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Evaluating decommissioning options

Steel jacket and monotower platforms

About Esso Australia

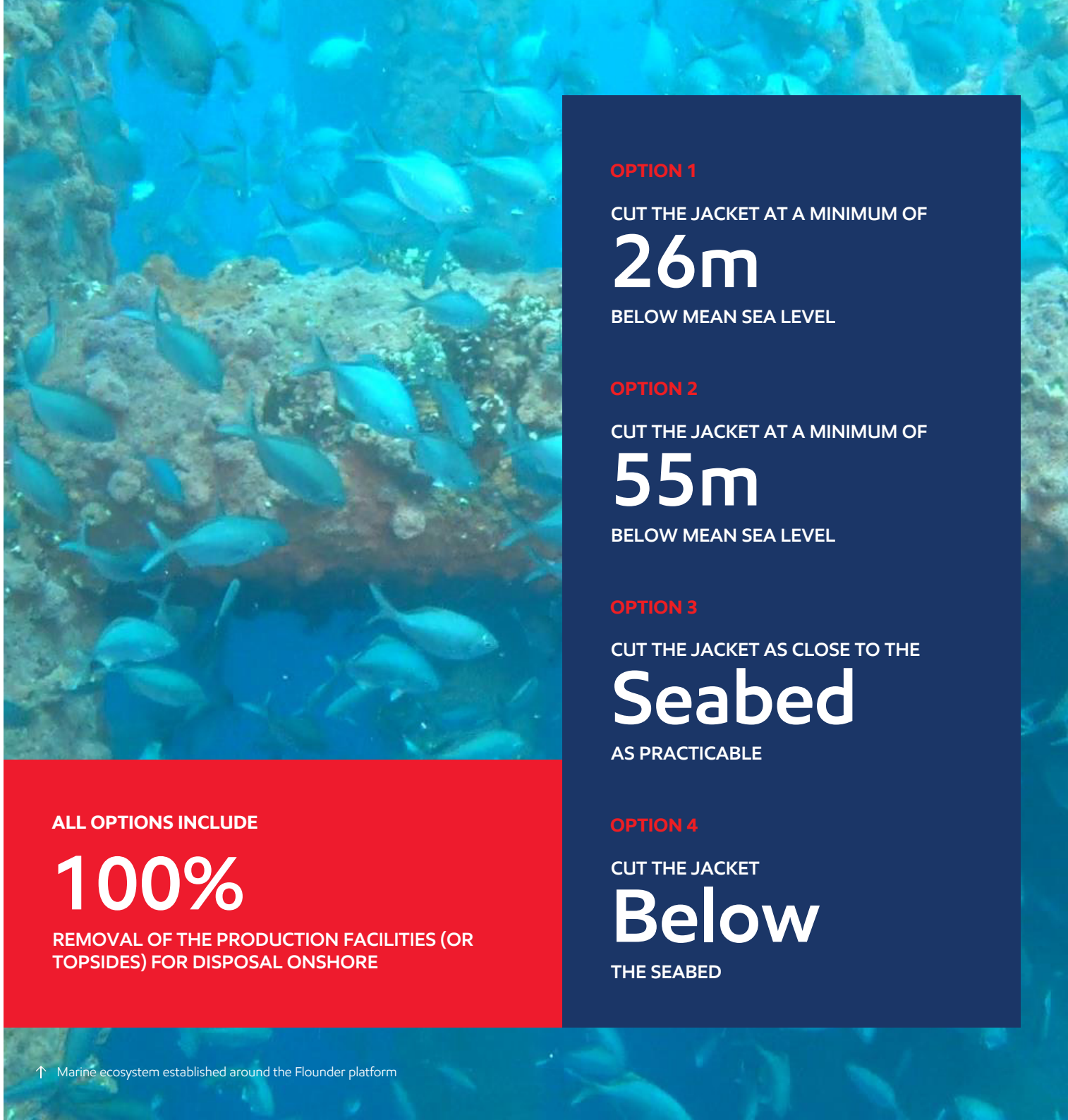
As operator of some of Australia's most mature oil and gas fields, Esso Australia is committed to decommissioning our Bass Strait offshore facilities safely and effectively. This includes working together with government, community and non-government organisation stakeholders to determine options for decommissioning non-producing infrastructure that balance environmental impacts and benefits with the needs of the community and requirements of regulatory authorities.

