities have been recorded, the spills have occurred in sheltered bays and released relatively

large volumes of hydrocarbons (i.e. tanker groundings). These volumes were significantly bigger than the worst-case credible spill scenario during production cessation activities). Given the nature and scale of the credible spill scenario, impacts to pelagic and demersal fishes are expected to be highly localised and temporary.

Marine Mammals

Cetaceans are highly mobile and are known to migrate through the region, though no known migration routes are known within the vicinity of the moderate exposure zone. Studies and field observations suggest that cetaceans may be able to detect and avoid hydrocarbon slicks (Geraci and St Aubin 1990; Smith et al. 1983). Cetaceans are vulnerable to the effects of surface hydrocarbon due to the need to surface and breathe. Direct contact with surface slicks and inhalation of vapours may irritate eyes, airways and lungs. Lethal or sub-lethal effects will depend on the concentration of the hydrocarbons and the duration of exposure. Potential impacts to dugongs are expected to be similar to cetaceans given their sensitivity to hydrocarbon exposure is likely to be similar.

Dugongs may be present in the nearshore waters around Bathurst Island in low numbers. Any hydrocarbon spill reaching the nearshore waters is likely to have weathered and is expected to pose little risk to dugongs either through direct contact or through impacts to seagrass habitats.

Given spilled MDO is expected to disperse and weather rapidly, the potential for impacts to marine mammals will be concentrated around the release location at KP380.

Marine Reptiles

Marine turtles are susceptible to the effects of hydrocarbon spills during all life stages (National Oceanic and Atmospheric Administration (NOAA) 2010). They are in frequent contact with the sea surface and show little avoidance behaviour in response to the presence of surface hydrocarbons, which makes them vulnerable to coating and inhalation of toxic vapours.

Inter-nesting BIAs and critical nesting habitat buffers for flatback and olive ridley turtles nesting in these areas overlap the moderate exposure zone (**Section 4.3.3.6**). An MDO release from a vessel collision in these areas may result in exposure of flatback and olive ridley turtles to hydrocarbons above impact thresholds. Marine turtles are more likely to be present in these BIAs and critical habitats during the nesting seasons shown in **Table 4-5**. Given the very low levels of hydrocarbons potentially stranding on shorelines, the potential for impacts to nesting turtles and egg clutches on beaches is considered to be very low.

Adult sea turtles exhibit no avoidance behaviour when they encounter hydrocarbon spills (NOAA 2010). Contact with surface slicks, or entrained hydrocarbon, can therefore, result in hydrocarbon adherence to body surfaces causing irritation of mucous membranes in the nose, throat and eyes leading to inflammation and infection (Gagnon and Rawson 2010, NOAA 2010). Oiling can also irritate and injure skin which is most evident on pliable areas such as the neck and flippers (Lutcavage et al. 1995). Given the non-persistent nature of the hydrocarbon, along with the expected rapid weathering of surface hydrocarbons in the tropical environment, the timeframe during which turtles may be exposed to hydrocarbons above impact thresholds is short. The spatial extent of the moderate exposure zone, along with the wide distribution of turtle species in the region, indicates population-scale impacts are unlikely.

Sea snakes may be vulnerable to hydrocarbon spills due to their need to surface to breathe and may spend time at the sea surface to bask in the sun however little information is available to describe the effects of hydrocarbon spills on sea snakes. Seasnakes are unlikely to be present in the moderate exposure zone in large numbers due to the relatively low abundance of their preferred habitat.

Birds

Seabirds and migratory shorebirds birds are particularly vulnerable to contact with floating hydrocarbons, which may mat feathers. This may lead to hypothermia from loss of insulation and ingestion of hydrocarbons when preening to remove hydrocarbons; both impacts may result in mortality (Hassan and Javed 2011). Seabirds generally do not exhibit avoidance behaviour to floating hydrocarbons. Physical contact of seabirds with surface slicks is by several exposure pathways, primarily, immersion, ingestion and inhalation. Such contact with hydrocarbons may result in plumage fouling and hypothermia (loss of thermoregulation), decreased buoyancy and potential to drown, inability to fly or feed, anaemia, pneumonia and irritation of eyes, skin, nasal cavities and mouths (AMSA 2013, International Petroleum Industry Environmental Conservation Association 2004) and result in mortality due to oiling of feathers or the ingestion of hydrocarbons. Longer term exposure effects that may potentially impact seabird populations include a loss of reproductive success (loss of breeding adults) and malformation of eggs or chick (AMSA 2013).

A hydrocarbon spill may result in surface slicks above impact thresholds in foraging habitat for seabirds. Seabird distributions are typically concentrated around islands and hydrocarbons in proximity to nesting / roosting areas may result in increased numbers of seabirds being impacted. Nesting / roosting areas in the vicinity of the moderate exposure zone include Bathurst Island. Given the nature and scale of the credible hydrocarbon spill, the potential or impacts to birds is expected to be temporary (hours to days) and restricted to the area covered by sea surface hydrocarbons above impact thresholds. No impacts to wetlands supporting migratory shorebirds are expected to occur.

Marine Protected Areas

As outlined above, a hydrocarbon spill has the potential to impact upon water quality and a range of biological receptors. These environmental values are contained with the Oceanic Shoals AMP. Impacts to environmental values within these protected areas may diminish the value of these protected areas, however given the nature

and scale of the credible spill scenario such impacts are improbable due to the relatively small portion of the Oceanic Shoals AMP that overlaps the moderate exposure zone.

Fishing

A hydrocarbon spill may impact upon fish species exploited by fishers (refer to the discussion on pelagic and demersal fish communities above), potentially reducing fish numbers available for capture within the moderate exposure zone. A hydrocarbon spill may also temporarily displace traditional, commercial and recreational fishers from the moderate exposure zone. This displacement would be localised and short-term (hours to days). Additionally, spilled hydrocarbons may contaminate fishing gear, which may require cleaning.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	4 – Major	2 – Remote	RRII – Medium
Residual risk	4 – Major	2 – Remote	RRII – Medium

Controls and Demonstration of ALARP

Existing Controls

Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***
Vessel equipped and crewed in accordance with Australian maritime requirements	This control is effective in avoiding unplanned interactions with other marine users. Crew qualifications and experience, along with communication and navigation equipment, allows production cessation vessels to detect, communicate with, and avoid other marine users	**C 2.1** Refer to **Section 5.3.2**	**EPS 2.1.1** Refer to **Section 5.3.2**
Undertake consultation with relevant persons (including applicable notifications) to support operation of the Pipeline	This control is effective in avoiding unplanned interactions with other vessels. Consultation with relevant persons allows all parties to be aware of activities associated with the operation and maintenance of the Pipeline. This provides COPPA and other users to undertake activities in such a way to minimise the potential for adverse interactions.	**C 1.1** Refer to **Section 5.3.1**	**EPS 1.1.1** Refer to **Section 5.3.1** **EPS 1.1.2** Refer to **Section 5.3.1**
Implement tiered spill response in the event of an MDO spill	This control is effective in reducing the potential impacts of an MDO release from a vessel collision. COPPA had developed a tiered response strategy (described in the OPEP (DCOM-652-EN-OPE-00001)) that scales to the needs of the spill.	**C 15.1**	**EPS 15.1.1** Implement tiered spill response in the event of an MDO spill

Assessment of Additional Controls

Additional control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Eliminate				
No additional controls identified				
Substitute				
Vessels use alternative fuels such as LNG	No	N/A	COPPA is aware of the use of LNG-powered vessels in parts of Australia. LNG fuel	N/A

			is less persistent in the environment than conventional fuels such as intermediate fuel oil and MDO. Note an unplanned release of LNG fuel poses a significantly higher safety risk than MDO due to the high potential for the formation of explosive vapour mixes. There are currently very few LNG-powered vessels that can reasonably undertake production cessation activities in the Asia-Pacific region, and there is currently no refuelling infrastructure at the port of Darwin to support LNG fuelled vessels. Additionally, COPPA vessels will use MDO, which are relatively non-persistent compared to heavier marine fuels such as IFO. Given the lack of suitable vessel and supporting refuelling infrastructure, the use of an LNG-powered vessel to undertake production cessation activities is not considered practicable, particularly when considering the expected short duration of production cessation activities under this EP.	
Engineering				
Use double hulled vessels	No	No	The vessels that may credibly be used during production cessation activities carry significantly smaller quantities of hydrocarbons than vessels that are typically double hulled (e.g. tankers). This is recognised in the suggested credible spill scenarios in AMSA guidance material (2013). The relatively short duration of production cessation activities means the prerequisites for a vessel collision spill (i.e. a vessel in the field) are not present for the majority of the in-force period of the EP. The requirement for double hulled vessels may	N/A

			considerably constrain vessel selection, which may impose additional costs, schedule constraints and operational restrictions. Given the existing controls, the risk reduction associated with the use of double hulled vessels is considered to be grossly disproportionate to the costs of implementing this control. The control has not been adopted.	
Administrative				
No additional controls identified				
ALARP statement				
Based on the outcomes of the risk assessment and the implementation of controls throughout the activity, COPPA considers that the impacts and risks from an MDO release from vessel collisions are reduced to ALARP. Relevant legislative requirements and standard industry practices/guidelines have been applied to control the risk. Additional controls have been evaluated; all additional controls considered were rejected as the reduction in risks was considered to be grossly disproportionate to the cost of implementation. The controls selected for implementation are effective in reducing the risk of an MDO release from a vessel collision. COPPA considers the controls adopted are commensurate to the nature and scale of the risks.				
Acceptability				
The potential impacts from an MDO release from a vessel collision are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes, COLREGS, SOLAS, STWC Convention and related Marine Orders. Pollution, such as could occur from a hydrocarbon spill, is identified as a threat in conservation advice for several marine species that may occur in the Operational Area and as a threat in the North Marine Parks Network Management Plan 2018. COPPA considers the selected controls are effective in managing the risk to these species and the Oceanic Shoals AMP to a level that is acceptable. Consultation in support of the EP has identified other users that may potentially be affected and provided sufficient opportunity to provide feedback. No claims or objections were raised in relation to an MDO release from a vessel collision.				
EPOs (Table 6-1)				
EPO 15 No MDO releases to the marine environment as a result of a vessel collision				

5.4.6 Discharges: MDO Release from Bunkering Incident

Risk	• Loss of MDO containment from a bunkering incident	
Aspect-receptor Reference (Table 5-6)	16C – Water quality	16J – Plankton
	16K – Pelagic and demersal fish communities	16L – Marine mammals
	16M – Marine reptiles	16N – Sharks and rays
	16O – Birds	16R – Fishing

Description of the Source of Risk

Bunkering of MDO at sea during production cessation activities will not routinely occur; bunkering will typically be done while vessels are in port (and hence beyond the scope of this EP). However, operational circumstances may require that vessels undertake bunkering at sea. Bunkering of MDO is done via hose. Bunkering operations are typically undertaken during daylight hours and suitable sea states; bunkering may extend into night but are always commenced during daylight hours.

Credible Spill Scenario

A release of MDO could occur as a result of hose break or coupling failure during vessel refuelling. Spill volumes were determined from transfer hose inventory and spill prevention measures including 'dry break' or 'break away' couplings, rapid shutdown of fuel pumps and spill response preparedness, with 10 m^3 considered to be the maximum volume that could escape from the hose (hose inventory) prior to shut down. This scenario was modelled by RPS using the methodology outlined below (RPS 2019).

Hydrocarbon Spill Modelling

As with the MDO release from a vessel collision scenario, COPPA commissioned RPS to complete hydrocarbon spill modelling to determine the risk of exposure to environmental receptors from an MDO release from a bunkering incident. This modelling was undertaken in support of a different petroleum activity; however, the scenario characteristics are identical apart from the release location, which was approximately 18 km east-southeast of KP380. Hence, the modelling results are considered suitable to inform the impact assessment of a bunkering incident. The below sections summarise the findings of the modelling.

Modelled Hydrocarbon Types

A description of MDO, including physical characteristics, is provided in **Section 5.4.5**.

Hydrocarbon Fate and Weathering

A description of MDO, including weathering, is provided in **Section 5.4.5**.

Modelling Methods

A description of modelling methods is provided in **Section 5.4.5**. **Table 5-16** provides a summary of the model settings and assumptions.

Table 5-16: Summary of model settings and assumptions used for spill modelling of bunkering incident scenario

Parameter	Scenario
Scenario description	Bunkering incident
Number of randomly selected spill start times per site per scenario	100
Oil Type	MDO
Spill Volume	10 m^3
Release duration	Instant
Simulation length	10 days

Hydrocarbon Thresholds

The same sea surface hydrocarbon thresholds were applied to the bunkering incident scenario as the MDO release form a vessel collision scenario. Refer to **Section 5.4.5** for information on the impact thresholds. No shoreline contact was predicted during any season for the bunkering incident scenario.

Modelling Results

The modelling results show:

- No probability of shoreline contact for any season.
- During the summer and transitional months, spill trajectories are predicted to travel to the east-south east and west – north west.
- During winter months spill trajectories are predicted to travel in a west – north west direction (**Figure 5-8**).
- When tracked to light exposure levels (1g/m^2), the maximum distance travelled was 21.2 km in summer and 15.2 km in winter.

Table 5-17: Maximum distances travelled by release of MDO from a bunkering incident

Season	Exposure to the Sea Surface by MDO		
	Low (1–10 g/m^2)	**Moderate** (10–25 g/m^2)	**High** (>25 g/m^2)
Summer	21.2 km East	9.5 km West – north west	2.2 km East – south east
Transitional	16.8 km East – south east	8.7 km West – north west	3.6 km West – north west
Winter	15.2 km West – north west	7.5 km West	2 km West – north west

Potential Impacts

The potential impacts for an MDO release during a bunkering incident are similar to those described in **Section 5.4.5**, although the significantly smaller credible release volume constrains the receptors that may be impacted. Water quality in the area affected by the bunkering incident will decline due to the presence of floating, entrained and dissolved hydrocarbons. This may result in toxic effects to marine organisms such as phyto- and zooplankton. The decrease in water quality is expected to be short-lasting (hours) as MDO has a high portion of volatile hydrocarbons that will evaporate quickly. The low viscosity of MDO indicates a surface slick will spread rapidly, which will facilitate evaporation and entrainment within the water column. Marine fauna may be exposed to hydrocarbons, particularly fauna associated with the sea surface such as birds and air-breathing animals such as cetaceans and turtles. Given the relatively small area that would be affected, and the low persistence of MDO in the environment, the potential for marine fauna to be impacted is considered to be very low.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	2 Remote	RRI – Low
Residual risk	1 Negligible	2 Remote	RRI – Low

Controls and Demonstration of ALARP

Existing Controls

Control	***Effectiveness***	Reference (***Table 6-1***)	***Environmental Performance Standard***
Vessel equipped and crewed in accordance with MARPOL Annex I requirements	This control effective in avoiding MDO releases from bunkering incidents. Crew qualifications and experience reduce the likelihood of an incident occurring.	**C 16.1**	**EPS 16.1.1** Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 91 (Marine Pollution Prevention – Oil), which implements Annex I of the MARPOL Convention, including (as required by vessel class):

			- A deck drainage system capable of controlling the content of discharges for areas of high risk of fuel/oil/grease or hazardous chemical contamination. - Waste oil storage available - Valid International Oil Pollution Prevention (IOPP) Certificate.
Vessel-specific bunkering procedures and equipment consistent with COPPA marine vessel vetting requirements	This control effective in avoiding MDO releases from bunkering incidents. Suitable vessel-specific procedures and communications, reduces the likelihood of an incident occurring.	**C 16.2**	**EPS 16.2.1** COPPA will confirm vessel bunkering procedures include: • defined roles and responsibilities – bunkering to be undertaken by trained staff • Pre-bunker safety meeting to ensure all personnel involved are fully briefed and understand their roles and responsibilities • Visual inspection of hose prior to bunkering to confirm they are in good condition • Testing emergency shutdown mechanism on the transfer pumps • Established communication protocols between vessel master and personnel responsible for monitoring tank levels, leaks and overflows during bunkering operations. • Continual visual monitoring during diesel transfers of hoses, connections and tank levels to detect leaks and prevent overflows during bunkering operations. • Assessment of weather/sea state.
Implement tiered spill response in the event of an MDO spill	This control is effective in reducing the potential impacts of an MDO release from a bunkering incident. COPPA has developed a tiered response strategy (described in the OPEP) that scales to the needs of the spill.	**C 15.1** Refer to **Section 5.4.5**	**EPS 15.1.1** Refer to **Section 5.4.5**

Assessment of Additional Controls

Additional Control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Eliminate				
No bunkering of fuel during the petroleum activity	No	No	Vessels will routinely bunker when in port, as this is the safest and most cost-effective means to refuel vessels. Under normal circumstances, no bunkering at sea is expected while undertaking the petroleum activity. However, there may be times when returning to port is not practicable and bunkering at sea will be required. Following implementation of the selected existing controls, the risk reduction associated with eliminating bunkering at	N/A

			sea is considered to be negligible. The cost of implementing the control is considered to be grossly disproportionate o the reduction in risk. The control has not been adopted.	
Substitute				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No bunkering during night hours during the petroleum activity	Yes	No	Bunkering only during daylight hours increases the likelihood of detecting a leak, as surface hydrocarbon sheens are typically more visible under sunlight. Bunkering operations are typically completed during daylight hours; however, circumstances may occur where bunkering is required during darkness (e.g. large volume transfers at slow rates). COPPA commits to only commencing bunkering operations during daylight hours (although bunkering may continue beyond daylight hours). Operational experience indicates the commencement of bunkering is the most likely time for leaks to be occur (e.g. due to misaligned connections). Following implementation of the selected existing controls, the risk reduction associated with prohibiting bunkering during darkness is considered to be negligible. The cost of implementing the control is considered to be grossly disproportionate to the reduction in risk. The control has not been adopted.	N/A
ALARP Statement				
Based on the outcomes of the risk assessment and through the implementation of controls throughout the activity, COPPA considers that the risks to the marine environment from a bunkering incident are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. Additional controls have been evaluated; all additional controls considered were rejected as the reduction in risks was considered to be grossly disproportionate to the cost of implementation. The controls selected for implementation are effective in reducing the risk of an MDO release from a bunkering incident. COPPA considers the controls adopted are commensurate to the nature and scale of the risks.				

Acceptability Statement
The risk of an MDO release from a bunkering incident is considered to be broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes, MARPOL, and related Marine Orders. Reasonable steps have been taken to avoid bunkering at sea where practicable (e.g. preference bunkering in port).
EPOs (Table 6-1)
EPO 16 No MDO releases to the marine environment during bunkering.

5.4.7 Discharges: Incidental Spills of Hydrocarbons and Chemicals

Risk	• Chemical or hydrocarbon release from incidental spill (e.g. minor deck spill)
Aspect-receptor Reference (Table 5-6)	17C – Water quality

Description of the Source of Risk

Vessels undertaking production cessation activities will routinely have a range of chemicals and hydrocarbons onboard, including:

- Fuel for portable / deck equipment;
- Hydraulic fluid; and
- Miscellaneous chemicals (e.g. cleaning fluids).

Chemicals and hydrocarbons (other than vessel fuel) are generally stored in relatively small isolated containers (typically < 200 L), with bunding in place to retain substances in the event of a leak.

Hydraulic fluid is used in a range of equipment, such as A-frames, ROVs and winches. Failure of hydraulic lines may result in the loss of hydraulic fluid to the environment. Operational experience indicates typical volumes released due to hydraulic line failure are < 20 L.

Small quantities of liquids such as paint and lubricants may be used on production cessation vessels, which may be accidentally lost to the environment if spilled. Operational experience indicates typical volumes of such spills are < 10 L.

Potential Impacts

Water Quality

Accidental spills of hydrocarbons or chemicals from vessels undertaking production cessation activities will decrease the water quality in the immediate area of the spill. Given the nature and volumes of chemicals and hydrocarbons that may be released, along with the open water environment, impacts to water quality will be temporary and highly localised. Spilled hydrocarbons or chemicals will be rapidly mixed and diluted in the water column.

Potential impacts to biological receptors will be limited to planktonic biota in the immediate vicinity of the spill; no impacts to fauna such as fishes, turtles, cetaceans or birds are expected to occur. No impacts to socio-economic receptors (e.g. fishers) will occur.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	2 Minor	RRI – Low
Residual risk	1 Negligible	2 Minor	RRI – Low

Controls and Demonstration of ALARP

Existing controls

Control	***Effectiveness***	Reference (***Table 6-1)***	***Environmental Performance Standard***
Chemical and hydrocarbon storage areas designed to contain leaks and spills	This control is effective in reducing the likelihood of a leak or spill reaching the marine environment by containing spilled material. Spills can then be recovered and disposed of accordingly.	**C 17.1**	**EPS 17.1.1** Selection of vessel contractor is subject to COPPA local and global marine vessel vetting processes, specifically: • Appropriate procedures for storage (e.g. bunding), labelling (including Safety Data Sheet (SDS) available) and handling of chemicals and hydrocarbons; • Completion of vessel inspection and report;

			• Implementation of a Permit to Work (PTW) or equivalent authorisation process (e.g. JSA) for transfers of hydrocarbon / chemicals (refer to bunkering for bunkering-specific controls).
			EPS 17.1.2 Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 91 (Marine Pollution Prevention – Oil), which implements Annex I of the MARPOL Convention, including (as required by vessel class): - Vessel-specific SOPEP - A deck drainage system capable of controlling the content of discharges for areas of high risk of fuel/oil/grease or hazardous chemical contamination. - Waste oil storage available - Valid IOPP Certificate. - Oil record book maintained.
Spill clean-up kits available in high risk areas	This control is effective in reducing the likelihood of spilled hydrocarbons or chemicals reaching the environment. Spill kits are required as part of vessel SOPEPs. Contaminated material from used spill kits is disposed of accordingly.	**C 17.2**	**EPS 17.2.1** Selection of vessel contractor is subject to COPPA local and global marine vessel vetting processes, specifically: • Spill kits stocked and ready for use by trained personnel.
ROV operations undertaken in accordance with good industry practice	Using good industry practice to maintain and operate ROVs reduces the likelihood of leaks of hydraulic fluids to the marine environment.	**C 17.3**	**EPS 17.3.1** Procedures for ROV operations meet requirements of IMCA guidelines or alternative equivalent guidelines for ROV operations including use of appropriate equipment, ROV operations undertaken by competent personnel, preventative maintenance and inspection of equipment.

Assessment of Additional Controls

Additional Control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Eliminate				
No additional controls identified				
Substitute				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement
Based on the outcomes of the risk assessment and through the implementation of controls throughout the activity, COPPA considers the risks from incidental spills of fluids, chemicals and lubricants to the environment are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. The controls selected for implementation are effective in reducing the risk of incidental spills of fluids, chemicals and lubricants to the environment. COPPA considers the controls adopted are commensurate to the nature and scale of the potential impacts. No credible additional controls were identified.
Acceptability
The risk from incidental spills of fluids, chemicals and lubricants to the environment are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes, MARPOL, industry guidelines and Marine Orders. Pollution, such as could occur from a hydrocarbon spill, is identified as a threat in conservation advice for several marine species that may occur in the Operational Area. COPPA considers the selected controls are effective in managing the risk to these species to a level that is acceptable. Consultation in support of the EP has identified other users that may potentially be affected and provided sufficient opportunity to provide feedback. No claims or objections were raised in relation to the risk of incidental spills of fluids, chemicals and lubricants.
EPOs (Table 6-1)
EPO 17 No incidental spills of hydrocarbons or chemicals to the marine environment with an environmental consequence greater than 1[9].

[9] ConocoPhillips' HSEMS requires all environmental incidents to be assessed and recorded. The actual or potential environmental consequence is routinely determined during this process. This determination provides the means to demonstrate whether this EPO has not been met.

5.4.8 Discharges: Loss of Wastes Overboard

Risk	• Loss of waste material overboard	
Aspect-receptor Reference (Table 5-6)	18L – Marine mammals	18M – Marine reptiles
	18N – Sharks and rays	18O – Birds

Description of Source of Risk

Vessels undertaking production cessation activities will generate a range of wastes, some of which are routinely disposed of overboard in accordance with relevant requirements (such as sewage). Wastes that are not discharged overboard are retained and disposed of onshore. These wastes can include domestic wastes, packaging, batteries, etc.

Wastes are required to be securely stored onboard such that they cannot easily be accidentally released into the environment. This may be achieved by having lids on bins, which are secured to the deck, or by storing wastes in sealed containers.

Solid wastes are typically offloaded from vessels in port and handled by a waste management service (and hence this activity is beyond the scope of this EP), however operational circumstances may require the back loading of wastes from vessels undertaking production cessation activities may be required.

Potential Impacts

The potential impacts of solid wastes accidentally discharged to the marine environment will depend on the nature and amount of waste, and the sensitivity of the receiving environment. Potential impacts may include impacts to fauna from entanglement and / or ingestion. This has been recognised as a threat for many marine species, as outlined in the *Threat Abatement Plan for the Impacts of Marine Debris on Vertebrate Marine Life* (DEWHA 2009).

Impacts to fauna may result in injury or mortality through entanglement and / or ingestion, however this would reasonably be expected to impact upon a small number of animals; no population-scale impacts would credibly occur.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	1 Negligible	2 Remote	RRI - Low
Residual risk	1 Negligible	2 Remote	RRI - Low

Controls and Demonstration of ALARP

Existing controls

Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***

All wastes managed in accordance with vessel waste management plan meeting MARPOL Annex II, III & V requirements	This control is effective in reducing the likelihood of wastes being lost to the environment. It is consistent with MARPOL requirements and standard maritime practices.	**C 18.1**	**EPS 18.1.1** Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 93 (Marine Pollution Prevention – Noxious Liquid Substances), which implements Annex II of the MARPOL Convention, including (as required by vessel class): - International Pollution Prevention (IPP) Certificate. • Marine Order 94 (Marine Pollution Prevention – Packaged Harmful Substances), which implements Annex III of the MARPOL Convention, including (as required by vessel class): - No disposal of harmful substances (identified as marine pollutants in the IMDG Code) overboard - Packaged harmful substances to be properly packed, marked, labelled, stowed and secured - any loss or discharge to sea of harmful materials will be reported to the AMSA rescue coordination centre (RCC) via a marine pollution report (POLREP). • Marine Order 95 (Marine Pollution Prevention – Garbage), which implements Annex V of the MARPOL Convention, including: - Garbage management plan in place. - Types of wastes that will be generated onboard and will require containment, transport and disposal at a licensed facility onshore - Procedures for handling, storage segregation and disposal of wastes - Maintenance of Garbage Record Book, recording the types and volumes of waste incinerated or disposed onshore - Garbage record book maintained onboard.

Assessment of Additional Controls

Additional Control	*Practicable?*	*Will it be applied?*	*Justification*	*Environmental Performance Standard*
Elimination				
No additional controls identified				

Substitution
No additional controls identified
Engineering
No additional controls identified
Administrative
No additional controls identified
ALARP Statement
Based on the outcomes of the risk assessment and through the implementation of the control throughout the activity, COPPA considers the risks from loss of wastes overboard are reduced to ALARP. Relevant legislative requirements and standard industry practices have been applied to control the risk. The control selected for implementation is effective in reducing the impacts and risks from loss of wastes overboard. COPPA considers the control adopted is commensurate to the nature and scale of the risk. No credible additional controls were identified.
Acceptability
The risks and impacts from loss of wastes overboard are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**. Relevant requirements have been met, including COPPA's internal processes, legislation and guidelines, and international conventions. Pollution, such as could occur from loss of wastes overboard, is identified as a threat in conservation advice for several marine species that may occur in the Operational Area. COPPA considers the selected controls are effective in managing the risk to these species to a level that is acceptable.
EPOs (Table 6-1)
EPO 18 No loss of wastes overboard with a consequence greater than 1.[10].

[10] ConocoPhillips' HSEMS requires all environmental incidents to be assessed and recorded. The actual or potential environmental consequence is routinely determined during this process. This determination provides the means to demonstrate whether this EPO has not been met.

5.4.9 Atmospheric Emissions: Dry Natural Gas Release from Pipeline Loss of Containment

Risk	• Loss of pipeline containment resulting in dry gas release	
Aspect-receptor Reference (Table 5-6)	19E – Air quality	19Q – Fishing

Description of Source of Risk

If the isolation of the Pipeline at KP380 is done using the local line stops method, the Pipeline will be left with residual dry gas during the time between installation of the local line stops and the pushing of the gas to the Bayu-Undan facility by seawater. A rupture of the Pipeline during this period will result in a release of dry gas to the environment. COPPA has identified the following potential causes of a pipeline rupture:

- Failure of the local line stop isolations or upstream skid/PLR.

Given the contents of the Pipeline consists entirely of dry gas, no liquid phase hydrocarbons will be released to the environment as a result of a Pipeline loss of containment. Given the pressure and temperature differential between the contents of the Pipeline and the receiving environment, condensation of gas phase components of the dry gas will not occur upon release.

There are no isolation points between KP0 and KP380; hence, any release from the Pipeline could only be stopped by sealing the release location. No additional gas will be introduced into the Pipeline following isolation; hence, the largest credible release is the volume of residual gas within the KP0 and KP380 Pipeline section.

The scale of a pipeline leak is dependent on the nature of the rupture. Small 'pinhole' leaks will result in a stream of bubbles which may dissolve before reaching the surface. A major rupture (e.g. catastrophic failure) would result in the rapid release of the entire residual dry gas volume forming a large plume in the water column and dispersing into the atmosphere. A catastrophic failure is considered to be the worst-case credible release form the Pipeline.

Potential Impacts

Air Quality

A gas plume would be released from the Pipeline in the event of a rupture. The plume would move towards the surface, with a small portion of the gas becoming dissolved in seawater as the plume rises. A worst-case rupture would lead to the formation of a large gas cloud, which would rapidly disperse in the atmosphere. Methane (the main component of the dry gas) is lighter than air and would rise into the atmosphere, away from the release location.

The gas cloud may result in impacts to air-breathing fauna, such as marine mammals, marine reptiles and birds. Animals breathing in the immediate vicinity of the release may be asphyxiated, potentially resulting in mortality. Given the dispersion of gas into the atmosphere, this potential effect would be highly localised to the release location.

Fishing

The gas cloud poses a significant risk to the health and safety of other users, such as fishers. A gas cloud could potentially form an explosive mix which, if ignited, result in injury / death and damage to property. Given the events that may credibly result in a loss of containment event can only occur around KP380, which is not routinely used by fishers, a gas release is highly unlikely to result in any impacts to other marine users such as fishers.

Risk Assessment

	Consequence	***Likelihood***	***Risk rating***
Inherent risk	3 Moderate	1 Improbable	RRI - Low
Residual risk	3 Moderate	1 Improbable	RRI - Low

Controls and Demonstration of ALARP

Existing controls

Control	***Effectiveness***	***Reference (Table 6-1)***	***Environmental Performance Standard***
Implement standards and	This control is effective in reducing the likelihood of a suspended load being dropped. Engineering	**C 11.1**	**EPS 11.1.1** See **Section 5.4.1**

procedures for lifting equipment	standards for load-bearing lifting equipment are widely used in the offshore industry and well understood. Suitable lifting procedures consider a range of technical and environmental factors to reduce the risk of loss of control of a suspended load.	See **Section 5.4.1**	
Local line stops isolation method designed to provide effective seal of dry gas within Pipeline.	This control is effective in maintaining containment of dry gas within the Pipeline. The local line stop method has been successfully used	**C 19.1**	**EPS 19.1.1** Local line stops tested after installation to confirm an effective seal has been created prior to cutting the Pipeline.

Assessment of Additional Controls

Additional Control	***Practicable?***	***Will it be applied?***	***Justification***	***Environmental Performance Standard***
Elimination				
No additional controls identified				
Substitution				
No additional controls identified				
Engineering				
No additional controls identified				
Administrative				
No additional controls identified				

ALARP Statement

Based on the outcomes of the risk assessment and the implementation of controls throughout the activity, COPPA considers that the impacts and risks to the environment and other users from a dry gas release from a Pipeline loss of containment are reduced to ALARP.

Relevant legislative requirements and standard industry practices have been applied to control the risk. The controls selected for implementation are effective in reducing the risk of a dry gas release from a Pipeline loss of containment. COPPA considers the controls adopted are commensurate to the nature and scale of the potential impacts. No credible additional controls were identified.

Acceptability

The potential impacts from a dry gas release from the pipeline are broadly acceptable based on the residual risk ranking and considerations outlined in **Section 5.2.3.2**.

Relevant requirements have been met, including COPPA's internal processes, design standards and regulatory requirements.

Consultation in support of the EP has identified other users that may potentially be affected and provided sufficient opportunity to provide feedback. No claims or objections were raised in relation to the potential of a dry gas release from the Pipeline.

EPOs (Table 6-1)

EPO 19

No unplanned releases of gas from the Pipeline or ancillary Pipeline infrastructure to the environment.

6. ENVIRONMENTAL PERFORMANCE OUTCOMES, STANDARDS AND MEASUREMENT CRITERIA

For each environmental aspect (risk) and the associated impacts, as identified and assessed in **Section 5**, specific EPO(s), EPSs and MC have been developed. The EPSs are related to the control measures that will be implemented to achieve the relevant EPO(s). The MC provide the evidence base to demonstrate that the EPOs and EPSs are being achieved.

This section details the EPOs, EPSs, and MC that have been developed as part of a systematic approach to the management of the environmental risks (**Section 5**) to ALARP and acceptable levels. The EPOs, EPSs and MC detailed in this EP are consistent with relevant legislation and other requirements (e.g. international conventions, guidelines etc.) and COPPA internal standards and procedures.

The ‘Aspect-receptor reference’ and EPO numbering have been included to provide a clear link to the environmental risk assessment (**Section 5**) and demonstrate that all risks have relevant EPOs and standards. The tables also identify key responsible and accountable personnel who will confirm that the records/documents required by the MC are captured and reflected in the appropriate internal and external environmental performance reports.

EPOs, EPSs and MCs applicable to oil pollution response are detailed separately in **Table 7-8.**

Table 6-1: Routine / non-routine planned activity EPOs, controls, EPSs and MCs

Risk / Impact	EPO	Control	Environmental Performance Standards	Measurement Criteria	Responsible Person	Accountable Person
Physical Presence						
Physical presence of the Pipeline and upstream skid/PLR on the seabed	**EPO 1** No adverse interactions[11] between other marine users and the Pipeline or ancillary Pipeline infrastructure.	**C 1.1** Undertake consultation with relevant persons (including applicable notifications) to support production cessation of the Pipeline	**EPS 1.1.1** Develop and implement consultation plan to support production cessation of the Pipeline	**MC 1.1.1.1** Consultation records demonstrate implementation of consultation plan, including any claims or objections raised during production cessation of the Pipeline (**Section 7.10**).	External Relations Advisor	Vice President Sustainable Development, Community Relations and External Affairs.
		C 1.2 The Pipeline is marked on current nautical charts	**EPS 1.2.1** Notify AHO prior to commencement of production cessation activities.	**MC 1.2.1.1** Consultation records demonstrate AHO provided sufficient information to generate Temporary Notice to Mariners prior to commencing production cessation activities	External Relations Advisor	Vice President Sustainable Development, Community Relations and External Affairs.
		C 1.3 The upstream skid/PLR will be designed to have inherently low risk of snagging	**EPS 1.3.1** Upstream skid/PLR design process to consider snag prevention measures and include these in the design where appropriate.	**MC 1.3.1.1** Design process documentation demonstrates snag prevention measures considered and implemented where practicable.	DLNG Life Extension Project Subsea Tie-in Project Engineer	DLNG Life Extension Project Manager
Physical presence of vessels undertaking production cessation activities	**EPO 2** No adverse interactions[12] between other marine users and COPPA vessels during production cessation activities.	**C 2.1** Vessel equipped and crewed in accordance with Australian maritime requirements	**EPS 2.1.1** Vessels will be equipped and crewed in accordance with the *Navigation Act 2012* (as applicable for vessel size, type and class), including implementing: • Marine Order 21 (Safety of navigation and emergency procedures) 2012, which implements elements of Chapters III, V and VI of SOLAS convention, including: - Design and maintenance of onboard safety critical equipment (e.g. navigation, bridge equipment etc.) and crew requirements as applicable to vessel class per the SOLAS convention. • Marine Order 27 (Radio Equipment) 2009, which implements Chapter IV of the SOLAS Convection, including: - Radio, vessel tracking and distress communications as applicable to vessel class per SOLAS requirements. • Marine Order 30 (Prevention of Collisions) 2009, which implements COLREGS, including: - Lights, shapes and sounds as applicable to vessel class per COLREGS requirements • Marine Order 71 (Masters and Deck Officers) 2014, which implements the STCW Convention, including: - All master, mate and watchkeeper officer duties undertaken by crew certified as applicable to vessel class per STWC requirements.	**MC 2.1.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance with SOLAS, COLREGS and STWC Convention and applicable Marine Orders	Vessel Owner	Marine Director
		C 1.1 See above	**EPS 1.1.1** See above	**MC 1.1.1.1** See above	See above	See above
			EPS 1.1.2 See above	**MC 1.1.2.1** See above	See above	See above
Seabed Disturbance						

[11] Whether an interaction constitutes an adverse interaction is determined on a case by case basis. Examples of adverse interactions may include substantiated complaints by other marine users to ConocoPhillips or NOPSEMA. Interactions where other users have not taken reasonable measures to avoid the interaction (e.g. third-party vessel failing to observe nautical charts) are not considered to be adverse for the purpose of this EP.

