

Commonwealth Environmental Impact Statement

Chapter 24 – EIS summary
and conclusions



Chapter 24 EIS summary and conclusions

24.1 Introduction

The Commonwealth Minister for the Environment (or delegate) will consider whether the Star of the South Offshore Wind Project (the project) should be approved under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

This chapter provides the conclusions of the assessment presented in the project's Environmental Impact Statement (EIS) for the project and how they address the matters to be considered under the EPBC Act.

24.1.1 Matters to be considered under the EPBC Act

The matters that must be considered by the Commonwealth Minister (or delegate) when deciding to approve a project are described in section 136 of the EPBC Act. These include:

- The relevant matters of national environmental significance protected under Part 3 of the EPBC Act. For the project, these are:
 - The ecological character of declared Ramsar wetlands (sections 16 & 17B)
 - Listed threatened species and communities (sections 18 & 18A)
 - Listed migratory species (sections 20 & 20A)
 - The environment in Commonwealth marine areas (sections 23 & 24A).
- Other factors to be considered include:
 - Economic and social matters
 - Principles of ecologically sustainable development
 - A person's environmental history.

This chapter summarises the EPBC Act requirements for the EIS and outlines how the project addresses requirements related to relevant matters of national environmental significance, the principles of ecologically sustainable development and the objects of the EPBC Act, as prescribed by the EIS guidelines. Refer to *Attachment V – EIS Guidelines checklist* for further details of where the requirements of the EIS guidelines are addressed throughout this EIS.

This chapter also considers potential impacts to matters of national environmental significance in Victorian land and waters as required under the EPBC Act, as well as impacts to non-Aboriginal underwater cultural heritage and submerged Aboriginal cultural heritage, as required under the *Underwater Cultural Heritage Act 2018*.

Assessment under the EPBC Act

Following the conclusion of the public exhibition period, Star of the South will review public submissions and provide an updated EIS to the Commonwealth Department of Climate Change, Energy, Environment and Water outlining the nature of the submissions and actions taken to address them.

Following receipt of the updated EIS, the Commonwealth Minister for the Environment will determine whether to approve the project and define conditions of approval under the EPBC Act.

24.2 Impacts on matters of national environmental significance

This section provides a summary of the potential impacts to relevant matters of national environmental significance protected under Part 3 of the EPBC Act. In doing so, it aims to outline the key conclusions regarding the project's potential impacts to these matters to assist the Commonwealth Minister for the Environment to make an informed decision on whether to approve the project under the EPBC Act.

The assessment of impacts to matters of national environmental significance was conducted in accordance with the EPBC Act and EIS guidelines. The assessment concludes that, with the implementation of the proposed mitigation measures, the project will not have a significant impact on the Commonwealth Marine area, threatened species, migratory species or ecological communities in the terrestrial or marine environments or on Ramsar wetlands. The assessment considered relevant international obligations and conventions, recovery plans, threat abatement plans and conservation advice related to threatened species and communities and migratory species.

The summary and conclusions draw on the EIS chapters and technical reports.

In the following sections, potential impacts on migratory species and threatened species are combined to provide summaries and conclusions addressing the Department of Climate Change, Energy, Environment and Water's guidance on the key environmental factors for offshore wind farm environmental impact assessments under the EPBC Act (DCCEEW, July 2023).

24.2.1 Listed threatened and migratory species and threatened ecological communities

24.2.1.1 Terrestrial environment

As described in *Chapter 4 – Project Description*, the terrestrial environment portion of the project extends from the shore crossing at Reeves Beach approximately 30 kilometres inland to the proposed VicGrid connection hub in Giffard, Victoria.

Offshore cables will reach land via a shore crossing, where the offshore export cables transition to shore, under the wave zone and dune system, to connect to the onshore transmission system. The shore crossing is constructed using trenchless crossing techniques to drill bores and install ducts that house the offshore export cables. From Reeves Beach, underground transmission cables will connect the offshore wind farm to the electricity network.

The project area is typically undulating country with primary use being mixed farming or plantation forestry. Farms are generally used for beef and sheep grazing. The project's onshore transmission alignment intersects with key and small waterways within the South Gippsland Basin, which typically flow seasonally, and discharge into wetlands and coastal estuaries located behind the sand dunes of Ninety Mile Beach, or the shallow wetland of Jack Smith Lake Wildlife Reserve.

Threatened terrestrial flora and ecological communities

The onshore ecology assessment identified no threatened ecological communities in the project area and no listed threatened flora were identified in the surveys. It is possible, however, that the following flora species, listed as vulnerable under the EPBC Act, occur in the area:

- Thick-lip Spider-orchid (*Caladenia tessellata*)
- Dense Leek-orchid (*Prasophyllum spicatum*)
- Spiral-leaved Sun-orchid (*Thelymitra matthewsii*).

While not observed in surveys, these species could be impacted by construction activities, either from the removal of potential habitat or from indirect impacts to adjacent habitat. The implementation of project design mitigation measures, such as trenchless construction methods and the refinement of onshore transmission alignment options and no-go zones, will result in minimal disruption to sensitive ecological areas and native vegetation. No significant impacts to threatened EPBC Act listed flora species are predicted.

Threatened and/or migratory terrestrial fauna

The onshore ecology assessment identified no threatened and/or migratory terrestrial reptiles or fish in the onshore project area. However, the table in Appendix A includes species listed as threatened and/or migratory under the EPBC Act that are identified as being possible, likely or present within the study area (see Appendix A).

Key impact and risk pathways to terrestrial fauna

The onshore ecology technical assessment considered the impact and risk of project activities on terrestrial fauna groups. The assessment of potential impacts from project activities on the related fauna groups is discussed below.

While significant efforts have been made to minimise habitat removal, up to approximately 16 hectares of native vegetation may be cleared for the construction of the onshore transmission system. The removal of this native vegetation, and its possible importance as habitat for the EPBC Act listed terrestrial species, is considered a negligible to minor impact given its localised extent. In addition, Star of the South will continue to seek opportunities to avoid and minimise impacts on ecological values during design and construction planning. This is the only key impact identified for EPBC Act listed terrestrial fauna species.

During construction, all risks for listed fauna associated with native vegetation removal and loss of habitat are considered low.

As the cable easement will need to remain cleared of vegetation that could impact the cable system (most farming uses could continue) during the operation phase for safety reasons, there is some localised risk of habitat fragmentation. Compliance with the measures outlined in the Commonwealth Environmental Management Plan will ensure this risk is not increased.

24.2.1.2 Marine environment

The offshore project area begins at the shore crossing at Reeves Beach and extends 40 kilometres offshore. It comprises the offshore wind farm area, which is a 586-square-kilometre area for the offshore wind turbines and offshore substations, and the offshore export cable area, a 232-square-kilometre area for the offshore export cables. The offshore export cable area extends from shore, across the three nautical mile Victorian limit, and into Commonwealth waters where the offshore wind farm area is located.

Threatened marine flora and benthic ecological communities

The marine benthic ecology assessment identified no EPBC Act listed flora or benthic taxa, communities or key ecological features within the offshore project area (which includes the Commonwealth marine area). Refer to Section 24.2.3 for an overview of the assessment of impacts from project activities on other Commonwealth marine area values.

Threatened and/or migratory marine fauna

The threatened and/or migratory marine species under the EPBC Act which could occur within the offshore project area are listed in Appendix B. The assessment of potential impacts from project activities on the related fauna groups is discussed below.

Key impact and risk pathways to marine fauna

The technical reports considered the impact and risk of project activities on marine fauna groups and are summarised below. These assessments address the Commonwealth Department of Climate Change, Energy, Environment and Water's guidance on the key environmental factors for offshore wind farm environmental impact assessments under the EPBC Act (DCCEE, July 2023).

Underwater construction noise

Underwater noise emissions from the impact piling of turbine and offshore substation foundations has the potential to impact cetaceans and other marine fauna during the construction phase. This impact pathway was assessed via multiple rounds of underwater noise modelling. The assessment indicates that the noise footprint of turbine foundations piling may overlap with Biologically Important Areas visited by the Southern Right Whale and Blue Whale - low-frequency cetaceans that are noise sensitive.

A suite of mitigation measures is proposed to manage underwater construction noise, including:

- Optimising piling procedures (such as hammer energy used)
- Implementing soft-start procedures for piling activities whereby hammer energy is increased over a period of time to enable marine fauna to relocate to a position of safety
- Using the best available noise abatement systems, such as Double Big Bubble Curtains
- Conducting noise modelling, monitoring and verification

- Using visual observation and acoustic monitoring to detect the presence of marine mammals
- Implementing operational procedures to prevent hearing impairment and behavioural disturbance to marine mammals
- Implementing adaptive management procedures in the event that real world events are different to the assumptions or modelling parameters used in the draft EIS.

The above mitigation measures will avoid, minimise and manage the impact of underwater noise from turbine foundation piling on marine fauna. These measures will also specifically minimise the likelihood of hearing impairment or behavioural disturbance from underwater noise on the Southern Right Whale and Blue Whale. Therefore, the project is not inconsistent with the recovery plans for these key species. Underwater noise effects on other EPBC listed bird, fish, mammal and turtle species will be limited to short-term disturbance to individuals in close proximity to pile driving activities which will not have significant impacts on these species.

Habitat change

The presence of project infrastructure in marine waters could lead to a reef effect, whereby hard artificial substrate acts as an artificial reef, attracting and supporting a variety of marine life. The reef effect can cause changes to community composition, species abundance and diversity, which may benefit reef-dependent species but impact those that rely on soft-sediment habitat.

Some syngnathid species, such as seahorses, pipefishes and seadragons, inhabit soft-sediment areas and may therefore be susceptible to such impacts; however, the assessment found that this impact pathway is unlikely to have any population effects given the vast extent (majority of seabed) of soft-sediment habitat across the offshore project area and surrounding region.

Much of the offshore project area overlaps with a Biologically Important Area (nursery) for the White Shark. Although the reef effect could create ecological benefits, there is some uncertainty as to how this may impact the White Shark, including through potential increases in prey abundance. This led to a medium impact rating for this species. While increased prey abundance could motivate White Sharks to stay in the vicinity longer, this is not expected to affect breeding or otherwise impact the eastern Australasian population adversely. Monitoring of White Sharks and fish assemblages during construction and operation will be implemented to better understand the environmental implications of habitat change.

