Woodside Energy

CONSULTATION

INFORMATION SHEET

January 2024

ACTIVITY UPDATE – MINERVA DECOMMISSIONING ENVIRONMENT PLANS

OTWAY BASIN, SOUTH EAST AUSTRALIA

Overview

Woodside Energy (Victoria) Pty Ltd (Woodside) consults relevant persons in the course of preparing an Environment Plan (EP) to notify them, obtain their input and to assist Woodside to confirm current measures or identify additional measures, if any, that could be taken to lessen or avoid potential adverse effects of the proposed activity on the environment. This is the intended outcome of consultation.

Woodside's aim is to ensure the activity is carried out in a manner that is consistent with the principles of Ecologically Sustainable Development (ESD), by which the environmental impacts and risks of the activity are reduced to As Low As Reasonably Practicable (ALARP) and of an acceptable level. We want relevant persons whose functions, interests or activities may be affected by the proposed activity to have the opportunity to provide feedback on our proposed activity, in accordance with the intended outcome of consultation.

Woodside is planning to undertake subsea decommissioning activities for the Minerva Field (previously operated by BHP Petroleum (Victoria) Pty Ltd (BHP)), located in Commonwealth waters in Petroleum Licence VIC-L22 and Pipeline Licence VIC-PL33, approximately 11 km south-southwest (SSW) of the township of Port Campbell, Victoria and in water depths of approximately -50 – 60 m. The pipeline also traverses State waters in Pipeline Licence VIC-PL33(v). Woodside plans to remove all subsea infrastructure and equipment from the seabed associated with the Minerva development in Commonwealth and State waters **(Figure 1)**.

Regulatory approvals are being sought for the following activities:

Minerva Plug and Abandonment (P&A) and Field Management EP

- Well P&A of two former production wells and two exploration wells by placing cement plugs in the wells to permanently prevent hydrocarbon release using a moored Mobile Offshore Drilling Unit (MODU).
- Removal of well infrastructure above the mudline (wellheads and subsea xmas trees).

Minerva Decommissioning and Field Management EP

- Ongoing field management activities (inspection and monitoring) for the Minerva subsea and well infrastructure until final decommissioning.
- Removal of the Minerva gas pipeline bundle **(Figure 2)** in Commonwealth waters. The pipeline comprises of approximately 4.9 km of 10-inch concrete coated rigid-steel flowline, bunded with an electro-hydraulic umbilical and two 2-inch steel chemical injection lines and stabilisation materials.
- Removal of Minerva subsea infrastructure within VIC-L22 in Commonwealth Waters comprising of five inline pipeline structures, five tie-in spools, and associated equipment and stabilisation material.

Minerva (State Waters) Decommissioning EP

- Removal of the Minerva pipeline bundle and stabilisation materials in VIC-PL33(**v**), in Victorian State waters. The pipeline will be recovered up to the horizontal directional drill (HDD) location, approximately 800 m from shore.

Decommissioning of the Minerva field is planned to be undertaken following acceptance of the EPs. Equipment removal activities are planned to commence in Q3 2024 and require approximately three to five months, subject to vessel availability and weather constraints. The P&A activities are expected to commence in Q2 2025 and take approximately two to three months to complete. However, an earlier start in Q1 2025 may be required.

The P&A activities and subsea removal are required to be completed by 30 June 2025, as per the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) General Direction 831.

Following removal, Woodside proposes to dispose of infrastructure onshore in accordance with applicable requirements, assessing all options to reduce waste through reuse or recycling of recovered infrastructure.

The location of the Minerva infrastructure is summarised in **Table 1** and proposed decommissioning activities summarised in **Table 2**.

An EP for the P&A activities has previously been submitted to NOPSEMA for assessment under the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023*. The Minerva Field Decommissioning EP will be submitted to NOPSEMA and the Minerva (State Waters) Decommissioning EP will be submitted to the Department of Energy, Environment and Climate Action (DEECA) under the *Victorian Offshore Petroleum and Greenhouse Gas Storage Act 2010.*

This Activity Update provides an overview of proposed activities under each of the three EPs. Woodside has revised the timing and duration of these proposed activities. These changes are in response to engineering work that has been completed and include:

- The timing and duration of the equipment removal and P&A activities have been updated to provide sufficient time to complete the activities.
- Woodside has identified that decommissioning work may encroach on the period between January and March 2025 depending on progress of the activities. This allows for the opportunity to undertake activities during calmer ocean conditions during this period. The January to March period is a peak foraging period for pygmy blue whales in the region, and Woodside had previously indicated work during this period was not required. Woodside will adopt several additional mitigation measures to limit potential impacts to whales including:
  - Dedicated trained marine fauna observers on vessels during January to March to monitor for whale presence, with trained vessel crew observing for marine fauna outside this period
  - Vessel speed limitations within the operational area during January to March and at other times when whales are observed
  - Additional adaptive management measures when whales are detected, such as monitoring for whales prior to support vessels coming alongside the MODU – if applicable
  - Using only moorings to maintain the MODU position, with no use of MODU thrusters.

Feedback from relevant persons as part of current consultation activities will be included in revisions to the EPs, which will be submitted to NOPSEMA and DEECA for assessment.