Assessing decommissioning options

In accordance with Section 572 (3) of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*, Esso Australia is required to remove all structures, equipment and other property no longer used for operations. This obligation is subject to other provisions of the Act, regulations, directions and other applicable laws, which allow variations to full removal if the variations meet acceptance criteria.

As such, Esso Australia evaluated a range of decommissioning options, including full removal required by the Act, for environmental impacts and risks that may arise, as well as technical, safety and socio-economic aspects. The evaluation was based on global studies and literature, supplemented by further assessments using Bass Strait specific studies, including environmental sampling, undertaken by Esso Australia with specialist partners. For example, Esso Australia partnered with expert researchers, academics and environmental consultants to complete a three-part comprehensive offshore environmental survey in 2021, which included: a detailed examination of fish and epibenthic communities by AIMS; a benthic infauna identification by AECOM; and a sediment analysis by CSIRO.

In addition to research and field studies, decommissioning options were also evaluated against applicable legislation, codes, standards, conventions and practices. The results of the extensive evaluation identified three feasible options. After further discussion and alignment with key stakeholders, a fourth feasible option was identified and assessed in detail.



ALL OPTIONS INCLUDE

100%

REMOVAL OF THE PRODUCTION FACILITIES (OR TOPSIDES) FOR DISPOSAL ONSHORE

OPTION 1

CUT THE JACKET AT A MINIMUM OF

26m

BELOW MEAN SEA LEVEL

OPTION 2

CUT THE JACKET AT A MINIMUM OF

55m

BELOW MEAN SEA LEVEL

OPTION 3

CUT THE JACKET AS CLOSE TO THE

Seabed

AS PRACTICABLE

OPTION 4

CUT THE JACKET

Below

THE SEABED

↑ Marine ecosystem established around the Flounder platform

→ WHICH REGULATORS APPROVE THE DECOMMISSIONING?

As the Bass Strait platforms proposed to be decommissioned are located in Commonwealth waters, the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) and the Commonwealth Department of Agriculture, Water and the Environment (DAWE) are the regulators responsible for approving decommissioning plans.

Meeting regulatory obligations

Esso Australia assessed whether the feasible options provide equal or better environmental, safety and well integrity outcomes than full removal. For the options shown to achieve equal or better outcomes, they were further assessed to ensure that:

i. environmental risks and impacts would be reduced to As Low As Reasonably Practicable (ALARP); and

ii. be of an acceptable level as defined in the regulations.

These assessments are required by the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulation 2009*.

Where a decommissioning concept does not propose the full removal of property, Esso Australia will present proposed alternatives to NOPSEMA for assessment.

Esso Australia is also required to seek approval from DAWE for any infrastructure that is intended to remain on or below the seabed after decommissioning is complete.

If NOPSEMA and DAWE approvals are obtained for the alternative approaches, Esso Australia will develop Environment Plans for the decommissioning of each platform based on the approved approaches.

Decommissioning options for steel jacket platforms still operating, concrete gravity structures, pipelines and subsea facilities will be the subject of future assessment, stakeholder consultation and regulatory submissions.