Habitat change, including changes to hydrodynamics, was assessed as having a negligible to minor impact to other EPBC Act listed bird, fish, mammal and turtle species.

Physical presence – collision risk with turbines

The presence of turbines in the marine environment presents a risk of collisions for bird species that move through or use the area. To reduce the risk of bird collisions, the air gap between the turbine blades and the surface of the water has been increased from 25 to 35 metres. With this design change, the assessment identified that collisions present a low to very low risk for all EPBC-listed threatened and migratory seabirds and Bass Strait migrants, except for the Shy Albatross.

The collision risk modelling indicated that a worst-case collision rate for the Shy Albatross was an estimated 4.31 collisions per year. This equates to approximately 0.01 per cent of the total Shy Albatross population potentially being affected by collisions each year. While only a small number of individuals may be affected annually, the species' vulnerability to declines in adult survival and its endangered status under the EPBC Act resulted in the risk of collisions being assessed as medium.

Monitoring of seabirds during the operation phase will be implemented, including monitoring of the avoidance behaviour of certain species such as Shy Albatross to the wind farm. Monitoring will inform the need for adaptive management, which will be detailed in a Seabird Monitoring and Management Plan to be developed and implemented prior to the commencement of construction.

Electromagnetic fields

Any electromagnetic fields generated by the offshore export and inter-array cables during the operation phase are anticipated to have negligible to minor impacts on marine fauna. The offshore export and inter-array cables will be buried at a minimum depth of one and 0.6 metres, respectively. Additional rock protection will be used where the required burial depth cannot be achieved. As such, only fauna in direct proximity to cables could experience electromagnetic fields slightly higher than those naturally occurring at background levels.

Benthic invertebrates, sharks, rays and fish may experience minor impacts given their preference for the seafloor, but negligible impacts are anticipated for all other fish, diving seabirds, pinnipeds and turtles, which have more limited interaction with the seabed. Monitoring of cable burial depths will help minimise interaction between marine fauna and electromagnetic fields closer to the cable.

Seabed disturbance and sediment plumes

During the construction phase, seabed preparation, cable installation and foundation installation activities will impact the seabed and temporarily affect water quality in the localised area where these activities occur. Up to 11.8 square kilometres of seabed could be disturbed - primarily soft-sediment habitat that is widespread across the project and surrounding areas. Impacts from plumes and sediment deposition may extend to the adjacent seabed; however, plumes will disperse rapidly due to the high-energy nature of the currents in the area, and deposits will mostly occur across similar, soft-sediment seabed.

Mitigation measures, including the avoidance of construction in rocky reef areas, will minimise impacts on diverse and more sensitive habitats. Overall, the impacts arising from seabed disturbance and associated changes to water quality are considered to be negligible or minor for all benthic habitat and marine fauna groups. Monitoring of benthic habitats will be implemented before and after construction to identify disturbance and recovery of the seabed communities.

Artificial light emissions

Lights from vessels and project infrastructure will illuminate localised areas that are otherwise dark, which has the potential to alter animal behaviour. Impacts arising from artificial light are considered negligible for fish and marine turtles but could have a medium impact on certain seabirds if unmitigated. To mitigate impacts on birds, Star of the South and all vessels will comply with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023), to avoid and minimise light spill from the project during construction, operation and decommissioning. A light management procedure will be developed to manage any bird attraction and groundings for project vessels, and detail bird handling procedures, monitoring and reporting. With these mitigation measures in place, the impacts of artificial light on seabirds are considered to range from negligible to minor.

Vessel interactions – injury and mortality to marine fauna

Project vessels transiting within the offshore wind farm area and between ports during the construction and operation phases present a collision risk with marine fauna, leading to injury or mortality.

Little Penguins (*Eudyptula minor*) are particularly vulnerable to propeller injuries from vessel interactions. To mitigate this potential impact, propeller guards will be used on vessels where practicable. To minimise vessel interactions with marine mammals, including the more sensitive Southern Right Whale and Blue Whale, project vessels will implement and adhere to no approach and caution zones, speed restrictions where applicable and pre-defined movement corridors. These mitigation measures would also benefit other fauna in the marine environment.

Vessel crew will be trained to identify large marine mammals and respond accordingly, including altering caution zones and vessel speed, in line with respective recovery plans, if a Southern Right Whale or Blue Whale is observed.

With the above measures in place, the risk of vessel interactions with marine fauna is considered low to very low.

Physical presence of offshore wind turbines – displacement and barrier effects

The physical presence of project infrastructure during the operation phase has the potential to disrupt the natural movement patterns (barrier effects) of seabirds and marine mammals or cause them to avoid the area (displacement). To minimise these potential impacts, Star of the South has committed to a minimum spacing of 1,062 metres between turbines and reduced the total number of turbines to be installed in the offshore wind farm area from up to 400 to a maximum of 147. Displacement and barrier effect impacts on seabirds and marine mammals are considered to range from negligible to minor, mainly because the project footprint does not encompass a significant area of critical habitat for marine fauna, and it is anticipated that fauna will be able to move through the wind farm. Post-construction monitoring of marine mammals, seabirds and turtles will be conducted to understand how these species adapt to the project.

Vessel discharge

All project vessels will comply with the Commonwealth and Victorian marine discharge and waste management regulations. In the unlikely event that an accidental spill occurs, the discharge will be responded to, recorded and monitored in accordance with the Spill Response Plan developed prior to the start of construction. Therefore, the overall impacts from vessel discharge, including accidental discharge, during the construction and operation phases are negligible.

Likewise, Star of the South will comply with respective plans to minimise the contribution of marine debris and as a result, this risk is considered low to very low for all marine mammals, seabirds and turtles.

Invasive marine species

To minimise the risk of introducing or translocating invasive marine species, all project vessels will comply with existing Commonwealth and Victorian biosecurity requirements. These requirements include developing a Ballast Water Management Plan, obtaining a Ballast Water Management Certificate and conducting an Invasive Marine Species Risk Assessment Procedure prior to entering the offshore project area. Additionally, ensuring foreign vessels have biosecurity clearance before entering Australian waters will also be required. With these measures in place, the overall risk of the introduction of invasive marine species from vessel movements during the construction phase is low.

Accidental hydrocarbon release (oil spill)

Project vessel movements will comply with existing Commonwealth and Victorian maritime requirements and will be managed through vessel passage plans and a marine coordination centre. Given these measures, an accidental hydrocarbon release is unlikely and is considered a low to very low risk for all marine fauna. An oil spill from an offshore substation is also a very low risk, as these will be regularly maintained and designed to avoid spilled hydrocarbons reaching the marine environment. A Spill Response Plan will also be developed to ensure a prompt and proportionate response to any spill event, thereby minimising impacts if a spill were to occur. As such, the overall risk of an accidental hydrocarbon release into the marine environment from a vessel collision is low.

24.2.2 Ramsar wetlands

Corner Inlet is the one Ramsar wetland that the project will have some interaction with, from project vessels coming and going from existing commercial ports within Corner Inlet. These vessels include crew and service operational vessels during construction and operational phases of the project.

The Corner Inlet Ramsar Site covers an area of about 67,186 hectares and is located approximately seven kilometres west of the offshore wind farm area at its nearest point. As a Ramsar wetland, the area provides supporting and critical ecological components, processes and services, including those related to physical coastal processes, aquatic habitat types, waterbirds and fish. Several technical reports consider the impact and risk of project activities on the different values of the Corner Inlet Ramsar Site, all of which were low to minor, as discussed further below.

Vessels and ports

The increased number of vessels entering ports within Corner Inlet during the project's construction and operation phases, and the associated risk of invasive marine species, oil spills and accidental discharges, have been assessed as a low to very low risk for fish, birds and aquatic habitats after implementation of the mitigation measures discussed in Section 24.2.1.2.

Bird collision risk

With the incorporation of a 35-metre air gap between the lowest tip of the turbine blades and the surface of the water, and the low likelihood of waterbirds entering the offshore wind farm area, the collision risk for waterbirds associated with the Corner Inlet Ramsar Site has been assessed as a low risk for waterbird abundance, waterbird breeding and threatened birds.

Fish

The project is not anticipated to significantly impact fish that use Corner Inlet as habitat or nursery, largely because of the localised spatial scale of impacts, as discussed in the fish and invertebrate assessment (refer to *Technical Report C – Fish and Invertebrates*).

Coastal processes

Potential impacts from the presence of project infrastructure on coastal processes and sediment transport were assessed, including impacts to coastal landforms and habitats within the Corner Inlet Ramsar Site. The assessment, conducted using predictive numerical models, indicates that impacts to coastal processes and sediment transport in the Corner Inlet Ramsar Site are negligible to minor, and any changes are unlikely to exceed the natural annual variability present in the area. Although the potential for impacts is limited, Star of the South will implement pre- and post-construction satellite monitoring of the coastline to detect any changes to coastal landforms outside the range of natural variation.

No pathway of potential impact from sediment dispersion and deposition during construction was identified between the offshore project area and Corner Inlet.

Transmission construction

The onshore transmission alignment traverses a catchment that flows into Corner Inlet. Accordingly, contaminated surface water flowing from the onshore construction area to the Corner Inlet Ramsar Site has been assessed. Trenchless construction techniques at sensitive waterways and best-practice measures will ensure that all impacts to waterways feeding into Corner Inlet are negligible to minor.

Ramsar wetlands conclusion

Overall, the respective assessments for each environmental value of the Corner Inlet Ramsar Site demonstrate that the project will not result in any significant impacts to the supporting or critical ecological components, processes or services that the Corner Inlet Ramsar Site provides. The proposed mitigation measures are consistent with the Australian Ramsar management principals as set out in Schedule 6 of the EPBC Regulations 2000. These principles include actions to maintain the ecological character of the wetland, actions to deal with impacts, including physical loss, modification or encroachment on the wetland, loss of biodiversity, pollution and nutrient input, changes to water regimes, use of resources, introduction of invasive species, and monitoring and reporting against ecological outcomes.

With the mitigation measures in place, the project is not inconsistent with the objectives of the Ramsar Convention.

24.2.3 Commonwealth marine area

24.2.3.1 Defining the Commonwealth marine area

A Commonwealth marine area is defined by section 24 of the EPBC Act to include any part of the sea that is not State or territory waters, but is:

- Within Australia's Exclusive Economic Zone
- Over the continental shelf of Australia
- Includes the water, seabed and airspace.