[12] Whether an interaction constitutes an adverse interaction is determined on a case by case basis. Examples of adverse interactions may include substantiated complaints by other marine users to ConocoPhillips or NOPSEMA, vessel collisions, or damage to unsupervised fishing equipment (e.g. traps). Interactions where other users have not taken reasonable measures to avoid the interaction (e.g. third-party vessel not adhering to standard maritime requirements) are not considered to be adverse for the purpose of this EP.

Risk / Impact	EPO	Control	Environmental Performance Standards	Measurement Criteria	Responsible Person	Accountable Person
Disturbance to seabed from pipeline cutting: • Local seabed excavation at Pipeline cut locations • Pipeline coating removal • Pipeline cutting and section removal • End cap or upstream skid/PLR installation	**EPO 3** Seabed disturbance limited to local seabed excavation at Pipeline cut locations, Pipeline cutting operations and end cap or upstream skid/PLR installation within the defined Operational Area around KP380.	No controls applied – impacts are inherently acceptable and ALARP	N/A	N/A	N/A	N/A
Discharges						
Routine discharge of sewage, grey water, putrescible waste, deck drainage, and bilge water from vessels	**EPO 4** Environmental impacts from vessel utility discharges will be within acceptable levels by maintaining discharge streams in accordance with standard maritime practices.	**C 4.1** Routine discharges of treated sewage, grey-water, putrescible waste, deck drainage, and bilge water in accordance with standard maritime practice	**EPS 4.1.1** Vessels shall be equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 91 (Marine Pollution Prevention – Oil), which implements Annex I of the MARPOL Convention, including (as required by vessel class): - Machinery space bilge/oily water shall have IMO approved oil filtering equipment (oil/water separator) with an on-line monitoring device to measure Oil in Water (OIW) content to be less than 15 ppm prior to discharge. - A deck drainage system capable of controlling the content of discharges for areas of high risk of fuel/oil/grease or hazardous chemical contamination. - Waste oil storage available - Valid International Oil Pollution Prevention (IOPP) Certificate. • Marine Order 95 (Marine Pollution Prevention – Garbage), which implements Annex V of the MARPOL Convention, including: - Putrescible waste and food scraps are passed through a macerator prior to discharge so that it can pass through a screen with no opening wider than 25 mm. - Garbage management plan in place. - Garbage record book maintained onboard. • Marine Order 96 (Marine Pollution Prevention – Sewage), which implements Annex IV of the MARPOL Convention, including (as required by vessel class): - a valid International Sewage Pollution Prevention (ISPP) Certificate; - an ASMA approved sewage treatment plant; - a sewage comminuting and disinfecting system; - a sewage holding tank sized appropriately to contain all generated waste (black and grey water); - discharge of sewage which is not comminuted or disinfected will only occur at a distance of more than 12 nm from the nearest land;	**MC 4.1.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance with MARPOL Annexes I, IV & V and applicable Marine Orders	Vessel Owner	Marine Director

Risk / Impact	EPO	Control	Environmental Performance Standards	Measurement Criteria	Responsible Person	Accountable Person
			- discharge of sewage which is comminuted or disinfected using a certified approved sewage treatment plant will only occur at a distance of more than 3 nm from the nearest land; - discharge of sewage will occur at a moderate rate while support vessel is proceeding (> 4 knots).			
Exposure of residual pipeline contaminants to the marine environment.	**EPO 5** Reduce likelihood of impacts from exposure of open sections of the Pipeline by limiting length and duration of exposure during Pipeline production cessation activities.	**C 5.1** Reduce the time between cutting of the Pipeline and installation of the debris caps where practicable.	**EPS 5.1.1** Time period between Pipeline cutting and debris caps installation must be within 7 days.	**MC 5.1.1.1** Records demonstrate that time period between Pipeline cutting and debris caps installation is within 7 days.	DLNG Life Extension Project Subsea Tie-in Installation Contractor	DLNG Life Extension Project Manager
		C 5.2 Reduce the time between cutting of the Pipeline and installation of the upstream mechanical connector and end cap or upstream skid/PLR where practicable.	**EPS 5.2.1** Time period between Pipeline cutting and end cap installation must be within four weeks.	**MC 5.2.1.1** Records demonstrate that time period between Pipeline cutting and mechanical connector and end cap or upstream skid/PLR installation is within four weeks.	DLNG Life Extension Project Subsea Tie-in Installation Contractor	DLNG Life Extension Project Manager
		C 5.3 Reduce the length of Pipeline exposed to the environment where practicable.	**EPS 5.3.1** Production cessation activities design process to ensure Pipeline cut is as close as practicable to the isolations at KP380.	**MC 5.3.1.1** Records demonstrate that Pipeline cut is located as close as practicable to isolation at KP380.	DLNG Life Extension Project Subsea Tie-in Installation Contractor	DLNG Life Extension Project Manager
Venting of production gas from the Pipeline between local line stops (local line stops isolation method only)	**EPO 6** Potential impacts to water and air quality from residual gas venting will be within acceptable levels and limited to a temporary, localised increase in dissolved gas in the water column or in the atmosphere.	**C 6.1** Reduce residual gas volume and pressure by setting local line stops as close as practicable	**EPS 6.1.1** Local line stops method design and installation to set local line stops as close as practicable.	**MC 6.1.1.1** Records demonstrate that local line stops (if used) are set as close as practicable to reduce residual gas volume between stops	DLNG Life Extension Project Subsea Tie-in Installation Contractor	DLNG Life Extension Project Manager
		C 6.2 Use diffuser on residual gas vent	**EPS 6.2.1** Diffuser to be installed on residual gas vent.	**MC 6.2.1.1** Records demonstrate that diffuser installed on residual gas vent (if gas is vented)	DLNG Life Extension Project Subsea Tie-in Installation Contractor	DLNG Life Extension Project Manager
Discharge of treated seawater at KP380 (HPIT method only)	**EPO 7** Impacts to water and sediment quality will be temporary and will recover completely within in a short time (several days) after cessation of the treated seawater discharge. Mortality of benthic biota from the treated seawater discharge will be limited to within 1 km of the release location.	**C 7.1** Implement chemical selection procedure for all chemicals planned to be released to the marine environment	**EPS 7.1.1** All chemicals planned to be release to the marine environment will be assessed through the chemical selection procedure	**MC 7.1.1.1** Records demonstrate that all chemical products used to treat seawater have been subject to chemical assessment process.	DLNG Life Extension Project Subsea Tie-in Installation Contractor	DLNG Life Extension Project Manager
		C 7.2 Monitor dosing of seawater treatment to prevent over-dosing	**EPS 7.2.1** Dosing of chemicals to treat seawater will not exceed guidelines for use by manufacturers to achieve intended technical requirements.	**MC 7.2.1.1** Records of demonstrate dosing of chemicals used for seawater treatment do not exceed planned target dosing concentration.	DLNG Life Extension Project Subsea Tie-in Installation Contractor	DLNG Life Extension Project Manager
Atmospheric Emissions						
Atmospheric emissions from vessel combustion engines and incinerators	**EPO 8** Impacts from atmospheric emissions will be maintained within acceptable levels and limited to a temporary, localised decrease in air quality within the Operational Area.	**C 8.1** Atmospheric emissions from combustion engines and incinerators in accordance with standard maritime practice	**EPS 8.1.1** Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 97 (Marine Pollution Prevention – Air Pollution), which implements Annex VI of the MARPOL Convention, including (as required by vessel class):	**MC 8.1.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance MARPOL73/78 Annex VI and applicable Marine Orders	Vessel Owner	Marine Director

Risk / Impact	EPO	Control	Environmental Performance Standards	Measurement Criteria	Responsible Person	Accountable Person
			- a valid International Air Pollution Prevention (IAPP) Certificate and / or Engine International Air Pollution Prevention (EIAPP) Certificate and / or International Energy Efficiency (IEE) Certificate - Use of low sulphur fuel; - Use of incinerators in accordance with Annex VI of the MARPOL Convention.			
Light Emissions						
Light emissions from vessels and ROVs	**EPO 9** Impacts from artificial light emissions will be maintained within acceptable levels and limited to a temporary, localised behavioural disturbance to fauna.	No controls applied – impacts are inherently acceptable and ALARP	N/A	N/A	N/A	N/A
Acoustic Emissions						
Underwater noise associated with production cessation vessels Underwater noise associated with Pipeline cutting	**EPO 10** Impacts from underwater noise emissions will be maintained within acceptable levels and limited to a temporary, localised behavioural disturbance to fauna.	No controls applied – impacts are inherently acceptable and ALARP	N/A	N/A	N/A	N/A

Table 6-2: Unplanned activity EPOs, controls, EPSs and MCs

Risk / Impact	EPO	Control	Environmental Performance Standards	Measurement Criteria	Responsible Person	Accountable Person
Physical Presence						
Accidental dropping of objects from vessels resulting from: • Loss of control of suspended loads • Loss of equipment off vessel deck	**EPO 11** No loss of equipment/cargo overboard from production cessation activity vessels resulting in a Consequence Severity greater than Minor	**C 11.1** Implement standards and procedures for lifting equipment	**EPS 11.1.1** COPPA will confirm the vessel procedures for lifting include • Lifting operations to be undertaken by competent personnel • Use of appropriate and certified lifting equipment and accessories • Preventative maintenance will be undertaken on the key lifting equipment as per manufacturer's specifications • Consideration of weather conditions (e.g. no heavy lifts undertaken in severe weather conditions	**MC 11.1.1.1** Records demonstrate inspection and certification of lifting equipment and accessories	Vessel Master	Vessel Owner
		C 11.2 Dropped objects recovered where safe and practicable to do so	**EPS 11.2.1** All dropped object incidents to assess the environmental risk and the potential to recover the object, and objects will be recovered where safe and practicable to do so.	**MC 11.2.1.1** Incident documentation details considerations and outcomes of recovery of dropped objects.	Vessel Master	Client Service Representative
Accidental introduction of invasive marine species (IMS) via: • Biofouling (e.g. on vessel hulls or submersible equipment) • Ballast water	**EPO 12** No introduction of IMS to the marine environment in the Operational Area as a result of production cessation activities.	**C 12.1** Vessels equipped with effective anti-fouling coatings	**EPS 12.1.1** Vessels will have a suitable anti-fouling coating in accordance with the *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* (as applicable for vessel size, type and class), including: • Marine Order 98 (Marine Pollution – Anti-fouling Systems) 2013, which implements the International Convention on the Control of Harmful Anti-fouling Systems on Ships, including (as required by vessel class): • A valid International Anti-fouling System Certificate	**MC 12.1.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance with Marine Order 98	Vessel Owner	Marine Director
		C 12.2 Vessels undertake ballast water management or treatment to achieve low-risk ballast water	**EPS 12.2.1** Ballast water discharges will comply with the requirements of the Australian Ballast Water Management Requirements, which implement the requirements of the *Biosecurity Act 2015* and the International Convention for the Control and Management of Ships' Ballast Water and Sediments (as appropriate for vessel class), including: • No discharge of high-risk ballast water within 12 nautical miles of coastlines, including any ports; • Maintain a ballast water record system to record the management of all ballast water taken up and discharged; • Implementation of approved methods of ballast water management (as detailed in the Requirements); • Vessel equipped with Ballast Water Management Plan; and • Vessels maintain a Ballast Water Recording System.	**MC 12.2.1.1** Records demonstrate compliance with Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 – MARPOL 73/78 (as appropriate to vessel class), Australian Ballast Water Management Requirements and *Biosecurity Act 2015*	Vessel Master	Vessel Owner
		C 12.3 Apply risk-based IMS management for vessels	**EPS 12.3.1** Vessels will comply with IMO Guidelines for the Control and Management of Ships' Biofouling to	**MC 12.3.1.1** Records demonstrate vessels have a Biofouling Management Plan	Vessel Master	Vessel Owner

			Minimize the Transfer of Invasive Aquatic Species (2011) (as appropriate to class), including: • Vessels equipped with a Biofouling Management Plan; and Vessels maintain a Biofouling Record Book.	**MC 12.3.1.2** Records show biofouling record book maintained and current	Vessel Master	Vessel Owner
			EPS 12.3.2 Vessels mobilised from international waters will comply with the Australian National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Department of Agriculture, Fisheries and Forestry 2009): • Completion of IMS Risk Assessment • Implement mitigation measures commensurate with the level of risk	**MC 12.3.2.1** Records demonstrate compliance with the Australian National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Commonwealth of Australia, 2008), including: • IMS Risk Assessment • implementation of mitigation measures commensurate with level of risk	Vessel Master	Vessel Owner
Accidental collision between marine fauna (e.g. turtles and cetaceans) and vessels	**EPO 13** No collisions between vessels and marine fauna	**C 13.1** Avoid operations near cetaceans and turtles.	**EPS 13.1.1** Vessels[13] will comply with EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans (and applied for marine turtles), specifically: • Apply the following Caution Zones, as per the meaning of Division 8.1 of the EPBC Regulations 2000: - 300 m for whales; - 150 m for dolphins; - 150 for turtles • When operating a vessel or equipment within a Caution Zone: - Operate the vessel or equipment at a constant speed of < 6 knots and minimise noise; - Make sure the vessel or equipment does not drift or approach closer than: o 100 m for whales; o 50 m for dolphins, turtles or whale sharks; - If the cetacean, turtle or whale shark shows signs of being disturbed, immediately withdraw (where safe to do so) from the Caution Zone at a constant speed of < 6 knots; • Post a lookout for cetaceans, turtles and whale sharks while within a Caution Zone; • Not approach, pursue or restrict the movement of cetaceans, turtles or whale sharks.	**EPS 13.1.1.1** Records demonstrate implementation of Part 8 Division 8.1 of the EPBC Regulations 2000 during production cessation activities	Vessel Master	Client Service Representative
				MC 13.1.1.2 Records demonstrate no breaches of EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans	Vessel Master	Client Service Representative
				MC 13.1.1.3 Collisions with marine fauna documented in daily reports as required. Where a collision with fauna that are MNES results in injury or death, COPPA will notify the DoEE.	Vessel Master	Client Service Representative
Implementation of inappropriate response strategies in response to a hydrocarbon spill requiring response strategy implementation	**EPO 14** In the event of a hydrocarbon spill, COPPA will manage the risks of implementing appropriate response strategies to reduce the potential impacts to the environment.	**C 14.1** Undertake operational NEBA during implementation of OPEP	**EPS 14.1.1** IMT to undertake spill response (operational) NEBA to determine applicable response strategies, initiation and termination of response options	**MC 14.1.1.1** Records demonstrate operational NEBA undertaken during OPEP implementation in accordance with OPEP requirements	Environment Unit Lead	Incident Commander
Discharges						
Loss of MDO containment resulting from vessel collision	**EPO 15**	**C 2.1** See above	**EPS 2.1.1** See above	**MC 2.1.1.1** See above	See above	See above
		C 1.1	**EPS 1.1.1**	**MC 1.1.1.1**	See above	See above

[13] For the purposes of implementing the requirements of Division 8.1, ConocoPhillips does not consider any vessels and equipment (including ROVs) to be Prohibited Vessels.

	No MDO releases to the marine environment as a result of a vessel collision	See above	See above	See above		
			EPS 1.1.2 See above	**MC 1.1.2.1** See above	See above	See above
		C 15.1 Implement tiered spill response in the event of an MDO spill	**EPS 15.1.1** Implement tiered spill response in the event of an MDO spill	**MC 15.1.1.1** Records demonstrate that spill response options are delivered in accordance with OPEP	Environment Unit Lead	Incident Commander
Loss of MDO containment from a bunkering incident	**EPO 16** No MDO releases to the marine environment during bunkering.	**C 16.1** Vessel equipped and crewed in accordance with MARPOL Annex I requirements	**EPS 16.1.1** Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 91 (Marine Pollution Prevention – Oil), which implements Annex I of the MARPOL Convention, including (as required by vessel class): - A deck drainage system capable of controlling the content of discharges for areas of high risk of fuel/oil/grease or hazardous chemical contamination. - Waste oil storage available - Valid International Oil Pollution Prevention (IOPP) Certificate.	**MC 16.1.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance with MARPOL Annex I and applicable Marine Orders	Vessel Owner	Marine Director
		C 16.2 Vessel-specific bunkering procedures and equipment consistent with COPPA marine vessel vetting requirements	**EPS 16.2.1** COPPA will confirm vessel bunkering procedures include: • defined roles and responsibilities – bunkering to be undertaken by trained staff • Pre-bunker safety meeting to ensure all personnel involved are fully briefed and understand their roles and responsibilities • Visual inspection of hose prior to bunkering to confirm they are in good condition • Testing emergency shutdown mechanism on the transfer pumps • Established communication protocols between vessel master and personnel responsible for monitoring tank levels, leaks and overflows during bunkering operations. • Continual visual monitoring during diesel transfers of hoses, connections and tank levels to detect leaks and prevent overflows during bunkering operations. • Assessment of weather/sea state.	**MC 16.2.1.1** Records of demonstrate compliance with vessel bunkering requirements	Vessel Master	Vessel Owner
		C 15.1 See above	**EPS 15.1.1** See above	**MC 15.1.1.1** See above	See above	See above
Chemical or hydrocarbon release from incidental spill (e.g. minor deck spill)	**EPO 17** No incidental spills of hydrocarbons or chemicals to the marine environment with an environmental consequence greater than 1[14].	**C 17.1** Chemical and hydrocarbon storage areas designed to contain leaks and spills	**EPS 17.1.1** Selection of vessel contractor is subject to ConocoPhillips local and global marine vessel vetting processes, specifically: • Appropriate procedures for storage (e.g. bunding), labelling (including Safety Data Sheet (SDS) available) and handling of chemicals and hydrocarbons; • Completion of vessel OVID inspection and report;	**MC 17.1.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance with chemical and hydrocarbon storage and handling requirements	Vessel Master	Marine Director

[14] ConocoPhillips' HSEMS requires all environmental incidents to be assessed and recorded. The actual or potential environmental consequence is routinely determined during this process. This determination provides the means to demonstrate whether this EPO has not been met.

			• Implementation of a Permit to Work (PTW) or equivalent authorisation process (e.g. JSA) for transfers of hydrocarbon / chemicals (refer to bunkering for bunkering-specific controls).			
			EPS 17.1.2 Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 91 (Marine Pollution Prevention – Oil), which implements Annex I of the MARPOL Convention, including (as required by vessel class): - Vessel-specific SOPEP - A deck drainage system capable of controlling the content of discharges for areas of high risk of fuel/oil/grease or hazardous chemical contamination. - Waste oil storage available - Valid International Oil Pollution Prevention (IOPP) Certificate. - Oil record book maintained.	**MC 17.1.2.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance with MARPOL Annex I and Marine Order 91	Vessel Owner	Marine Director
		C 17.2 Spill clean-up kits available in high risk areas	**EPS 17.2.1** Selection of vessel contractor is subject to ConocoPhillips local and global marine vessel vetting processes, specifically: • Spill kits stocked and ready for use by trained personnel.	**MC 17.2.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate availability of spill response kits by trained crew	Vessel Owner	Marine Director
				MC 17.2.1.2 Use of spill kits documented in daily reports as required	Vessel Master	Marine Director
		C 17.3 ROV operations undertaken in accordance with good industry practice	**EPS 17.3.1** Procedures for ROV operations meet requirements of IMCA guidelines or alternative equivalent guidelines for ROV operations including use of appropriate equipment, ROV operations undertaken by competent personnel, preventative maintenance and inspection of equipment.	**MC 17.1.1.1** Records demonstrate ROV operations conform to IMCA guidelines (or equivalent alternative)	Vessel Owner	Marine Director
Loss of waste material overboard	**EPO 18** No loss of wastes overboard with an environmental consequence greater than 1[15].	**C 18.1** All wastes managed in accordance with vessel waste management plan meeting MARPOL Annex II, III & V requirements	**EPS 18.1.1** Vessels will be suitably equipped and crewed in accordance with the *Navigation Act 2012* and the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (as applicable for vessel size, type and class), including implementing: • Marine Order 93 (Marine Pollution Prevention – Noxious Liquid Substances), which implements Annex II of the MARPOL Convention, including (as required by vessel class): - International Pollution Prevention (IPP) Certificate. • Marine Order 94 (Marine Pollution Prevention – Packaged Harmful Substances), which implements Annex III of the MARPOL Convention, including (as required by vessel class): - No disposal of harmful substances (identified as marine pollutants in the IMDG Code) overboard	**MC 18.1.1.1** Records of COPPA Marine Vessel Vetting Process demonstrate compliance with SOLAS, COLREGS and STWC Convention and Marine Order 95	Vessel Owner	Marine Director

[15] ConocoPhillips' HSEMS requires all environmental incidents to be assessed and recorded. The actual or potential environmental consequence is routinely determined during this process. This determination provides the means to demonstrate whether this EPO has not been met.

			- Packaged harmful substances to be properly packed, marked, labelled, stowed and secured - any loss or discharge to sea of harmful materials will be reported to the AMSA RCC via a marine pollution report (POLREP). • Marine Order 95 (Marine Pollution Prevention – Garbage), which implements Annex V of the MARPOL Convention, including: - Garbage management plan in place. - Types of wastes that will be generated onboard and will require containment, transport and disposal at a licensed facility onshore - Procedures for handling, storage segregation and disposal of wastes - Maintenance of Garbage Record Book, recording the types and volumes of waste incinerated or disposed onshore - Garbage record book maintained onboard.			
Atmospheric Emissions						
Loss of pipeline containment resulting in dry gas release	**EPO 19** No unplanned releases of gas from the Pipeline or ancillary Pipeline infrastructure to the environment	**C 11.1** See above	**EPS 11.1.1** See above	**MC 11.1.1.1** See above	See above	See above
		C 19.1 Local line stops isolation method and upstream skid/PLR designed to provide effective seal of dry gas within Pipeline.	**EPS 19.1.1** Local line stops and upstream skid/PLR tested after installation to confirm an effective seal has been created prior to cutting the Pipeline.	**MC 19.1.1.1** Records demonstrate that leak test confirms effective seal by local line stops to prevent gas release	DLNG Life Extension Project Subsea Tie-in Project Installation Contractor	DLNG Life Extension Project Manager

7. IMPLEMENTATION STRATEGY

This section details the implementation strategy for the operation of the Pipeline, as required under Regulation 14 of the OPGGS(E) Regulations 2009. The implementation strategy describes the arrangements for monitoring, review and reporting of environmental performance and the strategy to confirm that the controls are implemented, maintained and effective for the in-force period of the EP. This will allow environmental impacts and risks to be continually managed to a level that is ALARP and acceptable, and EPOs and environmental performance standards to be met.

The implementation strategy includes roles/responsibilities and training/competency requirements for all personnel (COPPA and contractors) in relation to:

- implementing controls;
- managing non-conformance;
- emergency response; and
- meeting monitoring, auditing, and reporting requirements.

COPPA, as titleholder, is responsible for ensuring that production cessation activities are undertaken in accordance with the implementation strategy and ConocoPhillips' ABU-W HSEMS.

7.1 CONOCOPHILLIPS HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT SYSTEM

At COPPA, a HSEMS provides a systematic process to identify, assess, and manage the operational risks to the business, employees, contractors, stakeholders and the environment. The routine application of a HSEMS provides ongoing identification, prioritisation and control of these risks.

The Corporate HSEMS Standard (Issue No. 3.1, October 2014) establishes a continuous improvement process for the implementation of the health, safety and environment (HSE) Policy, leadership expectations, and SPIRIT values (i.e. Safety, People, Integrity, Responsibility, Innovation and Teamwork, **Figure 7-1**). It also defines the framework and requirements for each element within each Business Unit's (BU's) HSEMS to ensure that HSE issues are managed in a consistent manner across the ConocoPhillips companies.

Figure 7-1: ConocoPhillips SPIRIT values

The HSEMS is implemented through a hierarchy of policies and procedures that cascade from the corporate level through to the BU's and their individual operating assets. The system has

four distinct phases and 15 interrelated elements, as shown in **Figure 7-2**, with each phase of the process building on the previous phases:

- PLAN: hazards, risks, and regulatory requirements are identified in these elements. These elements also identify the risk mitigation requirements that will be built-out in the DO phase and provide for the establishment of strategic plans, goals and objectives.
- DO: describes the specific implementation tools needed to manage the risks and requirements identified in the PLAN phase.
- ASSESS: describes detailed monitoring and auditing to ensure that risks and requirements are being identified, assessed, and managed.
- ADJUST: provides for modification of the HSEMS and its implementation to adjust for strengths, gaps and opportunities for improvement identified in the ASSESS phase.

Figure 7-2: Overview of ConocoPhillips HSEMS

The ABU-W HSEMS has a consistent content to the Corporate HSEMS 15 element model, with further detail on the individual elements provided below in **Section 7.1.1**.

In an ABU-W context, the policies and procedures are framed and implemented within the ABU-W HSEMS, which is aligned to the Australian Standards/New Zealand Standards (AS/NZS) ISO 14001:2004 Environmental Management Systems Standard. The ABU-W HSEMS outlines the key HSE processes and requirements for all HSE related activities for the ABU-W, including the broader aspects of plant equipment/infrastructure, programs and procedures, people,

management of change and their interactions. This HSEMS also maps out how ABU-W meets the corporate HSEMS standard.

The core objectives of the ABU-W HSEMS are to support implementation of the ABU-W HSE and Sustainable Development (HSE&SD) Policy and the ConocoPhillips SPIRIT values and to provide a consistent framework and approach for effective management of HSE. The ABU-W HSEMS applies to all ConocoPhillips ABU-W owned and/or operated facilities/locations and allows activities to be conducted in a safe, healthy, and environmentally conscious manner. The overarching intent of the HSEMS is to protect people, assets and the environment.

7.1.1 ConocoPhillips ABU-W HSEMS Elements

7.1.1.1 Element 1: Policy and Leadership

This element defines expectations for the ABU-W HSE policy and leadership requirements for supporting a strong HSE culture, ensuring compliance with HSE requirements and driving HSE excellence.

The HSE&SD Policy (**Figure 7-3**) establishes the expectations, principles of operation and desired outcomes for the ABU-W.

7.1.1.2 Element 2: Risk Assessment (and Management)

This element defines the HSE&SD risk management requirements outlined in the ABU-W HSEMS.

The ABU-W seeks to maintain the health and safety of its employees and minimise environmental impact through the active and progressive elimination of hazards and the reduction of risk in the workplace. This objective is achieved at all ABU-W facilities and sites through a systematic and integrated approach to risk management to reduce risks to a level that is ALARP.

The ABU-W Risk Management Procedure (ALL/HSE/PRO/040), outlines the risk assessment process, including for environment and sustainable development assessments.

Section 5 provides a full summary of the risk approach undertaken for this EP.

7.1.1.3 Element 3: Legal Requirements and Standards of Operation

This element establishes requirements for maintaining a process to monitor changing laws/regulations and site activities, and assigning responsibilities to help assure compliance with legal requirements (e.g. laws, regulations, permits or project approvals and commitments made in permit applications) and standards of operation (e.g. relevant ConocoPhillips and industry standards and/or design codes) applicable to the ABU-W.

All aspects of ABU-W operations (including project design, construction, commissioning, and operation and decommissioning) are compliant with relevant International, Commonwealth, State and Territory requirements, codes and standards of operation.

The ABU-W HSE Legal Requirements Identification and Monitoring Procedure (ALL/HSE/PRO/087) outlines the process for monitoring changing legal requirements and achieving legal compliance.

7.1.1.4 Element 4: Strategic Planning, Goals and Objectives

This element establishes the requirements associated with HSE planning and goal setting. Planning at ConocoPhillips cascades from the Corporate level to the BU level (including the ABU-W) and then to individual functions, including HSE, Governance and Capital Projects.

The ABU-W HSEMS defines and implements a strategic HSE&SD planning, goals and objectives process. The ABU-W HSE planning process includes a strategic HSE Plan that is developed, resourced, communicated and measured to contribute to continuous HSE improvement and the reduction of HSE risk.

7.1.1.5 Element 5: Structure and Responsibility

This element establishes requirements to define and manage roles, responsibilities, accountabilities, employee engagement, and interrelationships.

The ABU-W maintains a structured organisation to manage all HSE issues that impact on, or have the potential to impact, ConocoPhillips including:

- maintaining a dedicated, specialist HSE team with specialists deployed to project and operations groups as required;
- communicating organisation charts outlining the resourcing and management structure for ABU-W;
- HSE Committees that function at multiple levels to review and manage HSE related issues;
- conducting management reviews of the ABU-W HSEMS to assess resource needs;
- implementing specific processes which identify and effectively communicate roles, responsibilities and accountabilities associated with critical equipment and systems including via inductions, on-boarding processes and competency training programs; and
- documenting roles, responsibilities and accountabilities, as they relate to the HSEMS and the HSE&SD Policy, in various HSEMS documents.

7.1.1.6 Element 6: Programs and Procedures

This element establishes requirements to develop and implement, within the ABU-W HSEMS, programs and documented procedures to ensure compliance with legal requirements and standards of operation and to manage HSE risk. All ABU-W HSE procedures are maintained on the ABU-W (HSE) intranet site and accessible to the business.

Documented ABU-W HSE programs and procedures, relevant to operational activities, are established and maintained to manage significant risks and comply with legal requirements and standards of operation. These programs, processes and procedures are made easily accessible to relevant employees and contractors and are reviewed at an appropriate BU level in accordance with a defined review schedule. The ABU-W employs competent people capable of identifying and implementing programs and procedures to facilitate HSE compliance and continuous improvement.

7.1.1.7 Element 7: Asset and Operating Integrity

This element establishes standards for BU development, implementation and maintenance of its Asset and Operating Integrity (A&OI) programs to:

- properly managed risks associated with operations, equipment failure or uncontrolled loss of primary containment; and
- establish within the ABU-W a clear understanding of its assets, failure mechanisms and their consequences/associated risks.
- The ABU-W A&OI philosophy is communicated and fully integrated through the implementation of various A&OI programs, processes and procedures that define and manage the integrity of ABU-W assets and operations across the life cycle and comply with legal requirements (including statutory inspections, e.g. vessels) and standards of operation. These programs and procedures include:
- procurement and pre-construction HSE assessment (e.g. design considerations);
- identifying and documenting major accident hazards, safety critical elements and technical performance requirements;
- process, mechanical instrumentation and electrical system documentation;
- commissioning and pre-start up review;

- structural integrity systems;
- safe work practices;
- hazard registers;
- SAP maintenance system;
- operating and maintenance procedures and programs; and
- management of change procedures.

The A&OI programs are reviewed and updated by technically competent personnel to manage the risks associated with the asset life cycle. This process involves application of appropriate controls and A&OI integrity management performance measures, and engagement of ConocoPhillips personnel/contractors through communication of the aims and goals established for the management of technical integrity.

7.1.1.8 Element 8: Emergency Preparedness

This element defines the Crisis Management and Emergency Response (CM&ER) planning and preparedness requirements for ConocoPhillips operated assets and the Crisis Management support functions provided and coordinated from ConocoPhillips Corporate Headquarters.

All reasonably foreseeable crisis and emergency situations are identified via appropriate systematic review and analysis processes, with results documented in facility/project specific CM&ER processes and systems.

The ABU-W Crisis and Incident Management Plan (ALL/HSE/ER/001) defines the organisational responsibilities, actions, reporting requirements and management processes to be applied in the event of an emergency or crisis occurring. Crisis and emergency response is managed by a hierarchy of teams within the ABU-W, e.g. a facilities-based Emergency Response Team (ERT), an Incident Management Team (IMT) and Crisis Management Team (CMT) and supported by the international resources through the Crisis Management and Emergency Response group located at the ConocoPhillips Corporate office.

The corresponding Oil Pollution and Emergency Plan (DCOM-652-EN-OPE-00001) has been developed in accordance and to align with the ABU-W Incident Management Plan. EPOs, EPSs and MCs applicable to undertaking the oil spill response are detailed in **Table 7-8**.

7.1.1.9 Element 9: Awareness, Training and Competency

This element establishes the requirement that all employees, contractors, and visitors have the necessary awareness, training, and competency to perform their activities consistent with the Company HSE Policy, standards, and procedures.

The ABU-W implements a documented training and competency system to confirm that employees/contractors have the required training and competency to fulfil their duties in a safe, environmentally and socially responsible manner. The system addresses:

- employee selection and identification of training, competence and development needs;
- contractor evaluation and management;
- employee orientation;
- operator or mechanical skills training and qualification;
- development and maintenance of training resources and records; and
- demonstration of competency.

The level of training and competency required at ABU-W facilities is based on the degree of risk and the complexities of the actions required to control or mitigate the risk. Measures are put in place to assess the competency of those trained and to determine the effectiveness of implemented training programs. Managers are personally responsible for ensuring that the ABU-W complies with ConocoPhillips Corporate and Regulatory training and competency

requirements. Further information of training and competency requirements is provided in HSE Training and Competency procedure ALL/HSE/PRO/089.

7.1.1.10 Element 10: Non-Conformance, Incident, and Near Miss Investigation and Corrective Action

Through this element, the ABU-W implements a systematic approach so that all incidents and near misses are consistently, methodically and effectively investigated, as appropriate to their risk or potential severity. All incidents including near misses are reported, investigated in a timely manner and analysed to identify corrective actions/preventive measures to prevent recurrence and continuously improve HSE performance. Incident investigations are documented using a database to track actions and enable sharing of learnings. The ABU-W Incident Reporting and Investigation Procedure (ALL/HSE/PRO/003) is the key document which outlines these requirements.

Non-conformances may be identified through audits, observations or incident reports. Actions to address non-conformances are developed following the same process applied to address root causes of incidents.

Key performance indicators are in place to track and report the status of actions arising from incidents and audits.

7.1.1.11 Element 11: Communication

This element sets the requirements for the communication of information within the Company and engagement with external stakeholders.

The ABU-W actively seeks and obtains the co-operation and involvement of ABU-W personnel in promoting and improving HSE management and communication. Workers and technical experts are consulted when new HSE procedures or processes are developed or changes to the HSEMS occur (including risk management processes).

Internal Communication

The ABU-W has processes and procedures to facilitate effective internal communication of HSE&SD-related issues at ConocoPhillips Corporate, BU, project and operations levels. Examples include, but are not limited to, office and facility inductions, HSE Intranet websites with performance metrics, programs and procedures, ABU-W HSEMS Manual and HSE Procedures, HSE bulletins and safety moments, hazard reporting and issue resolution procedures and training programs and processes.

External Communication

The ABU-W is committed to ongoing, active, transparent and collaborative consultation with stakeholders throughout the lifecycle of its projects and operations. Accordingly, the ABU-W has developed processes and procedures to manage stakeholder relations, to understand and respond appropriately to their diverse and evolving expectations via free and open communication.

External communication processes define responsibility and chain of control for receiving and handling inquiries is defined in external communication processes and the ABU-W documents and tracks the receipt, response, and status of inquiries from external parties.

Refer to **Section 8** for an overview of the consultation program of relevance to this EP.

7.1.1.12 Element 12: Document Control and Records Management

This element establishes the requirements for management and control of HSEMS documents and records.