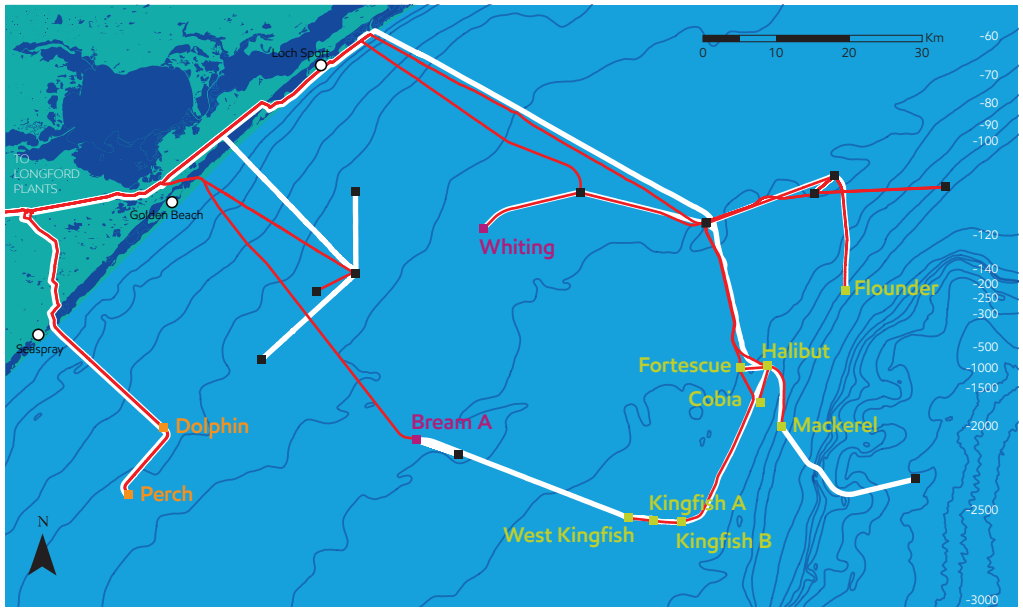
Kingfish A platform →

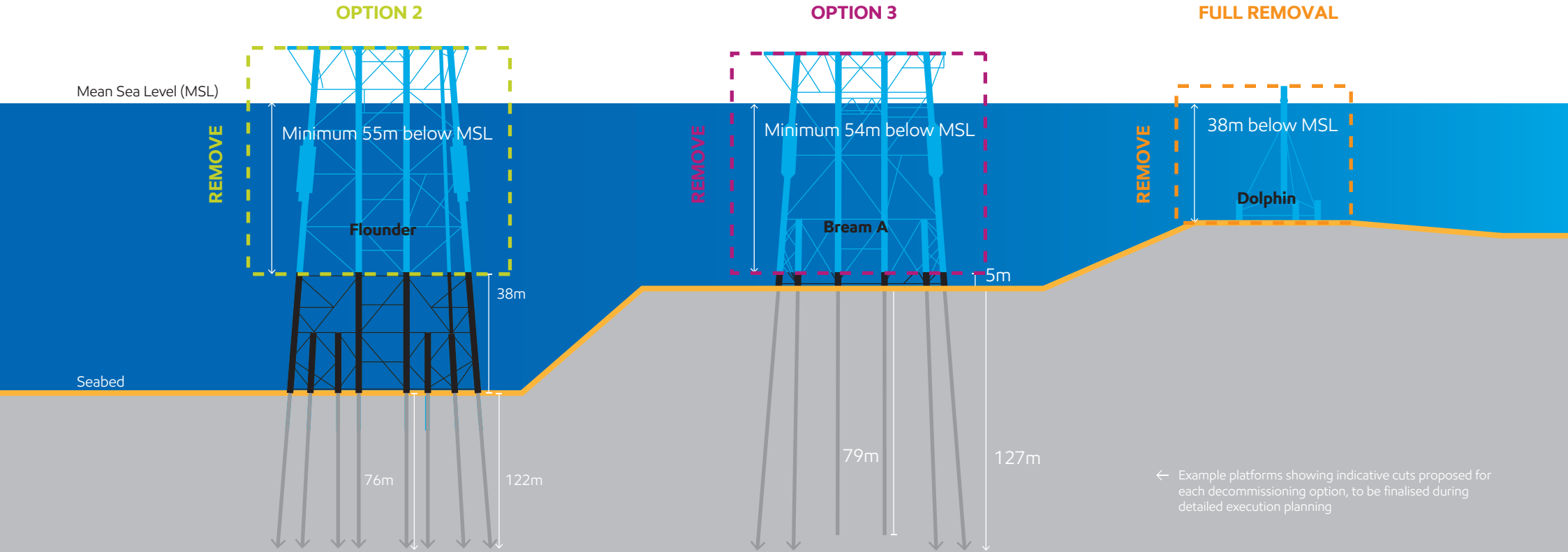
Identifying the best way forward

The detailed evaluation and assessment process highlighted the options which most effectively balance the retention of the extensive ecosystems that have developed on and around the platforms since their installation with the needs of communities, government and non-government stakeholders. These are:

- Option 2: Cut the jacket to a minimum of 55m below Mean Sea Level, for eight steel jackets in deeper water.
- Option 3: Cut the jacket as close as practicable to the seabed, for two steel jackets in shallower water.
- Full removal: For decommissioning of the two monotowers.