The project falls within the Commonwealth marine area in the South-east marine region (DCCEEW 2015). The whole of the environment, including social, economic and cultural aspects, must be considered in the assessment of impacts on the Commonwealth marine area.

Section 528 of the EPBC Act defines the environment as including heritage values, people and communities, including their social, economic and cultural aspects. Specifically, it is defined as:

- a Ecosystems and their constituent parts, including people and communities*
- b Natural and physical resources*
- c The qualities and characteristics of locations, places and areas*
- d Heritage values of places*
- e The social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).*

Indigenous heritage values are also defined in section 528 to mean 'a heritage value of the place that is of significance to indigenous persons in accordance with their practices, observances, customs, traditions, beliefs or history'. These matters are a consideration for actions within the Commonwealth marine area and are considered in the EIS.

24.2.3.2 Impacts on the Commonwealth marine area

Project activities will be undertaken in the Commonwealth marine area located within the Southeast Shelf Transition bioregion of the South-east Marine Region. The continental shelf is relatively broad and shallow in the southern area of the Gippsland offshore region, and marine waters are strongly influenced by several currents that run through and near the shelf, bringing both warm and cool coastal currents.

The seabed in this region is predominantly comprised of soft sediment with scattered rocky reefs and sections of sparse seagrass. It supports benthic communities and marine fauna, including cetaceans, fish, invertebrates, marine birds, pinnipeds and turtles. Many of these species transit through the Commonwealth marine area or are only present during certain seasons. A summary of the assessment of potential project impacts on these species is provided in Section 24.2.1.2.

The region is used by domestic and international shipping, commercial and recreational fishing, private boating and tourism charters. Numerous industries and infrastructure operate in the offshore project area and immediate surroundings, including the oil and gas industry, research agencies, defence, aviation, radar and communications systems, submarine power cables and other vessels. The region has various marine protected areas that safeguard a range of values.

Several technical reports considered the impact and risk of project activities on the different values of the Commonwealth marine area, the results of which are summarised in this section.

Marine protected areas

The offshore project area does not overlap with any key ecological features or Commonwealth marine protected areas, but it is situated seven kilometres from the Corner Inlet Ramsar Site and 20 kilometres from the Beagle Australian Marine Park. A full assessment of impacts is provided in *Technical Report F – Marine Protected Areas*. The primary potential impacts and risks are those related to underwater noise and vessel movements during construction. With the mitigation measures in place for these impact and risk pathways (refer to Section 24.2.1.2), the project will have no measurable impact on the marine park's conservation values.

Physical processes

Potential effects from the presence of project infrastructure on physical processes (wind, waves and currents) in the Commonwealth marine area were assessed as negligible to minor. Tailored models used to predict physical process conditions during the operation phase, with infrastructure in place, determined that respective conditions would be largely comparable to present-day conditions and within levels of year-to-year variation.

Commonwealth fisheries

Between 2001 and 2021, several commercial fisheries recorded catches in the offshore wind farm area, which is located within the Commonwealth marine area. While the assessment identified that the offshore wind farm area is not a highly productive fisheries zone in comparison to other sections of Bass Strait, the presence of project infrastructure and vessels could lead to a loss of some fishing grounds for commercial fishers using 'restrictive' fishing methods that may not be safe or practical to continue within the wind farm. Restrictive methods may include gillnet, purse-seine, longlines or other fishing apparatus that restrict vessel manoeuvrability.

Potential impacts from the presence of project infrastructure, which were initially assessed as having moderate consequences for commercial fishers using restrictive fishing methods, will be managed through efforts to achieve co-existence, and the provision of compensation in the event that this is not safe or practical. Opportunities for commercial fishers to participate in project work, particularly in the construction phase, will also be made available. With the implementation of these mitigation measures, impacts to fishers and the associated values of the Commonwealth marine area are considered negligible to minor.

Infrastructure and other users

Numerous industries and infrastructure operate in the offshore project area and immediate surroundings, including the petroleum industry, research, defence, aviation, radar and communications systems, submarine power cables and vessels. The assessment identified that the presence and operation of turbines could impact aviation and radar (civil, weather and defence). Impacts to aircraft are considered minor as these will be mitigated through raising the height of the lowest safe altitude for overlapping civil and Commonwealth Department of Defence airspace and the redesign of the Yarram Registered Aerodrome approach space. A range of mitigation measures relating to radar are proposed to reduce impacts to a moderate level. These measures include conducting an industry service interference assessment in conjunction with potentially impacted civil and weather radar providers if required, and ongoing consultation with impacted radar providers on the project's final wind farm layout with the Commonwealth Department of Defence and the Bureau of Meteorology.

Shipping and navigation

Current vessel activity within the offshore project area is relatively low but will increase during the project's construction and operation phases. Construction vessels will follow existing shipping lanes to and from existing ports where safe to do so. The assessment identified that with mitigation measures, including a marine coordination centre that will manage project vessel movements to and within the offshore project area, impacts to shipping and navigation in the Commonwealth marine area are considered negligible to minor.

Heritage Values

Aboriginal cultural heritage

A submerged Aboriginal cultural heritage assessment, including the development of a regional terrestrial sensitivity model and a submerged palaeolandscape assessment, identified potential submerged areas, embedded in geological layers, where Aboriginal cultural heritage could exist from historic times before the project area was inundated by the ocean. These assessments did not identify any confirmed submerged Aboriginal cultural heritage sites within the project footprint.

Residual impacts and risks associated with direct and indirect physical impacts during the project's construction and operation phase were considered to be of moderate to minor consequence, and of medium risk, depending on the palaeolandscape's potential to hold archaeological material and possible submerged Aboriginal cultural value.

Mitigation measures include additional geotechnical and geophysical surveys of the project area which will undergo archaeological assessment to further enhance and refine the understanding of the submerged landscape and potential sites of submerged Aboriginal cultural heritage. The preparation of an Underwater Cultural Heritage Plan will specify mitigation measures for submerged Aboriginal cultural heritage in Commonwealth Waters.

Historical heritage

The non-Aboriginal underwater cultural heritage assessment identified the shipwreck of the colonial schooner *Sarah* (1838) as the only listed item potentially located within the offshore project, in Victorian coastal waters. No items were identified in the offshore wind farm area in the Commonwealth marine area.

Pre-construction surveys will be undertaken to assist with siting project infrastructure to avoid direct and indirect impacts on underwater cultural heritage items. Archaeological exclusion zones will be established for all confirmed underwater cultural heritage items in the vicinity of project activities. An Underwater Cultural Heritage Management Plan will also be developed with measures for the assessment, monitoring and reporting of any unknown, unrecorded and/or newly discovered underwater cultural heritage items, thereby avoiding and minimising impacts on underwater historic heritage and archaeology.

The project will not impact any world heritage sites or Commonwealth or national heritage listed places.

Social and economic matters

The Gippsland region is characterised by farming, forestry, small towns and national parks, with a relatively slow population growth rate. The social impact assessment study area includes coastal areas and settlements, Wilsons Promontory National Park (Wilsons Promontory), Reeves Beach campground, areas used for recreational fishing and the rural areas that the project traverses.

The economic and social values offshore include those related to commercial and recreational fishers, other recreational and commercial users of the marine environment and vessel operators.

Identified impacts that encompass the whole of the environment include positive economic impacts on employment, local and regional economies, industries (agriculture and fisheries), and tourism. Workforce requirements may increase demand for housing and public services.

The social effects of the project would be concentrated in locations proximate to the onshore transmission alignment and shore crossing, coastal locations from Wilsons Promontory National Park to Seaspray, and in towns where people working on the project may live. In some cases, community resources may be used by people who live outside of the region, leading to impacts for affected individuals and social groups.

During construction, the project may result in disruptions to offshore fishing, demand for housing and community services, amenity and character of coastal settlements and access and amenity for landholders directly affected by the construction areas. At the same time, the project would have a substantial positive employment impact, with approximately 1,750 roles created within the region during the peak period of construction, and 214 full-time local roles created during the project's approximate 30 years of operation.

Key mitigation measures to manage potential adverse effects and enhance benefits include:

Workforce Accommodation Strategy (SOC-M001) - The draft Workforce Accommodation Strategy sets a limit on the number of rental properties that workers from outside the region stationed at Gippsland ports can access each year. Workers who cannot be accommodated immediately within the rental market will be accommodated within holiday rental or other suitable short-stay accommodation options (such as serviced apartments) and, if necessary, project-specific temporary accommodation. The draft Workforce Accommodation Strategy commits to using no more than 25 per cent of the current accommodation supply, to minimise displacement of existing users, including tourists.

Stakeholder Engagement Plan (SOC-M003) - One mitigation measure proposed to reduce impacts on recreational boating and fishing during construction is the implementation of a Stakeholder Engagement Plan. This plan will include the following in relation to social impact matters:

Communicating construction activities and sequencing regularly and clearly through a range of easy-to-understand tools

Charting the location of installed offshore infrastructure using digital tools that are suitable for use by the fishing community.

- Workforce Development Strategy (BTM-M005) - Star of the South will seek to maximise the number of workers who are recruited locally (those who live within a one-hour drive catchment of project workplaces) through procurement strategies developed post approval such as the Workforce Development Strategy (refer to BTM-M0005 - *Technical Report Q – Business and Tourism*) and would sequence construction to minimise peak labour demands where possible.

Visual impacts

From a visual impact perspective, project infrastructure will be constructed and operational within the Commonwealth marine area. The project's visual impacts have been assessed from coastal viewpoints where community members live or visit. Impacts range from negligible to high. High impacts are localised to specific locations and are not region wide.

24.3 Principles of ecologically sustainable development

Section 3A of the EPBC Act outlines the principles of ecologically sustainable development. These are as follows:

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

Appendix C outlines how the assessment of the project has accounted for these principles. Under section 136 of the EPBC Act, the Commonwealth Minister for the Environment is required to consider these principles when deciding whether or not to approve the project.

24.4 Objects of the EPBC Act

Section 3 of the EPBC Act outlines the objects of the Act, which are:

- a) *To provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance.*
- b) *To promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources.*
- c) *To promote the conservation of biodiversity.*
- ca) *To provide for the protection and conservation of heritage.*
- d) *To promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples.*
- e) *To assist in the co-operative implementation of Australia's international environmental responsibilities.*
- f) *to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity.*
- g) *To promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.*

Appendix D outlines how the project addresses the objects of the EPBC Act.