The COPPA HSE Documents and Records Management (ALL/HSE/PRO/004) is implemented to efficiently manage key documentation, including confirming that it remains accurate, current and available to required personnel. Documents and records, including procedures, work instructions and other information necessary to carry out work activities, are retained to

corporate and legislative requirements. Documents are also periodically reviewed and revised as necessary, with current versions made available and obsolete documents removed or identified and retained (where necessary) for legal use.

Key ABU-W document control and records management processes include HSE procedure review and update schedules, document retention codes, management of change procedures, HSE Controlled Documents Registers and SAP Document Management System. Further detail is provided in HSE Documents and Records Management Procedure (ALL/HSE/PRO/004).

7.1.1.13 Element 13: Measuring and Monitoring

This element defines the requirements for measuring and monitoring ABU-W HSE performance, providing assurance of compliance, assessing the effectiveness in meeting the COPPA's goals and legal obligations, and identifying opportunities for improvement.

The ABU-W has developed processes for measuring and monitoring HSE performance, evaluating the achievement of HSE goals and objectives, identifying opportunities for improvement and providing assurance of compliance. Leading and lagging performance measures are developed, identified and tracked to provide timely information to manage trends and impacts and to establish future goals and direction. Processes are also in place to measure and monitor project operations and activities, as per the ConocoPhillips Projects HSE Management System Manual (ALL/HSE/MAN001).

Key ABU-W processes for the measuring and monitoring HSE performance include development and implementation of HSE Strategic Plans, ABU-W competency assurance management, HSE committees and meetings, key performance indicators, environmental monitoring and reporting procedures, Asset Integrity and Process Safety Management System and contractor performance monitoring.

7.1.1.14 Element 14: Audits

This element establishes requirements for audit programs that assess the adequacy and effectiveness of HSE controls. The audit program also identifies any non-conformances within the HSEMS. The ABU-W implements and maintains a program for the planning, preparation, execution, reporting and close-out of HSE audits carried out across all areas of the ABU-W including Capital Projects.

The ABU-W HSE auditing process consists of a three-tier auditing hierarchy:

- Tier 3 – External to the BU (corporate, regulatory bodies and other external bodies);
- Tier 2 – Internal to the BU, independent to facility/project (HSEMS and A&OI MS policies and procedures); and
- Tier 1 – Workplace inspections (workplace hazard identification and control).

The ABU-W HSE Auditing and Inspection Procedure (ALL/HSE/PRO/031) provides methods and guidance for the implementation and execution of Tier 1, 2 and 3 auditing and inspection processes. An ABU-W Tier 1, 2 and 3 audit schedule is prepared on a three-year rolling plan basis and allows for an audit of all elements of the ABU-W HSE Management System over a three-year period. The schedule outlines which management system elements are to be audited in each year and refers to the applicable HSE Management System procedures. Once approved, the audit schedule is included in planning processes for the respective facilities and areas of operation for the coming year.

7.1.1.15 Element 15: Review

This element establishes requirements to review the content and functionality of the HSEMS to ensure there is a functioning and systematic process in place so that HSE&SD risks are identified and managed to achieve the Company and BU HSE&SD goals and objectives.

With participation from the most senior leadership positions, the ABU-W implements a documented annual HSE and A&OI Review Process for the review of the ABU-W HSEMS. The reviews are conducted by defined groups, teams, or committees (including HSE Steering

Committees), with results reported to, and reviewed by, ABU-W management.

The review process considers applicable HSEMS data and outputs and includes a consideration of:

- results of internal audits and evaluations of compliance with legal and other requirements;
- communications from external interested parties, including complaints;
- the environmental performance of the organisation;
- the extent to which objectives and targets have been met considering changing circumstances and commitment to continuous improvement;
- status of corrective and preventive actions from investigations and audits;
- follow-up actions from previous management reviews;
- significant issues from risk assessments;
- resource allocation for system implementation and maintenance;
- incidents; and
- recommendations for improvement.

The outcomes and decisions made in these reviews are distributed to appropriate management and planning teams. This ensures that the 'adjust' phase of the HSEMS process may feed into the 'plan' phase, closing the loop on the plan, do, assess, and adjust cycle of continuous improvement (**Figure 7-2**).

7.1.2 ConocoPhillips ABU-W Health, Safety, Environment and Sustainable Development Policy

The ConocoPhillips' ABU-W HSE&SD Policy (HSEMS Element 1), as presented in **Figure 7-3**, establishes the expectations, principles of operation and desired outcomes for the ABU-W. The policy is distributed to all ABU-W facilities and contracted parties and is displayed prominently at work sites. Inductions to the ABU-W facilities/projects include presentation and discussion of the HSE&SD Policy.

ConocoPhillips

AUSTRALIA BUSINESS UNIT - WEST

Health, Safety, Environment & Sustainable Development Policy

Our people are our most valuable asset and management is committed to providing a safe and secure workplace for them to work. We are collectively and individually responsible for maintaining a safe work environment.

We are committed to conducting our operations in an environmentally sound manner and in harmony with the surrounding community. We strive to be recognised as a valued and welcomed member of the community in which we operate.

To achieve these commitments, we support the following fundamental principles through our demonstrated actions:

- No work is so urgent or important that we cannot take the time to do it safely.
- Work in compliance with applicable regulations and laws to contribute to the prevention of injuries, releases, environmental impacts and property loss or damage.
- All employees and contractors have the authority and the responsibility to stop work, if concerns exist about safety, security, the environment or property loss, without regard to loss of production.
- Working safely and in a fit state, is a condition of employment and each employee and contractor is responsible for their own safety and the safety of those around them.
- All incidents are to be immediately reported. We will treat all incidents as opportunities to learn and prevent recurrence.
- We will safeguard our operations from process safety incidents by implementing systems to ensure the integrity and reliability of our equipment and operational capability.
- Managers and supervisors will demonstrate visible and active leadership that engages all employees and contractors to manage HSE performance with clear authorities, accountabilities and expectations.
- Provide employees with the capabilities, knowledge and resources necessary to instil personal ownership and motivation to achieve HSE excellence.
- Provide relevant safety and health information to contractors and require them to provide proper training for the safe and environmentally sound performance of their work.
- Employees and contractors are involved in comprehensive HSE audits and incident investigations to seek timely corrective action.
- Sustainability is a factor in our ongoing operations as well as in planning and execution of future projects.
- Business is conducted in a way that contributes to economic growth, a healthy environment and vibrant communities in the areas we operate.
- Employee participation and ownership in community activities is encouraged.

The success of the Australia Business Unit - West is dependent on fulfilling these commitments to our employees, our contractors and the communities in which we operate.

David Boyle
VP Operations, Drilling & Supply Chain

Chris Wilson
President

Michael Gardiner
VP Finance

Simon Wragg
VP HSE

Frank Krieger
VP Exploration & Development

Alison Smith
VP Human Resources

David J. Bridges
VP Legal

Mike Nazroo
VP Commercial

Steve Ovenden
VP Growth

Jose Lobato Goncalves
Timor-Leste Country Manager

Kayleen Ewin
VP Sustainable Development, Communications, External Affairs & Corporate Affairs.

Alice Barnett
AP & ME Regional IT Lead

February 2017

Figure 7-3: ConocoPhillips ABU-W HSE&SD Policy

7.2 OTHER SUPPORTING MANAGEMENT PROCESSES AND PROCEDURES

In addition to the HSEMS, COPPA has several supporting management processes and procedures that outline how it undertakes its business.

7.2.1 ConocoPhillips Life Saving Rules

ConocoPhillips has established a set of life saving rules (**Figure 7-4**) to help strengthen existing HSEMS barriers globally and drive appropriate HSE critical behaviours and practices at the ABU-W level. The life saving rules provide a specific ruleset for high-risk work activities and serve to ensure people, the environment and assets are protected during higher risk activities. They align with the COPPA's Safety Motto and Target Zero campaign, strengthen the corporate HSE culture, and communicate expectations to employees, contractors and partners.

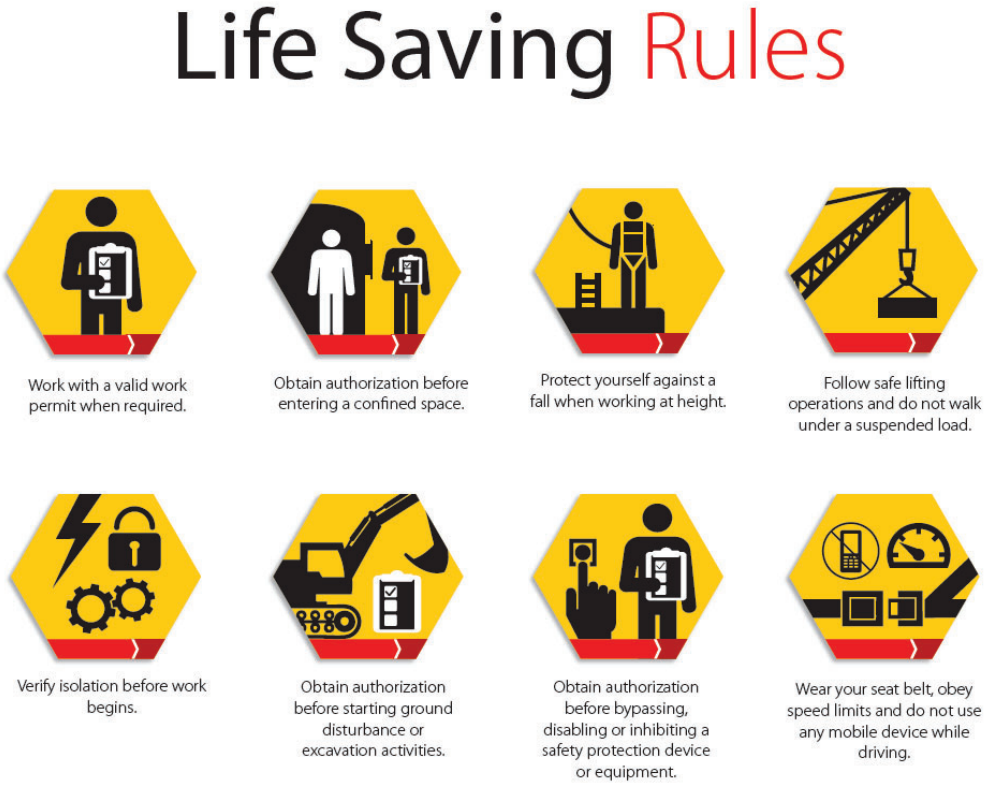


Figure 7-4: ConocoPhillips life-saving rules

7.2.2 Contractor HSE Requirements

In support of the Corporate HSEMS Standard, the Corporate Contractor HSE Standard (Issue No. 3, May 2008) establishes the minimum requirements and expectations for HSE management of Contractors and subcontractors.

For ABU-W, the HSE requirements for contracts/contractor management during pre-contract planning, contracting, contract execution and contract completion and evaluation are outlined in the HSE Contractor HSE Management Process document. It includes the following requirements:

- contractors to comply with all applicable HSE laws and regulations and any additional guidelines, operating standards and policies provided to the Contractor;
- a review of the Contractor HSE Management System is completed before being contracted; and
- provisions for COPPA to conduct audits/inspections of the Contractor's operations, equipment and emergency procedures at any time.

7.2.3 ConocoPhillips Marine Vessel Vetting Process

COPPA manages marine vessel vetting and assurance using a hierarchy of procedures, outlined below. These requirements for vessel acceptance criteria include technical, personnel (e.g. crew competencies) and operational requirements for marine vessels engaged by COPPA.

7.2.3.1 Marine Vetting and Audit Process Manual for Offshore Vessels

ConocoPhillips Marine Vetting and Audit Process Manual for Offshore Vessels (GM-PRO-MA-001) is a ConocoPhillips global standard that requires all vessels (including MODUs) used by ConocoPhillips to be vetted. The vetting process is based on industry standards and best practices along with considerations of guidelines and recommendations form recognised industry organisations such as Oil Companies International Marine Forum (OCIMF) and International Maritime Contractors Association (IMCA), and international regulatory agencies like the International Maritime Organization (IMO) and vessel Classification Societies.

The Marine Vetting and Audit Process Manual for Offshore Vessels (GM-PRO-MA-001) requires a valid Offshore Vessel Inspection Database (OVID) report or Common Marine Inspection Document (CMID) report as required for vessel operation types.

For vessels where the OVID and/or CMID are not valid or available, a ConocoPhillips Approved Inspection Report is required.

7.2.3.2 Vetting Exception Request Process

The Vetting Exception Request Process (GM-PRO-MA-006) is a global process to be used only in exceptional circumstances when a justifiable case exists for contracting a vessel rejected through the ConocoPhillips vetting process and is only to be used when no other approved document or equipment is available in the time required and rejecting the vessel would have significantly impeded operations.

An exception request will at no time conflict with the COPPA HSEMS. An exception requires the development of a risk assessment and risk mitigation plan.

7.2.3.3 Integrated Operations Support Centre Marine Operations Manual

The ConocoPhillips ABU-W Integrated Operations Support Centre Marine Operations Manual (IOSC/OPS/HBK/0003) and supporting Integrated Operations Centre Support Vessel Requirements (IOSC/OPS/GLN/0001) details:

- standard operating procedures for all vessels under contract with ConocoPhillips ABU-W;
- compliance requirements for relevant maritime legislation and relevant guidelines, standards and codes;
- compliance requirements for international conventions and agreements, including, but not limited to:
  - SOLAS;
  - MARPOL;
  - COLREGS; and
  - STCW Convention.
- compliance requirements for industry standards as set up by:
  - OCIMF;
  - IMCA;
  - Guidelines for Offshore Marine Operations; and
  - Nautical Institute;

- ConocoPhillips and contractor standards, procedures and best practice management, including, but not limited to:
  - vessels' safety of navigation; vessels' using dynamical positioning systems (DP vessels);
  - vessels' bunkering procedures;
  - crew competency and training records;
  - chemical storage and handling procedures;
  - discharge management procedures;
  - waste management procedures;
  - anchoring procedures; and
  - vessel and equipment maintenance procedures as per the vessel specific safety management system.

COPPA carries out a risk assessment or HSE Qualification Evaluation process for each vessel to identify any HSE issues or specific management requirements prior to commencing activities.

7.2.4 ConocoPhillips Waste Management Process

The Corporate HSE Waste Management Standard establishes a requirement to evaluate the suitability of industrial waste facilities used by ConocoPhillips and to only use those that are company approved. It applies to captive waste management units (owned or operated by ConocoPhillips or one of its subsidiaries) or commercial waste management facilities (not owned or operated by ConocoPhillips) where industrial wastes and residuals, generated by COPPA or its contractors, are subsequently managed.

ABU-W is responsible for evaluating the suitability of the waste facilities and the ABU-W Waste Management Plan outlines the requirements for the management of wastes produced by ConocoPhillips operated facilities, including compliance assurance processes (monitoring, auditing and reporting).

7.3 SYSTEMS, PRACTICES AND PROCEDURES

All activities associated with production cessation are identified, planned and implemented in accordance with relevant legislation, EP commitments and COPPA environment standards and procedures. Processes are in place to verify that these controls and requirements are being implemented to manage environmental impacts and risks associated with the maintenance activities to ALARP.

The key operational controls related to production cessation activities include:

- management of all activities under COPPA Health, Safety and Environment Management Systems, described further in **Section 7.1**.
- defined procedures for vetting of maintenance vessels prior to their contractual engagement to make sure that the marine vessels are fit for their intended purpose. These procedures include: "Support Vessel Requirements" (DOC/OPS/GLN/0001); 'Support Vessel Tender Evaluation Requirements' (DOC/OPS/GLN/0002); and Marine Vessel Management (DOC/OPS/GLN/0003).
- preparation of project-specific documentation to bridge between COPPA HSEMS documentation and contractor HSE management systems.
- documented procedures covering all operations, with all work executed under a PTW.

7.4 TRAINING AND COMPETENCIES

7.4.1 ConocoPhillips Employees

All ConocoPhillips personnel are vetted prior to their employment to ensure they have the suitable experience and qualifications for the roles they will be performing.

The ABU Vice-President Operations, Drilling and Supply Chain is ultimately accountable to ensure that the operating facilities are manned by adequate numbers of competent personnel and that trainees are properly managed.

7.4.2 Pre-cessation Vessel Engagement

All contractors are managed through COPPA Contractor HSE Management Process (ALL/HSE/PRO/016).

As part of this process all contractors undergo a prequalification screening of HSE Management systems. This includes a review of training and competency processes.

7.4.3 Pre-cessation Activities

All personnel, including third party contractors, involved with production cessation activities will undergo environmental awareness training prior to commencing work on the project as part of their induction. This will include being made aware of their responsibility to implement the commitments in this EP. The environmental training will inform the work crews of their obligations and specific environmental management procedures, including responsibilities and lines of communication.

Inductions will also cover the relevant components of this EP, COPPA HSEMS, Contractor HSEMS, and Bayu-Undan Gas Export Pipeline Safety Case revision documents developed to link production cessation and COPPA procedures, roles and responsibilities.

The induction will cover aspects such as:

- Environmental regulatory requirements of operation and maintenance of the Pipeline described in this EP;
- Marine user interaction:
  - Requirement to record and report sightings of whales; and
  - Complaint/issue handling from fisheries.
- Waste segregation, containment and disposal:
  - Requirements for waste, segregation, labelling, handling and storage; and
  - Requirements for recording waste movements and transfers in Garbage Record Book.
- Housekeeping and spill prevention:
  - Requirements to store chemicals, oils and wastes in designated area;
  - Requirements to adhere to bunkering procedure for fuel transfers; and
  - Availability of spill transfer equipment.
- Spill preparedness and response:
  - Alerting procedure and immediate spill response actions.
- Environmental incident reporting:
  - Requirements for reporting reportable and recordable incidents.

7.4.4 During Production Cessation Activities

HSE management system audits of third-party contractors are completed according to the ABU audit procedure, which includes an evaluation of training matrix, checks of training and competency and site-specific environmental training requirements. The frequency of contractor audits is reviewed and updated annually in the ABU HSE Audit schedule. Environmental risks will be discussed through job safety analyses, pre-tour and safety meetings conducted on board vessels undertaking production cessation activities.

Additional communications, including the findings of any incident investigations, will continue through daily meetings on board the vessels and via daily progress reporting.

7.4.5 IMT Roles Responsibilities and Training

Spill response training is provided to key roles within the ConocoPhillips IMT. ConocoPhillips maintains competent and trained response capability to ensure an emergency management and response capacity can be maintained. Training requirements and core competencies for ConocoPhillips key IMT response staff are outlined in **Table 7-1**Error! Reference source not found.. Additional detail on the listed training packages and drills is provided below:

- IMT Induction Computer Based Training (CBT) Module includes, but is not limited to the following content:
  - ConocoPhillips emergency response standards, philosophies and principles
  - Emergency Response and Management Groups
  - Overview of IMT structure within ConocoPhillips
  - Overview of IMT checklists
  - Corporate resources (e.g. GIMAT)
  - Initial response and assessment and Planning P
  - Communications
- ISC 100 and 200 training (Online CBT or face-to-face)
- ConocoPhillips induction package (face-to-face) includes, but is not limited to the following content:
  - IMT roles and responsibilities
  - Emergency Operations Centre (EOC) operation
  - Incident Action Plan software
  - IMT Tier 1-2 desktop drill or exercise
- Oil spill management computer-based training module includes, but is not limited to the following content:
  - ConocoPhillips Emergency Management Framework, including plans and processes
  - Context – hydrocarbon spills (international and Australia)
  - Australian response arrangements
  - Government, industry and AMOSC response
  - Response planning
  - Hydrocarbon spills and the environment

- Response issues
- Response options and implementation

- IMT Tier 1-2 desktop drill
  - Undertake an incident and hydrocarbon spill assessment process
  - Develop an IAP that includes hydrocarbon spill response options
  - Undertake preliminary planning for the implementation of those options
- IMT Tier 2 exercise (hydrocarbon spill scenario on a rotational basis)
  - Undertake an incident assessment process
  - Develop an IAP
  - Undertake preliminary planning for the implementation of those options
  - Interface with CMT

Role and responsibilities for the IMT are outlined in **Section 7.10**.

Table 7-1: IMT training summary

Role	Induction CBT Module	ICS 100 and 200	ConocoPhillips Induction Package (Face-to-Face)	Oil Spill Management CBT Module	IMT Tier 1-2 Desktop Drill or Exercise
Incident Commander	Initial	Initial	Initial	Initial	Annual
Operations Section Chief	Initial	Initial	Initial	Initial	Annual
Planning Section Chief	Initial	Initial	Initial	Initial	Annual
Logistics Section Chief	Initial	Initial	Initial	Not required	Annual
Safety Officer	Initial	Initial	Initial	Not required	Annual*
Liaison Officer	Initial	Initial	Initial	Not required	Annual*
Environmental Unit Leader	Initial	Initial	Initial	Initial	Annual
Historian	Initial	Initial	Initial	Not required	Annual*
Situation Unit Lead	Initial	Initial	Initial	Not required	Annual*
Human Resource Officer	Initial	Initial	Initial	Not required	Annual*
Public Information Officer	Initial	Initial	Initial	Not required	Annual*

Initial: required when personnel commence IMT position.
Annual: personnel holding this IMT position will need to undertake this training/drill annually.
* This position is required to participate in an annual exercise or drill, but this may not always be a hydrocarbon spill scenario.

7.5 MONITORING, AUDITING, MANAGEMENT OF NON-CONFORMANCE AND REVIEW

7.5.1 Environmental Monitoring

In accordance with ConocoPhillips' HSEMS (Element 9), the ABU-W has developed processes for measuring and monitoring HSE performance, evaluating the achievement of HSE goals and objectives, identifying opportunities for improvement and providing assurance of compliance. Leading and lagging performance measures are developed, identified and tracked to provide timely information to manage trends and impacts and to establish future goals and direction. Processes are also in place to measure and monitor project operations and activities, as per the ConocoPhillips Projects HSE Management System Standard.

COPPA and its contractors will monitor and review HSE performance during production cessation activities. Specific monitoring activities related to the management of environmental risks identified within **Section 5** will collect, as a minimum, the information referred to in the MC listed in **Section 6** and **Table 7-8**. This information will be collected through set internal reporting processes, as detailed in this section.

7.5.2 Environmental Audits and Review

The objectives of the environmental auditing and review programs are to:

- verify impacts and risks are being effectively managed;
- confirm relevant standards and procedures are being followed;
- demonstrate compliance with regulatory requirement, approval commitments and conditions within the EP;
- monitor, review and evaluate the effectiveness of ConocoPhillips HSE-MS;
- ensure a senior management review of performance via consideration of the audit reports; and
- ensure effective implementation of the implementation strategy.

HSE audits and follow-up actions are conducted in accordance with ConocoPhillips HSE Corporate Audit Standard, ConocoPhillips Business Unit Audit Guidelines and ConocoPhillips ABU Auditing and Inspection Procedure (ALL/HSE/PRO/031). The audits will be documented, and corrective actions will be tracked to completion in accordance with these procedures.

The ABU HSE auditing process consists of a three-tier auditing hierarchy. In the last quarter of each year an annual integrated Tier 1, 2 & 3 audit schedule is developed and once approved the audit schedule is included in the planning processes for the respective facilities and areas of operation for the coming year. The audit schedule applicable to the Pipeline is detailed within the Bayu-Undan Gas Export Pipeline Safety Case, and it consists of the following:

- Tier 1, (internal) routine inspections as detailed in the Pipeline Integrity Management Plan
- Tier 2, (internal) peer audit within the ABU – conducted at least yearly
- Tier 3, (external) corporate level audit by USA ConocoPhillips based auditors and/or 3rd Party audit conducted at least 3-yearly, Regulator audit schedule will be as agreed with the Regulator.
- Administering Authority Audits - at a frequency determined by NOPSEMA.

An audit review committee has been established which meets to track the status of audit findings and to improve the audit process, significant audit findings are shared across the business.

Corporate HSE, 3rd Party Audit and Regulator Audit findings and actions are tracked to completion in IMPACT. The audit process evaluates the effectiveness of the ConocoPhillips ABU HSE Management System audit findings are risk ranked using the corporate risk matrix.

COPPA will undertake internal audits of compliance against this EP. The risk assessment process detailed in this EP (**Section 5**) demonstrates that the highest risks to the environment from production cessation activities are associated with vessel activity; hence COPPA's audit

process will focus on vessel-based activities. Additionally, COPPA will submit annual environmental reports to NOPSEMA (**Section 7.7.2**) allowing the assessment of performance against the EPOs, EPSs and MCs of this EP. COPPA will feedback information from the annual reporting process into the EP, where appropriate. The key elements of the auditing and review program, and default frequencies, are specified in **Table 7-2**.

Table 7-2: Bayu-Undan Pipeline EP Auditing and Review Program

Audit Type	Description	Scope	Frequency
Tier 1	Routine production cessation activities	Compliance with EP	During production cessation vessel-based activities
Tier 2	Audit Internal ABU	Compliance with EP	3 –yearly
Tier 3	Audit External to ABU	Compliance with EP	5-yearly
Management Review	HSE Steering Committee HSE performance review	Management Team Monthly Review of HSE Performance.	Monthly
Management Review	ABU HSE Steering Committee Performance Reviews	Annual Review to assess the performance and effectiveness of existing programs and initiatives and to identify and initiate any process changes and improvements.	Annually
Incident Investigation Review	Review in line with ConocoPhillips Australasia Business Unit - Health, Safety & Environmental Procedures Incident Reporting and Investigation procedure ALL/HSE/PRO/003.	The objective of the incident investigation is to establish the root cause(s) of an incident and to raise and close-out corrective actions to prevent recurrence.	Following an incident or training exercise

7.5.3 Vessel Contractor Management

COPPA, as titleholder, is responsible for the planning of the production cessation activities, including selection and management contractors conducting the work.

HSE assurance of all contracted vessels will be performed in accordance with COPPA's Contractor HSE Management Process (ALL/HSE/PRO/016). The ConocoPhillips Marine Vessel Vetting Process (**Section 7.2.3**) outlines the minimum requirements that must be met and confirms that the vessels meet or exceed the standards and criteria set by industry practice, international regulations, and relevant authorities such as AMSA. The marine assurance process includes assessment of vessel suitability, equipment and design, and personnel training, including officer experience, followed by on vessel inspection and verification.

7.5.4 Management of Non-conformance, Investigation and Corrective Action

Non-conformances may be identified through audits, observations or incident reports. Actions required to address non-conforming incidents (including those associated with spill response drills, tests and exercises) and to prevent the escalation of pollution or environmental damage will be appropriate to the nature and scale of the event. All HSE hazards and incidents are reported in accordance with the ConocoPhillips ABU Incident Reporting and Investigation Procedure (ALL/HSE/PRO/003). Root cause analysis of incidents is performed to determine the cause and aid identification of appropriate corrective actions.

A corrective action plan is developed in consultation with senior management and other relevant action owners to address non-conformances. Audit findings and agreed audit follow-up actions are entered into a dedicated incident and assessment action tracking system and tracked through to closure by the ConocoPhillips ABU-W HSE Department. Key performance indicators are in place to track and report the status of actions arising from incidents and audits.

7.5.5 Management of Change

COPPA has a Management of Change (MOC) procedure (ALL/HSE/PRO/090) which is specific to managing (potential) changes associated with operations / activities within an accepted EP. It covers all content of the EP, including any legislative, procedural, engineering or physical change that is permanent, temporary, prospective or retrospective that may affect the potential impacts and risks from an activity and / or the environmental performance of an activity. The procedure defines a framework that enables changes to be considered in the merit of a number of aspects including regulatory requirements and a 'materiality test', i.e. screening for significance. The procedure allows for (potential) changes to be appropriately assessed and managed under internal decision points or to identify when resubmission to the regulator is required.

A risk assessment may also be completed to determine if there is an increased risk to the marine environment. In all cases, where a potential release to the marine environment has been identified, assessment of implementing additional risk control measures to lower the potential risk to ALARP will be undertaken. Any significant changes to the operations may necessitate amendment to the EP and OPEP, as appropriate to the level of change.

A revised EP will be submitted to NOPSEMA under Regulation 17 of the OPGGS(E) Regulations 2009 if any changes occur to this EP due to:

- a new activity;
- a significant modification or new stage of activity that is not provided for in the approved EP;
- significant new or increased environmental impact or risk; or
- changes in titleholder that results in a change in the way the environmental impacts and risks of the activity are managed.

NOPSEMA will assess the revised EP and all relevant documents under Regulation 21 of the OPGGS(E) Regulations 2009. While the revision is being assessed any activities adequately addressed under the existing accepted EP can still occur.

The EP may be revised in line with COPPA's management of change process but may not be resubmitted to NOPSEMA if it does not trigger Regulation 17 of the OPGGS (E) Regulations 2009.

COPPA will undertake an annual review of the description of the existing environment, including:

- Revised database searches for threatened fauna (e.g. PMST report) to identify species that may occur within the Operational Area and EMBA;
- Review of conservation advice, recovery plans and scientific literature for threatened fauna to identify threats; and
- Review sources of risk considered in the EP and update as required where the source of risk is identified as a threat.

7.6 ROUTINE REPORTING

7.6.1 Internal Routine Reporting

Table 7-6 contains a summary of internal reporting that will be completed for the duration of the production cessation activities.

Table 7-3: Summary of Internal Reporting

Report	Frequency	Contents
Daily Operations Report	Daily	Details of field activities, including any issues with the Pipeline

Report	Frequency	Contents
Vessel Report	Daily (during maintenance campaign)	Update on day's activities, including any identified non-conformance against this EP, and any issues that may need addressing.
First Incident Report	As per incident	Provides framework for Internal notification of incidents including spills. The first report contains tools for assessing the severity of the incident and escalating as per the ABU incident notification procedure.
EP Annual Report	Annual	Provides a summary of compliance performance, specifically in relation to the environmental performance objectives, standards and measurement criteria within this EP.
Incident Action Plan (see Attachment I)	As per incident	Provides an action plan in the event of an incident which summarises the appropriate policy, aims, objectives, response strategies and methods that will be employed as appropriate to the incident.
Incident Investigation Report	As per incident	Contains a summary of the audit and review process undertaken to investigate an incident. The report also details close-out corrective actions to prevent recurrence.
After Action Report	As per incident/drill	These reports are completed following an exercise or drill. They generally report on what worked well, opportunities for improvement and corrective actions to address opportunities for improvement.
Spill Debrief Report	As per spill	Spill debrief reports provide key information pertaining to the spill that has occurred. This includes details of the drill (date, time), list of attendees, key response actions, lessons learnt, outcomes/actions from the spill debrief meeting.

7.6.2 External Routine Reporting

7.6.2.1 Annual Environmental Report

COPPA will submit annual environmental reports to NOPSEMA in accordance with Regulation 15 of the OPGGS(E) Regulations 2009. The annual report will include all the information necessary to enable NOPSEMA to determine whether the environmental performance objectives and standards detailed within this EP have been met.

7.6.2.2 External Reporting Summary

Table 7-7 provides further information on the frequency, timeframe and contents of external reporting. Other agencies and organisations will be notified as appropriate to the nature and scale of the incident as per procedures and contact lists in COPPA's OPEP for production cessation activities.

Table 7-4 Summary of Routine and Incident Agency Reporting Requirements for the Pipeline

Report	Designated Authority	Frequency / Timeframe	Contents
Routine Reporting (Planned Impacts)			
Annual Report	NOPSEMA	Annually	In accordance with the OPGGS (E) Regulations 2009 (Regulation 14(2a, b; 26C)), the report will address compliance with EOPs and EPSs outlined in Section 6 of this EP.

Report	Designated Authority	Frequency / Timeframe	Contents
Reportable Incident Notification			
Reportable Incident Notification	NOPSEMA	Verbally, as soon as practicable, but within two (2) hours	COPPA must notify the Regulator of any unplanned event identified as having the potential to cause moderate to significant environmental damage. In most circumstances reportable incident parameters will be detailed specifically within an EP for an activity; however, should an unforeseen event occur that has caused or has the potential to cause moderate to significant environmental damage this must also be reported to NOPSEMA. **Section 7.8** details what constitutes a reportable incident.
Written report of reportable incident	NOPSEMA NOPTA	As soon as practicable but no later than three (3) days after the incident	A written report of a reportable environmental incident must be provided unless otherwise agreed with NOPSEMA. The report will contain all material facts and circumstances concerning the reportable incident, actions taken to avoid or mitigate any adverse impacts, and corrective action taken. If NOPSEMA is not satisfied that the initial written report satisfies the requirements of the OPGGS (E) Regulations 2009, further information may be requested from the operator, which may include but is not limited to: • immediate cause analysis; • root cause analysis and a full report; • actions taken to prevent recurrence of the incident with the responsible party; and • completion date. COPPA will provide NOPTA with a copy of the written report within 7 days after giving NOPSEMA the written report.
Recordable Incident Reporting			
Monthly Recordable Incident Reports	NOPSEMA	Monthly, on or prior to the 15th day of each month	Details of recordable incidents that have occurred in relation to production cessation activities for previous month (if applicable)
Other Reporting Requirements			
Any discharge or probable discharge in excess of MARPOL 73/78 discharge rates – Marine Pollution Report (POLREP)	AMSA Response Centre (ARC)	Within 24hrs of the incident occurring (by vessel master)	Contents of the reports will slightly differ depending on the type of discharge but generally will contain technical name, MSDS information, manufacturer, quantity spilled etc.
All actual or impending spills which occur within a marine park or are likely to impact on an AMP	Director of National Parks	As soon as practicable	The report will contain: • The location of the spill • The AMP at risk • A summary of the response being undertaken by COPPA • Details of the relevant contact person in the IMT

Report	Designated Authority	Frequency / Timeframe	Contents
Any discharge during the operation of the ship of oil or noxious liquid substances in excess of MARPOL discharge limits or rates; or any discharge or probable discharge of harmful substances in packaged form	AMSA Response Centre (ARC)	Within 1 hour of the incident occurring	Verbal reporting will consist of transfer of information in order to conduct a coordinated emergency response. All reporting will be carried out by the vessel master as per the vessel specific SOPEP.
Any spills within, or likely to enter, NT Waters	NT DPIR	As soon as practicable. Written report as soon as practicable after request by DPIR	Verbal reporting will consist of transfer of information in order to conduct a coordinated emergency response. All reporting will be carried out by the vessel master as per the vessel specific SOPEP. Written reports will contain all material facts and circumstances concerning the reportable incident, actions taken to avoid or mitigate any adverse impacts, and corrective action taken.

7.6.2.3 Start and End of Activities

Regulation 29 of the OPGGS(E) Regulations 2009 requires COPPA to notify NOPSEMA that a petroleum activity is commencing at least 10 days prior to the activity commencing. Regulation 29 also requires COPPA to notify NOPSEMA within 10 days of completion of a petroleum activity. COPPA will make these notifications.

7.6.2.4 End of the EP

As per Regulation 25A of the OPGGS(E) Regulations 2009, this environment plan will end when

- COPPA notifies NOPSEMA that:
  - The activity has ended; and
  - All obligations under the EP have been completed.
- NOPSEMA accepts the notification.

7.7 INCIDENT REPORTING

7.7.1 Reportable Incidents

A reportable incident is defined as ‘an incident relating to the activity that has caused, or has the potential to cause, moderate to significant environmental damage’, as categorised by the risk assessment process undertaken as part of the preparation of EP.

The environmental risk assessment conducted the following risks have a residual risk greater than Low and hence may constitute reportable incidents (**Section 5**):

- MDO release from a vessel collision.

The notification and reporting requirements for incidents in Commonwealth waters are outlined in **Table 7-7**. NOPSEMA reporting forms are provided in **Appendix D**.

Reporting of any injury or death of any marine fauna species listed as threatened or migratory under the EPBC Act will be also undertaken and reported to DoEE within seven days.

7.7.2 Recordable Incidents

A recordable incident as defined as an incident arising from the activity that breaches an EPO or EPS in the EP that applies to the activity and is not a reportable incident. NOPSEMA will be notified of all recordable incidents as soon as practicable but not later than 15 days after the end of the calendar month. The written report must contain:

- a record of all recordable incidents that occurred during the calendar month;
- all material facts and circumstances concerning the recordable incidents that the titleholder knows or is able, by reasonable search or enquiry, to find out;
- any action taken to avoid or mitigate any adverse environmental impacts of the recordable incidents;
- the corrective action that has been taken, or is proposed to be taken, to stop, control or remedy the recordable incident; and
- the action that has been taken, or is proposed to be taken, to prevent a similar incident occurring in the future.