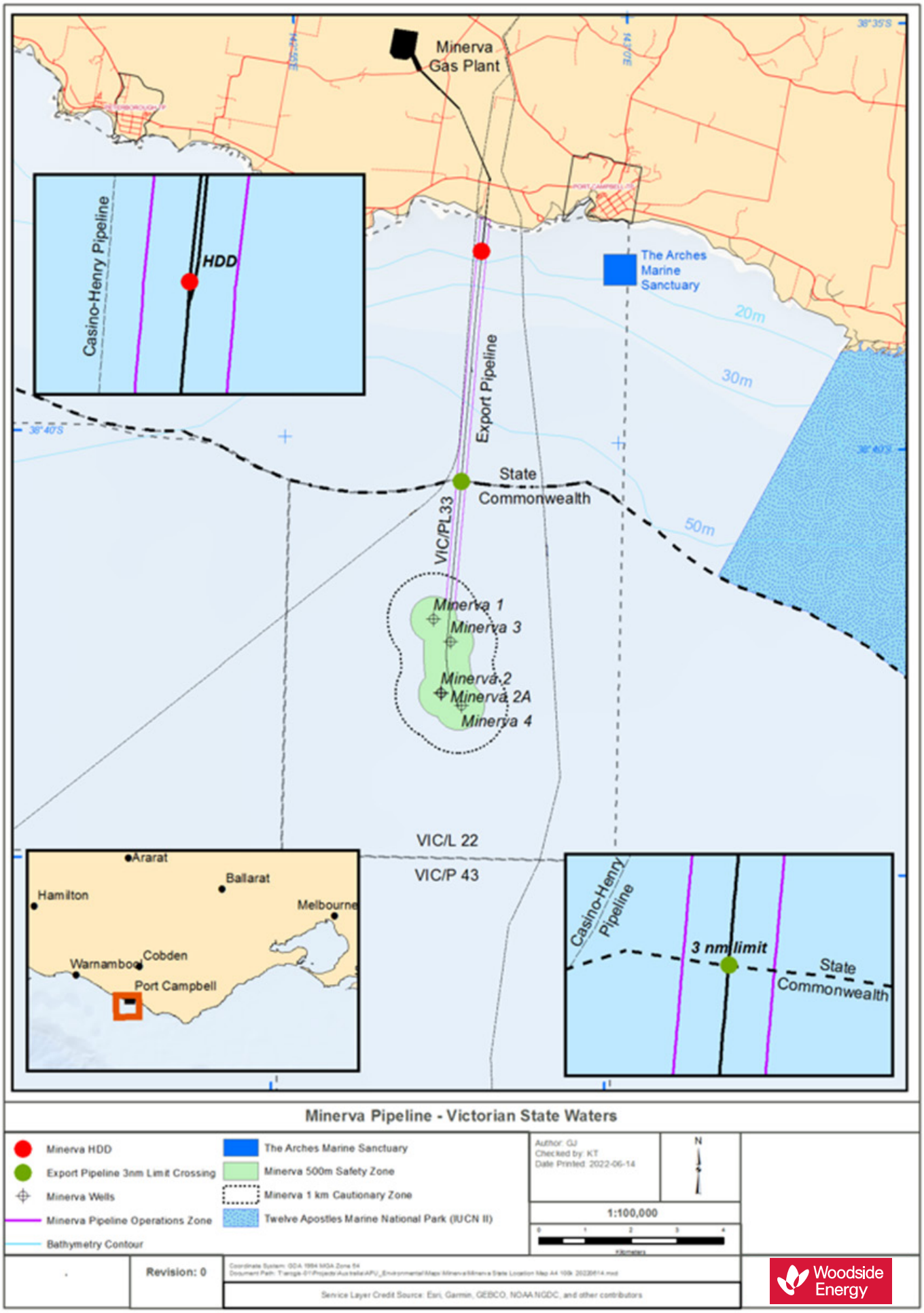

Figure 1. Minerva Location Map

Minerva Decommissioning Background

The offshore wells were drilled in late 2002 and the offshore and onshore pipeline was laid in 2003. The construction of the onshore Minerva Gas Plant was completed in December 2004, and the facilities were commissioned and commenced production in January 2005.

The Minerva field reached the end of its economic production life in September 2019. Immediately following the cessation of production, the Minerva wells were suspended and the subsea system was left in a preserved state (i.e. wells isolated and production system flushed of hydrocarbons) for final decommissioning. The onshore gas plant was sold for reuse to another Operator. A vessel-based campaign was conducted in Q1 2021 to disconnect flowlines from wells and install barrier plugs.

Communications with Mariners

Woodside will implement an Operational Area for the P&A and equipment removal activities. All planned activities will be restricted to within the Operational Area.

Commercial fishers and other marine users are permitted to use but should take care when entering the Operational Area and remain clear of the Exclusion Zone.

It is anticipated that vessels and MODU will operate 24 hours per day for the duration of the P&A activities. The duration of these activities is subject to change due to project schedule requirements, vessel availability, weather or unforeseen circumstances.

Well P&A: The Operational Area includes the area encompassing an approximate 1,500 m radius around each of the four wells within VIC-L22. A temporary 1,000 m exclusion zone will apply around the MODU and the associated project vessels during P&A activities.