24.4.1 Proponent's environmental history

Star of the South Wind Farm Pty Ltd (Star of the South) is a private company owned by Copenhagen Infrastructure IV (CI IV) and its associated trust entities, the project founders and United Super Pty Ltd as trustee for Construction and Building Unions Superannuation Fund (CBUS).

The project team has expertise in delivering large-scale offshore wind projects in different parts of the world, and an in-depth understanding of the Australian environment and regulatory requirements.

The fund manager for CI IV, Copenhagen Infrastructure Partners (CIP) is a global leader in offshore wind. CIP develops, constructs and owns renewable energy projects in Asia Pacific, Europe and North America. It was recognised as Infrastructure Investor's Renewables Investor of the Year in 2019. Investors in CI IV include superannuation funds from around the world, including Australia, and other institutional investors. CIP is committed to upholding high environmental, social and governance standards.

Star of the South conducts its operations in line with CIP's overarching principles, guidelines and systems. Environmental, social and corporate governance, including health and safety and corporate social responsibility, are integral to CIP's investment process and management. Through an investment strategy focused on greenfield and renewable energy projects, CIP aims to create a positive impact on job creation and the climate in line with the United Nations' Guiding Principles on Business and Human Rights (United Nations, 2011) and Principles of Responsible Investment¹ and the guidance provided in the Organisation for Economic Co-operation and Development's 2017 paper Responsible Business Conduct for Institutional Investors (OECD, 2017). These principles and policies guide CIP as an investment manager throughout the entire investment process.

¹ <https://www.unpri.org>

24.5 Summary of cumulative effects

24.5.1 Overall cumulative effects

The project is situated within the Gippsland region, where various industries and infrastructure are active, including oil and gas, submarine power cables, operational onshore wind farms and other proposed offshore wind farm developments. With other projects in the vicinity, there is potential for cumulative impacts, which may arise when the effects of a single project on a receptor are considered along with the effects of other projects on the same receptor.

Each technical assessment within the EIS conducted a cumulative impact assessment that considered the combined effects of the project with other relevant developments. Using publicly available information, each assessment topic evaluated interactions with different existing, approved or reasonably foreseeable projects based on the nature of potential impacts and a defined zone of influence. The potential cumulative impacts are summarised in Table 24-1.

Table 24-1 Summary of the project's cumulative impact assessments

Project	Impact pathway	Assessment findings
Chapter 8 – Coastal Processes and Sediment Transport		
Great Eastern Offshore Wind Farm (Corio Generation)	Changes to winds	With the Great Eastern Offshore Wind Farm being very similar in scale to the project, there is no change to the predicted impacts assessed for the project, all of which range from negligible to minor.
	Changes to waves	
	Changes to currents	
	Changes to coastal sediment transport	
Chapter 9 - Benthic Ecology		
Great Eastern Offshore Wind Farm (Corio Generation)	Temporary seabed disturbance	Given the Great Eastern Offshore Wind Farm is very similar in scope to the project, it is assumed that impacts to benthic ecology receptors will be broadly comparable. It is expected that similar habitat types will be present within Great Eastern Offshore Wind Farm area, including widespread soft sediment and the potential for low- and high-profile reef, but less potential for seagrass given the depths of the project area.
	Changes to water quality	
	Invasive marine species	
	Oil spill from a vessel	As demonstrated in the project's assessment, impacts to benthic ecology are likely to be very localised and/or temporary and any cumulative impacts are therefore unlikely to be greater than negligible to minor due to limited scope for spatial overlap between the projects.
	Altered hydrodynamics	
	Permanent loss of benthic habitat	
	Addition of artificial hard substrate	

Project	Impact pathway	Assessment findings
Chapter 10 – Fish and Invertebrates		
Great Eastern Offshore Wind Farm (Corio Generation)	Habitat change	The final consequence for potential cumulative impacts due to habitat change is predicted to remain at minor for all fish receptor groups except White Sharks and syngnathids, for which the final consequence level is predicted to be moderate.
	Underwater noise during construction	Underwater noise has the potential to result directly in behavioural effects to White Sharks and presents a moderate risk of injury to the larvae of the Australian Grayling within tens of metres of pile driving activities. However, these localised effects are not expected to result in significant impacts to the population of these species. Cumulative impacts are not anticipated for White Sharks because of the short duration of daily pile-driving events (four hours per monopile) and their low sensitivity to changes in sound pressure in the water column, with the implementation of mitigation measures that minimise the spatial extent of noise emissions. The cumulative effects to Australian Grayling larvae and juveniles are unlikely to be significantly more than for each project alone given the broad area across which the planktonic phase of this species are likely to be distributed and the short duration in which they may be present in the area where they are sensitive to noise emissions.
	Seabed disturbance	The area of disturbance is small compared to the overall extent of habitat in the region. Negligible population-level effects on fish, in particular syngnathids and other site-attached species, are predicted.
	Electromagnetic fields	As both projects' cables will be buried, impacts are unlikely to extend beyond the project areas of the wind farms and it is unlikely there will be any significant cumulative effect at the population level on sensitive benthic species and the White Shark.
Marinus Link	Electromagnetic fields	As both projects' cables will be buried, it is unlikely there will be any significant cumulative effect at the population level on sensitive benthic species and the White Shark.
Chapter 11 – Marine Mammals and Turtles		
Great Eastern Offshore Wind Farm (Corio Generation)	Underwater noise impacts on the Southern Right Whale, Blue Whale, Humpback Whale and other mysticetes	It is expected that Great Eastern Offshore Wind Farm will manage underwater noise so that impacts will be consistent with the Blue Whale and Southern Right Whale recovery plans, that is, no behavioural disturbance that prevents feeding, breeding or migrating within biologically important areas, and in accordance with the significant impact guidelines for matters of national environmental significance for Humpback Whales and other mysticetes. Therefore, there would not be any significant disturbance to marine fauna from both wind farms combined.
Gippsland Offshore Wind Farm marine survey investigations (Ørsted)		The probability of a temporal overlap is low as marine survey investigations would occur on a short-term (weeks to a few months) and intermittent (survey equipment will not be operating continuously) basis over eight years. Ørsted predicts that residual impacts will be of minor significance to mammals by implementing environmental protection measures to ensure the field work does not cause environmental harm. Given this, the potential for cumulative impacts is predicted to be negligible.
Gippsland Skies Offshore Wind Project marine surveys		With respect to geotechnical investigations there is the potential for direct spatial and temporal overlap with the construction phase. On the expectation that environmental protection measures will be implemented to prevent impacts from underwater noise to baleen whales, the cumulative contribution of the Gippsland Skies Offshore Wind Project marine survey investigations is predicted to be negligible.

Project	Impact pathway	Assessment findings
Marinus Link		<p>The Marinus Link Victorian EES commits to developing and implementing species-specific management plans to mitigate noise impacts. These plans are expected to include provisions that seek to identify and avoid the coincidence of noise-generating activities within behavioural disturbance ranges.</p> <p>Noting the limited potential for temporal overlap with the project's construction phase (a maximum of one year) and given the expectation that mitigation measures to avoid impacts from underwater noise will be implemented, the potential for cumulative impacts is predicted to be negligible.</p>
Chapter 12 – Offshore Ornithology and Bats		
Great Eastern Offshore Wind Farm (Corio Generation)	Vessel operations: artificial light emissions	Considering project-wide mitigations and management measures, the cumulative impact residual consequence for artificial light emissions is considered minor.
	Underwater noise	An increase in the number of vessels (specifically dynamic positioning) and piling activities has the potential to increase underwater noise and reduce potential foraging habitat for the Little Penguin where there is temporal overlap in construction projects. However, given the distance offshore and the distance in which Little Penguins are known to forage, underwater noise impacts are likely to be lower compared with project activities and cumulative impacts are predicted to be negligible.
	Physical presence of operational turbines - displacement	An increase in the number of offshore wind farms within the Gippsland Declared Area has the potential to reduce the extent of seabird foraging habitat if individuals avoid a wind farm array. The cumulative impact was assessed as minor for Shy-type albatrosses, and negligible cumulative impacts for Greater Crested Tern and Australasian Gannets. As mainly a benthic forager, the Black-faced Cormorant is restricted in the depth at which it can forage and water depths within much of the Great Eastern Offshore Wind Farm site are likely too deep for foraging, limiting any cumulative displacement effects on the species.
	Physical presence of operational turbines resulting in bird strike in significant numbers leading to a population level effect	Collision risk modelling completed for the project indicated the seabirds with the highest flights at risk of collisions with turbines were Greater Crested Tern, Australasian Gannet, Short-tailed Shearwater and Fluttering Shearwater. Species presence and abundance data is not available to inform collision risk modelling for Great Eastern Offshore Wind Farm, and it is not appropriate to apply collision risk model results from the project due to differences in seabird microhabitat use.
Gelliondale Onshore Wind Farm	Collision risk for White-throated Needletail	Without site-specific data from the Gelliondale Onshore Wind Farm, predictions about collision impacts cannot be made. However, there have been 11 collision records for the species at each of Bluff Point and Studland Bay Wind Farms, on the north-west coast of Tasmania. While cumulative impacts are possible, collisions from the two projects combined would likely be orders of magnitude less than natural losses and deaths from other sources.