7.7.3 Other Incident Reporting Requirements

7.7.3.1 Reporting Under MARPOL

In addition to the notification and reporting of environmental incidents defined in this EP and COPPA requirements, the following incident reporting requirements also apply:

- Damage, failure or breakdown of a ship of 15 metres in length or more which affects the safety of the ship or results in impairment of the safety of navigation (including collision, grounding, fire, structural or engine failure);
- Any discharge or probable discharge of oil or noxious liquids substances carried in bulk, resulting from damage to the ship or its equipment, or for the purpose of securing the safety of a ship or saving life at sea;
- Any discharge during the operation of the ship of oil or noxious liquid substances in excess of MARPOL discharge limits or rates; and
- Any discharge or probable discharge of harmful substances in packaged form (including freight containers, shipborne barges, road and rail vehicles, and portable tanks).

Reports are to be made without delay to AMSA via the national 24-hour emergency notification contacts:

- Phone: 02 6230 6811 or 1800 641 792
- Facsimile: 02 6230 6868
- Email: rccaus@amsa.gov.au

Additionally, the following pollution activity should also be reported to AMSA via RCC Australia by the Vessel Master:

- any loss of plastic material;
- garbage disposed of in the sea within 12 nm of land; and
- any loss of hazardous materials.

For oil spill incidents other agencies and organisations will be notified as appropriate to the nature and scale of the incident as per procedures and contact lists in the OPEP (DCOM-652-EN-OPE-00001).

7.8 RECORD KEEPING

Records management is the systematic control of information from creation to disposal. COPPA has procedures in place detailing the types of records and duration records need to be retained.

The following records will be maintained in relation to this EP:

- Environmental training and induction records;
- Details of non-conformance inducing environmental incidents, complaints and follow up actions; and
- Internal and external environmental audit reports.

Reports of any regulatory authority inspection and actions undertaken and actions taken to rectify any issues raised through the audit or inspection.

For vessels conducting production cessation activities, the vessel operator is responsible for retaining the following records as a minimum:

- Vessel log and manifests;
- Completed PTW forms;
- Completed specific risk assessments;
- Equipment and activity inspection records;
- Garbage record book (as per MARPOL 73/78, Annex V, Regulation 9);
- Vessel oil book records (MARPOL 73/78, Annex 1);
- Fuel usage and emission calculations; and
- GHG emissions.

7.9 EMERGENCY PREPAREDNESS AND RESPONSE

7.9.1 Overview

The ConocoPhillips HSEMS (Element 8) defines the Crisis Management and Emergency Response planning and preparedness requirements for ConocoPhillips operated assets and the Crisis Management support functions provided and coordinated from ConocoPhillips Headquarters Houston.

Under Regulations 14(8) of the OPGGS (E) Regulations 2009, the Implementation Strategy must contain an OPEP and provide for the updating of the OPEP. Regulation 14(8AA) outlines the requirements for the OPEP which must include adequate arrangements for responding to and monitoring of oil pollution.

A summary of the key documents that may be used to guide an emergency response are described in the following sections. It should be noted that in the event of an incident occurring, the Emergency Response Plan and OPEP will be used to guide personnel in the initial stages of an incident. Following this, if an IMT is established then IMT personnel will continue to use the OPEP and the detailed guidance and checklists in the ABUW Crisis and Incident Management Plan to direct the response.

7.9.2 Contractor Emergency Response Plan

The production cessation contractor will develop an Emergency Response Plan (ERP) that addresses emergency response actions associated with all credible incidents for the activity. It will describe the interface arrangements between the ABU-W IMT and covers all aspects of emergency response including technical, logistical and medical support.

The ERP also outlines roles and responsibilities of contractor personnel for emergency events. The ERP is accepted by COPPA and reviewed on an annual basis by the contractor or if a significant change has occurred to the incident management or emergency response

arrangements.

Scenario-based drills are performed to test the emergency response arrangements and updates are made to improve the ERP, if required.

7.9.3 Oil Pollution Emergency Plan

The OPEP (DCOM-652-EN-OPE-00001) outlines the emergency management arrangements for the activity. The OPEP provides activity-specific information required for an effective response in the unlikely event of an unplanned release of petroleum products. The OPEP details the actions to be taken by the Incident Management Team (IMT) in response to the incident (consistent with the ABUW Crisis and Incident Management Plan); describes arrangements and reporting relationships for command, control and communication; provides interfaces to oil spill response organisations and third party support entities; and provides procedures for notifying jurisdictional authorities and other external bodies.

For this EP, a 'fit-for-purpose' approach to spill response has been adopted, with consideration of:

- the low environmental risk profile of the installation campaign utilising MDO with little risk of significant liquid hydrocarbon release; and
- NOPSEMA's acceptance criteria, including the requirement for updating of the OPEP (Regulation 14(8) of the OPGGS(E) Regulations 2009).

The EPOs, EPSs and associated measurement criteria for the implementation of the response options in the OPEP are provided in **Table 7-5**.

7.9.4 ABU-W Crisis and Incident Management Plan

The ABUW Crisis and Incident Management Plan (CIMP) (ALL/HSE/ER/001) defines the organisational responsibilities, actions, reporting requirements and management processes to be applied in the event of an emergency or crisis occurring. It also provides detailed guidance and checklists for key roles in the IMT and CMT, consistent with the activity specific OPEPs.

The CIMP provides a graduated tiered response framework which classifies incidents based on the significance of the consequences, the risks involved and potential for escalation.

Individual operational facilities have detailed emergency response and oil pollution emergency plans developed that are aligned to this framework.

The CIMP also provides detail on Incident Action Plans (IAPs), which are developed by the IMT and communicated to the ERT and CMT (where applicable). IAPs are developed using current situational awareness and provide direction to response operations.

The CIMP is reviewed on an annual basis or if a significant change has occurred to the incident management or emergency response arrangements. Exercises and drills are performed to test the emergency response arrangements and updates are made to improve the CIMP, if required.

Table 7-5: Oil pollution response EPOs, EPSs and MCs

EPO	Performance Standard	Measurement Criteria
Incident Management		
EPO IS 1 Manage incident via a systematic planning process	**EPS IS 1.1** IMT to complete ICS Briefing Forms (ICS-201) during the initial phase of the incident, followed by an Incident Action Plan for each operational period	**MC IS 1.1.1** IMT to complete ICS Briefing Forms (ICS-201) during the initial phase of the incident, followed by an Incident Action Plan for each operational period
	EPS IS 1.2 IMT to monitor effectiveness of tactics being implemented and use information in the development of IAPs	**MC IS 1.2.1** Records demonstrate IMT used information on effectiveness of tactics in the development of IAPs
EPO IS 2 Maintain contracts with support agencies to obtain additional support or technical expertise to monitor and/or respond to a spill	**EPS 2.1** Service Level Agreement maintained with OSRL, Master Services Contract maintained with AMOSC and agreement maintained with RPS APASA for the duration of the activity	**MC 2.1.1** Records demonstrate that Service Level Agreement maintained with OSRL, Master Services Contract maintained with AMOSC and agreement maintained with RPS APASA for the duration of the activity
NEBA		
EPO IS 3 Implement emergency response options that result in net environmental benefit	**EPS IS 3.1** IMT to undertake spill response (operational) NEBA to determine initiation and termination of response options	**MC IS 3.1.1** Records demonstrate spill response (operational) NEBA undertaken during OPEP implementation
	EPS IS 3.2 IMT to undertake an operational NEBA during the preparation and review of IAPs	**MC IS 3.2.1** Records demonstrate IMT completed an operational NEBA during the preparation and review of IAPs
Monitor and Evaluate		
EPO IS 4 Maintain situational awareness and inform IMT decision making using monitor and evaluate tactics	**EPS IS 4.1** IMT to undertake fate and weathering modelling to estimate the current and projected weathering of the spill	**MC IS 4.1.1** Records demonstrate fate and weathering modelling undertaken within 3 hours of IMT activation
	EPS IS 4.2 IMT to initiate trajectory modelling to estimate trajectory of the spill	**MC IS 4.2.1** Records demonstrate trajectory modelling requested, received and incorporated into IMT situational awareness
	EPS IS 4.3 Use monitor and evaluate data to periodically reassess the spill and modify the response, using the Incident Action Plan	**MC IS 4.3.1** Records demonstrate monitor and evaluate data incorporated into the Incident Action Plan

EPO	Performance Standard	Measurement Criteria
	EPS IS 4.4 COPPA to maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of monitor and evaluate tactics	**MC IS 4.4.1** Records demonstrate that COPPA maintains contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of monitor and evaluate tactics
Wildlife Response		
EPO IS 5 Locate, identify and apply suitable response tactics to wildlife to prevent them from being contacted by oil or treat them if already contacted by oil	**EPS IS 5.1** Establish Wildlife Branch if monitor and evaluate activities have confirmed that wildlife is at risk of being contacted or have already been contacted by the spill	**MC IS 5.1.1** Records demonstrate that Wildlife Branch established if wildlife impacts confirmed via monitor and evaluate activities
	EPS IS 5.2 Conduct oiled wildlife operations in accordance with COPPA's Oiled Wildlife Response – Implementation Plan (ALL/HSE/PLN/025)	**EPS IS 5.2.1** Records demonstrate that oiled wildlife operations were conducted in accordance with COPPA's Oiled Wildlife Response – Implementation Plan (ALL/HSE/PLN/025)
Waste Management		
EPO IS 6 Collect, manage, transport and dispose of waste produced from response options to minimise secondary contamination of sensitive receptors	**EPS IS 6.1** Use the COPPA Waste Management Plan as guidance to collect, manage, transport and dispose of waste produced from response options	**MC IS 6.1.1** Records demonstrate that the COPPA Waste Management Plan was used as guidance to collect, manage, transport and dispose of waste produced from response options
	EPS IS 6.2 Waste management, storage, transport and disposal will comply with relevant legislation, conventions and standards, including: • MARPOL 73/78 (as appropriate to vessel class), including: - MARPOL 73/78, Annex I (Prevention of pollution by oil) - MARPOL 73/78 Annex II (Control of pollution by noxious liquid substances in bulk) • Relevant NT and Commonwealth Regulations, including: - Marine Order 91 (Marine pollution prevention – oil) (as appropriate for vessel class)	**MC IS 6.2.1** Records demonstrate waste generated during a hydrocarbon spill response is managed, stored, transported and disposed of in accordance with relevant legislations, conventions and legislation, including: • MARPOL 73/78 Annex I and Annex II • Marine Order 91 • Waste Management and Pollution Control Act 2015

EPO	Performance Standard	Measurement Criteria
	- Waste Management and Pollution Control Act 2015 (NT)	
	EPS IS 6.3 ConocoPhillips to maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of waste management activities.	**MC IS 6.3.1** Records demonstrate that ConocoPhillips maintains contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of shoreline clean-up tactics
EPO IS 7 Implement relevant Operational and Scientific Monitoring Plans	**EPS IS 7.1** IMT will ensure operational and scientific monitoring initiation criteria are reviewed during the initial Incident Action Plan (IAP) and subsequent IAPs, and if any criteria are met, the relevant Operational Monitoring Plans (OMPs) and/or Scientific Monitoring Plans (SMPs) will be activated	**MC IS 7.1.1** Records demonstrate that the IMT reviewed operational and scientific monitoring initiation criteria during the initial and subsequent IAPs, and when criteria were met, the relevant OMP and/or SMP was activated
	EPS IS 7.2 ConocoPhillips maintains the capability and capacity to deliver the OSMP through: • OSMP Implementation Plan describes the process for implementing the operational and scientific monitoring programs • Individual OMP and SMP methodology describe data acquisition techniques, personnel and equipment required to conduct OMPs and SMPs ConocoPhillips maintains access to OSMP resources through contracts with service and equipment providers listed in Attachment C of the OPEP	**MC IS 7.2.1** Records demonstrate OSMP carried out in accordance with the following: OSMP Implementation Plan Individual OMP and MSP methodologies Service provider and equipment provider contracts in place and maintained in accordance with Attachment C of the OPEP

7.9.5 Operational and Scientific Monitoring Plan

ConocoPhillips' ABU Operational and Scientific Monitoring Program (OSMP) (ALL/HSE/PLN/032) describes a program of monitoring oil pollution that will be adopted in the event of a hydrocarbon spill incident (tier 2 or 3) to marine or coastal waters. The OSMP is the principal tool for determining the extent, severity, and persistence of environmental impacts from a marine hydrocarbon spill and informing remediation activities.

The OSMP is structured so that it can provide a flexible framework that can be adapted to individual spill incidents. The OSMP provides an overarching framework, applicable to all assets where COPPA is the Nominated Titleholder.

7.9.5.1 Operational Monitoring Focus Areas

Operational monitoring is undertaken during the course of a spill and comprises physical, chemical and environmental assessments. Operational monitoring collects information about the spill and associated response activities to aid situational awareness, planning and decision making for executing spill response or clean-up activities. Information collected from operational monitoring provides details about the extent and quantity of contamination and the effectiveness of response activities. This information includes monitoring the properties of the hydrocarbons released, including the state of weathering, bioavailability and spatial extent of the spill. Continued operational monitoring is used to determine the point at which no further environmental improvement outcomes can be achieved through continued response implementation. This monitoring will then finish when the spill response is terminated, usually because response objectives were met, and/or scientific monitoring was initiated.

7.9.5.2 Scientific Monitoring Focus Areas

Scientific monitoring focuses on the short- and long-term environmental impact assessment. It may occur in parallel to operational monitoring and can continue for some time after the spill event. Scientific monitoring addresses defined objectives and collects information to determine the potential short- and long-term and/or ongoing environmental impact attributable to the spill or the associated response activities and informs the requirements for scientific research and any potential remediation activity.

7.9.5.3 Reporting

Operational monitoring reporting will be provided on a daily basis to the IMT to maintain situational awareness and inform response option planning. Scientific monitoring reporting requirements will be specific to the individual monitoring plans initiated and are likely to include interim reports. The terms of responsibilities, report templates, schedule, quality assurance/quality control and peer review (if required) will be agreed with the nominated Environmental Service Provider(s) engaged to implement the individual monitoring plans.

Operational and scientific monitoring results will be discussed with relevant stakeholders as identified at the time. Monitoring reports will be shared with regulatory agencies/authorities if requested and inputs received from stakeholders will be evaluated and where practicable, will be used to refine the ongoing spill response and/or ongoing operational and/or scientific monitoring. The form, frequency, and content of discussions and reporting will be appropriate to the nature and scale of the incident.

7.9.5.4 Personnel and Response Readiness

COPPA has a number of existing contracts, master service agreements, and business support relationships and alliances with service providers in place to provide support in the event of a spill, as outlined in the OPEP, and additional contracts will be in place with Environmental Service Providers prior to the commencement of the activity, to deliver the OMPs and SMPs as required. The OSMP includes an implementation strategy together with individual operational and scientific monitoring plans.

Indicative OSMP mobilisation time frames for personnel and resources are included in

Appendix F: OSMP Summary Table

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7.9.5.5 Initiation and Termination of the OSMP

Criteria for initiating and terminating individual monitoring plans are provided in **Appendix F**: OSMP Summary Table

. The final decision on activation and termination of the monitoring plans will be signed off by the ConocoPhillips IC, in consultation with the ConocoPhillips Environment Unit Lead. Additional stakeholders that may be consulted on initiation and termination include the following:

- AMSA if the spill is from a vessel;
- AMOSC and Environmental Service Providers;
- NT DoT personnel if the spill has entered, or has the potential to enter Territory waters;
- DoEE, if MNES are predicted to be affected; and
- NT Fisheries Department's and Australian Fisheries Management Authority (AFMA).

7.9.6 Cyclone and Severe Weather Response

Cyclones and other severe weather events are a potential risk to the safety and health of personnel. The timing of pipeline installation activities may overlap with the cyclone season (November to April, with most cyclones occurring between January and March). Vessel contractors must have a Cyclone Response Plan in place outlining the processes and procedures that would be implemented during a cyclone event, which will be reviewed and accepted by COPPA.

Activity vessels will receive daily forecasts from the BoM. If a cyclone (or severe weather event) is forecast, the path and its development will be plotted and monitored using the BoM data. If there is the potential for the cyclone (or severe weather event) to affect pipeline installation activities, the Cyclone Response Plan will be actioned. If required, vessels can transit away from the proposed track of the cyclone (or severe weather event).

7.9.7 Emergency and Spill Response Drills, Exercises and Audits

Exercises and drills are conducted annually to test the arrangements of the OPEP. The exercises are scheduled in the Crisis and Emergency Management Training Schedule which is located in the ABU Annual Exercise Plan folder, and include a number of exercise types, as outlined in **Table 7-6**.

Table 7-6: Exercise Types

Exercise Type	Description
Notification drill	Test procedures to notify and activate the IMT, oil spill response organisations, third party providers and regulators
Desktop drill	Normally involves interactive discussions of a simulated scenario amongst IMT members, but does not involve the mobilisation of personnel or equipment
Incident Management Exercise	Involves IMT activation to establish command, control, and coordination of a Tier 2 or 3 incident. Can simulate several different aspects of an oil spill incident and may involve third parties

The purpose of this testing is to confirm that the response arrangements and capability in place is available when needed and function as intended. As part of the exercise process, ConocoPhillips prepares a number of documents to ensure drills and exercises are well planned, conducted and evaluated. To support this, the following documents are used:

- ABUW Exercise Scope Document – provides background context to the exercise, outlines the exercise need, aim, objectives, details of the scenario, participating groups and agencies, exercise deliverables and management structure. This document can be used to engage a third-party contractor to assist in conducting the exercise
- Exercise plan and instructions – provide instructions and 'play' (including any injects) for conducting the exercise
- Post exercise report – includes an after-action review of the exercise, evaluating how the exercise performed against meeting its aim and objectives.

ConocoPhillips ABU-W routinely undertakes post-exercise debriefings following Tier 2-3 OPEP exercises and drills to identify opportunities for improvement and communicate lessons learned. All actions that are derived from drills and exercises including debriefs are documented in the HSE Action Tracking System (HATS).

The following exercises and drills will be conducted to specifically test response preparedness outlined within the scope of the OPEP (DCOM-652-EN-OPE-00001):

- test of arrangements when they are introduced or significantly amended;
- test of arrangements if a new location or activity is added to the EP after response arrangements have been tested, and before the next test is conducted; and
- IMT desktop exercise conducted at least annually. This desktop exercise will test the arrangements in place for a Tier 2 or Tier 3 level spill as defined in the OPEP (DCOM-652-EN-OPE-00001). Where response arrangements are the same for a number of activity specific OPEPs, one exercise may be used to test these response arrangements for these OPEPs at the same time.

7.10 ROLES AND RESPONSIBILITIES OF PERSONNEL

In general, it is the responsibility of all personnel to act in an environmentally sustainable manner and to follow the environmental procedures detailed within this EP. The production cessation contractor's HSEMS will ensure that responsibilities for environmental performance are clearly delegated, all personnel are aware of their roles/responsibilities and personnel achieve adequate training on environmental issues. The suitability of the Pipeline production cessation contractor to undertake the proposed work, including their HSEMS and past HSE performance, will be evaluated during the contractor evaluation phase of the project planning.

As detailed in **Section 1.5**, the titleholder and nominated operator of the Pipeline is COPPA. The DLNG Plant and the Pipeline from the beach valve to the plant is also operated by COPPA.

7.10.1 Production Cessation

The roles and responsibilities for production cessation activities for ConocoPhillips ABU-W and contractor personnel are outlined in **Table 7-7** and **Table 7-8** respectively. In the event of any emergency, response teams based on ConocoPhillips ABU-W Crisis and Emergency Management structure will be formed, as outlined in **Section 7.4.3**.

Table 7-7: ConocoPhillips ABU-W production cessation roles and responsibilities

Role	Responsibilities
VP Operations, Drilling and Supply Chain	The VP Operations, Drilling and Supply Chain has overall accountability for Bayu-Undan and DLNG Operations and the contribution toward activities that are managed out of each facility.
Integrated Operations Support Manager	The Integrated Operations Support Manager has overall responsibility for the safe operations and integrity of the Pipeline and: • provides sufficient resources to implement the management controls in this EP • confirms production cessation activities are undertaken in accordance with this EP

	• actions the management controls, as detailed in the EPSs in this EP (**Section 6**), as required, during operations and prior to the commencement of the production cessation activities; • Confirm production cessation activities meets the requirements of the ConocoPhillips HSEMS and relevant standards/procedures.
Bayu-Undan Operations Manager	The Bayu-Undan Operations Manager has overall responsibility for the safe operations, and integrity of the Pipeline and is responsible to ensure the effective implementation and compliance with this EP, including • Providing resources required to enable the commitments in this EP to be maintained; • Tracking and close out of any corrective actions raised from environmental audits as required by this EP; • Confirming the reporting of environmental incidents meets both external and ConocoPhillips ABU-W incident reporting requirements.
Marine Director	Confirm vessel vetting as per ABU-W Support Vessel Requirements Document No: IOSC/OPS/GLN/001 and obtain approvals from Corporate Marine Assurance for all vessels undertaking production cessation activities on the Pipeline Conduct relevant inspections to confirm vessels are in compliance with relevant Marine Orders and ConocoPhillips marine standards/procedures and on boarding requirements to meet pollution prevention safety, navigation and emergency response requirements
IOSC HSE Team Leader	The HSE Team Leader reports to the VP HSE and has a dotted line reporting arrangement to the VP Operations, Drilling and Supply Chain. They are responsible for monitoring HSE performance and promoting compliance and continual improvement of the HSEMS as well as providing technical support in HSE, Risk and Security Management.
Asset Integrity and Process Safety Lead	The Asset Integrity and Process Safety Lead reports to the Technical Manager and is responsible for: • ensuring production cessation Contractors attend an environmental induction upon commencing work on the production cessation activities. • tracking and close out of any corrective actions raised from environmental audits as required by this EP. • communicating any changes to the Pipeline activity that may affect the EPOs, EPSs and MC detailed in this EP to the ConocoPhillips ABU-W HSE team.
Subsea and Pipeline Engineer	The Subsea and Pipeline Engineer reports to the Asset Integrity and Process Safety Lead and is responsible for: • providing engineering assistance in the planning and scheduling of production cessation activities; • communicating activity-specific EP requirements to the production cessation vessel crew; and • confirming the reporting of environmental incidents meets both external and ConocoPhillips ABU-W incident reporting requirements.
Crisis and Emergency Management Specialist	Crisis and Emergency Management Specialist is responsible for: • assuring emergency response drills are undertaken as per the schedule outlined in this EP & OPEP. • developing ConocoPhillips ABU-W Crisis Management and Emergency Response Plans and Procedures • providing input into NEBA for response strategies
Environmental Supervisor / Environment Specialist	• Confirm environmental audits are undertaken as outlined in this EP; • Develop Pipeline EP documents, including EPs and OPEPs, for submission and acceptance by NOPSEMA; and • Provide environmental induction to production cessation vessel staff.
Senior External Relations Advisor	• Prepare and implement the stakeholder consultation program supporting all production cessation activities;

	• report on any stakeholder consultation received in relation to the production cessation activities; and • Undertake ongoing engagement with relevant stakeholders for the duration of production cessation activities, as required.
COPPA Client Site Representative (CSR)	The CSR will liaise with the Survey Contractor Party Chief, ensuring operations are completed to standard and that COPPA's requirements are adhered to. The CSR will represent the client on-site for any decisions that need to be made and will be in direct regular contact (at least daily) with the COPPA Engineering Project Manager. The CSR is responsible for conducting and lodging daily vessel reports, identifying and investigating any non-conformances with this EP and initiating incident reports.

Table 7-8: Contractor roles and responsibilities

Role	Responsibilities
Contractor Operations Manager	The Contractor Operations Manager is responsible for ensuring that vessel-based production cessation activities are carried out in accordance with this EP.
Vessel Owner	• Provide the Vessel Master with the resources to safely and efficiently fulfil the vessel requirements detailed in this EP
Vessel Master	• Confirm vessel management system and procedures are implemented and comply with the requirements detailed in this EP • Confirm personnel receive an environmental induction that meets the requirements outlined in this EP on commencing work on the vessel • Confirm crew personnel are competent to undertake the assigned work tasks • Confirm SOPEP drills are undertaken in accordance with the vessel's schedule • Confirm vessel crew are provided with sufficient training to implement the SOPEP/SMPEP (as appropriate to vessel class) • Report any environmental incidents or non-conformances with the EPOs, EPSs or MC in this EP, as soon as practicable to the COPPA Client Service Representative
Contractor Party Chief (Pipeline Inspection & Maintenance Contractor)	The Contractor Party Chief will be responsible for the production cessation operations.
All Offshore Staff	• Act in an environmentally responsible manner • Comply with this EP and all regulatory requirements as applicable to assigned role • Report any unsafe conditions, near misses or environmental incidents immediately to supervisors • Attend environmental inductions and HSE meetings, and complete training as required

7.10.2 Incident Management

ConocoPhillips implements a tiered Emergency Management Framework in response to incidents, which is scaled in accordance with operational requirements. The Framework is based on the Incident Command System (ICS), and is compatible with the Australasian Inter-service Incident Management System (AIIMS) and National Plan for Maritime Environmental Emergencies (National Plan).

The structure of the Framework and the teams activated at various incident classifications is shown in **Figure 7-5**. Refer to **Section 7.9** for further information on response preparedness. Roles and responsibilities for crisis and incident management are described below.

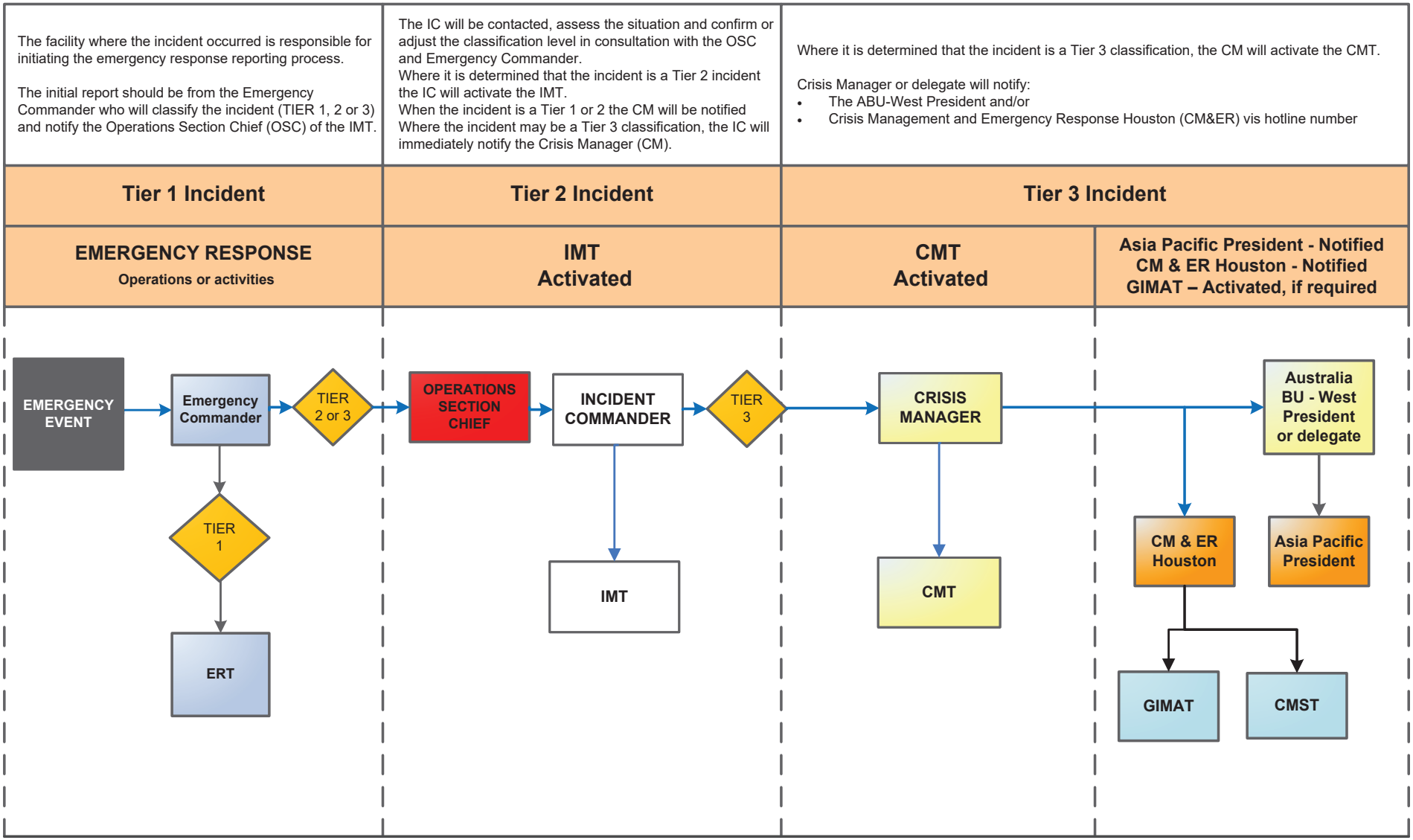


Figure 7-5: ConocoPhillips ABU-West tiered incident response framework

7.10.2.1 Incident Management Team (IMT)

In the event of an emergency, the ConocoPhillips ABU-W IMT will be mobilised. The IMT consists of Tactical Command, Operational, Planning, Logistic, and Support personnel. It is responsible for providing advice, logistical support and managing the operational and technical aspects of an incident response in support of the Emergency Response Team (ERT). In the case of a hydrocarbon spill from a vessel, the Vessel Master is the key member of the ERT and manages the shipboard response via the vessel Shipboard Oil Pollution Emergency Plan (SOPEP). The roles and responsibilities of key members of the IMT are defined in the Crisis and Incident Management Plan ALL/HSE/ER/001. During an incident, whenever any command or control position is transferred from one person to another, a formal handover will occur to ensure continuity during the response.

Two specialist Operations Section Chiefs exist within the IMT. One Operations Section Chief specialises in Production emergencies and the other in drilling / exploration. The nature of the emergency will determine which Operations Section Chief is mobilised; however, both can be used if required to provide additional support.

The IMT objectives are to:

- provide timely operational support to the ERT;
- protect employees, contractors and members of the public from injury or illness because of an incident;
- minimise injury to people and damage to assets and the environment;
- liaise with appropriate support agencies to assist ERT members in emergency situations;
- develop an Incident Action Plan (IAP);
- complete incident related communication and notifications to external parties; and
- provide regular information updates to the CMT.

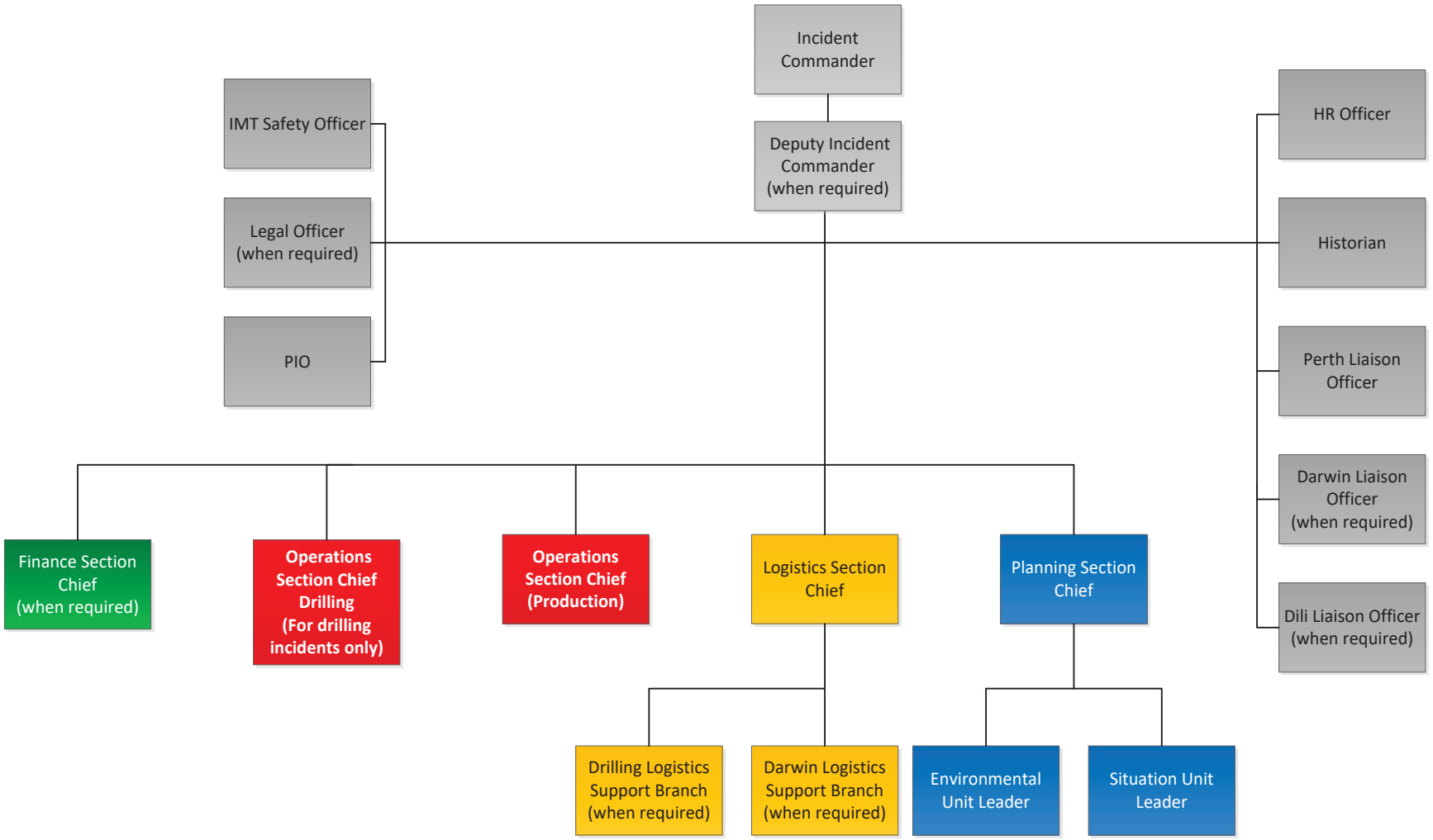


Figure 7-6: IMT structure

IMT Composition

To provide effective support and advice to the ERT at the site or facility, the IMT for Tier 2 and 3 incidents will be made up of the following roles and can be scaled up or down as required:

- Incident Commander (Deputy Incident Commander when required);
- Operations Section Chief;
- Planning Section Chief;
- Logistics Section Chief (Supplemented by Logistics Support as required);
- Liaison Officer (Darwin Liaison Officer when required);
- Safety Officer;
- Situation Unit Leader;
- Environmental Unit Lead;
- Public Information Officer;
- HR Officer;
- Legal Officer (As required);
- Finance Section Chief (As required); and
- Historian.

Key roles and responsibilities for ConocoPhillips ABU-W personnel for incident response are outlined in Table 7-9.