Facilities Removal: The Operational Area includes the area encompassing an approximate 1,000 m corridor along the pipeline route. It is intended that a temporary 500 m exclusion zone will apply around the Construction Support Vessel (CSV) and the associated project vessels during removal activities.

Figure 2. Minerva Pipeline Bundle Arrangement

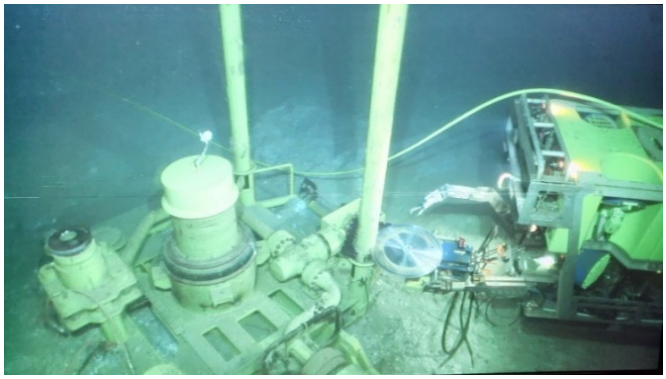

Figure 3. Typical Subsea Cutting Activity

Decommissioning Assessment

Woodside has undertaken an assessment to identify potential impacts and risks to the environment and relevant persons, considering timing, duration, location and environmental aspects of the planned activities. A number of mitigation and management measures will be implemented and are summarised in **Table 3**. Further details will be provided in the EPs.

In preparing the EPs, Woodside's intent is to minimise environmental and social impacts associated with the proposed activities. We are seeking comments and input from relevant persons to inform our decision making and for the intended outcome of consultation (see above).

Joint Venture

Woodside is the Operator of Minerva field on behalf of the Joint Venture Partners. The participants are Woodside Energy (Victoria) Pty Ltd and Cooper Energy (MF) Pty Ltd.

We welcome your feedback by **12 February 2024.**

Figure 4. Typical Subsea Equipment Recovery Activity

Table 1. Activity summary

Environment Plan	Minerva Plug and Abandonment and Field Management EP	Minerva Decommissioning and Field Management EP	Minerva (State Waters) Decommissioning EP
Summary	Permanent P&A of 4 wells (2 former productions wells, 2 exploration wells). Removal of wellhead and subsea trees, by the MODU or CSV.	Ongoing field management activities (monitoring and inspection) prior to removal. Removal of the pipeline bundle, well tie-in spools and flying leads, pipeline structures and stabilisation materials.	Ongoing pipeline management activities (monitoring and inspection) prior to removal. Removal of the pipeline bundle within State waters. Note: the shore crossing will not be removed as part of this campaign.
Commencement date	P&A start is around Q2 2025. However, it may commence Q1 2025, subject to approvals, MODU vessel availability and weather constraints. P&A must be completed by no later than 30 June 2025, pursuant to General Direction 831.	Planned removal activities are anticipated to commence from Q3 2024, subject to environmental approvals, vessel availability and weather constraints. Removal will be undertaken in State and Commonwealth waters as a single campaign (three to five months in total). Equipment removal in Commonwealth Waters must be completed no later than 30 June 2025, pursuant to General Direction 831.	
Simultaneous Operations (SIMOPs)	P&A and Facilities Removal SIMOPs are not planned but may occur depending on vessel and equipment availability.		
Petroleum Title	VIC-L22	VIC-L22, VIC-PL33	VIC-PL33(v)
Operational Area	1,500 m radius around each of the wells	1,000 m buffer along the pipeline route and around subsea infrastructure.	
Exclusion Zones	A temporary 1,000 m exclusion zone will apply around the MODU and the associated project vessels during P&A activities.	A temporary 500 m exclusion zone will apply around the CSV and the associated project vessels during removal activities.	
Estimated duration	Two to three months	Three to five months (removal activities in Commonwealth and State waters)	
Location and water depth	~10.45 km south south-west of Port Campbell in ~59 m water depth	~5.5 km to 10.45 km south south-west of Port Campbell in ~53 m to 59 m water depth	~1.7 km to 5.5 km south south-west of Port Campbell in ~15 m to 53 m water depth