<i>Project</i>	<i>Impact pathway</i>	<i>Assessment findings</i>
Chapter 13 – Marine Protected Areas		
Corner Inlet Ramsar Site		
Great Eastern Offshore Wind Farm (Corio Generation)	Changes to coastal processes	The nature of cumulative impacts with Great Eastern Offshore Wind Farm is predicted to be like impacts from the project alone, but of greater magnitude. Nevertheless, the magnitude of likely cumulative impacts remains small relative to natural variation and the assessment found no change in residual impacts on relevant receptors.
	Bird collision risk	Species presence and abundance data is not available to inform collision risk modelling for Great Eastern Offshore Wind project and may differ to the Star of the South due to differences in seabird microhabitat use.
Beagle Australian Marine Park		
Great Eastern Offshore Wind Project (Corio Generation) Marinus Link Cable Installation and Operation Gippsland Skies Offshore Wind Project marine surveys Gippsland Offshore Wind Farm Marine Survey Investigations (Ørsted)	Underwater noise, artificial light emissions and physical disturbance from vessels transiting	The potential for a cumulative impact is considered to be negligible as effects from other projects would be unlikely to combine or accumulate because vessels are transiting and therefore any impact would be highly localised and temporary.
Chapter 14 – Non-Aboriginal Underwater Cultural Heritage		
Great Eastern Offshore Wind Farm (Corio Generation)	Construction activities that interact with the seabed	There is slight overlap between Great Eastern Offshore Wind Farm with the project's offshore export cable area. Within this overlap of the cable route areas, there is a potential for cumulative impacts although this will depend on the final cable route for both projects and whether there are any items of non-Aboriginal underwater cultural heritage present.
Chapter 15 – Commercial and Recreational Fisheries		
Great Eastern Offshore Wind Farm (Corio Generation)	The final consequence levels of impacts from the project are predicted to be negligible for all impact pathways following the application of defined initial and final mitigation measures. These mitigation measures are particularly important for commercial fishers who use fishing methods that may restrict or prohibit their fishing activities within the project area, and who may be more sensitive to cumulative impacts if multiple offshore wind farms are established in the Gippsland area.	
Chapter 16 – Infrastructure and Co-Existence with Other Users		
Great Eastern Offshore Wind Farm (Corio Generation)	Underwater noise	Cumulatively, simultaneous piling activities could increase the extent of the area impacted by underwater noise within the region, resulting in overlapping ensonified areas, and concurrent construction schedules would reduce the time between noisy activities, when other activities could occur.
	Impacts to submarine power cables	Based on the ability of submarine power cable operators' vessels to adapt operations, with a complex level of standard operational planning, the potential cumulative impact to submarine power cable operators is considered to be minor.

Project	Impact pathway	Assessment findings
	Impacts to aviation and airspace	As the Great Eastern Offshore Wind Farm is located adjacent to the project, the projects overlap a similar airspace and therefore certain mitigations developed for the project are assumed to remove any impact from the Great Eastern Offshore Wind project. Military derived LSALTs may require adjustments for all projects, and relevant notice of large (over 100 metres) infrastructure or equipment to Civil Aviation Safety Authority and Air Services Australia will be required by both projects. The cumulative impacts are considered moderate, being of a medium to large scale and long-term, but reversible at the end of operation. As outlined above, both projects can work with aviation operators who would be able to adapt operations through operational planning, where required.
	Impacts to radar equipment and facilities	As the projects are similar in scope, cumulatively there is an increased extent of the potential impact on existing radar equipment and facilities during construction and operational phases, potentially including defence and weather radar. Star of the South will continue consultation with Defence and submit final turbine layout once determined and prior to construction commencing. Star of the South will also consult with Bureau of Meteorology when a final layout is known to assess the need, and if required, undertake an industry service interference modelling assessment to determine if mitigations would be required.
	Impacts to industry vessels	The cumulative displacement and/or increased interaction with non-project vessels is expected to be minor. Further information for shipping and navigation below.
Gippsland Skies Offshore Wind Project marine surveys	Underwater noise	Concurrent underwater noise generating activities could increase the complexity of simultaneous operation planning required between projects. Therefore, the impact is considered minor, as it would be medium to large in scale, but over a short-term, whilst coordination between the projects and proposed infrastructure operators in the area will minimise disruption between operators.
Chapter 17 – Shipping and Navigation		
Great Eastern Offshore Wind Farm (Corio Generation)	Displacement of vessels	During construction, in the unlikely event that timing of export cable installation overlapped for the two projects, vessels traversing along the coast may need to divert around both cable lay activities, however these diversions would be minimal in scale with Star of the South proposing a mobile demarcation area around the cable lay activity and the Great Eastern Offshore Wind Farm expected to apply similar controls.
	Physical barriers to shipping and navigation	It is anticipated that very few vessels will experience a cumulative impact on navigational safety due the presence of project vessels or infrastructure.
	Increased vessel traffic in the Port of Corner Inlet and Port Albert	Cumulatively, the increase in vessel traffic could potentially be double if activities were to coincide, resulting in the potential for increased congestion and delays for third party vessels. Impacts would be reversible, and more noticeable over the medium-term during construction. It is less likely that cumulative impacts will arise during operations, when vessel movements in Barry Beach Marine Terminal and Port Anthony due to the two projects will be minimal.

<i>Project</i>	<i>Impact pathway</i>	<i>Assessment findings</i>
Chapter 18 – Onshore Ecology (EPBC matters)		
Golden Beach Gas Project	Coastal and near-coastal habitat clearance and associated impacts on fauna	Cumulative impacts may result from vegetation clearance – 40.22 hectares for Golden Beach Gas Project, 21.21 hectares for Marinus Link, a currently unquantified amount for the proposed VicGrid connection hub in Giffard and up to 20.285 hectares for the project. Similar mitigation measures should be in place for the other projects to minimise cumulative impacts.
Marinus Link		
Gippsland Offshore Wind Transmission Project (VicGrid)		
Chapter 19 – Submerged Aboriginal Cultural Heritage		
Gippsland Offshore Wind Farm marine survey investigations (Ørsted)	Survey activities that interact with the seabed	Due to the spatially widespread nature of the survey scope and investigations, cumulative impacts to the same site with cultural heritage value is judged to be unlikely. As the nature and extent of the activities are likely to be localised and short term, there is limited potential for activities from both projects to give rise to cumulative effects.
Chapter 20 – Social		
Other offshore wind projects	Housing and community services	If one or more of the proposed Gippsland offshore wind projects proceed, they may place demands on the supply of labour in Gippsland and/or draw temporary workers to the region, potentially increasing demand for housing and community services alongside that generated by the project. However, the draft Workforce Accommodation Strategy would ensure that these (as yet uncertain) influences are accounted for when Star of the South seeks to recruit and house its workforce, so the project does not overwhelm existing housing markets. In addition, proposed mitigation measures seek to lessen the project's impact on local service capacity. Similarly, if one or more of the identified projects proceed, they may also need to take steps to ensure that the needs of their workforce can be met without exceeding the capacity of existing housing markets and services.
	Coastal character and amenity	If one or more of the proposed Gippsland offshore wind projects proceed, their operational life would almost certainly overlap with that of the project. In this context, the following cumulative impacts are possible: <ul style="list-style-type: none"> • Acute effects for sensitive receptors (such as small coastal communities) would be experienced along a greater proportion of the coastline. • The capacity of social receptors to avoid locations where the character and amenity is affected by offshore wind farm projects may be further diminished, making adaptation more complex. • The offshore industry may progressively grow and mature, allowing a greater proportion of employment and economic benefits generated to be retained in the region.
	Rural character and amenity	If the construction phase of one or more other projects coincides with the project's construction phase, there may be cumulative social impacts relating to a concentration of construction activity in the local area. It may also be that a larger proportion of the local farming community would be dealing with matters relating to the construction and operation of transmission infrastructure on their land at any one time. However, given that landholders are largely agreeable to the placement of underground transmission infrastructure on their land for the project, the cumulative impact of multiple underground cable systems connecting into the proposed VicGrid connection hub in Giffard would likely be minor.

Project	Impact pathway	Assessment findings
Chapter 21 – Business and Tourism		
Loy Yang Battery Energy Storage System	<p>The construction of these projects could result in various cumulative changes to aspects of business and tourism in the region, such as traffic congestion and disruption; displacement or interactions with commercial vessels; impacts to offshore recreation and tourism; competition for workers; competition for housing and accommodations; and visual impacts to visitation and tourism.</p> <p>Effective cooperation between Star of the South and these projects will be needed to reduce cumulative impacts and maximise the beneficial aspects of the projects on employment, skills and visitor infrastructure.</p>	
Hazelwood Rehabilitation Project		
Decommissioning of Bass Strait oil and gas fields		
Marinus Link		
Gippsland Offshore Wind Transmission Project (VicGrid)		
Great Eastern Offshore Wind Farm		
Chapter 22 – Seascape, landscape and visual		
<p>Based on currently available information, no projects within the zone of influence were carried forward for further assessment due to insufficient data. While there is potential for impacts to similar receptors and the possibility of both spatial and temporal overlap with other developments, the current lack of certainty makes any meaningful assessment speculative. Star of the South will incorporate mitigation measures discussed in the relevant chapter to minimise the potential for cumulative impacts to arise.</p>		

24.5.2 Ecosystem resilience

The EIS guidelines require an assessment of the potential cumulative impacts of the project on ecosystem resilience. The guidelines further require that the cumulative effects of climate change on the environment be considered in the assessment, where scientific information is available.

The consideration of ecosystem reliance includes an evaluation of the cumulative impacts to the general environment and the ecosystem function of matter of national environmental significance, with consideration of the potential magnitude of effects and the duration and reversibility of effects.

What is ecosystem resilience?

An ecosystem is a group of interconnected organisms (animals, plants and microbes) and their physical environment found in a particular area.

Ecosystem resilience is the capacity of ecosystems to deal with disturbances, either by resisting them, recovering from them or adapting to them, while retaining their ability to deliver services and benefits now and in the future. The common attributes of ecosystems that make them resilient include diversity, connectivity, extent (spatial) and condition.

24.5.2.1 Evaluation

At the highest level, two broad types of ecosystems are considered relevant to matters of national environmental significance and identified as potentially impacted by the project:

- Terrestrial ecosystems, which includes terrestrial matters of national environmental significance – threatened species
- Marine and coastal ecosystems, which includes marine matters of national environmental significance – migratory and threatened species, the CMA and the Corner Inlet Ramsar wetland site.

The receptors considered within the technical reports represent the key physical and biological components of these ecosystems where the project is located. The assessment conclusions drawn from the technical reports, therefore, provide the basis for assessing the project's potential impact to ecosystem resilience. The assessment took the following approach:

- Potential residual impacts to receptor groups, once the measures to avoid, minimise and mitigate impacts have been applied, as assessed in the technical reports, were initially considered in the assessment.
- Those receptors for which the project was assessed as having a residual impact of moderate or greater were carried forward in the assessment. Negligible or minor residual impacts were excluded because they are not expected to adversely affect ecosystem attributes to a degree that impacts ecosystem resilience.
- Unplanned risks were excluded from the assessment, as they would be a rare event with uncertain outcomes – for example, the trajectory and effects of a hydrocarbon spill. Measures to prevent the occurrence of unplanned risks are proposed as mitigation measures for the project, where appropriate.
- The socio-economic values of ecosystems were not included as receptors in the evaluation of ecosystem resilience, as they are a product of ecosystem services, rather than a component or attribute supporting resilience.