Platform locations →





← Example platforms showing indicative cuts proposed for each decommissioning option, to be finalised during detailed execution planning

WHAT ARE THE BENEFITS OF THIS APPROACH?

Cut and remove steel jackets leaving a section of the jacket in place

Leaving the lower section in place (cutting to a minimum of 55 metres below mean sea level) will allow the remaining jacket structures to continue to support thriving ecosystems. Recent offshore surveys have shown that the jacket structures are almost completely covered in marine life, including anemones and sponges.

This marine life is in turn providing habitat and a source of food for over 55 species of fish (including those fished commercially and recreationally) and larger marine fauna such as seals and sharks.

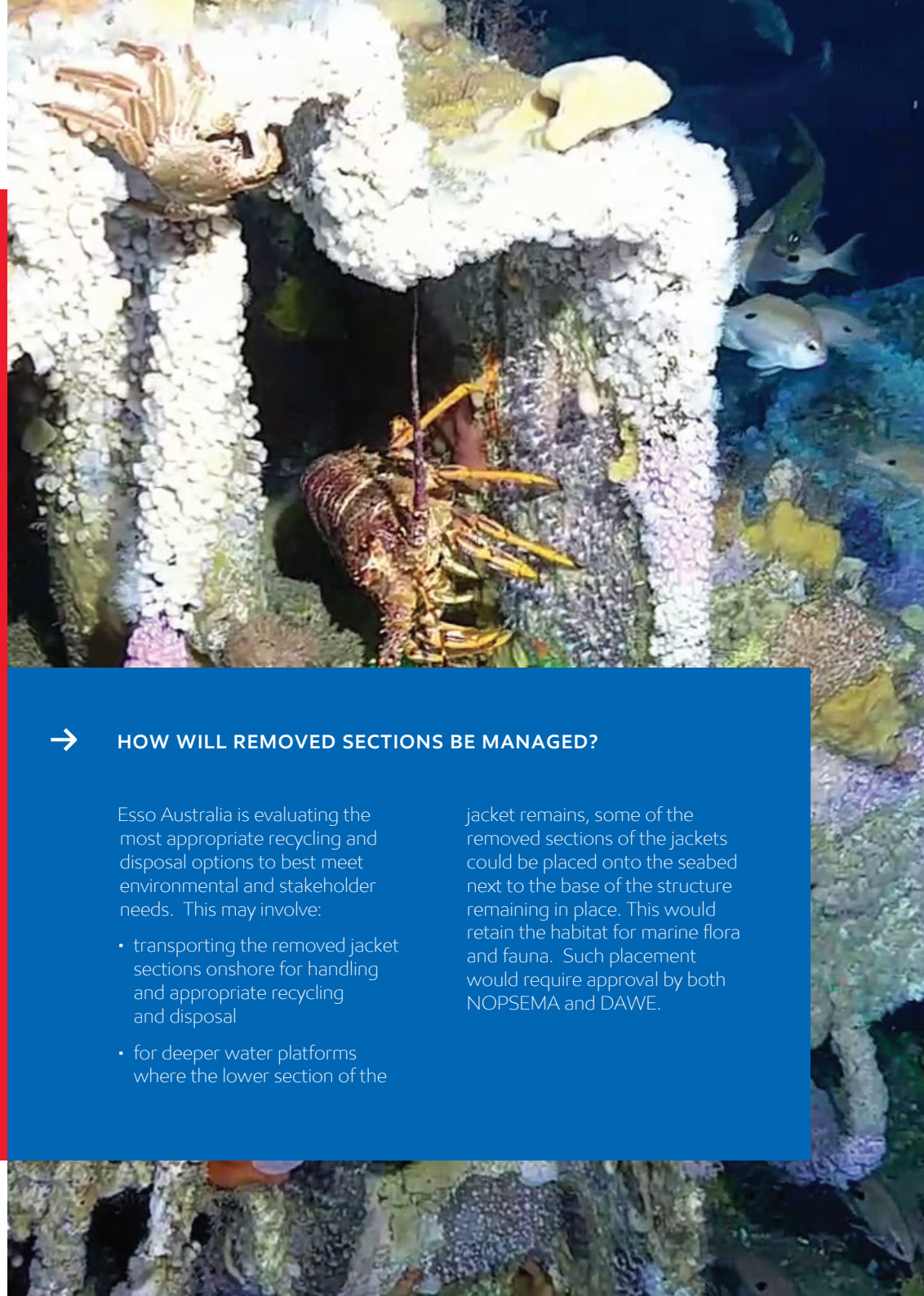
These extensive ecosystems were observed to be markedly different to the surrounding seafloor and a nearby natural reef, with more reef associated species being noted on and around the structures, compared with predominantly sand associated species in the surrounding areas.