Environment Plan	Minerva Plug and Abandonment and Field Management EP	Minerva Decommissioning and Field Management EP	Minerva (State Waters) Decommissioning EP
Infrastructure	2 x production wells, including xmas tree completion 2 x exploration wells The P&A covers the removal of well infrastructure below or as close as practical to the mudline including wellheads and xmas trees that may be conducted on the MODU or otherwise be covered during the facilities removal campaign by the CSV The EP includes ongoing field maintenance activities, such as inspection, as required until equipment is removed	Pipeline bundle encompassing: • 4.95 km of 10-inch steel pipeline • 2 lengths of Chemical Injection Lines • 1 length of Electro-Hydro Umbilical (EHU) • 821 Piggyback clamps • Stabilisation structures Inline field equipment comprising: • 2 Umbilical Termination Assemblies and protection structures • 2 Subsea Safety Isolation Valve Assemblies and protection structures • 1 Pipeline End Module Assembly and protection structure Equipment from wells to the pipeline bundle: • 2 ~85 m Gas Production Spools and a 1.6 km crossover spool • 2 ~85 m Chemical Injection Spools • 2 lengths of Electric Flying Leads (EFLs) • 2 lengths of Hydraulic Flying Leads (HFLs) Pipeline bundle, rigid spools and flying leads will be cut with hydraulic shears and recovered after deburial using a control flow excavator (CFE) tool. Flowline and stabilisation structures will be recovered by reverse install method by the CSV crane with minor cuts made, as required.	Pipeline bundle encompassing: • 5.0 km of 10-inch steel pipeline • 2 lengths of Chemical Injection Lines • 1 length of EHU • 832 Piggyback clamps • Stabilisation structures The recovery method options being considered for each group of equipment are as follows: • Pipeline bundle will be cut with hydraulic shears and recovered after deburial using a Control Flow Excavator (CFE) tool. • Recovery methods may use diver assist and/or ROV in the shallow water
Vessels	• Semi-submersible MODU. • MODU supported by 2 – 3 offshore support vessels.	• Multipurpose CSV • Supply Vessel	• Multipurpose CSV • Supply Vessel • Small Size Dive Air Vessel for operations near the shoreline, should diving operations be required
Distance to nearest marine park/nature reserve	~8.5 km from The Arches Marine Sanctuary (Minerva-1 well) ~6.2 km from the Twelve Apostles Marine National Park (Minerva-1 well)	~5.44 km from The Arches Marine Sanctuary ~4.74 km from the Twelve Apostles Marine National Park	~1.69 km from The Arches Marine Sanctuary ~5 km from the Twelve Apostles Marine Park

Table 2. Equipment locations (coordinates are GDA94)

Subsea Infrastructure	Latitude (South)	Longitude (East)
Minerva-1 well	-38° 42' 0.6.885"	142° 57' 17.278"
Minerva-2A well	-38° 42' 59.190"	142° 57' 25.742"
Minerva-3 well	-38° 42' 22.718"	142° 57' 32.997"
Minerva-4 well	-38° 43' 0.7368"	142° 57' 44.023"
Pipeline start	-38° 71' 89.530"	142° 96' 14.700"
Pipeline Commonwealth/State boundary point	-38° 40' 29.11"	142° 57' 39.42"
Pipeline end	-38° 62' 96.930"	142° 96' 48.470"

ENVIRONMENT THAT MAY BE AFFECTED (EMBA)

The environment that may be affected (EMBA) is the largest spatial extent where planned activities and unplanned events could potentially have an environmental consequence. For this EP, the broadest extent of the EMBA has been determined by the highly unlikely event of a hydrocarbon release from both the direct and indirect activities that are the subject of the EPs.

The EMBA does not represent the predicted impact of the highly unlikely hydrocarbon release. Rather, the EMBA represents the merged area of many possible paths that a highly unlikely hydrocarbon release could travel depending on the weather and ocean conditions at the time of the release.

This means that in the highly unlikely event that a hydrocarbon release does occur, the entire EMBA will not be affected and the specific and minimal part of the EMBA that is affected will only be known at the time of the release.

There are two potential hydrocarbon release EMBAs for Minerva P&A and decommissioning activities, reflecting the activities and the different locations that the activities will occur.

Each of the EMBAs are presented in **Figure 5** below and summarised as:

- **Loss of Well Containment EMBA:** Primary activity of the Well P&A EP – P&A of 4 production/exploration wells by a MODU.
- **Vessel Spill Marine Diesel Oil (MDO) EMBA:** Primary activity for the Minerva Decommissioning EP and the Minerva (State Waters) Decommissioning EP– Recovery of subsea infrastructure using a CSV.