Table 7-9: Roles and responsibilities of key IMT personnel

Role	Responsibilities
Incident Commander	• Overall management of incident response operations • Assess the situation and confirm or adjust the classification (tier) level in consultation with the Operations Section Chief and Emergency Commander • Notify the Crisis Manager of event and initial response tier • Set objectives for IMT • Confirm Incident Action Plan (IAP) is being developed and approve IAP • Validate that relevant regulators and other authorities have been notified • Consider and request Global Incident Management Assist Team (GIMAT) support via Houston • Approve Incident Demobilisation Plan
Operations Section Chief	• Assist in classifying the emergency (Tier 1,2,3) in consultation with the site Emergency Commander and maintain open line of communication • Inform Incident Commander of emergency notification and tier level and maintain an open line of communication • Provide overview of response operations at initial IMT brief • Communicate incident updates provided by the Emergency Commander to IMT through meetings and team briefs • Provide incident details to the Planning Section Chief and Situation Unit Lead for development of Initial IAP and help develop incident objectives and strategies • Determine operational areas e.g. staging areas, forward command, incident area, oiled wildlife receiving and demobilisation areas • Contribute to the preparation and implementation of the Incident Demobilisation Plan
Planning Section Chief	• Consider incident escalation potential and predication for incident

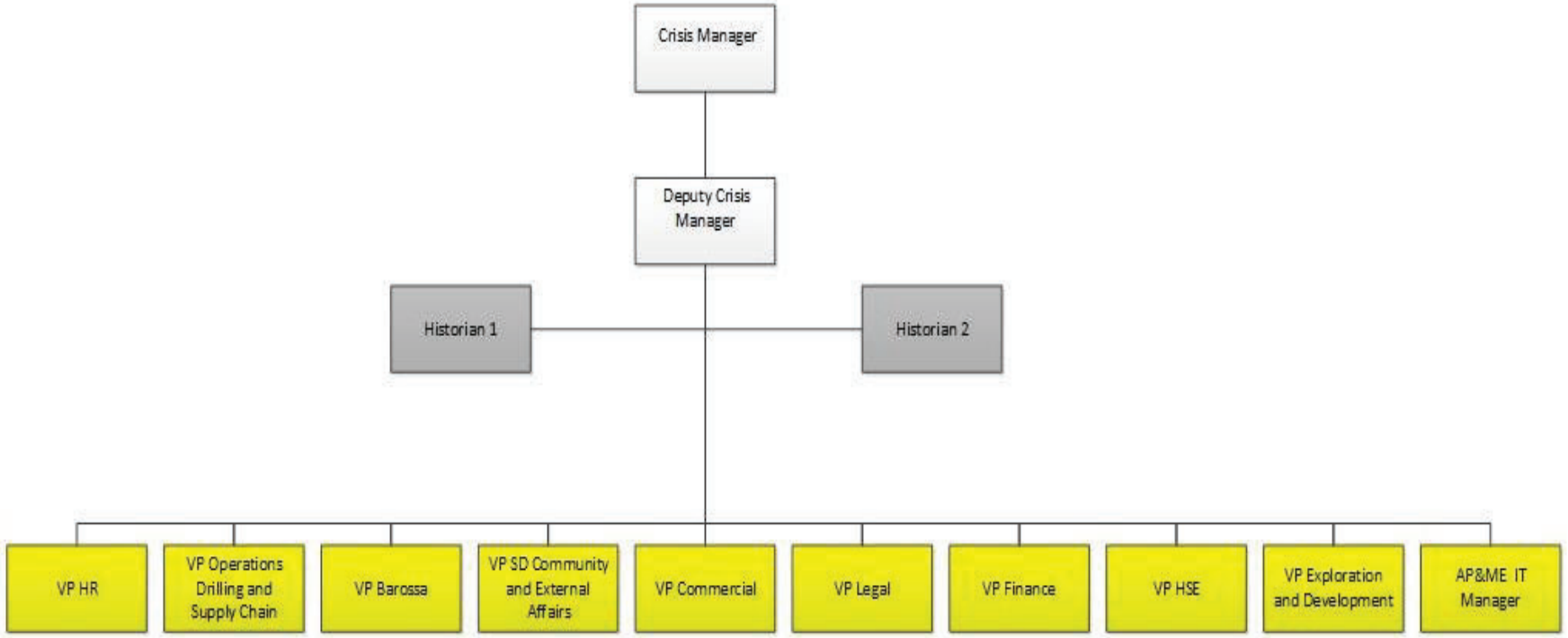
Role	Responsibilities
	• Develop Initial IAP in conjunction with Operations Section Chief and Situation Unit Lead • Liaise with Logistics, Safety Officer and Environment Unit Leads as to requirements to complete response strategies • Facilitate/Chair IMT meetings • Monitor situation reports and update Emergency Operations Centre (EOC) status displays with additional information and adjust IAP as necessary • Prepare the Incident Demobilisation Plan
Logistics Section Chief	• Source all logistical requirements to complete response operations, including personnel, equipment and supplies for ongoing incidents. • Upon approval from IC, source third party resources (e.g. vessels, helicopters) to assist in response operations • Liaise with Planning Section Chief on specialist resource requirements being considered in response strategies. Verify availability as this may affect strategy selection
Environment Unit Lead	• Activate oil spill response organisations upon approval of the IC • Notify external agencies and regulators of spill (as detailed in activity specific OPEPs) • Undertake operational NEBA

7.10.2.2 Crisis Management Team

The CMT, under the leadership of the Crisis Manager, is responsible for the overall management of the incident from a strategic, legal, ethical and public image perspective. The structure of the CMT is illustrated in **Figure 7-7**.

The primary objectives are to:

- provide strategic guidance and support to the IMT as required;
- consider the strategic, legal and public image aspects of the incident;
- attend to all public media issues;
- develop a Crisis Management plan to coordinate all actions;
- communicate with internal and external stakeholders;
- notify Crisis Management and Emergency Response – Houston, as appropriate; and
- comply with applicable regulatory requirements in an emergency situation.



The CMT membership will be determined by the Crisis Manager at the time of the incident and may not include all of the functions listed in this Org chart

Figure 7-7: CMT structure

7.10.2.3 Global Incident Management Assist Team (GIMAT)

GIMAT is a specialist incident management team. Members are located globally and can be readily mobilised to support and integrate into a business unit IMT that requires additional resources to manage the incident or is required to maintain sustained IMT operations over an extended duration incident.

GIMAT personnel are skilled in specific incident management disciplines that enhance the capabilities and capacity of the IMT. The key role of the GIMAT is to support the ABU-West IMT with specialist functions. The GIMAT is not responsible for taking control of an incident from ABU-West. It will provide comprehensive support to ensure that IMT activities are undertaken effectively.

8. STAKEHOLDER CONSULTATION

In accordance with the requirements of Regulations 11A and 14(9) of the OPGGS(E) Regulations, ConocoPhillips has engaged with interested and relevant stakeholders while preparing this EP. This section outlines ConocoPhillips' stakeholder consultation principles, approach and methodology, how these were applied to this specific consultation program, the outcomes achieved and how stakeholders will be consulted on an ongoing basis. ConocoPhillips has considered and addressed all feedback as appropriate and provided a detailed summary table supported by all relevant correspondence records.

8.1 APPROACH AND OBJECTIVES

ConocoPhillips understands the importance of thorough, meaningful and ongoing consultation with stakeholders as part of its social licence to operate and fulfilment of regulatory commitments. Our approach to consultation is embedded in our SPIRIT Value of integrity, which states that we will be ethical and trustworthy in our relationships with stakeholders.

ConocoPhillips' 'Principles for Effective Non-Financial Stakeholder Engagement' provide corporate guidance and expectations and commit ConocoPhillips to:

- proactively identifying and engaging with stakeholders at an early stage;
- including stakeholders in the design and implementation of the engagement process;
- listening to understand stakeholders' interests, concerns and culture;
- communicating openly and transparently;
- seeking solutions that create mutually beneficial business and engagement approaches and build long-term value for both the Company and our stakeholders;
- following through on our commitments and being accountable for the results, both internally and externally.

This approach is implemented through ConocoPhillips' stakeholder management standards, systems and practices and reflective of approaches commonly adopted by the oil and gas industry, within Australia and internationally. More specifically, it addresses stakeholder consultation requirements for Environment Plans established under OPGGS (E) Regulation 11A and 14(9) and aligns with NOPSEMA's consultation guidance on the application of the Regulations. The key sources of guidance for stakeholder engagement used by ConocoPhillips are summarised in **Table 8-1**.

Table 8-1: Stakeholder engagement guidance sources

Internal	• Corporate Principles for Stakeholder Engagement • Corporate Stakeholder Engagement Action Plan
External	• Australian regulatory agencies (legislation and guidelines) – NOPSEMA, NT Department of Primary Industry and Resources (DPIR), Australian Fisheries Management Authority (AFMA) • Australian industry organisations (principles and methodology) – APPEA • International organisations (guidelines) – IPIECA, American Petroleum Institute (API), International Finance Corporation (IFC), International Association for Public Participation (IAPP)

ConocoPhillips is committed to ensuring that stakeholders are kept informed of its activities and that clear response mechanisms are in place to receive feedback on relevant issues to inform development of each EP. ConocoPhillips' HS&E Management System establishes, at Element 11, the requirements for engagement with stakeholders during the HS&E function conducting its activities.

For stakeholder engagement conducted in preparing environmental approval documentation, including this Environment Plan, the HS&E and External Relations functions work in collaboration to ensure the relevant regulations and associated consultation and content guidance provided by NOPSEMA and other relevant organisations are understood and followed.

The consultation program for the Bayu-Undan to Darwin Gas Export Pipeline Production Cessation EP was designed to meet the following objectives:

- inform stakeholders of future plans for the Bayu-Undan Gas Export Pipeline and the scope of activities to be covered in the EP;
- explain how ConocoPhillips will identify and mitigate potential risks that may impact stakeholders;
- obtain information and advice regarding oil spill response resources and capability;
- understand any concerns, objections or claims that stakeholders may have in relation to the EP;
- address stakeholder concerns arising from the EP and requirements for ongoing consultation;
- inform stakeholder/s about how their concerns have been addressed and how they will be represented to NOPSEMA in the EP.

ConocoPhillips has operated the GEP since 2005 and during this time has developed a strong understanding of the environmental values that exist in the area and the activities of the other marine environment users.

This understanding has been deepened by the interactions undertaken and relationships formed with a range of stakeholders including Commonwealth and NT Government departments, commercial fishing associations and licence holders, spill response agencies, contractors and non-government organisations.

The minimum period that should be afforded stakeholders for consultation on proposed activities prior to an EP's submittal to the regulator is not mandated in the governing regulations. As per NOPSEMA's guidelines, ConocoPhillips determined an appropriate timeframe based on the nature of the proposed activity and our understanding of the likely issues and concerns that may be raised by stakeholders and need to be addressed and discussed with them.

In the case of this EP, an 11-week consultation period was determined as appropriate considering the nature and scale of the activity, specifically:

- The relevant GEP section is in water depths ranging from ~50m to ~135m and entirely within Commonwealth waters with the exception of the ~42 km in the Joint Petroleum Development Area (JPDA). This location minimises the opportunity for direct interaction with other marine users;
- The GEP is an established facility. ConocoPhillips consulted extensively with stakeholders at the time of its construction and commissioning;
- The activity duration is expected to be four-to-six-weeks;
- Consultation was also undertaken in 2018 for renewal of the existing GEP operations EP and no major concerns were identified by stakeholders;
- Pipeline operations to date have not resulted in any major incidents that would trigger potential ongoing interest or concern from stakeholders; and
- The dry natural gas inventory contained in the Pipeline represents a low environmental risk.

The 11-week period comprised an initial four weeks afforded to all interested and relevant stakeholders followed by a five-week period of direct follow-up by ConocoPhillips with all relevant stakeholders. An additional two weeks was allocated if required to finalise input.

Following each formal EP consultation period ConocoPhillips' practice is to continue assessing, responding to and recording any further feedback that may be provided prior to EP submittal.

8.2 IDENTIFICATION AND CLASSIFICATION

Consistent with Regulation 11A of the OPGGS(E) Regulations, ConocoPhillips must define stakeholders as either 'relevant' or 'interested'. The Regulations state that 'relevant' stakeholders are:

- persons or organisations whose functions, interests or activities may be affected by the production cessation activities; and
- those that have a regulatory role (Commonwealth or State/Territory).

Prior to development of the EP, ConocoPhillips reviewed its stakeholder database to verify all existing stakeholders that would be relevant to this activity and ensure any new stakeholders were captured.

An internal exercise then identified potential stakeholder-specific issues that needed to be addressed and cross-referenced these with the outcomes from the ENVID workshop and risk assessment conducted by HS&E as part of the EP preparation process. Around 50 stakeholders were identified as relevant for this EP.

Stakeholder groups identified included Commonwealth Government Departments and Agencies, fishing industry councils and commercial fishing licence-holders and guided fishing companies operating close to the GEP within Commonwealth Waters. Spill response agencies with a role to play should an incident occur during the proposed activities were also consulted during preparation of the OPEP.

Issues, risks and opportunities associated with the project were mapped to stakeholders' interests. To ensure consistency with regulatory requirements, ConocoPhillips adapted its categorisation and definition of stakeholder groups to broadly align with those used by NOPSEMA.

Within the broad stakeholder groupings, the stakeholders listed in Table 8-2 were identified as being interested or relevant for Commonwealth waters and NT Coastal Waters (for OPEP).

Table 8-2: Full list of stakeholders

Organisation	Stakeholder Group
Relevant	
A. Raptis & Sons Pty Ltd	Industry
Amateur Fishermen's Association of the Northern Territory (AFANT)	Other marine users
Aquarium Fishery NT Commercial License Holders	Industry
Arafura Bluewater Charters	Industry
Austfish Pty Ltd	Industry
Austral Fisheries Pty Ltd	Industry
Australia Bay Seafoods	Industry
Australian Fisheries Management Authority (AFMA)	Commonwealth Gov
Australian Marine Oil Spill Centre (AMOSC)	OPEP
Australian Maritime Safety Authority (AMSA)	Commonwealth Gov/OPEP
Australian Southern Bluefin Tuna Industry Association	Associations
Beach Energy	Industry
Carnarvon Petroleum	Industry
Commonwealth Fisheries Association	Associations
Darwin Port Corporation	NT Gov/OPEP
Demersal Fishery NT Commercial License Holders	Industry

Organisation	Stakeholder Group
Department of Agriculture & Water Resources, Commonwealth	Commonwealth Gov
Department of Defence (inc Australian Hydrographic Service and Maritime Border Command)	Commonwealth Gov
Department of Foreign Affairs and Trade	Commonwealth Gov
Department of Industry, Innovation and Science	Commonwealth Gov
Department of Infrastructure, Planning and Logistics NT	OPEP
Department of Primary Industry and Resources (Fisheries) NT	NT Gov
Department of the Environment and Energy (inc Parks Australia)	Commonwealth Gov
ENI Australia	Industry
Fischer, Horst (commercial fishing license holder)	Industry
INPEX	Industry
Jamaclan Marine Services	Industry
Melbana Energy	Industry
Monsoon Aquatics	Industry
Neptune Energy	Industry
Northern Oil & Gas	Industry
Northern Prawn Fishery (NPF)	Associations
Northern Territory Guided Fishing Industry Association (NTGFIA)	Other marine users
Northern Territory Seafood Council (NTSC)	Associations
Northern Wildcatch Seafood Australia	Industry
Octanex	Industry
Offshore Net and Line Fishery Commercial License Holders	Industry
Oil Spill Response Ltd	OPEP
Paspaley Pearling Company	Industry
Pearl Oyster Fishery Commercial License Holders	Industry
Santos	Industry
Shell	Industry
Spanish Mackerel Fishery (NT) License Holders	Industry
Tellurian Inc	Industry
Timor Reef Fishery License Holders	Industry
WA Fishing Industry Council (WAFIC), representing Western Tuna and Billfish Fishery license holders	Associations
WA Seafoods	Industry
Interested	
Australian Institute of Marine Science	Research
Australian Marine Conservation Society	NGO
Australian Petroleum Production & Exploration Association	Industry
Bathurst Island Lodge	Other marine users
Centre for Whale Research	Research
Chamber of Commerce NT	Associations

Organisation	Stakeholder Group
Charles Darwin University	Research
Clearwater Island Lodge	Other marine users
CSIRO	Research
Department of Environment and Conservation WA	WA Gov
Department of Environment and Natural Resources, NT	NT Gov
Department of Environment Regulation WA	WA Gov
Department of Fisheries WA	WA Gov
Department of Mines, Industry Regulation and Safety WA	WA Gov
Department of the Chief Minister NT	NT Gov
Department of Tourism and Culture, NT	NT Gov
Department of Trade and Business Innovation NT	NT Gov
Environment Centre NT	NGO
Environmental Defenders Office NT	NGO
Environmental Protection Authority NT	NT Gov
Federal Member for Solomon NT	Commonwealth Gov
Fisheries Research Development Council NT	Research
Geoscience Australia	Commonwealth Gov
Member for Arafura, NT	NT Gov
Monash University	Research
NAILSMA	NGO
National Energy Resources Australia	Commonwealth Gov
NOPTA	Commonwealth Gov
Northern Land Council	NGO
NT Port and Marine	OPEP
Office of Aboriginal Affairs	NT Gov
Office of the Chief Minister NT	NT Gov
Office of the Leader of the Opposition NT	NT Gov
Office of the Minister for Energy and Environment Cwlth	Commonwealth Gov
Office of the Minister for Environment and Natural Resources NT	NT Gov
Office of the Minister for Indigenous Affairs Cwlth	Commonwealth Gov
Office of the Minister for Industry, Innovation and Science Cwlth	Commonwealth Gov
Office of the Minister for Infrastructure, Planning and Logistics NT	NT Gov
Office of the Minister for Primary Industry and Resources NT	NT Gov
Office of the Minister for Resources and Northern Australia Cwlth	Commonwealth Gov
Office of the Minister for Tourism and Culture, NT	NT Gov
Office of the Minister for Trade, Business and Innovation, NT	NT Gov
Office of the Senator for the Northern Territory	Commonwealth Gov
Origin Energy	Industry
Pearl Producers Association	Associations

Organisation	Stakeholder Group
Pendoley Environmental	Research
Power & Water Corporation NT	Industry
RPS Group	OPEP
Sea Turtle Foundation	NGO
Shadow Minister for Industry, Innovation and Science Cwlth	Commonwealth Gov
Shadow Minister for Resources and Northern Australia Cwlth	Commonwealth Gov
Shadow Parliamentary Secretary for Northern Australia Cwlth	Commonwealth Gov
Tiwi Land Council	NGO
Whale and Dolphin Conservation (WDC)	NGO
Wilderness Society	NGO
World Wide Fund for Nature (WWF)	NGO

8.3 METHODS AND TOOLS

During consultation supporting an EP, ConocoPhillips is mindful of NOPSEMA guidance which advises that the time required for consultation varies depending on the individual circumstances of the relevant person, the proposed activity, the extent of potential impact to that relevant person and the level of information that has been provided. For this EP, ConocoPhillips incorporated the updated requirements around sensitive information contained in Regulation 4. Each stakeholder to provide feedback was asked to advise ConocoPhillips if any information provided during consultation was sensitive information which should not be published.

During the consultation period, ConocoPhillips sought to provide all stakeholders with appropriate time to assess the information provided and consider ConocoPhillips' responses.

Stakeholder engagement for this EP occurred over a total of 11 weeks in two stages:

- Initial feedback period for all interested and relevant stakeholders including an additional week for any late feedback - 15 March 2019 to 12 April 2019 (approx. four weeks);
- Direct follow-up by ConocoPhillips with all relevant stakeholders - 15 April to 17 May 2019 (approx. five weeks);
- Additional time (approx. two weeks to 31 May 2019) was provided to ensure incorporation of any late comments if required.

On 15 March 2019, a fact sheet was provided under covering email or letter to all stakeholders, whether designated as 'relevant' or 'interested'. The information provided included the GEP location and map, summaries of the GEP's existing purpose, the scope of production cessation activities, environmental management, regulatory and consultation process. Feedback was requested by 12 April 2019. During this period ConocoPhillips responded via email to all correspondence.

After waiting a further week for any late feedback or enquiries, ConocoPhillips started a period of direct follow-up via phone and email with all 'relevant' stakeholders. During this period ConocoPhillips left detailed messages when unable to contact stakeholders and continued to respond via email to all feedback.

After the direct follow-up period, ConocoPhillips set aside an additional period to ensure any further comments could be incorporated into the EP. At the end of this period all relevant stakeholders were advised that the EP was in its final stage of preparation and were thanked for their input.

During consultation, most stakeholders did not provide any written feedback. Where stakeholders did provide written or verbal feedback, the consultation is summarised in **Table**

8.3 at the end of this section and full records provided in **Appendix E**. If a comment was provided by a stakeholder during a phone discussion but not followed-up by the stakeholder with an email, ConocoPhillips initiated its own summary of the issues raised and its assessment back in writing to the stakeholder.

All relevant/interested stakeholders who raised either written or verbal issues, concerns or claims during the consultation process were provided with written details, where required, indicating how their concerns had been or would be addressed.

Throughout the consultation process, ConocoPhillips sought to provide fully considered and appropriate written responses to issues as soon as possible, dependant on the nature of the required response and the information that was available to be provided.

If responses could not be provided within the original advised response period, ConocoPhillips advised stakeholders as such and provided an update to the stakeholder as to when a written response would be provided.

All stakeholder feedback received over the duration of the stakeholder engagement program, including post the formal consultation period and prior to EP submittal, has been recorded and is stored in ConocoPhillips' records management system. A record of all relevant meeting notes, phone calls and email exchanges, along with copies of project letters and fact sheets have been incorporated in **Appendix E**: Stakeholder Consultation to this EP.

8.4 CONSULTATION OUTCOMES

The majority of stakeholders did not have specific issues or concerns, as evidenced by the detailed consultation summary and records of correspondence. A small number of stakeholders made reference to decommissioning activities which, as mentioned in the initial fact sheet, are outside the scope of this EP and will be the covered in a future EP.

ConocoPhillips believes the limited response is predominantly due to the fact the Pipeline is an existing piece of infrastructure and its safe operation since 2005 has not raised any significant stakeholder issues or concerns.

The predominantly remote location of the Pipeline section to be isolated and the short duration of the activities also means the number of relevant stakeholders who will or may be impacted in their ability to conduct their activities is minimal.

The majority of stakeholders contacted by phone advised during the discussion that they were only likely to provide feedback via email if they had concerns. Many stakeholders advised that if an email was not received it could be assumed there were no concerns.

The following is a summary of the consultation outcomes for the key stakeholder groups while further detail for every stakeholder is provided in **Appendix E**: Stakeholder Consultation to this EP.

8.4.1 Commonwealth Government

A total of ten Commonwealth Government departments were contacted, including key regulatory agencies the Australian Fisheries Management Authority (AFMA), AMSA and Parks Australia within the Department of Environment and Energy. Eight offices of Ministerial and other political officeholders were also contacted.

Correspondence was received from Parks Australia, AFMA, AMSA and the Department of Defence. Parks Australia and AMSA both requested further information on the pipeline route and AFMA also recommended ConocoPhillips provide information on the activity to the Northern Prawn Fishery. The Department of Defence provided information on exercise training areas and the process for managing unexploded ordnance. ConocoPhillips provided timely responses and considers that no further action is required for these stakeholders for the preparation of the EP.

8.4.2 NT Government

While the scope of activities for this EP occurs in Commonwealth Waters and Timor-Leste

waters, ConocoPhillips contacted seven NT Government departments, including key regulatory agencies for the NT Coastal Water section of the Pipeline (outside this EP scope) the Mines and Energy and Fisheries divisions of the Department of Primary Industry & Resources (DPIR), the Environment division of the Department of Environment & Natural Resources and the Darwin Ports Corporation. Eight offices of Ministerial and other political officeholders were also contacted.

The Department of Primary Industry and Resources (Fisheries) in the NT asked to be kept informed of future decommissioning activities, recommended vessels take appropriate aquatic biosecurity precautions and suggested that information should be provided to the NT Seafood Council. ConocoPhillips provided the department with a copy of the tailored information provided to commercial fishing licence holders. No further concerns or issues were raised as a result.

8.4.3 Timor-Leste Government

As the Bayu-Undan field will revert to Timor-Leste jurisdiction following the ratification of the *Treaty Between Australia and the Democratic Republic of Timor-Leste Establishing Their Maritime Boundaries in the Timor Sea*, ConocoPhillips provided information on the proposed activities to the ANPM in Timor-Leste. The ANPM is responsible for managing and regulating petroleum and mining activities in Timor-Leste area, both offshore and onshore and in the Joint Petroleum Development Area (JPDA). The ANPM did not provide any response.

8.4.4 WA Government

With a short section of the pipeline crossing into Commonwealth waters within the WA Offshore area, four WA Government departments were contacted. No responses were received.

8.4.5 Associations

Of the seven associations contacted, the majority represent either commercial fishing licence-holders or recreational fishers. Following recent engagement with the Western Australian Fishing Industry Council (WAFIC) and the Northern Territory Seafood Council (NTSC), ConocoPhillips adjusted the approach to also engaging directly with the commercial fishing industry.

As requested by the associations, ConocoPhillips provided a tailored information sheet addressing issues and concerns ConocoPhillips believes are of relevance to commercial fishers. For this EP, coordinates showing the existing pipeline route and information on safety/exclusion zones likely to be in place where production cessation activities will take place were also provided.

Multiple attempts were made to seek responses from the NTSC and fishing licence-holders and no further comments were received. The WAFIC advised it was not relevant for this activity because no activity occurs within the short section of the Pipeline that traverses WA waters.

As indicated above, initial and tailored information was provided to all commercial fishing licence holders for the relevant fisheries identified via letter to their postal addresses. Follow up phone calls were made to key fishers and messages left via phone and email.

The Northern Prawn Fishery Industry (NPFI) was also provided with all relevant information and contacted directly. The NPFI had previously noted that the Pipeline had been in place for more than 10 years at a depth of 60 plus metres and ran along the seabed in an area not fished by their operators.

8.4.6 Industry/Business

Commercial fishing interests are the key industry stakeholders in their capacity as co-users of the Commonwealth waters within which the Pipeline is located. ConocoPhillips provided initial and tailored written information to more than 40 licence-holders across all relevant fisheries

and followed-up with phone calls to 12 businesses or individuals and their relevant association representatives. The limited number that responded either advised they had no concerns or would only respond if they had concerns or queries.

The other main industry with interests and/or operations in the area is the oil and gas industry and 11 companies were contacted. Again, the limited number that responded advised they had no concerns or would only respond if they had concerns or queries.

8.4.7 Other Marine Users

Recreational fishing and military exercises are the other key activities that are or can be active in the area. The recreational fishing representative organisation contacted did not express any concerns while the Commonwealth Department of Defence did not raise any concerns or queries.

8.4.8 Environmental Interest Groups

Nine environmental interest groups were provided written information and follow-up was made by phone to five of these, including the three NT-based organisations with no responses received.

8.4.9 Darwin Harbour Users

Darwin harbour users were contacted as stakeholders for the preparation of the OPEP. The main activity within the harbour is recreational fishing and boating and the key organisations and government agencies representing these interests were also contacted and did not express any concerns. The other oil and gas company using the harbour, INPEX, was also contacted and did not raise concerns.

8.4.10 Indigenous Groups

The Tiwi Islands are the nearest land mass to the Pipeline in Commonwealth Waters. The Tiwi Land Council, the governing indigenous-based organisation for the Islands was provided written information with follow-up phone contact and did not provide any feedback.

8.4.11 Research/Education Groups

Six research and/or education organisations with interests in Commonwealth and/or NT Waters were provided written information and follow-up was made by phone to two with no responses received.

8.4.12 Summary

ConocoPhillips' view is that all stakeholders have been provided information in a fair and reasonable timeframe for the discussion and assessment of all issues raised during the course of the consultation period, and that this has been accurately represented in the EP, as presented in the detailed summary of consultation.

The consultation records demonstrate the lengths to which ConocoPhillips has undertaken its regulatory responsibilities and applied its corporate principles to ensure stakeholders, in particular co-users with the same access rights to conduct activities in the marine environment, are fully informed and aware of how the issues they have raised have been addressed by ConocoPhillips in the EP that will be presented to the regulator.

8.5 ONGOING PROCESS

ConocoPhillips is committed to ongoing consultation in relation to the progress of this EP, future activities associated with the Pipeline and as part of a broader commitment to thorough stakeholder engagement around its operations. An important aspect of this approach is to understand from each stakeholder how they wish to be consulted. ConocoPhillips is committed to ongoing consultation with all stakeholders relevant to the ongoing operation of

the Pipeline. This occurs in three ways:

- Pipeline activity notification
- General enquiry process
- Regular stakeholder engagement and updates

8.5.1 Pipeline activity notification

Prior to commencement of this activity ConocoPhillips will make direct contact with its relevant stakeholders to inform them that the activity will be occurring. This is followed up by an email advice to all potential users of the area including commercial fishers.

This notification will advise stakeholders of the name of the vessel and who will be undertaking the work on ConocoPhillips behalf and all notifications are also provided to the AHO and the AMSA for Commonwealth waters and the Darwin Harbour Master for Territory waters prior to and during the duration of the activities in compliance with all maritime safety and navigation procedures.

Given the short duration and limited geographic footprint of the production cessation activities, ConocoPhillips will adopt a specific stakeholder communication plan for relevant stakeholders.

The physical presence of vessels involved in production cessation activities has the potential to impact other marine users, particularly commercial fishing and shipping.

Other marine users will have specific questions and/or observations relating to the potential impacts to the marine environment as a result of the activities, the effectiveness of the mitigation measures and controls that have been or are being applied to the activities and the communication process being followed.

The steps below detail ConocoPhillips approach to consultation closer to the period when the production cessation activities will take place.

Lead-up Period:

- Provide a latest version of the Stakeholder Communication and Consultation Plan to stakeholders (via email) three (3) weeks prior to commencement date of activity;
- Provide notification to AHO and AMSA three (3) weeks prior to commencement date of activity;
- Provide a weekly activity update to stakeholders (via email) with information to include the status of approvals, details of the vessels undertaking the activities, and the proposed schedule, starting two (2) weeks prior to commencement date of activity;
- Follow-up telephone contact with stakeholders who have not responded to email prior to commencement date of activity;
- Advise stakeholders (via email) that the full EP will be available on the NOPSEMA website once approved by NOPSEMA;
- Provide approved EP (via email) to stakeholders once posted by NOPSEMA;
- Manage stakeholder queries (via email/phone; fortnightly teleconference and, separate meeting if required) as per assessment process stated below.

Activity Period:

- Provide weekly status report, including information re activity progress, look-ahead for coming week and vessel interactions to stakeholders via email;
- Provide opportunity for stakeholders to have weekly direct access to ConocoPhillips HSE and External Affairs via telephone conference;
- Manage stakeholder queries (via email/phone; weekly teleconference and, separate meeting if required) as per assessment process stated below.

Post Activity Period:

- Provide notification (via email) to stakeholders that activity has been completed;
- Manage stakeholder queries (via email/phone; meeting if required) as per enquiry communication and consultation process below.

8.5.2 General Enquiries Process

At all times ConocoPhillips manages external enquiries and concerns on an ongoing basis through active and transparent engagement to ensure issues are identified and resolved in a mutually satisfactory manner. Stakeholders are encouraged to make contact with ConocoPhillips directly and immediately if a concern is identified.

External enquires are received by a range of functions within ConocoPhillips. After being received they are forwarded to ConocoPhillips' External Relations (ER) Function to be formally recorded. ER and the Function directly responsible for the activity, in this case HSE, have joint responsibility to ensure the enquiry is appropriately assessed, answered and recorded within appropriate timeframes.

Under this general process for all external inquiries, ConocoPhillips endeavours to acknowledge receipt of an enquiry within one (1) working day and seeks to address all correspondence in a timely manner, based on the complexity of the required response, and in accordance with the provision of an open feedback mechanism as defined within performance standards commonly adopted internationally by the oil and gas industry. Under this process, stakeholders are advised in a timely manner when they can expect to have their query answered in writing.

The flow chart below (**Figure 8-1**) shows the Communication and Enquiry Management Process that is used by ConocoPhillips to address external inquiries. This process will be used for management of enquiries from all identified stakeholders and the general public related to the Pipeline's operation.

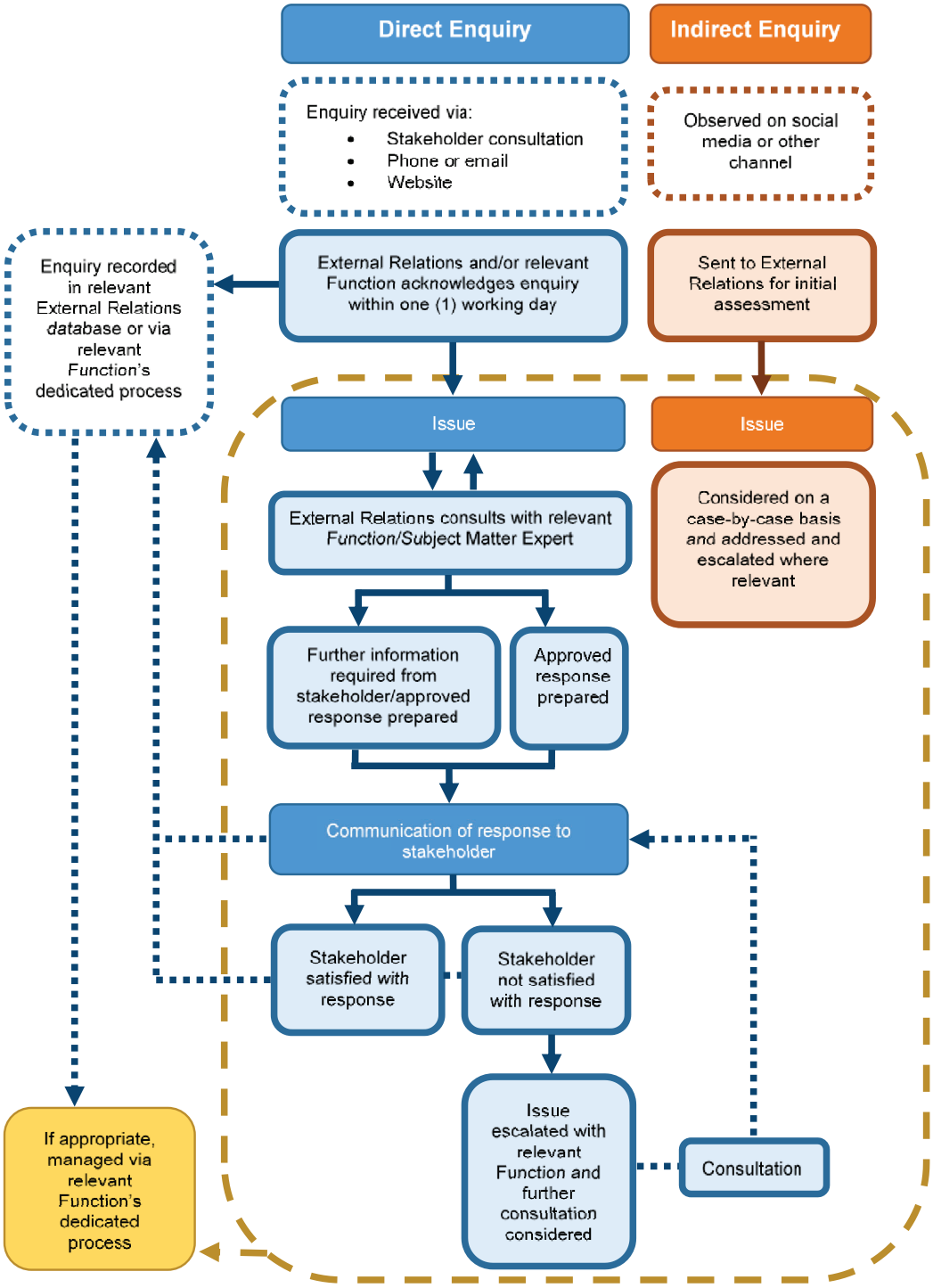


Figure 8-1: Communications and enquiries flowchart

8.5.3 Regular stakeholder engagement and updates

As operator of the Bayu-Undan offshore field and Pipeline, the Darwin LNG facility and the Barossa development project, ConocoPhillips expects to be undertaking a number of activities over coming years that will require frequent stakeholder consultation. With a high number of common stakeholders across these activities, ConocoPhillips plans to meet on a regular basis with relevant commercial fishing industry stakeholders to ensure they are kept updated on activities and schedules. The frequency of meetings will be determined with each stakeholder.

In addition, a quarterly activity update will be provided to all relevant stakeholders. It is expected that the first update will be published in Q1 2020. ConocoPhillips will use the quarterly updates to complement, not replace, stakeholder consultation requirements in Regulations 11A and 14(9) of the OPGGS(E) Regulations.

8.6 CONSULTATION SUMMARY TABLE

A detailed summary of the consultation conducted for this EP is provided in **Appendix E**: Stakeholder Consultation. The table include dates of meetings, telephone discussions and written communications; the issues, objections and claims raised by stakeholders; how ConocoPhillips has assessed this information; and ConocoPhillips' response to each issue, objection and claim.