Leaving the lower sections of the jackets in place, where this meets international guidelines and standards to ensure the safety of navigation, enable these thriving marine ecosystems to be retained, while also balancing the needs of other users of the sea.

This approach also avoids the risk of extensive dredging that may be required to remove jacket foundations to below the seabed. While the immediate footprint of the remaining infrastructure will be untrawlable, the area for fishers to trawl is unchanged from when the platforms were producing.

Full removal of monotowers

Seabed dredging will not be required to remove the two monotowers as these facilities have a gravity design base without deep set foundations.



HOW WILL REMOVED SECTIONS BE MANAGED?

Esso Australia is evaluating the most appropriate recycling and disposal options to best meet environmental and stakeholder needs. This may involve:

- transporting the removed jacket sections onshore for handling and appropriate recycling and disposal
- for deeper water platforms where the lower section of the jacket remains, some of the removed sections of the jackets could be placed onto the seabed next to the base of the structure remaining in place. This would retain the habitat for marine flora and fauna. Such placement would require approval by both NOPSEMA and DAWE.

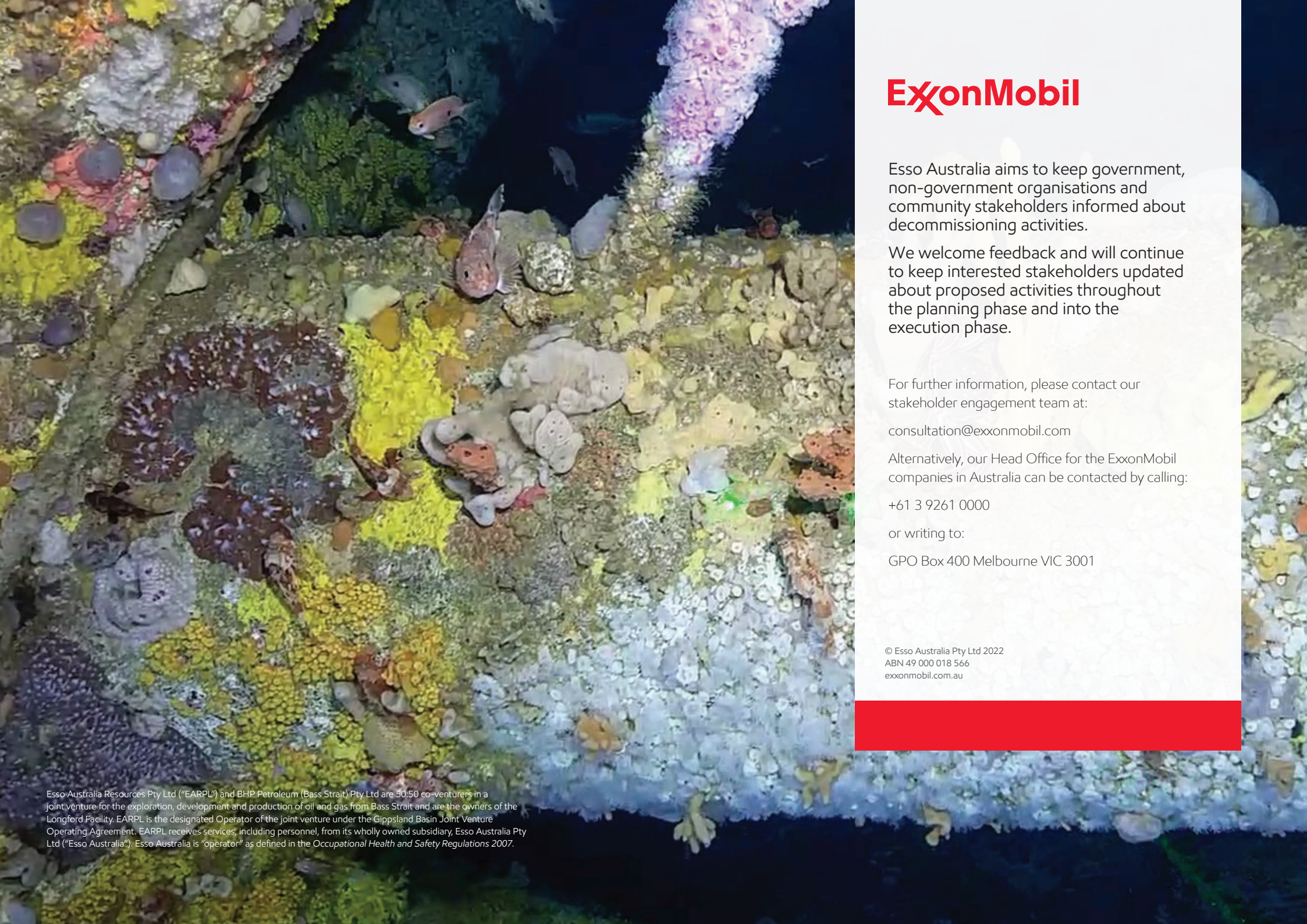
Marine ecosystems established at 73.2 metres below Mean Sea Level on the Cobia platform →

Key impacts, risks and benefits of proposed decommissioning approach

	POTENTIAL IMPACT/RISK/BENEFIT		IMPACT/RISK REDUCTION AND MITIGATION MEASURES
	SHORT TERM	LONG TERM	
COMMERCIAL SHIPPING	No change as the locations of the infrastructure remaining in place are within the Area To Be Avoided where commercial shipping movements are restricted.	No impacts are expected as the water clearance over the infrastructure remaining in place will meet international guidelines and standards to ensure the safety of navigation.	Locations of infrastructure remaining in place will continue to be marked on navigational charts.
COMMERCIAL FISHING	No change while Petroleum Safety Zones remain in force.	The infrastructure remaining in place will not be overtrawlable. Commercial fishing activities involving trawling will need to continue to avoid the immediate footprint of the facilities.	Locations of infrastructure remaining in place will continue to be marked on navigational charts. Esso Australia is seeking to understand what arrangements might be possible instead of the currently gazetted Petroleum Safety Zones. The processes in place to address damage claims will remain unchanged while Esso Australia continues to operate in Bass Strait.