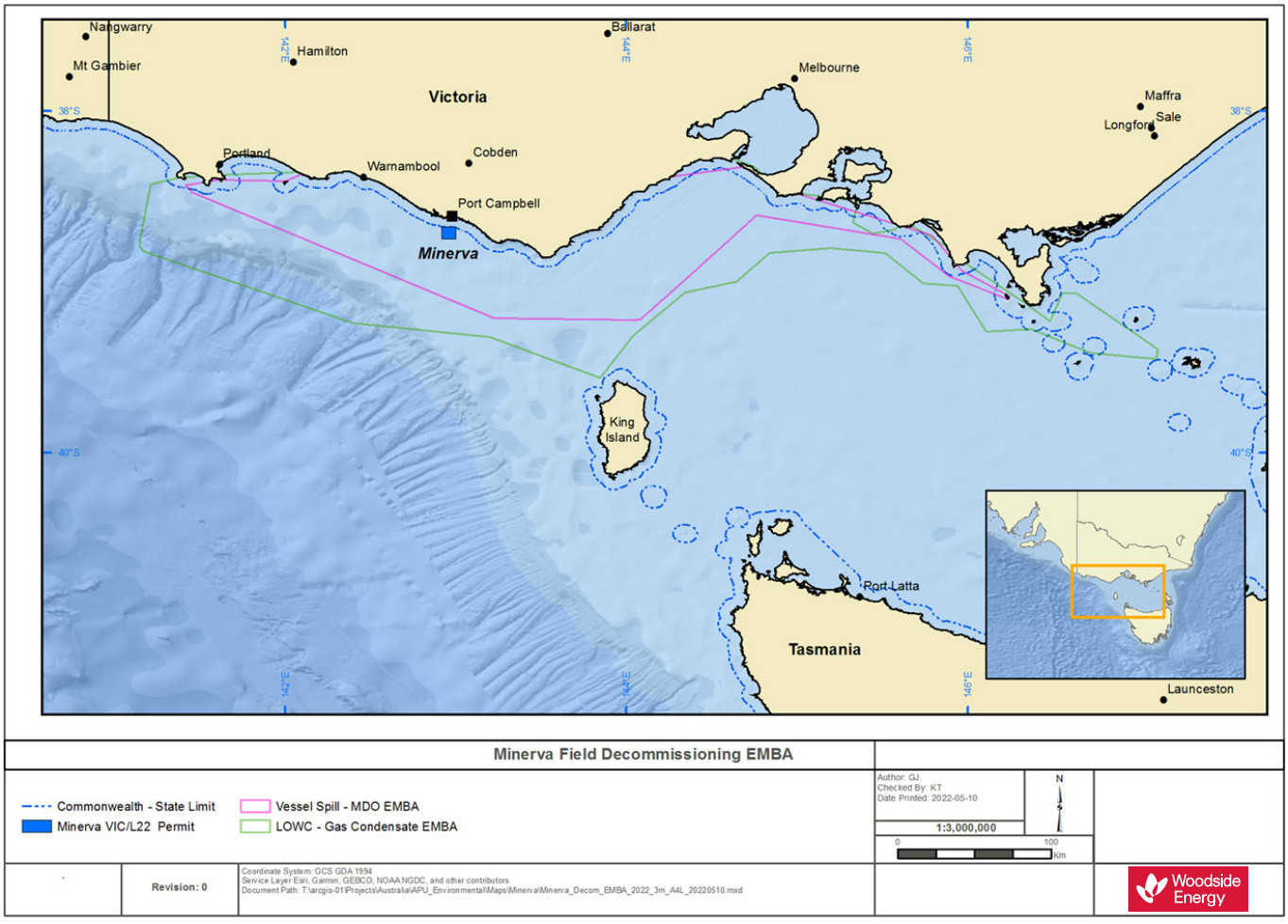

Figure 5. Environment that may be affected (EMBA) for the proposed decommissioning activities.

Mitigation and management measures

Woodside has undertaken an assessment to identify potential impacts and risks to the marine environment arising from the decommissioning activities considering timing, duration and location.

A number of mitigation and management measures for the P&A and decommissioning of the Minerva field are outlined in **Table 3**. Further details will be provided in the EPs.