Every effort has been undertaken to ensure the table, while a summary, represents a true and accurate reflection of the consultation undertaken and views expressed by stakeholders and ConocoPhillips for every interaction listed. As per recent amendments to regulations, where a stakeholder has identified sensitive information, ConocoPhillips has not included this information in the summary table.

9. REFERENCES

Abascal, F.J., Quintans, M., Ramos-Cartelle, A., Mejuto, J., 2011. Movements and environmental preferences of the shortfin mako, *Isurus oxyrinchus*, in the southeastern Pacific Ocean. *Marine Biology* 158: 1175–1184.

Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council of Australia and New Zealand, 2000. *Australian and New Zealand guidelines for fresh and marine water quality: volume 3 - primary industries - rationale and background*. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.

Australian Maritime Safety Authority, 2013. Technical guideline for the preparation of marine pollution contingency plans for marine and coastal facilities. Australian Maritime Safety Authority, Canberra.

Bamford, M., Watkins, D., Bancroft, W., Tischler, G., Wahl, J., 2008. Migratory shorebirds of the East Asian-Australasian flyway: population estimates and internationally important sites. Wetlands International - Oceania, Canberra.

Bannister, J., Kemper, C.M., Warneke, R.M., 1996. *The action plan for Australian cetaceans*. Australian Nature Conservation Agency, Canberra.

Bishop, S., Francis, M., Duffy, C., Montgomery, J., 2006. Age, growth, maturity, longevity and natural mortality of the shortfin mako shark (*Isurus oxyrinchus*) in New Zealand waters. *Marine and Freshwater Research* 57: 143–154.

Bond, T., Partridge, J.C., Taylor, M.D., Langlois, T.J., Malseed, B.E., Smith, L.D., McLean, D.L., 2018. Fish associated with a subsea pipeline and adjacent seafloor of the North West Shelf of Western Australia. *Marine Environmental Research*. doi:10.1016/j.marenvres.2018.08.003

Bruce, B., 2013. Shark futures: a synthesis of available data on mako and porbeagle sharks in Australiasian waters. Current and future directions (Tactical Research Fund No. FRDC 2011/045). Fisheries Research and Development Corporation, Canberra.

Bruce, B.D., 2008. The biology and ecology of the white shark, *Carcharodon carcharias*, in: Camhi, M.D., Pikitch, E.K., Babcock, E.A. (Eds.), Sharks of the Open Ocean : Biology, Fisheries and Conservation. Blackwell Publishing Limited, Oxford, pp. 69–81.

Bruce, B.D., Stevens, J.D., Malcolm, H., 2006. Movements and swimming behaviour of white sharks (*Carcharodon carcharias*) in Australian waters. *Marine Biology* 150: 161–172.

Burbidge, A.A., Fuller, P.J., 1989. Numbers of breeding seabirds on Pelsaert Island, Houtman Abrolhos, Western Australia. *Corella* 13: 57–61.

Campana, S.E., Marks, L., Joyce, W., 2005. The biology and fishery of shortfin mako sharks (*Isurus oxyrinchus*) in Atlantic Canadian waters. *Fisheries Research* 73: 341–352. doi:10.1016/j.fishres.2005.01.009

Castro, A.L.F., Stewart, B.S., Wilson, S.G., Hueter, R.E., Meekan, M.G., Motta, P.J., Bowen, B.W., Karl, S.A., 2007. Population genetic structure of Earth's largest fish, the whale shark (*Rhincodon typus*). *Molecular Ecology* 16: 5183–5192. doi:10.1111/j.1365-294X.2007.03597.x

Cavanagh, R.D., Kyne, P.M., Fowler, S.L., Musick, J.A., Bennett, M.B. (Eds.), 2003. The conservation status of Australasian chondrichthyans: report of the IUCN Shark Specialist Group Australia and Oceanica Regional Red List Group. Presented at the IUCN Shark Specialist Group. Australia and Oceania Regional Red List Workshop, University of Queensland, Brisbane, p. 170.

Chatto, R., Baker, B., 2008. The distribution and status of marine turtle nesting in the Northern Territory (Technical Report No. 77). Department of Natural Resources, Environment, the Arts and Sport, Darwin.

Clancy, G.P., 2005. Feeding behaviour of the osprey (*Pandion haliaetus*) on the north coast of New South Wales. *Corella* 29: 91–96.

Clark, R., 1984. Impact of oil pollution on seabirds. *Environmental Pollution Series A, Ecological and Biological* 33: 1–22.

Commonwealth of Australia, 2015a. Conservation management plan for the blue whale: A recovery plan under the *Environment Protection and Biodiversity Conservation Act 1999* 2015-2025. Department of the Environment, Canberra.

Commonwealth of Australia, 2015b. Sawfish and river shark multispecies recovery plan (Recovery Plan). Department of the Environment, Canberra.

Commonwealth of Australia, 2017. Recovery plan for marine turtles in Australia 2017-2027. Department of the Environment and Energy, Canberra.

Corkeron, P.J., Morissette, N.M., Porter, L., Marsh, H., 1997. Distribution and status of hump-backed dolphins *Sousa chinensis* in Australian waters. *Asian Marine Biology* 14: 49–59.

Couturier, L.I.E., Jaine, F.R.A., Townsend, K.A., Weeks, S.J., Richardson, A.J., Bennett, M.B., 2011. Distribution, site affinity and regional movements of the manta ray, *Manta alfredi* (Krefft, 1868), along the east coast of Australia. *Marine and Freshwater Research* 62: 628. doi:10.1071/MF10148

D'Anastasi, B., Simpfendorfer, C., van Herwerden, L., 2013. *Anoxypristis cuspidata* (Knifetooth Sawfish, Narrow Sawfish, Pointed Sawfish) [WWW Document]. *The IUCN Red List of Threatened Species*. URL http://www.iucnredlist.org/details/39389/0 (accessed 7.25.17).

Deakos, M., Baker, J., Bejder, L., 2011. Characteristics of a manta ray *Manta alfredi* -population off Maui, Hawaii, and implications for management. *Marine Ecology Progress Series* 429: 245–260. doi:10.3354/meps09085

Department of Agriculture, Fisheries and Forestry, 2009. National biofouling management guidance for the petroleum production and exploration industry. (The National System for the Prevention and Management of Marine Pest Incursions). Department of Agriculture, Fisheries and Forestry, Canberra.

Department of Sustainability, Environment, Water, Population and Communities, 2012a. Marine bioregional plan for the North Marine Region: prepared under the *Environment Protection and Biodiversity Conservation Act 1999*. Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Department of Sustainability, Environment, Water, Population and Communities, 2012b. Species group report card - seabirds. Supporting the marine bioregional plan for the North Marine Region prepared under the *Environment Protection and Biodiversity Conservation Act 1999*. Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Department of the Environment, Water, Heritage and the Arts, 2008. The North Marine Bioregional Plan: Bioregional Profile. Department of the Environment, Water, Heritage and the Arts, Canberra.

Department of the Environment, Water, Heritage and the Arts, 2009. Threat abatement plan for the impacts of marine debris on vertebrate marine life. Department of the Environment, Water, Heritage and the Arts, Canberra.

Department of the Environment, Water, Heritage and the Arts, 2010. Legislative changes for recreational fishing of three shark species. Department of the Environment, Water, Heritage and the Arts, Canberra.

Director of National Parks, 2018. Australian Marine Parks - North Marine Parks Network Management Plan 2018. Director of National Parks, Canberra.

Double, M., Jenner, K., Jenner, M.-N., Ball, I., Laverick, S., Gales, N., 2012. Satellite tracking of pygmy blue whales (*Balaenoptera musculus brevicauda*) off Western Australia. Australian Marine Mammal Centre, Hobart.

Double, M.C., Andrews-Goff, V., Jenner, K.C.S., Jenner, M.-N., Laverick, S.M., Branch, T.A., Gales, N.J., 2014. Migratory movements of pygmy blue whales (*Balaenoptera musculus brevicauda*) between Australia and Indonesia as revealed by satellite telemetry. *PloS one* 9: e93578.

Eckert, S.A., Stewart, B.S., 2001. Telemetry and satellite tracking of whale sharks, *Rhincodon typus*, in the Sea of Cortez, Mexico, and the north Pacific Ocean. *Environmental Biology of Fishes* 299–308.

Engelhardt, F.R., 1983. Petroleum effects on marine mammals. *Aquatic Toxicology* 4: 199–217.

French, D., Reed, M., Jayko, K., Feng, S., Rines, H., Pavignano, S., 1996. The CERCLA Type A Natural Resource Damage Assessment Model for Coastal and Marine Environments (NRDAM/CME) (Technical Documentation Volume No. I). Office of Environmental Policy and Compliance, Washington, D.C.

French, D.P., Schuttenberg, H.Z., Isaji, T., 1999. Probabilities of oil exceeding thresholds of concern: examples from an evaluation for Florida Power and Light. Presented at the Arctic and Marine Oilspill Program Technical Seminar, Ministry of Supply and Services, Ottawa, pp. 243–270.

French-McCay, D., 2003. Development and application of damage assessment modeling: example assessment for the North Cape oil spill. *Marine Pollution Bulletin* 47: 341–359. doi:10.1016/S0025-326X(03)00208-X

French-McCay, D., 2009. State-of-the-art and research needs for oil spill impact assessment modeling, in: Proceedings of the 32nd AMOP Technical Seminar on Environmental Contamination and Response. Presented at the 32nd AMOP Technical Seminar on Environmental Contamination and Response, Environment Canada, Ottawa, pp. 601–653.

French-McCay, D.P., 2002. Development and application of an oil toxicity and exposure model, OilToxEx. *Environmental Toxicology and Chemistry* 21: 2080–2094.

Gagnon, M.M., Rawson, C., 2010. Montara well release: Report on necropsies from a Timor Sea green turtle. Curtin University, Perth.

Geraci, J.R., St Aubin, D.J. (Eds.), 1988. *Synthesis of Effects of Oil on Marine Mammals*. Department of the Interior, Minerals Management Service, Atlantic OCS Region.

Hassan, A., Javed, H., 2011. Effects of Tasman Spirit oil spill on coastal birds at Clifton, Karachi coast, Pakistan. *Journal of Animal and Plant Sciences* 21: 333–339.

Hazel, J., Lawler, I.R., Marsh, H., Robson, S., 2007. Vessel speed increases collision risk for the green turtle *Chelonia mydas*. *Endangered Species Research* 3: 105–113.

Heyward, A., Radford, B., Cappo, M., Wakeford, M., Fisher, R., Colquhoun, J., Case, M., Stowar, M., Miller, K., 2017. Barossa environmental baseline study, Regional shoals and shelf assessment 2015 (Final Report). Australian Institute of Marine Science, Townsville.

Heyward, A.A., Pinceratto, E., Smith, L.L. (Eds.), 1997. *Big Bank Shoals of the Timor Sea: an environmental resource atlas*. BHP Petroleum & Australian Institute of Marine Science, Melbourne.

International Petroleum Industry Environmental Conservation Association, 2004. A guide to oiled wildlife response planning (IPIECA Report Series No. 13). International Petroleum Industry Environmental Conservation Association, London.

International Tanker Owners Pollution Federation, 2011. Effects of oil pollution on fisheries and mariculture (Technical Information Paper No. 11). International Tanker Owners Pollution Federation Limited, London.

Jacobs, 2016. Sediment quality and infauna field survey report (Barossa Environmental Studies Report No. WV04831- NMS- RP- 0027 Rev 2). Jacobs Group (Australia) Pty Ltd, Perth.

Jefferson, T.A., 2000. Population biology of the Indo-Pacific hump-back dolphin in Hong Kong waters. *Wildlife Monographs* 144: 1–65.

Jefferson, T.A., Rosenbaum, H.C., 2014. Taxonomic revision of the humpback dolphins (*Sousa* spp.), and description of a new species from Australia. *Marine Mammal Science* 30: 1494–1541.

Jenner, K., Jenner, M., McCabe, K., 2001. Geographical and temporal movements of humpback whales in Western Australian waters. *APPEA Journal* 41: 692–707.

Jensen, A., Silber, G., 2004. Large whale ship strike database (NOAA Technical Memorandum No. NMFS-OPR). National Marine Fisheries Service, Silver Spring.

Jenssen, B.M., 1994. Effects of oil pollution, chemically treated oil, and cleaning on thermal balance of birds. *Environmental Pollution* 86: 207–215.

King, D., Lyne, R., Girling, A., Peterson, D., Stephenson, R., Short, D., 1996. Environmental risk assessment of petroleum substances: The hydrocarbon block method (CONCAWE No. 96/52). CONCAWE, Brussels.

King, J.K., Kostka, J.E., Frischer, M.E., Saunders, F.M., Jahnke, R.A., 2001. A quantitative relationship that demonstrates mercury methylation rates in marine sediments are based on the community composition and activity of sulfate-reducing bacteria. *Environmental Science & Technology* 35: 2491–2496.

Koops, W., Jak, R., van der Veen, D., 2004. Use of dispersants in oil spill response to minimize environmental damage to birds and aquatic organisms. *Interspill 2004*.

Kyne, P., Rigby, C., Simpfendorfer, C., 2013. *Pristis clavata* (Dwarf Sawfish, Queensland Sawfish) [WWW Document]. Pristis clavata *(Dwarf Sawfish, Queensland Sawfish)*. URL http://www.iucnredlist.org/details/39390/0 (accessed 11.26.13).

Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S., Podesta, M., 2001. Collisions between ships and whales. *Marine Mammal Science* 17: 35–75.

Larcombe, J., Marton, N., Curtotti, R., 2018. Northern Prawn Fishery, in: Fishery Status Reports 2018. Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, pp. 64–86.

Limpus, C.J., 2007. *A biological review of Australian marine turtles. 5. Flatback turtle,* Natator depressus *(Garman)*, A biological review of Australian marine turtles. Queensland Government Environmental Protection Agency, Brisbane.

Limpus, C.J., 2008a. *A biological review of Australian marine turtles. 1. Loggerhead turtle,* Caretta caretta *(Linnaeus)*, A biological review of Australian marine turtles. Queensland Government Environmental Protection Agency, Brisbane.

Limpus, C.J., 2008b. *A biological review of Australian marine turtles. 2. Green turtle,* Chelonia mydas *(Linnaeus)*, A biological review of Australian marine turtles. Queensland Government Environmental Protection Agency, Brisbane.

Limpus, C.J., 2008c. *A biological review of Australian marine turtles. 4. Olive Ridley turtle,* Lepidochelys olivacea *(Linnaeus)*, A biological review of Australian marine turtles. Queensland Government Environmental Protection Agency, Brisbane.

Limpus, C.J., 2009a. *A biological review of Australian marine turtles. 6. Leatherback turtle,* Dermochelys coriacea *(Vandelli)*, A biological review of Australian marine turtles. Queensland Government Environmental Protection Agency, Brisbane.

Limpus, C.J., 2009b. *A biological review of Australian marine turtles. 3. Hawksbill turtle,* Eretmochelys imbricata *(Linnaeus)*, A biological review of Australian marine turtles. Queensland Government Environmental Protection Agency, Brisbane.

Lohmann, K.J., Lohmann, C.M.F., 1992. Orientation to oceanic waves by green turtle hatchlings. *Journal of Experimental Biology* 171: 1–13.

Lohmann, K.J., Salmon, M., Wyneken, J., 1990. Functional autonomy of land and sea orientation systems in sea turtle hatchlings. *Biological Bulletin* 179: 214–218.

Lutcavage, M., Lutz, P., Bossart, G., Hudson, D., 1995. Physiologic and clinicopathologic effects of crude oil on loggerhead sea turtles. *Archives of Environmental Contamination and Toxicology* 28: 417–422.

Marine Environment Protection Committee, 2011. 2011 guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (MEPC No. 62/24/Add.1). International Maritime Organisation, London.

Marsh, H., Penrose, H., Eros, C., Hughes, J., 2002. *Dugong: status report and action plans for countries and territories*, Early warning and assessment report series. United Nations Environment Programme, Nairobi.

Marshall, A., Bennett, M., Kodja, G., Hinojosa-Alvarez, S., Galvan-Magana, F., Harding, M., Stevens, G., Kashiwaga, T., 2011. *Manta birostris* (Chevron Manta Ray, Giant Manta Ray, Oceanic Manta Ray, Pacific Manta Ray, Pelagic Manta Ray) [WWW Document]. *The IUCN Red List of Threatened Species*. URL http://www.iucnredlist.org/details/198921/0 (accessed 10.12.15).

Marshall, A.D., Compagno, L.J., Bennett, M.B., 2009. Redescription of the genus *Manta* with resurrection of *Manta alfredi* (Krefft, 1868)(Chondrichthyes; Myliobatoidei; Mobulidae). *Zootaxa* 2301: 1–28.

McCauley, R., 1998. Radiated underwater noise measured from the drilling rig *Ocean General*, rig tenders *Pacific Ariki* and *Pacific Frontier*, fishing vessel *Reef Venture* and natural sources in the Timor Sea, Northern Australia. (Report No. C98-20). Centre for Marine Science and Technology, Curtin University of Technology, Perth.

McLean, D.L., Partridge, J.C., Bond, T., Birt, M.J., Bornt, K.R., Langlois, T.J., 2017. Using industry ROV videos to assess fish associations with subsea pipelines. *Continental Shelf Research* 141: 76–97. doi:10.1016/j.csr.2017.05.006

McPherson, C., Kowarski, K., Delarue, J., Whitt, C., MacDonnell, J., Martin, B., 2016. Passive acoustic monitoring of ambient noise and marine mammals - Barossa Field (JASCO Document No. 00997). JASCO Applied Sciences, Capalaba.

Meekan, M., Radford, B., 2010. Migration patterns of whale sharks: A summary of 15 satellite tag tracks from 2005 to 2008. Australian Institute of Marine Science, Perth.

Mollet, H., Cliff, G., Pratt Jr, H., Stevens, J., 2000. Reproductive biology of the female shortfin mako, *Isurus oxyrinchus* Rafinesque, 1810, with comments on the embryonic development of lamnoids. *Fishery Bulletin* 98.

Morgan, D., Whitty, J., Phillips, N., 2010. Endangered sawfishes and river sharks in Western Australia. Centre for Fish and Fisheries Research, Murdoch University, Perth.

National Oceanic and Atmospheric Administration, 2010. Oil and sea turtles: Biology, planning and response. National Oceanic and Atmospheric Administration, Washington.

Nichol, S., Howard, F., Kool, J., Stowar, M., Bouchet, P., Radke, L., Siwabessy, J., Przeslawski, R., Picard, K., Alvarez de Glasby, B., Colquhoun, J., Letessier, T., Heyward, A., 2013. Oceanic shoals Commonwealth marine reserve (Timor Sea) biodiversity survey GA0339/SOL5650 - post-survey report (Geoscience Australia Record No. 2013/38). Geoscience Australia, Canberra.

Northern Territory Government, 2017. Status of key Northern Territory fish stocks report 2015 (Fishery Report No. 118). Department of Primary Industry and Resources, Darwin.

Olsen, P., Marples, T.G., 1993. Geographic variation in egg size, clutch size and date of laying of Australian raptors (Falconiformes and Strigiformes). *Emu* 93: 167–179.

Poot, H., Ens, B., de Vries, H., Donners, M., Wernand, M., Marquenie, J., 2008. Green light for nocturnally migrating birds. *Ecology and Society* 13.

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S.M., Carlson, T.J., Coombs, S., Ellison, W.T., Gentry, R.L., Halvorsen, M.B., Løkkeborg, S., Rogers, P., Southall, B.L., Zeddies, D.G., Tavolga, W.N., 2014. *ASA S3/SC1.4 TR-2014 sound exposure guidelines for fishes and sea turtles: a technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI*. Springer, New York.

Prieto, R., Janiger, D., Silva, M.A., Waring, G.T., Gonçalves, J.M., 2012. The forgotten whale: a bibliometric analysis and literature review of the North Atlantic sei whale *Balaenoptera borealis*. *Mammal Review* 42: 235–272. doi:10.1111/j.1365-2907.2011.00195.x

Przeslawski, R., Daniell, J., Anderson, T., Barrie, J.V., Heap, A., Hughes, M., Li, J., Potter, A., Radke, L., Siwabessy, J., Tran, M., Whiteway, T., Nichol, S., 2011. Seabed habitats and hazards of the Joseph Bonaparte Gulf and Timor Sea, Northern Australia (Record No. 2011/40). Geoscience Australia, Canberra.

Radford, B., Heyward, A., Birt, M.J., Case, M., Colquhoun, J., Currey-Randall, L.M., Stowar, M.J., Vaughan, B.I., Wyatt, M., 2018. Oceanic Shoals Commonwealth Marine Reserve (CMR) final

quantitative report on benthic habitats (Report No. AIMS/COP/RPT/002/2018). Australian Institute of Marine Science, Perth.

RPS, 2019. ConocoPhillips Bayu-Undan Decommissioning Project Oil Spill Modelling (Report No. MAQ0792J). RPS, Bundall.

Salmon, M., Reiners, R., Lavin, C., Wyneken, J., 1995. Behavior of loggerhead sea turtles on an urban beach. I. Correlates of nest placement. *Journal of Herpetology* 560–567.

Salmon, M., Witherington, B.E., 1995. Artificial lighting and seafinding by loggerhead hatchlings: evidence for lunar modulation. *Copeia* 931–938.

Scholten, Mct., Kaag, N., Dokkum, H. van, Jak, R., Schobben, H., Slob, W., 1996. Toxische effecten van olie in het aquatische milieu (TNO Report No. TNO-MEP-R96/230). den Helder.

Sepulveda, C., Kohin, S., Chan, C., Vetter, R., Graham, J., 2004. Movement patterns, depth preferences, and stomach temperatures of free-swimming juvenile mako sharks, *Isurus oxyrinchus*, in the Southern California Bight. *Marine Biology* 145: 191–199.

Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene, C.R., Kastak, D., Ketten, D.R., Miller, J.H., Nachtigall, P.E., Richardson, W.J., Thomas, J.A., Tyack, P.L., 2007. Marine mammal noise exposure criteria: Initial scientific recommendations. *Aquatic mammals* 33: 411–414.

Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E., Ellison, W.T., Nowacek, D.P., Tyack, P.J., 2019. Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals* 45: 125–232.

Stevens, J., McAuley, R., Simpfendorfer, C., Pillans, R., 2008. Spatial distribution and habitat utilisation of sawfish (*Pristis* spp.) in relation to fishing in northern Australia. CSIRO Marine and Atmospheric Research, Hobart.

Stevens, J., Pillans, R., Salini, J., 2005. Conservation assessment of *Glyphis* sp. A (speartooth shark), *Glyphis* sp. C (northern river shark), *Pristis microdon* (freshwater sawfish) and *Pristis zijsron* (green sawfish). CSIRO Marine Research, Hobart.

Stevens, J.D., Bradford, R.W., West, G.J., 2010. Satellite tagging of blue sharks (*Prionace glauca*) and other pelagic sharks off eastern Australia: depth behaviour, temperature experience and movements. *Marine Biology* 157: 575–591.

Thorburn, D.C., Morgan, D.L., Rowland, A.J., Gill, H.S., Paling, E., 2008. Life history notes of the critically endangered dwarf sawfish, *Pristis clavata*, Garman 1906 from the Kimberley region of Western Australia. *Environmental Biology of Fishes* 83: 139–145.

Threatened Species Scientific Committee, 2008. Approved conservation advice for green sawfish. Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Threatened Species Scientific Committee, 2009. Approved conservation advice for *Pristis clavata* (dwarf sawfish). Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Threatened Species Scientific Committee, 2015. Conservation advice *Rhincodon typus* whale shark. Department of the Environment, Canberra.

Tsvetnenko, Y., 1998. Derivation of Australian tropical marine water quality criteria for the protection of aquatic life from adverse effects of petroleum hydrocarbons. *Environmental Toxicology and Water Quality: An International Journal* 13: 273–284.

URS, 2015. 2014 Bayu-Undan marine environmental survey (Report No. 42908705: R1786/M&C3922/0). URS Australia Pty Ltd, Perth.

Vanderlaan, A.S.M., Taggart, C.T., 2007. Vessel collisions with whales: the probability of lethal injury based on vessel speed. *Marine Mammal Science* 23: 144–156. doi:10.1111/j.1748-7692.2006.00098.x

Waayers, D., Smith, L., Malseed, B., 2011. Inter-nesting distribution of green turtles (*Chelonia mydas*) and flatback turtles (*Natator depressus*) at the Lacepede Islands, Western Australia. *Journal of the Royal Society of Western Australia* 94: 359–364.

West, L., Lyle, J., Matthews, S., Stark, K., Steffe, A., 2012. Survey of recreational fishing in the Northern Territory 2009-2010 (Fishery Report No. 109). Northern Territory Government, Darwin.

Whiting, S., Long, J., Coyne, M., 2007. Migration routes and foraging behaviour of olive ridley turtles Lepidochelys olivacea in northern Australia. *Endangered Species Research* 3: 1–9.

Whittock, P., Pendoley, K., Hamann, M., 2014. Inter-nesting distribution of flatback turtles *Natator depressus* and industrial development in Western Australia. *Endangered Species Research* 26: 25–38. doi:10.3354/esr00628

Wilson, S., Polovina, J., Stewart, B., Meekan, M., 2006. Movements of whale sharks (*Rhincodon typus*) tagged at Ningaloo Reef, Western Australia. *Marine Biology* 148: 1157–1166.

Wink, M., Sauer-Gürth, H., Witt, H.-H., 2004. Phylogenetic differentiation of the Osprey *Pandion haliaetus* inferred from nucleotide sequences of the mitochondrial cytochrome b gene, in: Chancellor, R., Meyburg (Eds.), Raptors Worldwide. Berlin, pp. 511–516.

10. ACRONYMS AND ABBREVIATIONS

Acronym	Definition
A&OI	Asset and Operating Integrity
ABU	Australian Business Unit
ABU-E	Australian Business Unit - East
ABU-W	Australian Business Unit - West
AFMA	Australian Fisheries Management Authority
AFZ	Australian Fishing Zone
AHO	Australian Hydrographic Office
AIMS	Australian Institute of Marine Science
ALARP	As low as reasonably practicable
AMOSC	Australian Marine Oil Spill Centre
AMP	Australian Marine Park
AMSA	Australian Maritime Safety Authority
ANPM	Autoridade Nacional do Petróleo e Minerais
BIA	Biologically Important Area
BTEX	Benzene, ethylbenzene, toluene and xylene
CAN	Australian Company Number
CBT	Computer-based training
CHARM	Chemical Hazard and Risk Management
CIMP	Crisis and Incident Management Plan
CMID	Common Marine Inspection Document
CMT	Crisis Management Team
COLREGS	Convention on the International Regulations for Preventing Collisions at Sea 1972
COPPA	ConocoPhillips Pipeline Australia Pty Ltd
CPP	Central Production and Processing
CSR	Client Site Representative
DEWHA	Department of the Environment, Water, Heritage and the Arts
DLNG	Darwin liquefied natural gas
DoEE	Department of the Environment and Energy
DP	Dynamic Positioning
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EIAPP	Engine International Air Pollution Prevention
EMBA	Environment that may be affected
ENVID	Environmental hazard identification and risk assessment
EOC	Emergency Operations Centre
EP	Environment Plan
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPO	Environmental Performance Outcome
EPS	Environmental Performance Standard

ERP	Emergency Response Plan
ERT	Emergency Response Team
ESD	Ecologically sustainable development
GHG	Greenhouse gas
GIMAT	Global Incident Management Assist Team
HATS	HSE Action Tracking System
HFO	Heavy Fuel Oil
HPIT	High pressure isolation tool
HQ	Hazard Quotient
HSE&SD	Health, Safety, Environment and Sustainable Development
HSEMS	Health, Safety and Environmental Management System
IAP	Incident Action Plan
IEE	International Energy Efficiency
IFO	Intermediate Fuel Oil
IMCA	International Maritime Contractors Association
IMO	International Maritime Organization
IMS	Invasive Marine Species
IMT	Incident Management Team
IOPP	International Oil Pollution Prevention
ISPP	International Sewage Pollution Prevention
ITF	Indonesian Throughflow
IUCN	International Union for the Conservation of Nature
JPDA	Joint Petroleum Development Area
KEF	Key Ecological Feature
MARPOL	International Convention for the Prevention of Pollution from Ships 1973/1978
MC	Measurement Criteria
MDO	Marine diesel oil
MNES	Matters of National Environmental Significance
MOC	Management of Change
NEBA	Net Environmental Benefit Analysis
NEC	No Effect Concentration
NMR	North Marine Region
NOAA	National Oceanic and Atmospheric Administration
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
NT	Northern Territory
OCIMF	Oil Companies International Marine Forum
OCNS	Offshore Chemical Notification Scheme
OIW	Oil in Water
OMP	Operational Monitoring Plan
OPEP	Oil pollution emergency plan

OPGGS Act	Offshore Petroleum and Greenhouse Gas Storage Act 2006
OPGGS(E) Regulations 2009	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
OSMP	Operational and Scientific Monitoring Program
OVID	Offshore Vessel Inspection Database
PEC	Predicted Effect Concentration
PLR	Pig launcher/receiver
PLR	Pig launcher / receiver
PMST	Protected Matters Search tool
POLREP	Marine Pollution Report
PPE	Personal protective equipment
PTS	Permanent Threshold Shift
PTW	Permit to Work
RCC	Rescue Coordination Centre
ROV	Remotely Operated Vehicle
SDS	Safety Data Sheet
SMP	Scientific Monitoring Plan
SOLAS	International Convention for the Safety of Life at Sea
SPRAT	species profile and threats
STCW Convention	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
the Treaty	Treaty Between Australia and the Democratic Republic Timor-Leste Establishing Their Maritime Boundaries in the Timor Sea
TTS	Temporary Threshold Shift
VP	Vice President
WA	Western Australia

11. APPENDICES

Appendix A: Relevant Environmental Requirements

Legislation	Summary	Relevance to Production Cessation
Australian Maritime Safety Authority Act 1990	This Act establishes the Australian Maritime Safety Authority (AMSA) which manages the National Plan for Maritime Environmental Emergencies in coordination with industry. AMSA is also responsible for administering the Marine Orders in Commonwealth waters.	AMSA has been consulted as part of the stakeholder engagement process. COPPA will adhere to incident reporting requirements regarding pollution.
Biosecurity Act 2015	This Act relates to the management of diseases and pests that may cause harm to human, animal or plant health or the environment. The Act includes provisions for ballast water management plans and certificates, record-keeping obligations and powers to ensure compliance.	COPPA will ensure vessels comply with the requirements of this Act.
Environment Protection and Biodiversity Conservation Act 1999 Environment Protection and Biodiversity Conservation Regulations 2000 Environment Protection and Biodiversity Conservation Amendment Regulations 2006	While the Environment Regulations under the OPGGS Act (see below) manage day to day petroleum activities and apply to any activity that may have an impact on the environment, the EPBC Act (Chapter 4) regulates assessment and approval of proposed actions that are likely to have a significant impact on a matter of National Environmental Significance (NES). Actions that are likely to have a significant impact on a matter of NES require approval by the Commonwealth Environment Minister; the assessment process is administered by the Department of the Environment, Water, Heritage and the Arts. The EPBC Act does not replace the need for an Environment Plan to be approved under the OPGGS(E) Regulations before an action can proceed. Schedule 8 of the EPBC Regulations outlines the Australian IUCN Reserve Management Principles.	COPPA will adhere to the requirements of the EPBC Act and Regulations, as relevant to the operation of the Pipeline. COPPA will have regard to the Australian IUCN Reserve Management Principles, where relevant.
EPBC Regulations 2000 - Part 8 Division 8.1 Interacting with cetaceans	These Regulations provide for the protection and conservation of cetaceans.	Described requirements for vessel interactions with cetaceans.
Maritime Legislation Amendment (Prevention of Air Pollution from Ships) Act 2007	This Act implements the requirements of MARPOL 73/78 Annex VI for shipping in Commonwealth waters.	COPPA, in consultation with the vessel owners, shall induct the vessel masters to this Act as relevant to the operation of the Pipeline. Vessel owners are to ensure MARPOL and this Act are adhered to as relevant to the operation of the Pipeline.
Navigation Act 2012	A number of Marine Orders enacted under this Act apply directly to offshore petroleum activities: • Marine Order 21 (Safety of navigational and emergency procedures) • Marine Order 30 (Prevention of collisions) • Marine Order 70 (Seafarer certification) • Marine Order 71 (Masters and deck officers)	COPPA, in consultation with the vessel owners shall induct the vessel masters to this Act and relevant Marine Orders as relevant to the operation of the Pipeline. Vessel owners are to ensure this Act and relevant port state Marine Orders are adhered to as relevant to the operation of the Pipeline.

	• Marine Order 91 (Marine pollution prevention – oil) • Marine Order 94 (Pollution prevention – packaged harmful substances) • Marine Order 95 (Marine pollution prevention – garbage) • Marine Order 96 (Marine pollution prevention – sewage) • Marine Order 97 (Marine pollution prevention – air pollution) AMSA has the authority and responsibility for the operational activities under the Act, including vessel certification, seafarers' qualifications, marine pollution prevention, monitoring and enforcement activities.	
Protection of the Sea (Harmful Antifouling Systems) Act 2006	This Act relates to the protection of the sea from the effects of harmful anti-fouling systems. It prohibits the application or reapplication of harmful anti-fouling compounds on Australian ships or foreign ships that are in an Australian shipping facility.	Vessels will comply with the relevant requirements of this Act.
Protection of the Sea (Prevention of Pollution from Ships) Act 1983 Protection of the Sea (Prevention of Pollution from Ships) (Orders) Regulations 1994	This Act and Regulations relate to the protection of the sea from pollution by oil and other harmful substances discharged from ships. This Act disallows any harmful discharge of sewage, oil and noxious substances into the sea and sets the requirements for a shipboard waste management plan. The following Marine Orders relating to marine pollution prevention have been put in place to give effect to relevant regulations of Annexes I, II, III, IV, V and VI of MARPOL 73/78: • Marine Order 91 (Marine pollution prevention – oil) • Marine Order 94 (Pollution prevention – packaged harmful substances) • Marine Order 95 (Marine pollution prevention – garbage) • Marine Order 96 (Marine pollution prevention – sewage) • Marine Order 97 (Marine pollution prevention – air pollution) • Marine Order 98 (Marine pollution prevention – anti-fouling systems)	COPPA, in consultation with the vessel owners shall induct the vessel masters to this Act and relevant Marine Orders as relevant to the operation of the Pipeline. Vessel owners are to ensure the requirements of MARPOL 73/78, this Act and Regulations, and relevant port state Marine Orders are adhered to as relevant to the operation of the Pipeline.

International Agreement / Convention	Summary	Relevance to Production Cessation
International Convention for the Prevention of Pollution from Ships 1973/1978 (MARPOL 73/78)	This Convention aim to prevent and minimise pollution from ships, both accidental pollution and that from routine operations. Several Annexes apply directly to offshore petroleum activities: • MARPOL 73/78 Annex I (Prevention of pollution by oil)	This Convention is implemented under Australian law by Marine Orders, which will be adhered to during the operation of the Pipeline.

	• MARPOL 73/78 Annex II (Control of pollution by noxious liquid substances in bulk) • MARPOL 73/78 Annex III (Prevention of pollution by harmful substances carried by sea in packaged form) • MARPOL 73/78 Annex IV (Pollution by sewage from ships) • MARPOL73/78 Annex V (Pollution by garbage from ships	
International Convention for the Control and Management of Ships' Ballast Water and Sediment 2004	The convention aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments.	The Convention is implemented under Australian law by the *Biosecurity Act 2015*, which will be adhered to during the operation of the Pipeline
Convention on the Control of Harmful Anti-fouling Systems on Ships 2001	The Convention prohibits the use of harmful organotins in anti-fouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.	The Convention is implemented under Australian law by the *Protection of the Sea (Harmful Antifouling Systems) Act 2006*, which will be adhered to during the operation of the Pipeline
International Convention on Standards of Training, Certification and Watchkeeping (STCW) for Seafarers 1978	Outlines the qualification standards for bridge personnel on merchant ships.	This Convention is implemented under Australian law by Marine Orders, which will be adhered to during the operation of the Pipeline.
Treaty Between Australia and the Democratic Republic of Timor-Leste Establishing Their Maritime Boundaries in the Timor Sea 2018	This treaty established permanent maritime boundaries between Australia and Timor-Leste and upholds Australia's commitment to international rules through the UN Convention on the Law of the Sea (UNCLOS).	This treaty is implemented under international law, specifically the UNCLOS.