24.5.2.1.1 Terrestrial ecosystems

Climatic conditions strongly influence the distribution, abundance and behaviours of species, as well as the structure, composition and functions of terrestrial ecosystems. Consequently, climate change adversely affects terrestrial ecosystem resilience. Among wide-ranging impacts, it exacerbates the impacts of vegetation clearance on the capacity of native vegetation to support biodiversity (Australian State of the Environment, 2021). Therefore, where applicable, the potential cumulative effects of climate change and project impacts on terrestrial ecosystem resilience have been considered.

Due to terrestrial ecosystems being interconnected and reliant on water, the project's impacts to both surface and groundwater were considered. The technical reports determined that the project's residual impacts to groundwater and surface water were all considered to be negligible or minor. In addition, cumulative impacts to either groundwater or surface water are not expected; therefore, no adverse effects to ecological function and integrity are expected for these receptor groups and the services they provide to the ecosystem.

As summarised in Section 24.2.1.1, the project is not expected to impact EPBC-listed ecological communities. Residual impacts to EPBC-listed fauna are considered to range from negligible to minor. Potential residual impacts to habitat for three EPBC listed orchid species were considered to be of moderate consequence due to the high sensitivity of the receptors. These orchids are not known to occur within the project area; however, it is possible they could be present due to the suitability of the habitat. Notwithstanding, the magnitude of impact from project activities was assessed as low and unlikely to constitute a significant impact under the EPBC Act. Changing climate, particularly changing fire regimes and drought frequency, is listed as a threat in the Commonwealth Department of Climate Change, Energy, Environment and Water's conservation advice for the orchids.

Vegetation clearance may threaten terrestrial ecosystems. The impacts from vegetation clearance resulting from the loss and degradation of native vegetation may include biodiversity decline, reduced ecosystem functioning and a decline in ecosystem resilience. The effects of climate change exacerbate these impacts. Patches of native vegetation occur along roadsides and in conservation reserves along the onshore transmission alignment. Although the project is located predominantly in modified agricultural land and efforts have been made to minimise vegetation loss, some amount of clearance is unavoidable. In addition to implementing measures to avoid, minimise and mitigate impacts to native vegetation, the project will offset the removal of native vegetation in accordance with Victorian regulations, to ensure no net loss to biodiversity. The residual impacts of vegetation clearance to EPBC Act species are therefore not considered to be significant.

Overall, no significant adverse effects to the ecological function and integrity of the terrestrial ecosystem are expected to result from the construction and operation of the project.

24.5.2.1.2 Marine and coastal ecosystem

Nationally, pressures associated with climate change have a high to very high impact on the Australian marine environment (Australian State of the Environment Report, 2021). The marine environment of south-east Australia is a global warming hotspot, with rates of warming above the global average. Climate change is expected to reduce marine ecosystem resilience in the region, although impacts are uncertain and likely to be complex. Warming ocean temperatures, ocean acidification, increased frequency of extreme events and changing oceanographic processes may cause changes in the range of fish, invertebrates and other marine organisms, including habitat-forming species such as seagrass and kelp. This could lead to the degradation of key habitats and reduced biodiversity, altering community structure and ecosystem dynamics.

As discussed in Section 24.2, the project is expected to have negligible or minor residual impacts on coastal processes and sediment transport, benthic ecology, marine mammals and turtles and seabirds. Interrelated and potential cumulative impacts are also expected to be minor. No adverse effects to ecological function and integrity are expected for these receptor groups.

Most residual impacts to fish are expected to be negligible or minor. Physical changes to habitat, as a result of the installation of project infrastructure, were assessed as having a potentially moderate consequence for the White Shark and some syngnathids (seahorses, pipefish and seadragons), mainly due to the sensitivity of these species given their conservation value, as discussed below.

White Shark

The White Shark was assigned a high sensitivity level due to its high conservation status, as the species is listed as vulnerable and migratory under the EPBC Act and vulnerable under the Flora and Fauna Guarantee Act. Much of the project also overlaps with a White Shark Biologically Important Area (nursery). The principal threats to White Shark are bycatch, illegal fishing and shark control activities. Other potential threats include ecosystem effects arising from habitat modification and climate change.

The introduction of artificial hard substrate may result in changes to the existing fish assemblages and the broader food web. Although no decrease in abundance or diversity of prey species is expected, how changes may affect the abundance and interaction between higher-level predators is somewhat uncertain. Impacts to the White Shark would only occur in exceptional circumstances.

The magnitude of the impacts to the White Shark from physical changes to habitat is considered low given its localised to medium spatial scale (within the offshore wind farm area), long-term time scale, and predicted recovery of the receptor population once the project has ceased. The effects of habitat change on individuals within the offshore project area are not expected to have population-level impacts and therefore would not affect ecosystem function.

Syngnathids

Syngnathids (which include seahorses, pipefishes and seadragons) were assigned a high sensitivity rating as this group consists of 29 listed marine species under the EPBC Act. Furthermore, these species have ecological/behavioural traits that make individuals more vulnerable to impacts, for example, they are site-attached and tend to be less mobile than other fish. Many species inhabit soft-sediment habitats, which will be replaced with artificial hard substrate around turbine foundations.

The magnitude of impacts to syngnathids from physical changes to habitat was considered low given its localised to medium spatial scale (within the offshore wind farm area), occurring for the duration of project operation, and predicted recovery of the receptor population once the project has ceased.

Knowledge about syngnathids across southern Australia is limited due to their cryptic behaviour and limited research. However, they are typically broadly distributed, and while there is potential for individuals to be adversely impacted by habitat change within the offshore project area, no population-level effects are expected.

The installation of project infrastructure will introduce additional hard substrate into the existing, soft-sediment-dominated marine ecosystem. There is currently little high-profile reef habitat within the offshore project area, and this will result in localised changes to ecosystem structure. For species that rely on sediment-based habitats, including some syngnathids, the impacts may be negative, with localised reduced habitat extent. However, sediment-based habitat will remain the most widely distributed and connected habitat type within the offshore wind farm area. Over time, the novel hard substrate will be colonised by other components of the marine ecosystem typical of reef habitats, including algae, sessile invertebrates, mobile invertebrates such as rock lobster and octopus, reef fishes and pelagic fish species that are attracted to structure for feeding opportunities. This may enhance connectivity between existing patches of reef habitat, and there may be an overall increase in species diversity within the offshore wind farm area.

Although some localised changes to ecosystem structure will occur, no significant adverse effects to the overall ecological function and integrity of the marine and coastal ecosystem are expected as a result of the construction and operation of the project.

24.6 Environmental Management Framework

The Commonwealth Environmental Management Framework has been developed to provide a governance framework for the management of environmental impacts that arise from the construction, operation and decommissioning of the project. It covers the whole project (offshore and onshore) and associated mitigation and monitoring measures.

The framework also specifies the committed mitigation measures identified through the impact and risk assessments to avoid, minimise and manage impacts, contingency measures, adaptive management approaches and offset commitments, where required. This is a suitable approach to managing the environmental outcomes and delivery of the project over its lifetime.

24.7 Conclusion

As the Commonwealth aims to rapidly transition the electricity network to one that is predominantly powered by renewable energy, there is a need for diversified renewable energy sources, like offshore wind, which can be deployed rapidly and contribute significantly to the grid. By harnessing the robust and consistent winds of the Bass Strait, the project will play a pivotal role in meeting Commonwealth and State climate and renewable energy targets by generating up to 2.2 GW of clean, reliable energy, enough to power 1.2 million homes.

The project will create up to 6,000 jobs in Australia over its lifetime, including up to 200 long-term local jobs at a Gippsland operations and maintenance port during its 30-year operation phase. This energy and job creation would coincide with the decommissioning of local coal power facilities, providing opportunities for the local workforce and preventing an energy deficit for electricity consumers. At the same time, the project will pioneer a new industry in Australia, guided by global expertise responsible for the successful development of offshore wind farms worldwide.

As part of the environmental impact assessment process, the project design and construction methods have been selected to minimise direct and indirect impacts during construction and operation. The implementation of mitigation measures, where necessary, will ensure impacts and risks are acceptable and remain within the requirements of legislation, policy and guidelines. With these mitigation measures in place, potential impacts and risks of the project have been minimised and are considered manageable and acceptable. Pre- and post-construction monitoring will address areas of uncertainty (where uncertainty remains) and will allow for adaptive management measures if needed.

As presented in Appendix C, the principles of ecologically sustainable development have been considered in the assessment of the project. The project demonstrates a clear alignment with the principles of ecologically sustainable development. Through the evaluation of potential impacts and the integration of mitigation strategies, the assessment ensures the project is not only legally compliant but also environmentally responsible. This approach reflects a commitment to sustainable development that balances human needs with the preservation of Australia's biodiversity.

The project has demonstrated that it meets the objects of the EPBC Act and considers that, through the implementation of comprehensive mitigation measures, the project will provide for the protection of the whole of the environment, including matters of national environmental significance, biodiversity and heritage values.

The Commonwealth Environmental Management Framework and associated mitigation and monitoring measures have been developed to provide a governance framework for the management of environmental impacts that arise from the construction, operation and decommissioning of the project. This is a suitable approach to managing the environmental outcomes and delivery of the project over its lifetime.

Overall, the project provides for a net environmental and community benefit with acceptable environmental and social outcomes.

Appendix A

Threatened and/or migratory terrestrial fauna that were identified as being possible, likely or present within the study area.

Species common name	Species scientific name	Threatened EPBC listing	Migratory EPBC listing
Mammals			
Grey-headed Flying-Fox	<i>Pteropus poliocephalus</i>	VU	
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	VU	
Birds			
Blue-winged Parrot	<i>Neophema chrysostoma</i>	VU	
Swift Parrot	<i>Lathamus discolor</i>	CR	
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	EN	
Latham's Snipe	<i>Gallinago hardwickii</i>	VU	Mi
White-throated Needletail	<i>Hirundapus caudacutus</i>	VU	Mi
Fork-tailed Swift	<i>Apus pacificus</i>		Mi
Frogs			
Martin's Toadlet	<i>Uperoleia martini</i>	EN	

Appendix B

Threatened and/or migratory marine fauna that could occur in the offshore project area.