Table 3. Summary of key risks and/ or impacts and management measures for the Minerva Decommissioning activities. Key risks and/ or impacts and management measure apply to activities occurring within the Operational Area.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts	Proposed Mitigation and/or Management Measure
Planned			
Physical presence and interactions with other marine users	• The activities will be undertaken using a range of project vessels, namely a MODU and CSV, along with general support vessels. A 1,000 m exclusion zone will apply around the MODU and a 500 m exclusion zone around the CSV. • Presence of vessels in the safety and exclusion zones has the potential to result in interaction with third-party marine users.	• Interference with commercial shipping. • Interference with commercial fishing activity. • Displacement of recreational fishing activity. • Interaction with existing oil and gas infrastructure.	• 500 m gazetted petroleum safety zones maintained around Minerva-3 and Minerva-4 wells. • 1500 m operational area maintained around the wells and 1000m along the pipeline corridor during activities. • 1,000 m exclusion zone established around the MODU and 500 m exclusion zone around the CSV. • Activity support vessel(s) to communicate with third-party vessels to assist in maintaining the exclusion zones. • Consultation with relevant persons for the consultation outcomes.
Physical presence – disturbance to benthic habitat from MODU anchoring, P&A and removal activities and ROV operations.	Seabed disturbance may result from: • Removal of excess marine growth from infrastructure prior to removal using high-pressure water jetting. • Infrastructure deburial and short-term wet parking of infrastructure may be required. • MODU mooring and transponder installation for MODU positioning. • Cutting and recovery of infrastructure on the seabed. • Temporary equipment laydown or ROV operations. • Post decommissioning sediment sampling.	• P&A and subsea removal activities including infrastructure deburial, marine growth removal, cutting and recovery of infrastructure, MODU mooring installation, ROV operations and temporary laydown of equipment may result in localized, temporary physical disturbance to benthic habitat and indirect disturbance to benthic habitats from sedimentation. • Seabed disturbance as a result of these activities could occur within a localized radius of the Minerva wells and subsea infrastructure locations. Near this area, it is possible that benthic communities may be reduced or altered, leading to a highly localized impact to epifauna and infauna benthic communities.	• Use controlled recovery techniques to limit seabed disturbance. • Subsea infrastructure to be marked on navigational charts until removal. • Project specific mooring design analysis for anchored MODU to reduce the likelihood of anchor drag leading to seabed disturbance. • All infrastructure and temporary wet parked equipment will be removed from the seabed on completion of the P&A and removal activities.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts	Proposed Mitigation and/or Management Measure
Routine Discharges: MODU and Project Vessels	• Sewage, greywater and putrescible waste will be discharged from MODU and project vessels. • Bilge water, deck drainage, brine and cooling water may also be discharged.	• The main impact associated with ocean disposal of sewage and other organic wastes (i.e. putrescible waste) is eutrophication. Eutrophication occurs when the addition of nutrients, such as nitrates and phosphates, causes adverse changes to the ecosystem including short-term, localized impacts to water quality. • No significant impacts are expected to water quality from planned discharges because of the minor quantities involved, the expected localized mixing zone, and the high level of dilution into the open water marine environment of the Operational Area. • Similarly, although some marine fauna may transit the Operational Area, potential for impacts remains low due to the localized nature of discharges and rapid dilution.	• All routine marine discharges will be managed according to legislative and regulatory requirements.
Discharges: Decommissioning Activities	• During infrastructure removal, residual fluid remaining in infrastructure will be drained to the surrounding environment. Fluid includes treated seawater with residual hydrocarbon (less than 5ppm) and other minor volumes of chemicals such as monoethylene glycol (MEG), biocide and water-based hydraulic fluid. • Chemical use may be required to remove marine growth and calcium/scale buildup • Routine P&A discharges including well kill and well clean up brine, water-based drilling fluids, cement and cementing fluids, residual wellbore fluids including residual hydrocarbon. • Routine discharges of subsea control fluid, treated seawater and residual wellbore fluids during subsea tree preparation for P&A. • Potential non-routine discharge of unused bulk product.	• Localised short-term impacts to water quality from the release of seawater ballast and residual chemicals and hydrocarbons.	• All chemicals intended or likely to be discharged into the marine environment reduced to ALARP using the Woodside chemical assessment process. • Fluids contaminated with hydrocarbons will be treated to meet specified discharge limits prior to discharge or contained. If discharge specifications are not met the fluid will be returned to shore. • During well kill activities, if formation water and any wellbore fluids that are not able to flared, will be processed through a water filtration treatment package prior to discharge to the environment. • No bulk cement, bentonite or barite will be discharged without a documented environmental assessment.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts	Proposed Mitigation and/or Management Measure
Light Emissions	• Project vessels and MODU will use external lighting to navigate and conduct safe operations at night. • Vessel lighting will also be used to communicate the vessel's presence to other marine users (i.e. navigation/ warning lights). • Light emissions may be generated by flaring during well P&A if required. Flaring is only expected to occur for short durations (hours).	Light emissions may affect fauna (such as marine turtles and birds) in two main ways: 1. Behaviour: artificial lighting has the potential to create a constant level of light at night that can override natural levels and cycles. 2. Orientation: if an artificial light source is brighter than a natural source, the artificial light may override natural cues, leading to disorientation. • During the decommissioning activities, there is potential a small number of seabirds and migratory shorebirds may be attracted to lighting on the MODU and project vessels. The Operational Area overlaps ten seabird species foraging BIAs. Potential impacts are expected to be limited to localised behavioural disturbance to isolated individuals, with no significant impact to seabird foraging. • The Operational Area does not overlap any critical habitat for marine turtle species. Localised behavioural impacts to individual foraging marine turtles from light emissions generated during the activity are considered negligible, with no impact predicted at a community or population level.	• Lighting limited to the minimum required for navigational and safety requirements, except for emergency events. • Flaring restricted to a duration necessary to perform the activity for well bleed-off. • Implementation of a Seabird Management Plan and relevant controls in the National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds (2020).