Appendix B: EPBC Protected Matters Search Report

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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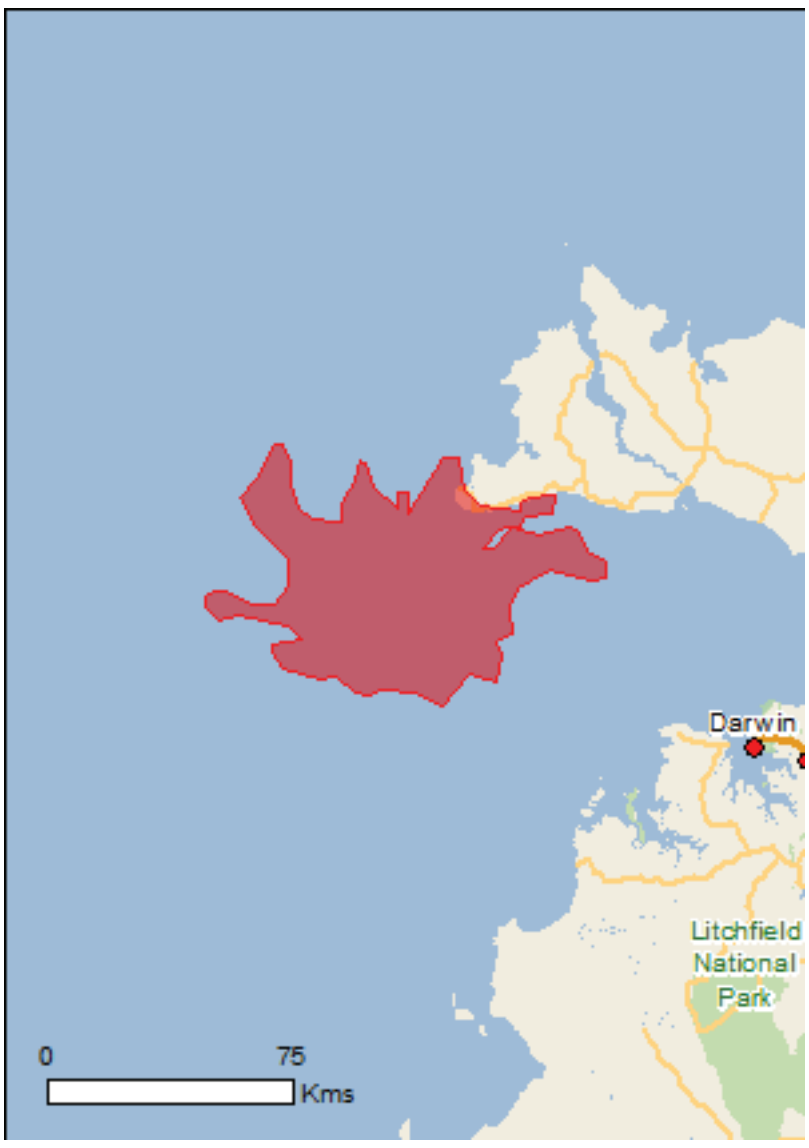

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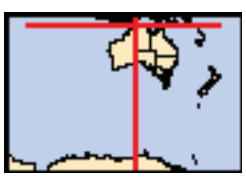


Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	37
Listed Migratory Species:	47

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	84
Whales and Other Cetaceans:	15
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	10
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	1

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name
EEZ and Territorial Sea

Marine Regions [Resource Information]

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name
North

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area
Geophaps smithii smithii Partridge Pigeon (eastern) [64441]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Melanodryas cucullata melvillensis Tiwi Islands Hooded Robin, Hooded Robin (Tiwi Islands) [67092]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tyto novaehollandiae melvillensis Tiwi Masked Owl, Tiwi Islands Masked Owl [26049]	Endangered	Species or species habitat known to occur

Name	Status	Type of Presence within area
Mammals		
Antechinus bellus Fawn Antechinus [344]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
Conilurus penicillatus Brush-tailed Rabbit-rat, Brush-tailed Tree-rat, Pakooma [132]	Vulnerable	Species or species habitat known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Saccolaimus saccolaimus nudicluniatus Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat may occur within area
Sminthopsis butleri Butler's Dunnart [302]	Vulnerable	Species or species habitat likely to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Burmannia sp. Bathurst Island (R.Fensham 1021) [82017]	Endangered	Species or species habitat likely to occur within area
Hoya australis subsp. oramicola a vine [55436]	Vulnerable	Species or species habitat known to occur within area
Typhonium jonesii a herb [62412]	Endangered	Species or species habitat likely to occur within area
Typhonium mirabile a herb [79227]	Endangered	Species or species habitat likely to occur within area
Xylopia monosperma a shrub [82030]	Endangered	Species or species habitat likely to occur within area
Reptiles		
Acanthophis hawkei Plains Death Adder [83821]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area

Name	Status	Type of Presence
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Glyphis garricki Northern River Shark, New Guinea River Shark [82454]	Endangered	Species or species habitat may occur within area
Glyphis glyphis Speartooth Shark [82453]	Critically Endangered	Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding known to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Migratory Terrestrial Species		
Cecropis daurica Red-rumped Swallow [80610]		Species or species habitat may occur within area
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Acrocephalus orientalis Oriental Reed-Warbler [59570]		Species or species habitat may occur within area
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
[Glareola maldivarum](#) Oriental Pratincole [840]		Species or species habitat may occur within area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat likely to occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
[Acrocephalus orientalis](#) Oriental Reed-Warbler [59570]		Species or species habitat may occur within area
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Anous stolidus](#) Common Noddy [825]		Species or species habitat may occur within area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
[Ardea alba](#) Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
[Ardea ibis](#) Cattle Egret [59542]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundo daurica Red-rumped Swallow [59480]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Fish		
Bhanotia fasciolata Corrugated Pipefish, Barbed Pipefish [66188]		Species or species habitat may occur within area
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Corythoichthys haematopterus Reef-top Pipefish [66201]		Species or species habitat may occur within area
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area
Corythoichthys schultzi Schultz's Pipefish [66205]		Species or species habitat may occur within area
Cosmocampus banneri Roughridge Pipefish [66206]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys parvicarinatus Short-keel Pipefish, Short-keeled Pipefish [66230]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Enhydrina schistosa Beaked Seasnake [1126]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hydrelaps darwiniensis Black-ringed Seasnake [1100]		Species or species habitat may occur within area
Hydrophis atriceps Black-headed Seasnake [1101]		Species or species habitat may occur within area
Hydrophis coggeri Slender-necked Seasnake [25925]		Species or species habitat may occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Hydrophis inornatus Plain Seasnake [1107]		Species or species habitat may occur within area
Hydrophis mcdowelli null [25926]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
Hydrophis pacificus Large-headed Seasnake, Pacific Seasnake [1112]		Species or species habitat may occur within area
Lapemis hardwickii Spine-bellied Seasnake [1113]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Parahydrophis mertoni Northern Mangrove Seasnake [1090]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Australian Marine Parks	[Resource Information]
Name	Label
Oceanic Shoals	Habitat Protection Zone (IUCN IV)

Extra Information

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Plants		
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Mimosa pigra Mimosa, Giant Mimosa, Giant Sensitive Plant, ThornySensitive Plant, Black Mimosa, Catclaw Mimosa, Bashful Plant [11223]		Species or species habitat likely to occur within area
Pennisetum polystachyon Mission Grass, Perennial Mission Grass, Missiongrass, Feathery Pennisetum, Feather Pennisetum, Thin Napier Grass, West Indian Pennisetum, Blue Buffel Grass [21194]		Species or species habitat may occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat likely to occur within area

Key Ecological Features (Marine)

[Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Carbonate bank and terrace system of the Van	North

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-12.316624 129.791598,-12.306388 129.745727,-12.261956 129.696613,-12.271434 129.647982,-12.242362 129.550875,-12.202768 129.523068,-12.176864 129.523618,-12.165358 129.597017,-12.127718 129.564036,-12.10137 129.424127,-12.115134 129.374545,-12.076516 129.337916,-12.050079 129.338799,-12.037083 129.363798,-12.037638 129.399831,-12.074604 129.471383,-12.073155 129.530829,-12.020509 129.564991,-11.949521 129.561241,-11.862252 129.473824,-11.785509 129.429887,-11.728848 129.48604,-11.643049 129.524938,-11.642827 129.546076,-11.691018 129.573415,-11.750441 129.569851,-11.813236 129.595367,-11.840214 129.627518,-11.851672 129.674422,-11.84745 129.710619,-11.800125 129.707913,-11.745534 129.743807,-11.685441 129.757701,-11.690444 129.775144,-11.760026 129.793953,-11.814626 129.859443,-11.770263 129.860771,-11.769301 129.891353,-11.828889 129.895269,-11.676461 129.984621,-11.679587 130.026429,-11.767537 130.045318,-11.80739 130.091165,-11.820652 130.195693,-11.797837 130.197059,-11.785368 130.217862,-11.778097 130.295099,-11.827919 130.285721,-11.83861 130.212212,-11.864799 130.200217,-11.865688 130.196901,-11.865734 130.174869,-11.86672 130.1636,-11.874559 130.139474,-11.921479 130.099271,-11.921206 130.123827,-11.86602 130.177265,-11.886166 130.247146,-11.86602 130.333106,-11.878228 130.35485,-11.930368 130.381651,-11.959641 130.430783,-11.998233 130.429976,-12.009911 130.397005,-11.977454 130.279513,-12.02813 130.190289,-12.076269 130.168898,-12.14866 130.179367,-12.171599 130.133188,-12.207709 130.14637,-12.279629 130.132889,-12.257479 130.061273,-12.343616 129.986814,-12.306176 129.913776,-12.297246 129.815472,-12.316624 129.791598

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

Australian Government
Department of the Environment and Energy

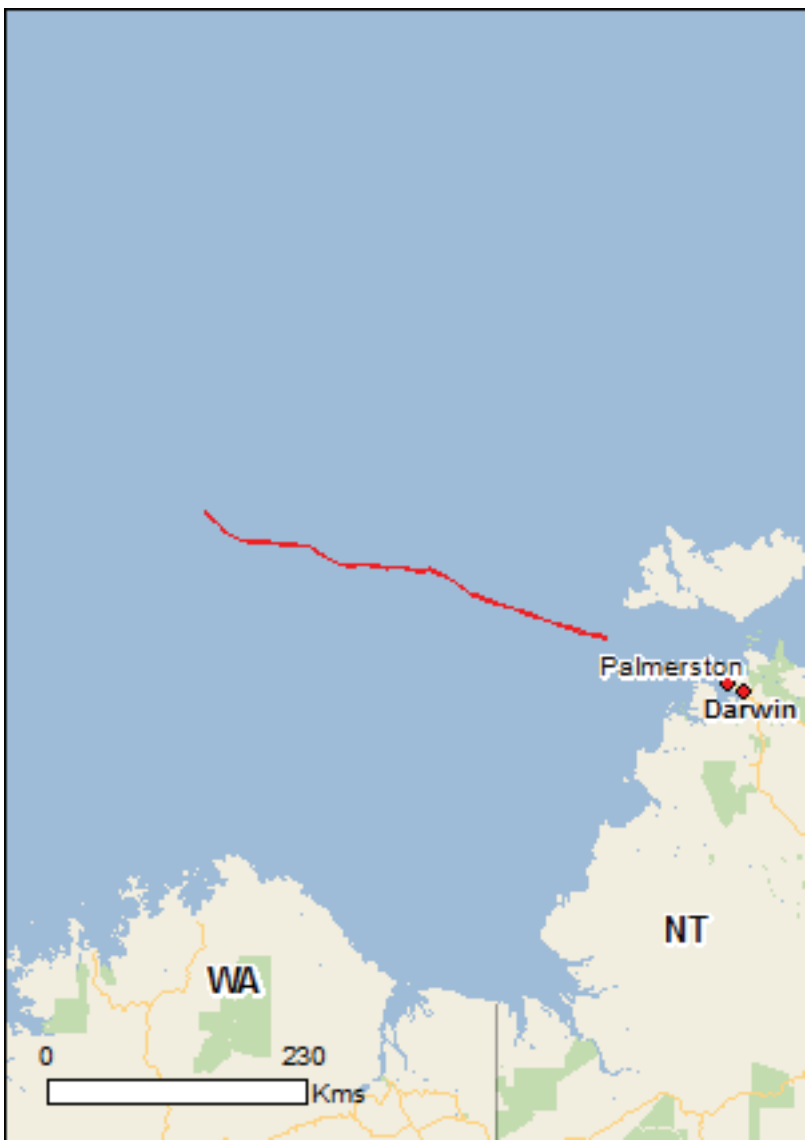
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 12/03/19 11:07:50



Coordinates
Buffer: 1.0Km

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	20
Listed Migratory Species:	36

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	66
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	2

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	None
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	4

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name
EEZ and Territorial Sea

Marine Regions [Resource Information]

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name
North
North-west

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Name	Status	Type of Presence
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Lepidochelys olivacea		
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Glyphis garricki		
Northern River Shark, New Guinea River Shark [82454]	Endangered	Species or species habitat may occur within area
Glyphis glyphis		
Speartooth Shark [82453]	Critically Endangered	Species or species habitat may occur within area
Pristis clavata		
Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis		
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron		
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat may occur within area
Calonectris leucomelas		
Streaked Shearwater [1077]		Species or species habitat known to occur within area
Fregata ariel		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor		
Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Migratory Marine Species		

Name	Threatened	Type of Presence
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat may occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Name	Threatened	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Fish		
Bhanotia fasciolata Corrugated Pipefish, Barbed Pipefish [66188]		Species or species habitat may occur within area
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area
Corythoichthys schultzi Schultz's Pipefish [66205]		Species or species habitat may occur within area
Cosmocampus banneri Roughridge Pipefish [66206]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Enhydrina schistosa Beaked Seasnake [1126]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Hydrophis atriceps Black-headed Seasnake [1101]		Species or species habitat may occur within area
Hydrophis coggeri Slender-necked Seasnake [25925]		Species or species habitat may occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Hydrophis inornatus Plain Seasnake [1107]		Species or species habitat may occur within area
Hydrophis mcdowelli null [25926]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
Hydrophis pacificus Large-headed Seasnake, Pacific Seasnake [1112]		Species or species habitat may occur within area
Lapemis hardwickii Spine-bellied Seasnake [1113]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Parahydrophis mertoni Northern Mangrove Seasnake [1090]		Species or species habitat may occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area

Name	Status	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat may occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Australian Marine Parks [Resource Information]

Name	Label
Oceanic Shoals	Multiple Use Zone (IUCN VI)
Oceanic Shoals	Special Purpose Zone (Trawl) (IUCN VI)

Extra Information

Key Ecological Features (Marine) [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Carbonate bank and terrace system of the Van	North
Pinnacles of the Bonaparte Basin	North
Carbonate bank and terrace system of the Sahul	North-west
Pinnacles of the Bonaparte Basin	North-west

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

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127.748515,-11.438451 127.682209,-11.413764 127.635434,-11.413591 127.635133,-11.362837 127.554448,-11.33352 127.506011,-11.330951
127.452234,-11.324451 127.39113,-11.319236 127.31555,-11.310127 127.227068,-11.304924 127.163325,-11.297113 127.066984,-11.289301
126.970642,-11.253746 126.892279,-11.224693 126.831674,-11.169455 126.775035,-11.121348 126.728229,-11.071937 126.676218,-11.07081
126.675355,-11.069474 126.674886,-11.06806 126.674859,-11.066708 126.675274,-11.065548 126.676093,-11.064695 126.677234,-11.064232
126.678587,-11.064205 126.680017,-11.064616 126.681387,-11.065424 126.682561,-11.114896 126.734638

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix C: Pre-spill NEBA Assessment and ALARP Assessment of Response Strategies

Response option	Scenario 1 – bunkering incident resulting in up to 10m^3 release of MDO	Scenario 2 – vessel collision resulting in up to 700 m^3 release of MDO	NEBA Summary
Source control	Primary response option	Primary response option	Source control onboard the vessel that has spilled the MDO is a primary response strategy. This strategy is managed by the Vessel Master and crew by implementing the SOPEP and/or ERP, depending on the nature of the spill.
Monitor and evaluate	Primary response option	Primary response option	The requirement for situational awareness is critical in order to implement a coordinated, focussed and effective spill response. Therefore, the benefits of undertaking this response are considered to significantly outweigh the potential environmental risks/impacts.
Wildlife response – hazing	N/A	Secondary response option	Wildlife response - hazing is considered a secondary response option for the vessel collision scenario. This means that this response would not be automatically triggered but will be considered where it is safe and practicable to implement, and where significant aggregations of wildlife are detected during the monitor and evaluate response.
Offshore pre-emptive capture/post-contact wildlife response	N/A	Secondary response option	Offshore pre-emptive capture/post-contact wildlife response is considered a secondary response option for the vessel collision scenario. This option would only be triggered if the monitor and evaluate option and/or operational monitoring showed wildlife were at risk of being impacted or had already been impacted by the spill, and it is safe and practicable to implement wildlife response tactics.
(Mechanical) physical dispersion	N/A	N/A	Mechanical dispersion may assist natural dispersion (e.g. prop wash or use of fire monitor sprays from vessels) to remove MDO from the sea surface. However, MDO is expected to weather rapidly at the sea surface and the benefits of undertaking this response are not considered to significantly outweigh the potential risk to human health. As such mechanical dispersion is not considered a suitable response for these scenarios.
Chemical dispersion – surface application	N/A	N/A	MDO is not a persistent hydrocarbon and has high natural spreading, dispersion and evaporation rates in the marine environment. Dispersant application has a low probability of being effective in increasing the dispersal rate of MDO and would introduce more chemicals to the marine environment. The benefits of applying chemical dispersant do not significantly outweigh the potential environmental risks/ impacts and therefore this response option is not considered suitable.

Response option	Scenario 1 – bunkering incident resulting in up to 10m^3 release of MDO	Scenario 2 – vessel collision resulting in up to 700 m^3 release of MDO	NEBA Summary
Containment and recovery	N/A	N/A	Containment and recovery is unlikely to be effective in either scenario. This is due to the scenarios being in open ocean where MDO rapidly degrades and the inability to deploy an effective response prior to the product degrading. In addition, MDO spreads quickly into a thin film, making recovery via skimmers difficult and ineffective.
Protection and deflection	N/A	N/A	Modelling indicates low probability of shoreline contact. Contact exposure levels are also well below thresholds that would cause significant impact. The exposed nature of the shorelines and typical metocean conditions (large tidal range and associated strong currents) means that shoreline protection and deflection is unlikely to be effective along much of the shoreline. Shoreline protection and deflection activities involve mobilising personnel and equipment to remote coastal environments, which can result in physical disturbance to intertidal and shoreline habitats. Given the small volumes and area of shoreline predicted to be impacted, leaving the product to degrade naturally would cause less harm than active methods of protection and deflection. The benefits of conducting this response option are not considered to significantly outweigh the potential environmental risks/ impacts associated with its implementation. Therefore, shoreline protection and deflection is not considered a suitable response option.

Response option	Scenario 1 – bunkering incident resulting in up to 10m^3 release of MDO	Scenario 2 – vessel collision resulting in up to 700 m^3 release of MDO	NEBA Summary
Shoreline clean-up	N/A	N/A	Modelling indicates low probability of shoreline contact. Contact exposure levels are also well below thresholds that would cause significant impact. Shoreline clean-up activities involve mobilising personnel and equipment to remote coastal environments, which can result in physical disturbance to intertidal and shoreline habitats. Given the small volumes and area of shoreline predicted to be impacted, leaving the product to degrade naturally would cause less harm than active methods of clean-up. The benefits of conducting this response option are not considered to significantly outweigh the potential environmental risks/ impacts associated with its implementation. Therefore, shoreline clean-up is not considered a suitable response option.

N/A - Response option excluded after NEBA assessment

Appendix D: NOPSEMA reporting forms

Appendix D1: Recordable Environmental Incident Monthly Report

Recordable Environmental Incident Monthly Report

Due Date: By the 15th day of the following month.

Send completed form to: submissions@nopsema.gov.au via secure file transfer at https://securefile.nopsema.gov.au/filedrop/submissions

Reference: Regulation 26B

Please check the following boxes if applicable to this report		Nil Incident Report: ☐		Final report for this activity: ☐	
Titleholder name:		**Titleholder business address:**		**Title of environment plan for the activity:**	
Activity type: (e.g. drilling, seismic, production)		**Month, Year:**		**Facility name and type :** (e.g. MODU, Seismic Vessel, FPSO)	
Contact person:		**Email:**		**Phone:**	

Incident date	All material facts and circumstances (including release volumes to environment if applicable)	Performance outcome(s) and/or standard(s) breached	Action taken to avoid or mitigate any adverse environmental impacts of the incident	Corrective action taken, or proposed, to stop, control or remedy this incident	Action taken, or proposed, to prevent a similar incident occurring in future

Note 1: As at 28 February 2014, amendments to the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations changed from environmental performance objective to environmental performance outcome. If you are reporting against an EP accepted under the old Regulations please report against the environmental performance objective for that activity.

Note 2: This form may be submitted in conjunction with the 'Injuries and Fatalities – Monthly Summary Report' Form available at www.nopsema.gov.au

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- individuals who make a request under the *Freedom of Information Act 1982*
- the Australian National Audit Office and other privately-appointed auditors
- NOPSEMA's legal advisors.

NOPSEMA may occasionally be required to disclose information to overseas recipients in order to discharge its functions or exercise its powers, or to perform its necessary business activities. Information about how you can access, or seek correction to, your personal information is contained in NOPSEMA's APP Privacy Policy at www.nopsema.gov.au/privacy. If you have an enquiry or a complaint about your privacy, please contact NOPSEMA's Privacy Contact Officer on 08 6188 8700 or by email at privacy@nopsema.gov.au.

Appendix D2: Report of an accident, dangerous occurrence or environmental incident

Report of an accident, dangerous occurrence or environmental incident

For instructions and general guidance in the use of this form, please see the last page.

Part 1 is required within 3 days of a notified incident.
Part 2 is required within 30 days of notified incident.

What was the date and time of the initial verbal incident notification to NOPSEMA?			
Date		**Time**	

NOTE: It is a requirement to request permission to interfere with the site of an accident or dangerous occurrence. Refer OPGGS(S)R, Reg. 2.49.

What is the date and time of this written incident report?			
Date		**Time**	

What type of incident is being reported?	*Please tick appropriate incident type*	
Accident or dangerous occurrence		Complete parts 1A, 1B & part 2
Environmental Incident		Complete parts 1A, 1C
BOTH (Accident or dangerous occurrence AND environmental incident)		Complete ALL parts (1A, 1B, 1C, 2)

Please tick all applicable (one or more categories) *To use electronically: MS Word 2007-10 – click in check box*

Categories *Please select one or more*	Accidents	Death or Serious injury Lost time injury ≥3 days	☐ ☐
	Dangerous occurrences	Hydrocarbon release >1 kg or ≥80 L (gas or liquid) Fire or explosion Collision marine vessel and facility Could have caused death, serious injury or LTI Damage to safety-critical equipment Unplanned event - implement ERP Pipeline incident Well kick >50 barrels Other _____	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
	Environmental incidents	Hydrocarbon release Chemical release Drilling fluid/mud release Fauna Incident Other _____	☐ ☐ ☐ ☐ ☐

Part 1A – Information required within 3 days of an accident, dangerous occurrence or environmental incident

General information – all incidents

1.	**Where did the incident occur?**	Facility / field / title name		
		Site name and location *Latitude/longitude*		
2.	**Who is the registered operator/titleholder or other person that controls the works site or activity?**	Name		
		Business address		
		Business phone no.		
3.	**When did the incident occur?**	Time and time zone		
		Date		
4.	**Did anyone witness the incident?**	Yes or no *If yes, provide details below*		
	Witness details	Witness no 1	Witness no 2	Witness no 3
	Full name			
	Phone no. (Business hours)			
	Phone no. (Home) (Mobile)			
	Email (Business) (Private)			
	Postal address			
	NB: If more witnesses, copy and insert this section (4) here , and add extra witness numbers appropriately			
5.	**Details of person submitting this information**	Name		
		Position		
		Email		
		Telephone no.		
6.	**Brief description of incident**			
7.	**Work or activity being undertaken at time of incident**			

Part 1A – Information required within 3 days of an accident, dangerous occurrence or environmental incident

General information – all incidents

8.	**What are the internal investigation arrangements?**					
9.	**Was there any loss of containment of any fluid (liquid or gas)?**	Yes or no *If Yes, provide details below*				
		Type of fluid (liquid or gas) *If hydrocarbon release please complete item no.15 as well*	Hydrocarbon ☐ *Please specify*_____ Non-hydrocarbon ☐ *Please specify*_____			
		Estimated quantity *Liquid (L), Gas (kg)*				
		Estimation details	Calculation ☐		Measurement ☐	
			*Please specify*_____			
		Composition *Percentage and description*				
		Known toxicity to people and/or environment	Toxicity to people			
			Toxicity to environment			
		How was the leak/spill detected?	F&G detection ☐ CCTV ☐		Visual ☐ Other ☐	
		Did ignition occur?	No ☐ Yes ☐		Immediate ☐ Delayed ☐	
			If yes, what was the likely ignition source		Hotwork ☐ Spark electrical source ☐ Spark metallic contact ☐ Hot surface ☐ Other ☐	
10.	**Has the release been stopped and/or contained?**	Yes or no				
		Duration of the release *hh:mm:ss*				
		Estimated rate of release *Litres or kg per hour*				
11.	**Location of release**	What or where is the location of the release?				
		What equipment was involved in the release?				
		Is this functional location listed as safety-critical equipment?				

Part 1A – Information required within 3 days of an accident, dangerous occurrence or environmental incident

General information – all incidents

12.	**Weather conditions** *Please complete as appropriate*	Ambient temperature C°				
		Relative humidity %				
		Wind speed m/s *NB: for enclosed areas use* Air change per hour				
		Wind direction e.g. from SW				
		Significant wave height m				
		Swell m				
		Current speed m/s				
		Current direction e.g. from SW				
13.	**Hydrocarbon release details** *If hydrocarbon fluid (liquid or gas) was released, please complete this section as well*	System of hydrocarbon release	Process ☐ Drilling ☐ Subsea / Pipeline ☐		Utilities ☐ Well related ☐ Marine ☐	
		Estimated inventory in the isolatable system *Litres or kg*				
		System pressure and size of piping or vessel *diameter (d in mm)* *length (l in m)* *or volume (V in L)*	Pressure MPag			
			Size Piping (d) and Piping (l) or Vessel (V)			
		Estimated equivalent hole diameter *d in mm*				

Part 1B - Complete for accidents or dangerous occurrences

Accidents and dangerous occurrences information

	Was NOPSEMA notified through the dedicated notification phone line? *Phone No. 08 6461 7090*		Yes	☐	No	☐
15.	**Action taken to make the work-site safe**	Was permission given by a NOPSEMA inspector to interfere with the site? OPGGS(S)R 2.49.	Yes	☐	No	☐
		Action taken				
		Details of any disturbance of the work site				

Part 1B - Complete for accidents or dangerous occurrences

Accidents and dangerous occurrences information

16.	**Was an emergency response initiated?**		Yes	☐	No	☐
		Type of response	Manual Automatic alarm	☐ ☐	Muster Evacuation	☐ ☐
		How effective was the emergency response?				

17.	**Was anyone killed or injured?** *Provide details below*		Yes	☐	No	☐		
	Injured persons (IP)	**Casualty No 1**						
	If different from item 2. Employer name		Employer address					
	Employer phone no.		Employer email					
	IP full name							
	IP date of birth		Sex	M	☐	F	☐	
	IP residential address							
	IP phone no. (Work)		IP phone no. (Home) (Mobile)					
	IP occupation/job title		Contractor or core crew					
	Details of injury							
	Based on TOOCS (refer last page) Nature of injury	a. Intracranial injury b. Fractures c. Wounds, lacerations, amputations, internal organ damage	☐ ☐ ☐	d. Burn e. Nerve or spinal cord injury f. Joint, ligament, muscle or tendon injury g. Other _____	☐ ☐ ☐ ☐			
	Part of body	G1. Head or face G2. Neck G3. Trunk G4. Shoulder or arm	☐ ☐ ☐ ☐	G5. Hip or leg G6. Multiple locations G7. Internal systems G8. Other _____	☐ ☐ ☐ ☐			
	Mechanism of injury	G0. Falls, stepping, kneeling, sitting on object G1. Hitting object G2. Being hit or trapped	☐ ☐ ☐	G3. Exposure to sound or pressure G4. Muscular stress G5. Heat, cold or radiation G6/7 Chemical, biological substance G8. Other _____	☐ ☐ ☐ ☐ ☐			
	Agency of injury	1. Machinery or fixed plant 2. Mobile plant or transport 3. Powered equipment 4. Non-power equipment	☐ ☐ ☐ ☐	5/6. Chemicals, materials, substances 7. Environmental agencies 8. Human or animal agencies 9. Other _____	☐ ☐ ☐ ☐			

Part 1B - Complete for accidents or dangerous occurrences

Accidents and dangerous occurrences information

	Details of job being undertaken					
	Day and hour of shift	Day *e.g. 5th day of 7 (5 / 7)*		Hour *e.g. 3rd hour of 12 (3 / 12)*		
	NB: If more casualties, please copy/paste this section (19) for each additional casualty and insert here					
18.	**Was there any serious damage?** *Provide details below*			Yes	☐	No ☐
	Details	**Item 1**		**Item 2**		**Item 3**
	Equipment damaged					
	Extent of damage					
19.	**Will the equipment be shut down?** *Yes or No*					
	If Yes, for how long?					
	NB: If more equipment seriously damaged, please copy/paste this section as required					
20.	**Will the facility be shut down?**	Yes or no *If yes provide details below*				
	Facility shutdown	Date		dd/mm/yyyy		
		Time		24 hour clock		
		Duration		days / hours / minutes		
21.	**Immediate action taken/intended, if any, to prevent recurrence of incident.**	**Action**		**Responsible party**		**Completion date** *Actual or intended*
22.	**What were the immediate causes of the incident?**					

Attachments

Are you attaching any documents?			Yes or no *If yes provide details below*	
No.	**ID**	**Revision**	**Date**	**Title/description**

Attachments

Are you attaching any documents?			Yes or no *If yes provide details below*	

Insert or delete rows as required

Part 1C – Complete for environmental incidents

Environmental Impacts

23.	**What is the current environment plan for this incident?**	Environment plan		
24.	**Has the incident resulted in an impact to the environment?**	Yes or no *If yes provide details below*		
		Incident details *e.g. estimated area of impact, nature/significance of impact*		
		ENVIRONMENTAL RECEPTORS		
		Open ocean ☐ Shoreline ☐ Population centre ☐ Stakeholders ☐ Other sensitivity ☐ *e.g. conservation area, nesting beach*		Macroalgae ☐ Coral Reef ☐ Benthic invertebrates ☐ Seagrass ☐ Mangrove ☐
		Further details		

Details	**Environment 1**	**Environment 2**	**Environment 3**
Location of receiving environments *Lat/Long*			
Date & time of impact			
Action taken to minimise exposure			
Specify each matter protected under Part 3 of the EPBC Act impacted			

NB: If more environments were damaged, please copy/paste this section (Item E3) and add extra data

25.	**Are any environments at risk?** ***Including as a result of spill response measures***	Yes or no *If yes, provide details*	
		Details *e.g. zone of potential impact*	
		AT RISK ENVIRONMENTS	

Part 1C – Complete for environmental incidents

Environmental Impacts

		Open ocean ☐ Shoreline ☐ Population Centre ☐ Stakeholders ☐ Other sensitivity ☐ *e.g. conservation area, nesting beach*		Macroalgae ☐ Coral Reef ☐ Benthic Invertebrates ☐ Seagrass ☐ Mangrove ☐			
	Details	**Environment 1**		**Environment 2**		**Environment 3**	
	Estimated location of 'at-risk' environments						
	Estimated impact date & time						
	Action required to minimise exposure						
	Specify each matter protected under Part 3 of the EPBC Act at risk						
	NB: If more environments at risk of damage, please copy/paste this section (Item E2) and add extra data						
26.	**Was an oil pollution emergency plan activated?**	Yes or no					
		If yes, what action has been implemented /planned?					
		If yes, how effective is/was the spill response?					
27.	**Was an environmental monitoring program initiated?**	Yes or no					
		If yes, what actions have been implemented and/or planned?					
28.	**Did the incident result in the death or injury of any fauna?**	Yes or no (If yes provide details of species in the table below)					
	Injured fauna	**Species 1**		**Species 2**		**Species 3**	
	Species name (common or scientific name)						
	Number of individuals killed or injured	Killed: Injured:		Killed: Injured:		Killed: Injured:	
	NB: If more species were injured or killed, please copy/paste this section (Item E4) and add extra data						
29.	**Actions taken to avoid or mitigate any adverse environmental impacts of the incident.**	**Action**		**Responsible party**		**Completion date** *Actual or intended*	
	NB: If more actions, please add extra rows as required						

Part 1C – Complete for environmental incidents

Environmental Impacts

		Action	Responsible party	Completion date *Actual or intended*
30.	**Corrective actions taken, or proposed, to stop, control or remedy the incident.**			
	NB: If more actions, please add extra rows as required			
		Action	**Responsible party**	**Completion date** *Actual or intended*
31.	**Actions taken, or proposed, to prevent a similar incident occurring in the future.**			
	NB: If more actions, please add extra rows as required			

Attachments

Are you attaching any documents?			Yes or no *If yes provide details below*	
No.	**ID**	**Revision**	**Date**	**Title/Description**
Insert or delete rows as required				

Part 2 – Information required within 30 days of accident or dangerous occurrence

NOPSEMA acknowledges that in many circumstances an operator may not have completed an investigation within 3 days of an accident or first detection of a dangerous occurrence and agrees that these items must be provided within 30 days unless otherwise agreed, in writing with NOPSEMA. In circumstances where an investigation has been completed within 3 days, and these items are available (supplemented, as required by any attachments) this part should also be completed at that time.

32.	**Has the investigation been completed?**	Yes or no	
	Root cause analysis *What were the root causes?*	Root cause 1	
		Root cause 2	
		Root cause 3	
		Other root causes	
	Full report *Describe investigation in detail, including who conducted the investigation and in accordance with what standard/procedure with reference to attachments listed in the 'attachments table' (following) as applicable*		

33.	**Actions to prevent recurrence of same or similar incident**	**Action**	**Responsible party**	**Completion date** *Actual or intended*
				NB: Add or delete rows as appropriate

Attachments (Insert/delete rows as required)

Are you attaching any documents?	Yes or no *If yes provide details below*	

No.	ID	Revision	Date	Title/description

Instructions and general guidance for use:

1. The use of this form is voluntary and is provided to assist operators and titleholders to comply with their obligations to give notice and provide reports of incidents to NOPSEMA under the applicable legislation.
2. Accidents, dangerous occurrences or environmental incidents can all be reported using this same form.
3. The applicable legislation for incident reporting is:
    a. Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009 [OPGGS(S)R]; and
    b. Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 [OPGGS(E)R], for facilities located in Commonwealth waters; or
    c. for facilities located in designated coastal waters, the relevant State or Territory Act and associated Regulations where there is a current conferral of powers to NOPSEMA.
4. In the context of this form an incident is a reportable incident as defined under:
    a. OPGGSA, Schedule 3, Clause 82.
    b. OPGGS(E)R, regulation 4.
5. This form should be used in conjunction with NOPSEMA Guidance Notes available on the NOPSEMA website:
    a. N-03000-GN0099 Notification and Reporting of Accidents and Dangerous Occurrences
    b. N-03000-GN0926 Notification and Reporting of Environmental Incidents
6. Part 1 requires completion for all incidents; then ALSO complete part 2 if the incident is an accident or dangerous occurrence.
7. NOPSEMA considers that a full report will contain copies of documentary material referenced and/or relied on in the course of completing this form, which may include (but not be limited to) as appropriate: witness statements, management system documents, drawings, diagrams and photographs, third party reports (audit, inspection, material analysis etc.), internal records and correspondence.
8. This form is intended to be completed electronically using Microsoft Word by completing the unshaded cells which will expand as required to accept the information required and the check boxes where relevant (NB: check boxes may appear shaded and have reduced functionality in MS Word versions prior to 2010).
9. The completed version of this form (and any attachments, where applicable) should be emailed to: submissions@nopsema.gov.au or submitted via secure file transfer at: https://securefile.nopsema.gov.au/filedrop/submissions as soon as practicable, but in any case within three days of the incident.