Species common name	Species scientific name	Threatened EPBC listing	Migratory EPBC listing
Cetaceans			
Blue Whale	<i>Balaenoptera musculus</i>	EN	Mi
Southern Right Whale	<i>Eubalaena australis</i>	EN	Mi
Sei Whale	<i>Balaenoptera borealis</i>	VU	Mi
Fin Whale	<i>Balaenoptera physalus</i>	VU	Mi
Humpback Whale	<i>Megaptera novaeangliae</i>		Mi
Antarctic Minke Whale	<i>Balaenoptera bonaerensis</i>		Mi
Bryde's Whale	<i>Balaenoptera edeni</i>		Mi
Pygmy Right Whale	<i>Caperea marginata</i>		Mi
Killer Whale	<i>Orcinus orca</i>		Mi
Turtles			
Leatherback Turtle	<i>Dermochelys coriacea</i>	EN	Mi
Loggerhead Turtles	<i>Caretta caretta</i>	EN	Mi
Green Turtle	<i>Chelonia mydas</i>	VU	Mi
Seabirds			
Gould's Petrel	<i>Pterodroma leucoptera</i>	EN	
Shy Albatross	<i>Thalassarche cauta</i>	EN	Mi
Southern Giant-Petrel	<i>Macronectes giganteus</i>	EN	Mi
Campbell Albatross	<i>Thalassarche impavida</i>	VU	Mi
White-capped Albatross	<i>Thalassarche steadi</i>	VU	Mi
Soft-plumaged Petrel	<i>Pterodroma mollis</i>	VU	
Little Tern	<i>Sternula albifrons</i>	VU	Mi
Fairy Tern	<i>Sternula nereis nereis</i>	VU	
Wandering Albatross	<i>Diomedea exulans</i>	VU	Mi
Southern Royal Albatross	<i>Diomedea epomophora</i>	VU	Mi
Black-browed Albatross	<i>Thalassarche melanophris</i>	VU	Mi
Indian Yellow-nosed Albatross	<i>Thalassarche carteri</i>	VU	Mi
Buller's Albatross	<i>Thalassarche bulleri</i>	VU	Mi
Sooty Albatross	<i>Phoebastria fusca</i>	VU	Mi
Northern Giant-Petrel	<i>Macronectes halli</i>	VU	Mi
White-chinned Petrel	<i>Procellaria aequinoctialis</i>		Mi
Westland Petrel	<i>Procellaria westlandica</i>		Mi
Fluttering Shearwater	<i>Puffinus gavia</i>		Mi
Wedge-tailed Shearwater	<i>Ardenna pacifica</i>		Mi

Species common name	Species scientific name	Threatened EPBC listing	Migratory EPBC listing
Sooty Shearwater	<i>Ardenna grisea</i>		Mi
Short-tailed Shearwater	<i>Ardenna tenuirostris</i>		Mi
Flesh-footed Shearwater	<i>Ardenna carneipes</i>		Mi
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>		Mi
Arctic Jaeger	<i>Stercorarius parasiticus</i>		Mi
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>		Mi
Pomarine Jaeger	<i>Stercorarius pomarinus</i>		Mi
Caspian Tern	<i>Hydroprogne caspia</i>		Mi
Crested Tern	<i>Thalasseus bergii</i>		Mi
Common Tern	<i>Sterna hirundo</i>		Mi
Shorebirds			
Curlew Sandpiper	<i>Calidris ferruginea</i>	CR	Mi
Far Eastern Curlew	<i>Numenius madagascariensis</i>	CR	Mi
Bar-tailed Godwit	<i>Limosa lapponica</i>	EN	Mi
Black-tailed Godwit	<i>Limosa limosa</i>	EN	Mi
Common Greenshank	<i>Tringa nebularia</i>	EN	Mi
Lesser Sand Plover	<i>Charadrius mongolus</i>	EN	Mi
Great Knot	<i>Calidris tenuirostris</i>	VU	Mi
Greater Sand Plover	<i>Charadrius leschenaultii</i>	VU	Mi
Grey Plover	<i>Pluvialis squatarola</i>	VU	Mi
Hooded Plover	<i>Thinornis cucullatus cucullatus</i>	VU	
Latham's Snipe	<i>Gallinago hardwickii</i>	VU	Mi
Red Knot	<i>Calidris canutus</i>	VU	Mi
Ruddy Turnstone	<i>Arenaria interpres</i>	VU	Mi
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	VU	Mi
Double-banded Plover	<i>Charadrius bicinctus</i>		Mi
Pacific Golden Plover	<i>Pluvialis fulva</i>		Mi
Red-necked Stint	<i>Calidris ruficollis</i>		Mi
Sanderling	<i>Calidris alba</i>		Mi
Whimbrel	<i>Numenius phaeopus</i>		Mi
Bass Strait Migrants			
Swift Parrot	<i>Lathamus discolor</i>	CR	
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	CR	
Blue-winged Parrot	<i>Neophema chrysostoma</i>	VU	
White-throated Needletail	<i>Hirundapus caudacutus</i>	VU	
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	VU	
Fork-tailed Swift	<i>Apus pacificus</i>		Mi
Satin Flycatcher	<i>Myiagra cyanoleuca</i>		Mi
Fish			

Species common name	Species scientific name	Threatened EPBC listing	Migratory EPBC listing
Australian Grayling	<i>Prototroctes maraena</i>	VU	
White Shark	<i>Carcharodon carcharias</i>	VU	Mi
Whale Shark	<i>Rhincodon typus</i>	VU	Mi
Blue Warehou	<i>Seriolella brama,</i>	CD	
School Shark	<i>Galeorhinus galeus</i>	CD	

Appendix C

EPBC Act principles of ecologically sustainable development in relation to the project's assessment approach

Principle	Assessment approach	Relevant part of EIS
Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations	<p>Project planning and design have considered the potential long-term and short-term economic, environmental and social impacts that may occur during construction, operation and decommissioning.</p> <p>Alternative designs were considered for various project components, including:</p> <ul style="list-style-type: none"> Offshore wind turbine size, wind farm layout, foundation type (and installation method), offshore substation design and offshore export cable type Onshore transmission alignment options and transmission system design Shore crossing location and construction method Electricity network connection location. <p>Onshore transmission options were assessed in relation to environmental, socio-economic, technical/constructability and logistical factors (refer to <i>Chapter 3 – Project Development</i> for details on the multi criteria analysis undertaken for the initial route selection/s). The introduction of the Gippsland Offshore Wind Transmission Project (VicGrid) resulting in the removal of the majority of the onshore transmission from the project scope. The project was also required by the state government to connect to the electricity grid at the proposed VicGrid connection hub in Giffard. To facilitate this, additional assessments were undertaken on three potential alignments to connect to the hub to ensure any potential impacts on terrestrial ecology and cultural heritage were known. These additional assessments have been included in the relevant EIS technical reports.</p> <p>With up to 147 turbines, the project could generate up to 2.2 GW of power. With an investment of around \$3 billion in Gippsland and around \$7 billion in Victoria, the project could create up to 6,000 Australian jobs, including 4,600 in Victoria across the life of the project. Through proposed design and mitigation measures, the project aims to achieve a sustainable and beneficial economic outcome for the communities and industries involved.</p> <p>The assessment led to the adoption of the following key design alternatives to minimise environmental impacts:</p>	<ul style="list-style-type: none"> <i>Chapter 3 – Project Development</i> <i>Chapter 7 – Community Engagement</i> Chapters 8 to 17 (marine environment matters) <i>Chapter 18 – Onshore Ecology (EPBC matters)</i> <i>Chapter 20 – Social</i> <i>Chapter 21 – Business and Tourism</i> <i>Chapter 22 – Seascape, Landscape and Visual</i> <p>Technical reports</p> <ul style="list-style-type: none"> <i>Technical Report A - Coastal Processes and Sediment and Transport</i> <i>Technical Report B - Benthic Ecology</i> <i>Technical Report C - Fish and Invertebrates</i> <i>Technical Report D - Marine Mammals and Turtles</i> <i>Technical Report E - Offshore Ornithology and Bats</i> <i>Technical Report F - Marine Protected Areas</i> <i>Technical Report G - Onshore Ecology</i> <i>Technical Report K - Aboriginal Cultural Heritage</i> <i>Technical Report L - Historical Heritage</i> <i>Technical Report M - Non-Aboriginal Underwater Cultural Heritage</i> <i>Technical Report N - Commercial and Recreational Fisheries</i>

Principle	Assessment approach	Relevant part of EIS
	<ul style="list-style-type: none"> Increasing the air gap between the turbine blades and the surface of the water from 25 to 35 m to significantly reduce bird collision risk. Using trenchless methods for the construction of the shore crossing to avoid and reduce impacts to the sensitive dune system and coastal habitats. Selecting onshore transmission alignment options to avoid significant economic, environmental and social impacts where possible. <p>Long-term and short-term economic, environmental, social and equitable impacts are assessed throughout the EIS in line with the assessment approach in <i>Chapter 6 – Assessment Framework</i>.</p> <p>Star of the South has undertaken significant consultation to understand social sensitivities and constraints on the topics and issues relevant to the project’s development, recording over 16,300 interactions with a wide range of stakeholders including:</p> <ul style="list-style-type: none"> First Nations Commonwealth, Victorian and local government departments, agencies and bodies Education and training providers Energy industry Environmental groups Fishers Local communities and community groups Landholders Media Peak bodies, associations and unions Ports and shipping stakeholders Supply chain and local businesses. <p>Star of the South has responded to issues raised in a number of ways (refer to <i>Chapter 7 - Community Engagement</i> for details). Community and stakeholder feedback has informed various aspects of the assessment. Feedback specific to an assessment topic is documented in the relevant technical report and outlined in summary form in Tables 7-8 to 7-12 in <i>Chapter 7 - Community Engagement</i>.</p> <p><i>Attachment II – Consultation Report</i> also provides a summary of consultation activities, key feedback and Star of the South’s response.</p>	<ul style="list-style-type: none"> <i>Technical Report O - Infrastructure and Co-Existence with Other Users</i> <i>Technical Report P - Shipping and Navigation</i> <i>Technical Report Q - Business and Tourism</i> <i>Technical Report R - Social</i> <i>Technical Report Z - Submerged Aboriginal Cultural Heritage</i>