RECREATIONAL FISHING AND BOATING	No change while Petroleum Safety Zones remain in force.	Esso Australia is seeking to understand what alternate arrangements might be possible to provide enhanced access for recreational fishing around infrastructure remaining in place.	The water depth and unobstructed water column provided by the proposed approach will ensure the presence of the infrastructure remaining in place will not interfere with recreational boating and fishing activities.
POSSIBLE FUTURE INDUSTRIES	No change while Petroleum Safety Zones remain in force.	All approaches will result in displacement of future potential marine industries from the immediate footprint of the infrastructure remaining in place.	Esso Australia will continue to consult with relevant industry stakeholders. The small footprint of infrastructure proposed to remain in place, relative to the size of Bass Strait, suggests that impacts to future projects are expected to be minimal.
RETENTION OF THRIVING ECOSYSTEMS	Marine flora and fauna, such as anemone, sponges, crustaceans, sea urchins and sea stars, which almost completely cover the jacket structures, will be retained. Habitat and food sources for species such as fish, sharks and seals, which are observed in abundance around the jacket structures, will be partially retained.	The marine flora and fauna present on and around the infrastructure remaining in place will continue to contribute to the ecological richness and abundance of marine life in Bass Strait.	The proposed approach to retain some of the jacket in place (below 55m water depth) allows a balance between retaining as much marine life and habitat as possible, while meeting international guidelines and standards to ensure the safety of navigation.
MATERIAL DEGRADATION	Degradation of jacket material left in place leads to constituent metals dissolving into the surrounding water and sediment.	Degradation of jacket material remaining in place leads to constituent metals dissolving into the surrounding water and sediments, and eventual collapse of the structure, over many hundreds of years.	All sections of jackets with components or residues that could be harmful to marine flora and fauna will be transported onshore for handling and appropriate recycling and disposal. Material remaining in place will be limited to steel and concrete, which assessments have shown are not harmful to the marine environment.