Noise Emissions	• MODU and project vessels will generate noise both in the air and underwater due to the operation of thruster engines, propellers, and the use of cutting tools, or positioning equipment subsea.	Underwater noise may affect marine fauna, including marine mammals in three main ways: 1. By causing direct physical effects, including injury or hearing impairment. Hearing impairment may be temporary or permanent. 2. Through disturbance leading to behavioural changes or displacement from important areas. The occurrence and intensity of disturbance is highly variable and depends on a range of factors relating to the animal and situation. 3. By masking or interfering with other biologically important sounds (including vocal communication, echolocation, signals and sounds produced by predators or prey). • Predicted noise levels from the MODU and project vessels may have short term behavioural impacts to Pygmy Blue Whales and Southern Right Whales transiting within or utilising a Biologically Important Area (BIA). • Marine turtle presence is expected to be infrequent, and potential impacts from predicted noise levels are not considered to be ecologically significant at a population level. • Fish, sharks and rays may demonstrate avoidance or attraction behaviour to the noise generated by the activity. However, potential impacts from predicted noise levels are not considered to be ecologically significant at a population level. • Woodside has proposed controls that when implemented will ensure activities will not have physical and/or observable biologically significant behavioural disturbance (including breeding, foraging and resting on migration) on these species. Noise levels are expected to be localised, with possible effects limited to, at worst, short-term avoidance behaviour.	• Compliance with legislative and regulatory requirements for interactions with marine fauna to prevent adverse interactions. • Implementation of a Blue Whale and Southern Right Whale Adaptive Management Plan which details adaptive management measures for vessels operating on DP to reduce the risk of displacement of blue whale and southern right whales during the petroleum activities. • Dedicated trained marine fauna observers on vessels during January to March to monitor for whale presence, with trained vessel crew observing for marine fauna outside this period. • Vessel speed limitations within the operational area during January to March and at other times when whales are observed. • Additional adaptive management measures when whales are detected, such as monitoring for whales prior to support vessels coming alongside the mobile offshore drilling unit (MODU). • Using only moorings to maintain the MODU position, with no use of MODU thrusters. • Whale sightings to be reported to support greater environmental knowledge.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts	Proposed Mitigation and/or Management Measure
Atmospheric Emissions	• Atmospheric emissions will be generated by the MODU and project vessels from internal combustion engines and incineration activities. • Atmospheric emissions will be generated from venting of residual gas and contingent flaring from the MODU during P&A activities.	• Emissions from MODU and project vessels could result in temporary, localised reductions in air quality in the immediate vicinity of the vessels. • Venting or flaring of hydrocarbon gas may result in a short-lived localised gas plume and a minor contribution to greenhouse gas emissions.	• Compliance with legislative and regulatory requirements for marine air pollution. • Flaring and venting of hydrocarbons is restricted to a duration necessary to perform the P&A activity.
Unplanned			
Unplanned Hydrocarbon Release – Loss of Well Containment during P&A	• Accidental loss of wellbore fluids and hydrocarbons to the marine environment due to loss of well containment may occur, caused by failure of well barriers during the P&A activity.	• A loss of well containment and resulting blowout event is considered to be a highly unlikely event as it has occurred only very infrequently in the industry, and never in the Company's history. • Modelling a loss of well containment was undertaken with the outcome, EMBA illustrated in **Figure 5.** • Minerva condensate is a light, non-persistent natured hydrocarbon with a high tendency to evaporate. • A release of gas condensate from a loss of well control has the potential to impact an array of receptors. Potential impacts across the whole EMBA were assessed including relevant ecological and socio-economic receptors. Given the limited volumes, low wax content and non-persistent nature of condensate, potential impacts are not expected to persist. The residual risk has been assessed to be tolerable.	**Preventing loss of well containment** • Wells to be permanently plugged in compliance with an accepted Well Operating Management Plan including implementation of barriers to prevent a loss of well containment. • Checks completed during well P&A operations to establish minimum acceptable standard of well integrity. • An approved Source Control Emergency Response Plan will be prepared prior to P&A, including feasibility and specific considerations for relief well. • Subsea blow out preventer specification, installation and testing compliant with internal Woodside Standards and international requirements. **Spill Response arrangements** • Arrangements supporting the Oil Pollution Emergency Preparation document (OPEP)/Emergency Response Manual (ERM) will be tested to ensure the OPEP can be implemented as planned. • Emergency response activities would be implemented in line with the OPEP/ERM.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts	Proposed Mitigation and/or Management Measure
Unplanned Hydrocarbon Release – Vessel Collision	• Project vessels will use marine diesel fuel. • In the unlikely event of a vessel collision involving a project vessel or third-party vessels during the activity, there is potential for a release of marine diesel fuel if the collision has enough force to penetrate the vessel hull in the exact location of the fuel tank.	• In the highly unlikely event of a vessel collision causing a release of hydrocarbons, impacts to water quality and marine ecosystems could occur. • Modelling of a surface releasee of marine diesel was undertaken at a representative location within the Operational Area. • Marine diesel is a relatively volatile, non-persistent natured hydrocarbon with up to 41% evaporating within the first 24 hours. • A release of marine diesel from a vessel collision has the potential to impact an array of receptors. Potential impacts across the whole EMBA were assessed including relevant ecological and socio-economic receptors. Potential impacts are considered moderate to significant but are unlikely to persist due to the nature of the marine diesel. The residual risk has been assessed to be tolerable.	**Preventing Vessel Collision** • Comply with regulatory requirements for the prevention of vessel collisions and safety and emergency arrangements. • Consult with relevant persons so that other marine users are informed and aware, reducing the likelihood of a collision. • Establish temporary exclusion zones around vessels which are communicated to marine users to reduce the likelihood of collision. • Develop a management plan for simultaneous operations where multiple campaigns occur concurrently in the same Operational Area. **Spill Response Arrangements** • Arrangements supporting the Oil Pollution Emergency Preparation document (OPEP)/Emergency Response Manual (ERM) will be tested to ensure the OPEP can be implemented as planned. • Emergency response activities would be implemented in line with the OPEP/ERM.