References

NOPSEMA website: www.nopsema.gov.au

TOOCS – Type of Occurrence Classification System.

The *Type of Occurrence Classifications System, Version 3.0* (TOOCS3.0) was developed to improve the quality and consistency of data. This system aligns with the International Classification of Diseases –Australian Modification (ICD10-AM).

http://www.safeworkaustralia.gov.au/sites/SWA/AboutSafeWorkAustralia/WhatWeDo/Publications/Documents/207/TypeOfOccurrenceClassificationSystem(TOOCS)3rdEditionRevision1.pdf

OPGGS(S)R. Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009. Select Legislative Instrument 2009 No. 382 as amended and made under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006.*Commonwealth of Australia.

OPGGS(E)R. Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009. Statutory Rules 1999 No. 228 as amended and made under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006.* Commonwealth of Australia.

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- individuals who make a request under the *Freedom of Information Act 1982*
- the Australian National Audit Office and other privately-appointed auditors
- other law enforcement bodies (for example, the police or the Coroner)
- NOPSEMA's legal advisors.

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Appendix E: Stakeholder Consultation

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
Relevant Stakeholders				
A Raptis and Sons				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Amateur Fisherman's Association NT (AFANT)				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Aquarium Fishery, NT Commercial Licence Holders				
19 Mar 2019	COPA provided initial fact sheet via covering letter with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
2 Apr 2019	COPA provided follow up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector. 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as Notices to Mariners closer to the time of the proposed activities.			provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
9 May 2019	COPA provided letter to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Arafura Bluewater Charters				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Austfish				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer			

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	be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Austral Fisheries				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Australia Bay Seafoods				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector:			

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	1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities are dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will also be notified in advance of activities occurring as per the ongoing communications plan.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Australian Fisheries Management Authority (AFMA), Commonwealth Government				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised. COPA advised stakeholder that the Northern Prawn Fishery and other relevant commercial fishing stakeholders had been provided the relevant information and opportunity to respond.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will also be notified in advance of maintenance activities occurring.
20 Mar 2019	Email from stakeholder recommending that information regarding the proposed activity be provided to the Northern Prawn Fishery Industry and that other relevant fishing industry that may be affected by the proposed activity should also be contacted.			
8 Apr 2019	COPA email response to stakeholder advising that information has been provided to the Northern Prawn Fishery Industry and that other relevant fishing industry that may be affected by the proposed activity should also be contacted.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Australian Marine Oil Spill Centre (AMOSC)				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			

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				The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
Australian Maritime Safety Authority (AMSA)				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised. COPA provided the requested additional information to the stakeholder.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process and the stakeholder's specific request.
25 Mar 2019	Email from stakeholder requesting COPA send through the ESRI ArcGIS shapefile/s for the Bayu-Undan Gas Export Pipeline so that AMSA can map it against vessel traffic AIS data. COPA provided response on the same day containing the requested information. AMSA responded the same day providing vessel traffic plots over the whole pipeline and the Bayu-Undan wells. AMSA requested that vessels involved in the planned activities notify AMSA and the Australian Hydrographic Office in advance.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Australian Southern Bluefin Tuna Industry Association				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Beach Energy				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Carnarvon Petroleum				
15 Mar	COPA provided initial fact sheet via covering email with the			No issues/concerns have been raised. COPA

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2019	following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Commonwealth Fisheries Association (CFA)				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 April 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as Notices to Mariners closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Darwin Port				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			

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Demersal Fishery, NT Commercial Licence-holders				
15 Mar 2019	COPA provided initial fact sheet via covering letter with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will also be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as Notices to Mariners closer to the time of the proposed activities.			
9 May 2019	COPA provided letter to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Department of Agriculture and Water Resources, Commonwealth Government				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Department of Defence (including Australian Hydrographic Service and Marine Border Command), Commonwealth Government				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No objections raised. ConocoPhillips notes that unexploded ordnance (UXO) may be present on and in the sea floor in the area of the proposed Bayu-Undan Gas Export Pipeline Production Cessation activities.	COPA notes the risks associated with conducting activities in an area where UXO may be present.	COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will also be notified in advance of activities occurring as per the ongoing communications process.
18 Mar 2019	Email response from Australian Hydrographic Service acknowledging receipt of COPA email.			
18 Apr 2019	Email from Defence. Defence advised no objections to the proposed activities. Defence also advised that a portion of the pipeline is within the Darwin Air Weapons Range (Central) and that unexploded ordnance (UXO) may be present on and in the sea floor in the area of the proposed activities. Defence also			

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	reminded COPA of notification requirements and timings to Defence and the AHS.			
29 Apr 2019	COPA email response to Defence acknowledging the advice provided in Defence email on 18 Apr 2019.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
9 May 2019	Email response from Australian Hydrographic Service acknowledging receipt of COPA email.			
Department of Environment and Energy (including Parks Australia), Commonwealth Government				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	The following confirmations were provided by COPA to the stakeholder in response to the issues and concerns raised (see entry in left column): • The final EP will reflect compliance with all the obligations and considerations cited by the DNP in its comments, including the following: o Obligations included in the Class Approval (and Conditions) governing operation of the pipeline in the Oceanic Shoals Marine Park o Consideration of information on values of the Marine Park provided in the North Marine Parks Network Management Plan 2018 and its accompanying Guidance Note and the Australian Marine Parks Science Atlas. • The submitted EP will identify and manage the potential impacts and risks on marine park values to an acceptable level and consider all options to avoid them or reduce them to as low as reasonably practicable and demonstrate that the activity will not be inconsistent with the management plan. • The notification requirements and requests [1 (a) and (b), 2 and 3 (a), (b) and (c)] cited by DNP in its comments will be reflected in the submitted EP and Oil Pollution Emergency Plan and will also be addressed in the notification procedures that will be developed for the cessation activities.	The issues and concerns raised by the stakeholder have informed the commitments by COPA related to proposed activity in the Oceanic Shoals Marine Park. The submitted/final EP will reflect compliance with all the obligations and considerations cited by the DNP.	COPA believes it has conducted the appropriate consideration of the issues and concerns raised and has made the relevant inclusions to the submitted EP. COPA also believes it has provided reasonable and adequate time and information for the stakeholder to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and provide access to the full EP. The stakeholder will continue to be notified of Barossa activities through project updates and provided opportunity to provide feedback during the preparation of all EPs. As a 'relevant' stakeholder, they will also be engaged by COPA in advance of cessation activities as per the ongoing communications process and the DNP's specific notification requirements.
2 Apr 2019	Email from Parks Australia requesting information on the length of the pipeline planned to be decommissioned that overlaps with marine park/s.			
4 Apr 2019	COPA email to Parks Australia providing the requested information along with a map showing the pipeline length that overlaps with the Oceanic Shoals Marine Park.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
17 June 2019	Email received from Parks Australia in response to COPA's requests for feedback: • Noted the pipeline proposed to be decommissioned runs through the Multiple Use (IUCN VI) – Zone 3 and the Special Purpose (Trawl) (IUCN VI) – Zone 4 of the Oceanic Shoals Marine Park for 221.62 km • Noted the North Marine Parks Network Management Plan 2018 provides information on values for the marine park. • Advised that in preparing the EP for submittal to NOPSEMA, COPA is expected to consider the impacts and risks of activities in the context of the Management Plan objectives and values, including representativeness of the relevant values and activity footprint on the representative area of the Australian marine park. • Advised that specific values for the Oceanic Shoals Marine Park include (but are not limited to): o ecosystems representative of the Northwest Shelf Transition including key ecological features: carbonate bank and terrace systems of the Van Diemen Rise, carbonate bank and terrace system of the Sahul Shelf; pinnacles of the Bonaparte Basin and shelf break and slope of the Arafura Shelf, all valued as unique seafloor features with ecological properties of regional significance. o Biologically important areas for marine turtles including foraging and internesting habitat. • Advised that, in the context of the management plan objectives and values, the EP should:			

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	- identifies and manages the impacts and risks on marine park values to an acceptable level and has considered all options to avoid them or reduce them to as low as reasonably practicable. - clearly demonstrates that the activity will not be inconsistent with the management plan. • Noted that, consistent with the management plan, any vessels used for or in connection with the pipeline installation must not anchor in the Habitat Protection Zone (IUCN IV) – Zone 2 unless it is required in an emergency. • Advised the following notification requirements for the EP: 1. The DNP requests that in the EP, the titleholder define as a reportable environmental incident, any incidents of pollution or loss of articles or equipment that have caused, or have potential to cause, moderate to significant environmental damage to a marine park or its values. The DNP should be made aware of oil/gas pollution incidences which occur within a marine park or are likely to impact on a marine park as soon as possible. As such, if the titleholder is required to notify NOPSMEA of any reportable environmental incident within or likely to impact on a marine park: (a) notice of such an incident should be reported to the DNP's 24 hour Marine Compliance Duty Office as soon as is possible on 0419 293 465. The notification should include: - titleholder details - time, location and description of the incident (including name of marine park likely to be affected and what pollutants, articles or equipment have been lost in the park) - proposed response arrangements as per the Oil Pollution Emergency Plan (e.g. dispersant, containment, etc) - contact details for the response coordinator. (b) provide any report prepared by the titleholder in accordance with the OPGGS Act about the incident must be provided to the DNP at the same time that such report is given to NOPSEMA. 2. The DNP request that the titleholder inform the DNP of the full details of any suspected contravention of the OPGGS Act relating to undertaking activities within the Habitat Protection Zone that are the subject of the EP and the Parks Australia licence (PA2018 00041 1), within 24 hours of becoming aware of any such suspected contravention. 3. The DNP requests: (a) notification of the date that the pipeline installation works will commence at least 10 days prior to the start date. (b) notification of the completion of the pipeline installation within 10 days of the date of completion. (c) details of any vessels used for, or in connection with, the installation activities within the marine park at the time the DNP is notified of the commencement of the activity.			
20 June 2019	COPA provided response via email to Parks Australia's comments of 24 May (as per column right).			
Department of Foreign Affairs & Trade (DFAT), Commonwealth Government				

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15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Department of Industry, Innovation and Science (DIIS), Commonwealth Government				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and provide access to the EP summary.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Department of Infrastructure, Planning and Logistics (Marine Transport), NT Government				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will also be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Department of Primary Industry and Resources (Fisheries), NT Government				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	Vessels and equipment that are sourced from waters outside Australia have the potential to introduce IMS. IMS have the potential to influence marine ecosystems which can indirectly affect commercial fisheries. Potential impacts can include competition for resources (space and food) and changes to species composition resulting in altered community structures, increased predation on native species, introduction of pathogens, or a reduction of biodiversity which may directly or indirectly result in changes or declines to target populations. Direct impacts to commercial fishing may also arise from biofouling of fishing equipment. Given the management controls that will be implemented throughout the production cessation activities the risk is considered low.	Ballast water discharges will comply with the requirements of the Australian Ballast Water Management Requirements, which implements the requirements of the *Biosecurity Act 2015* and the International Convention for the Control and Management of Ships' Ballast Water and Sediments (as appropriate for vessel class) Vessels will have a suitable anti-fouling coating in accordance with the *Protection of the Sea (Harmful Antifouling Systems) Act 2006* (as applicable for vessel size, type and class), including Marine Order 98. Vessels will comply with the International Convention on the Control of Harmful Anti-fouling Systems on Ships (as appropriate to class) including	Vessels involved in the production cessation activities will take all precautions in relation to aquatic biosecurity requirements. COPA has provided the stakeholder with the requested information related to oil spill modelling. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will also be notified in advance of activities occurring as per the ongoing communications process.
18 Mar 2019	Email from stakeholder requesting they be kept informed of timing of planned decommissioning activities and to be informed of the area/scope of the environment that may be affected if there is a spill, release of gas or chemical during the decommissioning of the pipeline. Stakeholder also stated that vessels involved in the decommissioning must ensure they take all precautions in relation to aquatic biosecurity requirements for the NT. Stakeholder also advised that the NT Seafood Council be informed of the proposed decommissioning activity.			
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector:			

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
	1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.		vessels having a valid IAFS Certificate. Vessels mobilising from outside Australia or from nearshore waters within Australia will be subject to an IMS risk assessment, the findings of which will determine if additional management measures are required prior to mobilisation, such as a hull inspection and cleaning as required.	
9 Apr 2019	COPA email response to stakeholder email on 18 March 2019. Advised stakeholder that COPA will ensure they are kept informed of future activities related to the Bayu-Undan Gas Export Pipeline by way of regular updates and the ongoing stakeholder engagement and communications process to be included in the EP submitted to NOPSEMA for assessment. COPA advised that we are still working on preparing the OPEP for this activity and will provide NT Fisheries with information on the area/scope of the environment that may be affected if there is a spill etc later in April or early May when the work is complete. COPA confirmed that vessels involved in the production cessation activities will take all precautions in relation to aquatic biosecurity requirements and that these precautions were outlined in the tailored information relevant to the commercial fishing industry provided to the stakeholder on 2 April 2019. COPA also advised that we had contacted the NT Seafood Council on 15 March and 1 April to provide information on the proposed activities and that we had also posted and emailed the tailored information direct to licence-holders in early April 2019.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
13 June 2019	Updated Department that spill information would be provided when finalised.			
Department of Primary Industry and Resources (Mines & Energy), NT Government				

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Eni Australia				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Fischer Wholesale / H & T Investments Pty Ltd				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May	COPA provided email to stakeholder attaching initial fact sheet			

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
2019	and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
INPEX				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Jamaclan Marine				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Melbana Energy				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
Monsoon Aquatics				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Neptune Energy				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
				activities occurring as per the ongoing communications process.
Northern Oil & Gas				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Northern Prawn Fishery (NPF)				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2018	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Northern Territory Seafood Council (NTSC)				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process and advised that an additional fact sheet addressing commercial	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required

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	fishing issues and concerns will be prepared and provided as soon as possible.			prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
1 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the Bayu-Undan Gas Export Pipeline. 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. Advised stakeholder that safety operational zones are expected to be placed around the activity locations and certain vessels for the duration of activities, which is expected to be around 4-to-6 weeks. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities. COPA advised NTSC that this information will also be provided to its relevant commercial fishing members. COPA offered to meet with NTSC to discuss the proposed activities at a convenient time for them.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Northern Wildcatch Seafood Australia				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones			

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	will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
NT Guided Fishing Industry Association (NTGFIA)				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Octanex				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Offshore Net and Line Fishery NT, Commercial Licence Holders				
15 Mar 2019	COPA provided initial fact sheet via covering letter with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholders that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as Notices			

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
	to Mariners closer to the time of the proposed activities.			
9 May 2019	COPA provided letter to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Oil Spill Response Ltd				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Paspaley Pearling Company				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Pearl Oyster Fishery NT, Commercial Licence Holders				

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
15 Mar 2019	COPA provided initial fact sheet via covering letter with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholders that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as Notices to Mariners closer to the time of the proposed activities.			
9 May 2019	COPA provided letter to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Pearl Producers Association				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 April 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Santos				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
	timing/schedule; regulatory and consultation process.			reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
Shell Development Australia				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
Shark Fishery, NT Commercial Licence Holders				
15 Mar 2019	COPA provided initial fact sheet via covering letter with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholders that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as Notices to Mariners closer to the time of the proposed activities.			COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
9 May 2019	COPA provided letter to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Spanish Mackerel Fishery NT, Commercial Licence Holders				
15 Mar 2019	COPA provided initial fact sheet via covering letter with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
9 May 2019	COPA provided letter to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Tellurian Inc				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Timor Reef Fishery, Commercial Licence Holders				
15 Mar 2019	COPA provided initial fact sheet via covering letter with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer			

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
	be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholders that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as Notices to Mariners closer to the time of the proposed activities.			The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
9 May 2019	COPA provided letter to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
Top End Sports Fishing				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
WA Fishing Industry Council				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process and advised that an additional fact sheet addressing commercial fishing issues and concerns will be prepared and provided as soon as possible.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. . The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
1 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that safety operational zones are expected to be placed around the activity locations and certain vessels for the duration of activities, which is expected to be around 4-to-6 weeks. These safety operational zones will also			

Date	Contact made/feedback received/issues raised	ConocoPhillips assessment of issues raised	ConocoPhillips response (including outcomes proposed/achieved)	Summary of ConocoPhillips assessment and response
	be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities. COPA offered to meet with WAFIC to discuss the proposed activities at a convenient time for them.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			
WA Seafoods				
15 Mar 2019	COPA provided initial fact sheet via covering email with the following information: activity overview; operational area and timing/schedule; regulatory and consultation process.	No issues raised.	No response required.	No issues/concerns have been raised. COPA believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COPA will advise the stakeholder when an EP is accepted and advise how to access the full EP. The stakeholder will be notified in advance of activities occurring as per the ongoing communications process.
2 Apr 2019	COPA provided follow-up email/letter attaching additional information on issues and concerns relevant to the commercial fishing sector: 1. Shape files with coordinates for the existing Bayu-Undan Gas Export Pipeline (email only). 2. A tailored information sheet for the Commercial Fishing sector. 3. The Fact Sheet previously sent to all relevant and interested stakeholders. Reminded stakeholder that the timing of pipeline production cessation activities is dependent upon when gas can no longer be economically produced and could commence as early as 2021 and as late as 2023. COPA advised stakeholder that for the duration of those activities, expected to be around 4-to-6 weeks, safety operational zones are expected to be placed around the activity locations and certain vessels. These safety operational zones will also be communicated to marine users by AMSA as *Notices to Mariners* closer to the time of the proposed activities.			
8 May 2019	COPA provided email to stakeholder attaching initial fact sheet and tailored information for the commercial fishing sector and advising that this information will be available on the COPA website; requested stakeholder to contact COPA with any issues or concerns by 22 May 2019 and that COPA will advise the stakeholder when the EP is submitted to NOPSEMA.			

Appendix F: OSMP Summary Table

Plan	Title	Aim	Initiation Criteria	Termination Criteria	Approximate Mobilisation Time	Resources Required	Monitoring Support/Providers
Operational Monitoring Plans							
OMP01	Oil properties and weathering behaviour at sea	To provide in field information on the hydrocarbon properties, behaviour and weathering of the spilled hydrocarbon to assist in spill response activities	• Tier 2 or tier 3 hydrocarbon spill	• The IMT Incident Commander (or delegate) considers that continuation of monitoring under this OMP will not result in a change to the scale or location of active response options; or • The IMT Incident Commander (or delegate) has advised that agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response; or • This OMP is no longer contributing to or influencing spill response decision-making; or • Relevant scientific monitoring components initiation criteria have been triggered.	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the OMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in field sampling • Suitable vessels • Sampling and sample storage equipment • Accredited National Association of Testing Authorities (NATA) Laboratory	• AMSA • OSRL • AMOSC • Vessel contractor/aerial contractor • Environmental Service Provider under contract
OMP02	Pre-emptive assessment of sensitive receptors at risk	To undertake a rapid assessment of the presence, extent and current status of sensitive receptors based on a desktop review, prior to contact from a hydrocarbon spill	• A probable hydrocarbon impact (or impact of dispersed hydrocarbon) on a resource, habitat or shoreline is anticipated on the basis of trajectory modelling or other assessment of the incident; or • Damage to a natural resource or sensitive receptor is possible as a result of that impact	• Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response; or • The assessment of sensitive receptors that were identified as being potentially impacted/contact by the hydrocarbon spill are completed	< 24 hours	• Personnel with appropriate training and expertise to undertake a desktop review, identify key information gaps in baseline data, assist with determining study design	• Environmental Service Provider under contract
OMP03	Shoreline clean-up assessment technique (SCAT)	To provide in field information on the physical and biological characteristics of shorelines within the predicted trajectory of the hydrocarbon spill or that have been exposed to the spill. It also provides a baseline for determining the effectiveness of the response	• The ConocoPhillips ABU-W IMT has determined that Tier 2 or 3 hydrocarbon spill to marine or coastal waters has occurred; and • Analysis of data from hydrocarbon spill modelling, monitoring, evaluation and/or surveillance predicts an exposure of hydrocarbon to shoreline habitat; or • Relevant response activities are being undertaken	• This OMP will not result in a change to the scale or location of active response options; or • Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response; or • Continuation of monitoring of this OMP is likely to increase overall environmental impact; or • Relevant scientific monitoring components initiation criteria have been triggered	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the OMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with aerial, satellite and/or vessel surveillance experience • Personnel with appropriate training and expertise in shoreline clean-up assessment • Suitable vessels and/or aircraft	• AMSA • OSRL • AMOSC • Vessel/aerial contractor • Environmental Service Provider
OMP04	Water quality assessment	To provide a rapid assessment of the presence, type, concentrations and character of hydrocarbons and dispersants (if applicable) in marine water to assess the extent of spill contact and verify trajectory predictions to inform other monitoring plans	• The ConocoPhillips ABU-W IMT has determined that Tier 2 or 3 hydrocarbon spill to marine or coastal waters has occurred	• The IMT Incident Commander (or delegate) considers that continuation of monitoring under this OMP will not result in a change to the scale or location of active response options; or • The IMT Incident Commander (or delegate) has advised that agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response; or	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the OMP has been triggered. • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in water quality sampling • Suitable vessels • Sampling and sample storage equipment • Accredited NATA Laboratory	• Vessel contractor • Environmental Service Provider under contract

Plan	Title	Aim	Initiation Criteria	Termination Criteria	Approximate Mobilisation Time	Resources Required	Monitoring Support/Providers
				• The spill is or is likely to be below visible criteria for surface hydrocarbon and low thresholds for entrained and dissolved hydrocarbon concentrations; or • The Monitoring Coordinator (or delegate) considers that continuation of monitoring under this OMP is likely to increase overall environmental impact; or • Relevant scientific monitoring components initiation triggers have been assessed			
OMP05	Sediment quality assessment	To provide a rapid assessment of the presence, type, concentrations and character of hydrocarbons in marine sediments to assess the extent of spill contact and verify trajectory predictions to inform other monitoring plans	• The ConocoPhillips ABU-W IMT has determined that Tier 2 or 3 hydrocarbon spill to marine or coastal waters has occurred; and • Modelling and/or analysis of data from surveillance activities predicts an exposure of hydrocarbon to marine and/or coastal sediment	• The IMT Incident Commander (or delegate) considers that continuation of monitoring under this OMP will not result in a change to the scale or location of active response options; or • The IMT Incident Commander (or delegate) has advised that agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response; or • The Monitoring Coordinator (or delegate) considers that continuation of monitoring under this OMP is likely to increase overall environmental impact; or • Relevant scientific monitoring components initiation triggers have been assessed	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the OMP has been triggered. • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in sediment quality sampling • Suitable vessels • Sampling and sample storage equipment • Accredited NATA Laboratory	• Vessel contractor • Environmental Service Provider under contract
OMP06	Marine fauna assessment	To undertake a rapid assessment of marine fauna at risk to assist in decisions on appropriate management and response actions during a hydrocarbon spill event to minimise the potential impact on marine fauna	• The IMT/EMT has determined that Tier 2 or 3 hydrocarbon spill to marine or coastal waters has occurred, and • Modelling and/or analysis of data from surveillance activities predicts, or has reported, an exposure of hydrocarbon to known sensitive fauna habitat	• The IMT/EMT Incident Commander (or delegate) considers that continuation of monitoring under this OMP will not result in a change to the scale or location of active response options; or • The IMT/EMT Incident Commander (or delegate) has advised that agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response; or • The Monitoring Coordinator (or delegate) considers that continuation of monitoring under this OMP is likely to increase overall environmental impact; or • Relevant scientific monitoring components initiation triggers have been assessed	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the OMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in marine fauna monitoring • Suitable vessels and/or aircraft • Sampling and sample storage equipment • Accredited NATA Laboratory	• Vessel contractor/aerial contractor • Environmental Service Provider under contract
OMP07	Air quality modelling (responder health and safety)	To assess the impact of the hydrocarbon spill on human health, particularly that of the public and response personnel	• The ConocoPhillips ABU-W IMT has determined that Tier 2 or 3 hydrocarbon spill to marine or coastal waters has occurred; and	• Completion of the gas, vapour and hydrocarbon discharge, hydrocarbon containment and recovery, dispersant operations and shoreline clean-up activities; or	• Commence within 12 hours	• Air quality modelling software	• Service Provider under contract

Plan	Title	Aim	Initiation Criteria	Termination Criteria	Approximate Mobilisation Time	Resources Required	Monitoring Support/Providers
			• Response activities that may pose a risk to the air quality of response personnel and/or public will occur	• Continuing hazardous and noxious plume detection and monitoring has a low probability of contributing or influencing spill response decision making		• Personnel with appropriate training and expertise in air quality modelling	
Scientific Monitoring Plans							
SMP01	Water quality impact assessment	Detect and monitor the presence, concentration and persistence of hydrocarbons in marine waters following the spill and associated response activities. The specific objectives of this SMP are as follows: • Assess and document the temporal and spatial distribution of hydrocarbons and dispersants in marine waters; and • Consider the potential sources of any identified hydrocarbons; and • Verify the presence and extent of hydrocarbons (both on water and in water) that may be directly linked to the source of the spill; and • Assess hydrocarbon/dispersant content of water samples against accepted environmental guidelines or benchmarks to predict potential areas of impact; and • Provide information that may be used to interpret potential cause and effect drivers for environmental impacts recorded for sensitive receptors monitored under other SMPs	• Operational monitoring has indicated that contact on a sensitive resource is possible and it is considered likely that ongoing (scientific) monitoring of impacts will be required, supported by scientifically rigorous water quality monitoring; or • Water quality monitoring (OMP04) has identified hydrocarbon and/or dispersant concentrations exceed accepted guidelines and benchmarks; or • Chemical dispersants have been applied as part of the spill response program	• Hydrocarbon concentrations in marine waters are below benchmark levels which can be defined as: • ANZECC Water Quality Objectives for the Protection of Aquatic Ecosystems, or • The relevant regulatory site-specific trigger level (where these exist); or • Below baseline levels, or • Reference site values (whichever is applicable); or • When appropriate, meaningful and defensible scientific monitoring results have been achieved for marine waters	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered. • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in water quality sampling • Suitable vessels • Sampling and sample storage equipment • Accredited NATA Laboratory	• Vessel contractor • Environmental Service Provider under contract
SMP02	Sediment quality impact assessment	Detect and monitor the presence, concentration and persistence of hydrocarbons in sediments following the spill and associated response activities. The specific objectives of this SMP are as follows: • Assess and document the temporal and spatial distribution of hydrocarbons in marine sediments; and • Consider the potential sources of any identified hydrocarbons; and • Verify the presence and extent of hydrocarbons that may be directly linked to the source of the spill; and • Assess hydrocarbon content of sediment samples against accepted environmental guidelines or benchmarks to predict potential areas of impact; and • Provide information that may be used to interpret potential cause and effect drivers for environmental impacts recorded for sensitive receptors monitored under other SMPs	• Sediment quality monitoring (OMP05) has identified hydrocarbon concentrations exceed accepted guidelines and benchmarks; and • Operational monitoring has indicated that an impact on a sensitive resource that is closely linked to marine sediments is possible, and it is considered likely that ongoing (scientific) monitoring of a biological parameter will be required that supported by scientifically rigorous sediment quality monitoring	• All hydrocarbon concentrations in sediments are below benchmark levels, which can be defined as: - Revised ANZECC/ARMCANZ sediment quality guidelines related to petroleum hydrocarbons (Simpson et al.,2013); or - The relevant regulatory site-specific trigger level (where these exist); or - Below baseline levels; or - Reference site values (whichever is applicable); or • No ongoing impacts to biological receptors can be linked to sediment quality	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered. • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in sediment quality sampling • Suitable vessels • Sampling and sample storage equipment • Accredited NATA Laboratory	• Vessel contractor • Environmental Service Provider under contract

Plan	Title	Aim	Initiation Criteria	Termination Criteria	Approximate Mobilisation Time	Resources Required	Monitoring Support/Providers
SMP03	Intertidal and coastal habitat assessment	To assess the impact (extent, severity, and persistence) and subsequent recovery of intertidal and coastal habitats and associated biological communities in response to a hydrocarbon release and associated response activities	• Operational monitoring predicts or confirms exposure of coastal or intertidal habitats or communities to hydrocarbons	• There has been no demonstrable impact to coastal and intertidal habitats and associated biological communities (confirmation that habitats and species were not exposed to hydrocarbons); or • Measured parameters of coastal and intertidal habitats and associated biological communities impacted by hydrocarbons spills have returned to within the expected natural dynamics of baseline state (taking into account natural variability) and/or reference sites	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in field sampling (intertidal habitat/communities) • Suitable vessels and/or vehicles • Sample collection and sample storage equipment • Accredited NATA Laboratory	• Vessel contractor • Environmental Service Provider under contract
SMP04	Benthic habitat assessment	To assess the impact (extent, severity, and persistence) and subsequent recovery of subtidal benthic habitats and associated biological communities in response to a hydrocarbon release and associated response activities	• Operational monitoring predicts or confirms exposure of benthic habitats or communities to hydrocarbons	• There has been no demonstrable impact to benthic habitats and associated biological communities (confirmation that benthic habitats were not exposed to hydrocarbons); or • Measured parameters of benthic habitats and associated biological communities impacted by hydrocarbons spills have returned to within the expected natural dynamics of baseline state (taking into account natural variability) and/or reference sites.	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in field sampling (i.e. coral reef, seagrass, macroalgae) • Suitable vessels • Sample collection and sample storage equipment • Accredited NATA Laboratory	• Vessel contractor • Environmental Service Provider under contract
SMP05	Seabird and shorebird assessment	Document and quantify shorebird and seabird presence; and any impacts and potential recovery from hydrocarbon exposure. The objectives are to: • Identify and quantify, if time allows, the post-spill/pre-impact presence and status (e.g. foraging and/or nesting activity) of shorebirds and seabirds in the study area; and • Observe and, if possible, quantify and assess, the impacts from exposure of shorebirds and seabirds to hydrocarbons (i.e. post-impact) and to the response activities, including abundance, oiling, mortality, and sub-lethal effects; and • Identify, quantify and evaluate the post-impact status and if applicable, recovery of key behaviour and breeding activities of shorebirds and seabirds (e.g. foraging and/or nesting activity and reproductive success) over time and with regard to reference sites	• Operational monitoring predicts contact is possible to seabirds or shorebird populations or any of their habitats of importance for breeding, nesting or foraging; or • Operational monitoring has identified contact or an impact to seabirds or shorebird populations as a result of the hydrocarbon spill; or • There are reports or scientific evidence of oiled seabirds or shorebird populations	• There has been no demonstrable evidence of an impact on seabirds and/or shorebirds or key biological activities from the hydrocarbon spill; or • Key seabird and shorebird behaviour and breeding activities have been quantified in the zone of exposure and are comparable to reference sites; or • Measured parameters have returned to baseline conditions (taking into account natural variability) in terms of breeding population (for seabirds) or counts (for shorebirds) and impacts on species and taxa are no longer detectable, with regard to reference sites	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Suitable survey platform • Personnel with appropriate training and expertise in field sampling (avian ecologists) • Photographic/video equipment • Tissue sample collection and sample storage equipment • Accredited NATA laboratory	• Vessel/aerial contractor • Environmental Service Provider under contract

Plan	Title	Aim	Initiation Criteria	Termination Criteria	Approximate Mobilisation Time	Resources Required	Monitoring Support/Providers
SMP06	Marine mega-fauna assessment	Document and quantify the status and recovery of marine megafauna related to a hydrocarbon spill. The objectives are to: • Observe and quantify the post-impact presence of marine megafauna within the areas that have been exposed to the hydrocarbon spill; and • Observe and record any changes in the levels of marine fauna strandings; and • Assess and quantify lethal and/or sub-lethal impacts to indicator marine megafauna species (e.g. behaviour, body condition changes, disease level changes, reproductive success) directly related to the spill or related response activities; and • Identify, quantify and evaluate the post-impact status and if applicable, recovery of key biological activities (e.g. foraging activity, breeding etc.) for indicator marine megafauna; and • Investigate short term or long-term environmental effects on marine megafauna which may have resulted from a hydrocarbon spill	• Operational monitoring predicts contact is possible to marine megafauna populations or any of their habitats of importance for breeding or foraging; or • Operational monitoring has identified contact or an impact to marine megafauna populations as a result of the hydrocarbon spill; or • There are reports or scientific evidence of oiled marine megafauna	• There has been no demonstrable evidence of an impact on marine megafauna or key biological activities from the hydrocarbon spill; or • The extent of damage of impacted marine mega-fauna has been quantified; and • Key biological processes (e.g. abundance, distribution, breeding) are similar to pre-spill or reference sites	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in field sampling (Marine megafauna ecologists) • Photographic/video equipment • Tissue sample collection and sample storage equipment • Accredited NATA laboratory	• Vessel/aerial contractor • Environmental Service Provider under contract
SMP07	Demersal fish assessment	To assess the impacts to and subsequent recovery of demersal fish assemblages (for which baseline fish assemblage data exist) in response to a hydrocarbon release and associated response activities. The specific objectives of this SMP are as follows: • Characterise the status of resident fish populations associated with habitats monitored in SMP04 (for which baseline fish assemblage data exist) that are exposed/contacted by released hydrocarbons; and • Quantify any impacts to species (e.g. abundance, richness and density) and resident fish assemblage structure (representative functional trophic groups); and • Determine and monitor the impact of the released hydrocarbons and potential subsequent recovery to residual demersal fish assemblages.	• Operational monitoring predicts or confirms exposure to habitats known to support demersal fish assemblages.	• There has been no demonstrable impact on fish and fish assemblage structure; or • Measured parameters of fish, fish habitat, and/or fish assemblage structure impacted by hydrocarbon spills have returned to within the expected natural dynamics of baseline state and/or reference sites.	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered • Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• Personnel with appropriate training and expertise in field sampling (Marine ecologists) • Photographic/video equipment	• Vessel contractor • Environmental Service Provider under contract
SMP08	Fisheries assessment	To monitor potential contamination and tainting of important finfish and shellfish species from commercial, aquaculture and recreational fisheries to evaluate the likelihood that a hydrocarbon spill will have an impact on the fishing and/or aquaculture industry. The specific objectives of this SMP are as follows: • Assess any physiological impacts to important fish and shellfish species	• Operational monitoring predicts contact is possible to commercial, recreational, traditional species and or aquaculture species; or • Advice has been provided to government to restrict, ban or close a fishery; or	• Contamination in the edible portion or in the stomach/intestinal contents attributable to the spill is no longer detected; or • No differences are detected in commercial, recreational or aquaculture fisheries from reference and impact sites; or	• Preparation to deploy field personnel and equipment will commence on notification from ConocoPhillips ABU-W IMT that the SMP has been triggered	• Personnel with appropriate training and expertise in field sampling (i.e. ecotoxicology, fisheries sampling) • Fishing equipment • Tissue sample collection and sample storage equipment	• Vessel contractor • Environmental Service Provider under contract

Plan	Title	Aim	Initiation Criteria	Termination Criteria	Approximate Mobilisation Time	Resources Required	Monitoring Support/Providers
		and if applicable, seafood quality and safety; and • Assess targeted fish and shellfish species for hydrocarbon contamination; and • Provide information that can be used to make inferences on the health of fisheries and the potential magnitude of impacts to fishing industries (commercial, aquaculture and recreational)	• Declarations of intent by commercial fisheries or government agencies to seek compensation for alleged or possible damage	• The physiological and biochemical parameters of commercial, traditional, recreational or aquaculture species are comparable between reference and impact sites; or • Evidence that catch rates, species composition, community abundance, distribution and age structure of commercial fisheries and by-catches have returned to baseline levels (taking into account natural variability); or • Agreement has been reached with the relevant Jurisdictional Authorities to cease monitoring of fisheries	• Deployment of field personnel and equipment into the field within 7 days of receipt of notification	• NATA accredited laboratory	