Key impacts, risks, benefits and mitigation measures of possible placement of cut jacket sections in deeper water on the seabed

	POTENTIAL IMPACT/RISK/BENEFIT		IMPACT/RISK REDUCTION AND MITIGATION MEASURES
	SHORT TERM	LONG TERM	
COMMERCIAL SHIPPING	Locations of infrastructure remaining in place remains within the Area To Be Avoided where commercial shipping movements are restricted.	No impacts are expected, as the water clearance over the infrastructure remaining in place will meet international guidelines and standards to ensure the safety of navigation.	Locations of infrastructure remaining in place will continue to be marked on navigational charts.
COMMERCIAL FISHING	No change while Petroleum Safety Zones remain in force.	The placement of sections of cut jacket on the seabed will increase the footprint of the infrastructure remaining in place for some jackets. Commercial fishing activities involving trawling will need to continue to avoid the immediate footprint of the facilities.	Locations of infrastructure remaining in place will continue to be marked on navigational charts. The removed sections of jacket will be placed as close as practicable to the base of the remaining structure to minimise the area of seabed unavailable for commercial fishing activities involving trawling.
INJURY TO/ MORTALITY OF SESSILE BIOTA	Marine life established at higher points on the jacket structure may be lost when the structure is placed on the seabed due to the change in conditions, such as light and nutrients, in deeper water.	Recolonisation of the jacket structure over time would occur with other marine life suited to seabed depth.	Placement of cut jacket sections on the seabed is expected to increase the overall habitat available for sessile biota, by the provision of additional hard substrate on the seabed, much like we can see today on the existing jacket structures.
CHANGE IN FISH HABITAT	Habitat for mobile species such as certain fish which require specific conditions such as light and food sources present on the higher points of the jacket structure will be lost.	Mobile species such as fish will either move downward on the remaining jacket structure if conditions are suitable, or migrate to other habitats.	Placement of the cut jacket sections on the seabed will increase the overall habitat and food source availability for mobile species such as fish.
DISTURBANCE DURING PLACEMENT	Physical impact (including smothering) may lead to a localised and minor loss of benthic infauna within the seabed sediments and/or alteration of their habitat.	No long term impacts to benthic infauna are expected.	Impacts to benthic infauna will be limited to the immediate footprint of the placed jacket sections, hence expected to be minor, short term and localised.
CHANGE IN WATER QUALITY DURING PLACEMENT	Suspension of sediments and the subsequent change in water quality may impact marine life by smothering or exposure to potential contaminants in the sediments.	No long term impacts to water quality are expected.	Any impacts to marine life due to the temporary suspension of sediments during placement activities are expected to be short term, minor and localised.



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Esso Australia aims to keep government, non-government organisations and community stakeholders informed about decommissioning activities.

We welcome feedback and will continue to keep interested stakeholders updated about proposed activities throughout the planning phase and into the execution phase.

For further information, please contact our stakeholder engagement team at:

consultation@exxonmobil.com

Alternatively, our Head Office for the ExxonMobil companies in Australia can be contacted by calling:

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