Chemical and Hydrocarbon Spills (Deck Spills and Bunkering)	• Accidental loss of chemicals or hydrocarbons to the marine environment during bunkering/ refuelling may occur caused by partial or total failure of a bulk transfer hose or fittings due to operational stress or other integrity issues. • Accidental spills of chemicals or hydrocarbons from MODU or project vessel deck activities and equipment.	• Accidental loss of such chemicals from the MODU or vessels to the marine environment could occur as a result of failure of bulk transfer hoses or fittings during bunkering, spillage during handling, inadequate bunding and/ or storage, inadequate method of securing or tank/ pipework failure, leak from equipment or rupture or failure of ROV hydraulic hoses whilst underwater. • Spills from bunkering/refuelling or deck activities could result in short term, localised impacts to water quality or marine fauna in the immediate area surrounding the spill.	• Compliance with legislative and regulatory requirements for the prevention of marine pollution. • Chemicals will be selected with the lowest practicable environmental impacts and risks subject to technical constraints and approved through the Woodside chemical assessment process. • Liquid chemical and fuel storage areas bunded or secondarily contained when they are not being handled or temporarily moved. • Maintain and locate spill kits in close proximity to hydrocarbon storage and deck areas for use to contain and recover deck spills. • Appropriate bunkering equipment kept and maintained, and contractors to follow procedures and requirements for bunkering and refuelling to reduce the likelihood of a spill.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts	Proposed Mitigation and/or Management Measure
Unplanned Discharge of Solid Hazardous/ Non-Hazardous Waste/ Equipment	• Accidental, unplanned loss of hazardous or non-hazardous solid wastes/equipment to the marine environment may occur if dropped or blown overboard.	• The potential impacts of hazardous or non-hazardous solid wastes and equipment accidentally discharged to the marine environment include contamination of the environment as well as secondary impacts relating to potential contact of marine fauna with wastes. • The temporary or permanent loss of waste materials/ equipment into the marine environment is not likely to have a significant environmental impact, based on the location of the Operational Area, the types, size and frequency of wastes that could occur, and species present.	• Compliance with legislative and regulatory requirements for the prevention of marine pollution and handling of hazardous wastes. • Implement a Waste Management Plan. • Solid waste/equipment dropped to the marine environment will be recovered where safe and practicable to do so. • Where retrieval is not practicable and/ or safe, material items (property) lost to the marine environment will undergo an impact assessment and will be added to the inventory for the title.
Unplanned Interaction with Marina Fauna	• Accidental collision between project vessels and protected marine fauna.	• Vessel movements have the potential to result in accidental collisions between the vessel (hull and propellers) and marine fauna. • The risk of vessel collision with marine mammals is present year-round but is seasonally elevated for species such as pygmy blue whales during foraging periods and southern right whales when resting on migration (May – October). Given the short duration of activities within the Operational Area, and the slow speeds at which project vessels operate collisions with cetaceans are considered highly unlikely.	• Compliance with legislative and regulatory requirements for interactions with marine fauna to reduce the likelihood of a collision occurring.
Disturbance to Seabed from Dropped Objects and Unplanned Anchor Drag	• Accidental, unplanned dropping of objects overboard from project vessels during recovery operations. • High energy weather conditions, occurring while the MODU is on station, can lead to excessive loads on the mooring lines, resulting in failure (either anchor(s) dragging or mooring lines parting).	• In the unlikely event of an object being dropped or mooring failure, potential environment effects should be limited to minor physical damage to seabed and benthic communities in a localized area.	• MODU and project vessel inductions include control measures and training for crew in dropped object prevention. • Lost waste/ dropped objects will be recovered where safe and practicable to do so. • Procedures for lifts, bulk transfers and cargo loading if an unplanned object release does occur. • Project-specific Mooring Design Analysis and mooring system testing undertaken to reduce the likelihood of mooring failure or anchor drag.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts	Proposed Mitigation and/or Management Measure
Accidental Introduction of Invasive Marine Species (IMS)	• Vessels transiting to the Operational Area may be subject to marine fouling whereby organisms attach to the vessel hull. • Organisms can also be drawn into ballast tanks during onboarding of ballast water. • IMS could also be present as biofouling on submersible equipment.	• There is potential for the transfer of IMS between the project vessels while in its currently location within the Operational Area.	• Ballast water and biofouling will be managed according to regulatory requirements, including the Australian Ballast Water Management Requirements, and the Australian Biofouling Management Requirements, as applicable. • Woodside's IMS risk assessment process will be applied to the MODU, project vessels and submersible equipment entering the Operational Area.
Indirect			
Waste Generation	• Removal of the Minerva subsea infrastructure will result in the generation of waste products.	• Generation of waste products that require appropriate management.	• Waste generated on the MODU and project vessels, including recovered infrastructure will be managed in accordance with legislative requirements. • Recovered infrastructure will be transported onshore by a licensed waste contractor for disposal including recycling and reuse opportunities. • Infrastructure and resource recovery strategy that ensures waste is handled and disposed of in accordance with applicable legislation, monitors and tracks waste and sets KPIs for recycling and reuse of decommissioned infrastructure.

Feedback

If you would like to comment on the proposed activities outlined in this information sheet, or would like additional information, please contact Woodside before **12 February 2024** via:

E: Feedback@woodside.com

Toll free: 1800 442 977

You can subscribe on our website to receive Consultation Information Sheets for proposed activities: www.woodside.com/sustainability/consultation-activities.

Please note that stakeholder feedback will be communicated to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) and the Department of Energy, Environment and Climate Action DEECA) as required under legislation. Woodside will communicate any material changes to the proposed activity to affected stakeholders as they arise.

Please note that your feedback and our response will be included in the Environment Plans for the proposed activities, which will be submitted to NOPSEMA or DEECA for acceptance in accordance with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (Cth) and the *Victorian Offshore Petroleum and Greenhouse Gas Storage Act 2010*.

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA or DEECA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA or DEECA.