Principle	Assessment approach	Relevant part of EIS
	<p>In the context of all feedback raised with Star of the South over the life of the project, potential environmental impacts and risks of the project have been raised significantly less frequently than other topics including jobs and procurement, land and property and general project information.</p> <p>Consultation will continue throughout the construction, operation and decommissioning phases of the project.</p> <p>An assessment of the project's technical requirements and potential impacts, considering both short-term and long-term impacts, was completed to inform the development of the project design assessed in the EIS.</p>	
<p>If there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation</p>	<p>Star of the South's integrated assessment has been informed by extensive environmental investigations across the land and marine environments where the project will be located. The marine ecological surveys completed included one of the largest marine research programs ever undertaken in the Bass Strait. Terrestrial ecological surveys were conducted to inform the selection of onshore transmission alignment options to connect the project to the electricity network. These surveys provided a detailed understanding of the existing environment, addressing knowledge gaps and uncertainty on the values that could be impacted.</p> <p>This ecological characterisation provided a contextual understanding of the potential impacts that were assessed in the different technical reports prepared by experienced technical specialists.</p> <p>The precautionary principle was applied to the ornithological assessment, specifically the turbine collision impact pathway where there was a level of residual uncertainty in the collision risk model parameters, such as the species-specific avoidance behaviour. As a result of applying the precautionary principle the project implemented additional mitigations specific to this impact pathways, in the form of raising the minimum air gap of the turbines from 25 to 35 meters, this resulted in an average 40% reduction in predicted annual collisions across all species, and a more significant reduction for some of the key species of greater conservation value (70% reduction in Shy Albatross).</p> <p>To address this residual uncertainty the project has proposed monitoring that will target the input parameters of the model where the residual uncertainties lie to give more confidence in the outputs of the collision risk modelling. The Seabird Monitoring and Management Framework provides further details on the monitoring approaches to address these uncertainties and an adaptive management framework with clear triggers values to initiate additional management measures based on the results of the monitoring programme.</p>	<ul style="list-style-type: none"> • <i>Chapter 6 – Assessment Framework</i> • Chapters 8 to 17 (Marine Environment Matters) • <i>Chapter 18 – Onshore Ecology (EPBC Matters)</i> • <i>Chapter 23 – Commonwealth Environmental Management Framework</i> <p>Technical Reports</p> <ul style="list-style-type: none"> • <i>Technical Report A - Coastal Processes and Sediment Transport</i> • <i>Technical Report B - Benthic Ecology</i> • <i>Technical Report C - Fish and Invertebrates</i> • <i>Technical Report D - Marine Mammals and Turtles</i> • <i>Technical Report E - Offshore Ornithology and Bats</i> • <i>Technical Report F - Marine Protected Areas</i> • <i>Technical Report G - Onshore Ecology</i>

Principle	Assessment approach	Relevant part of EIS
	<p>The findings of the technical reports have been used to develop mitigation measures that set out performance indicators that must be achieved during design, construction, operation and decommissioning of the project. A complete list of the mitigation measures and the framework for how they will be delivered for the project can be found in <i>Chapter 23 – Commonwealth Environmental Management Framework</i>.</p>	
<p>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</p>	<p>To align with and support Commonwealth and Victorian renewable energy targets for a decarbonised future, Star of the South aims to deliver clean and reliable energy to the electricity network while ensuring the economic, environmental and technological viability of the project.</p> <p>As a party to the Paris Agreement, Australia has set legislated targets under the <i>Climate Change Act 2022 (Cth)</i> to achieve net zero emissions by 2050, reduce greenhouse gas emissions by 62-70% below 2005 levels by 2035 and generate 82% renewable energy by 2030.</p> <p>Recognising that offshore wind is a large-scale, consistent renewable energy source that complements solar and onshore wind generation, Victoria became the first state to legislate offshore wind capacity goals of at least 2 GW by 2032, 4 GW by 2035 and 9 GW by 2040. These targets align with the State's broader commitment to achieving 65% renewable electricity generation by 2030 and 95% by 2035.</p> <p>The project has the potential to contribute to these targets significantly. Notably, the carbon emissions associated with project component manufacturing and construction activities are expected to be offset after approximately six months of operations. Thereafter, the project would save an estimated 7 m tonnes of carbon emissions per year of operations.</p> <p>The project would create up to 6,000 jobs in Australia over its lifetime, including up to 200 long-term local jobs at a Gippsland port during its approximate 30-year operation phase. The project will also invest around \$8 b in Australia, including providing an estimated \$3 b direct boost to Gippsland's economy. These socio-economic benefits would be realised at the same time as coal-fired power stations are being decommissioned.</p> <p>The implementation of mitigation measures during the project's construction, operation and decommissioning will minimise environmental impacts in the short and long term. The project also allows for the continued use of the land and water resources where it will be installed, once construction is complete, by current and future generations.</p> <p>The project contributes to inter-generational equity by contributing to Australia's transition to renewable energy to reduce emissions by 2050 whilst ensuring impacts to the environment are minimised.</p>	<ul style="list-style-type: none"> • <i>Chapter 2 – Project Rationale</i> • <i>Chapter 23 – Commonwealth Environmental Management Framework</i>

Principle	Assessment approach	Relevant part of EIS
<p>The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making</p>	<p>The potential for the project to affect biological diversity and ecological integrity onshore and offshore was a key consideration in the project design process.</p> <p>Flora and fauna surveys were completed to understand the project's potential impacts better and to inform the selection of design measures that avoid impacting threatened flora, fauna and vegetation communities.</p> <p>The following key avoidance, minimisation and mitigation measures were adopted to conserve biological diversity and ecological integrity:</p> <ul style="list-style-type: none"> • Avoiding national parks, marine parks, state parks, conservation parks, reserves and registered heritage places. • Implementing no-go zones for protected areas during onshore construction. • Development of construction management plans to protect and manage interactions with native fauna • Using trenchless methods for the construction of the shore crossing to avoid and reduce impacts to the sensitive dune system and coastal habitats. • Using construction techniques for cable installation such as fluidisation of the seabed to minimise sediment dispersion and reduce impacts to water quality. • Burying offshore export and inter-array cables, or covering them if burial is not possible, to reduce electromagnetic field (EMI) emissions so they do not have a significant impact on the marine environment. • Implementing light pollution management measures to minimise the impacts of artificial light on marine fauna. • Increasing the air gap between the turbine blades and the surface of the water from 25 to 35 m to significantly reduce bird collision risk. • Implementing a minimum spacing of 1,062 m between turbines to minimise potential displacement and barrier effects to marine and bird life. • Implementing noise abatement systems, active monitoring processes and marine mammal observers aboard vessels to maintain precaution zones and minimise the impact of underwater noise on marine fauna during construction. • Using vessel propeller guards, speed restrictions and no-approach and caution zones to avoid and minimise the impacts of collisions with birds and mammals. • Positioning turbines to avoid areas of rocky reefs, which are high in biodiversity. • Implementing archaeological exclusion zones on confirmed cultural heritage assets to avoid impacts. 	<ul style="list-style-type: none"> • <i>Chapter 3 – Project Development</i> • <i>Chapter 4 – Project Description</i> • Chapters 8 to 17 (Marine Environment Matters) • <i>Chapter 18 – Onshore Ecology (EPBC Matters)</i> • Chapters 19 to 22 (Social, Business and Tourism, SLVIA, Submerged Aboriginal Cultural Heritage) • <i>Chapter 23 – Commonwealth Environmental Management Framework</i> <p>Technical Reports</p> <ul style="list-style-type: none"> • <i>Technical Report A - Coastal Processes and Sediment Transport</i> • <i>Technical Report B - Benthic Ecology</i> • <i>Technical Report C - Fish and Invertebrates</i> • <i>Technical Report D - Marine Mammals and Turtles</i> • <i>Technical Report E - Offshore Ornithology and Bats</i> • <i>Technical Report F - Marine Protected Areas</i> • <i>Technical Report G - Onshore Ecology</i>

Principle	Assessment approach	Relevant part of EIS
<p>Improved valuation, pricing and incentive mechanisms should be promoted</p>	<p>The project will increase the nation's energy security and reduce dependency on fossil fuels, while kick-starting a new renewable energy industry to support a more diverse and resilient economy.</p> <p>Once developed, the project will play a pivotal role in improving valuation and pricing mechanisms across the National Electricity Market by providing a stable, large-scale source of clean power. Its offshore location in Gippsland offers higher and more consistent wind speeds compared to onshore wind farm projects, contributing to a more predictable generation profile that can reduce volatility in wholesale electricity prices. This predictability enhances the value of and strengthens the case for offshore wind. As a flagship project, the project will also set new benchmarks for the cost-reflective pricing of offshore wind in Australia, creating more transparent and credible valuation methodologies that can be used across the electricity sector.</p> <p>Incentive mechanisms are likely to evolve significantly following the start of operations, as policymakers and regulators gain clearer insight into the cost structures, grid benefits and environmental advantages of offshore wind.</p> <p>The project's development is expected to trigger the creation of more targeted and efficient incentive structures, encouraging further investment in offshore renewable energy and helping to align investor expectations with system and policy needs.</p>	<ul style="list-style-type: none"> • <i>Chapter 2 – Project Rationale</i> • <i>Chapter 20 – Social</i> • <i>Chapter 21 – Business and Tourism</i> <p>Technical Reports</p> <ul style="list-style-type: none"> • <i>Technical Report Q - Business and Tourism</i> • <i>Technical Report R - Social</i>

Appendix D

Objects of the EPBC Act in relation to the project's assessment approach

Object	Assessment approach	Relevant part of EIS
<p>a) To provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance</p>	<p>Star of the South has adopted key measures to reduce impacts on the environment and matters of national environmental significance in particular. These include:</p> <ul style="list-style-type: none"> • Conducting a multicriteria analysis of various onshore transmission alignments, which led to the decision to underground the onshore transmission system to reduce the impacts of native vegetation removal • Refining the onshore transmission design through flora and fauna surveys and targeted landholder engagement to further avoid and minimise impacts to terrestrial biodiversity values • Implementing construction no-go zones to avoid and minimise impacts to terrestrial biodiversity values • Developing construction fauna management plans to protect and manage interactions with native fauna • Using trenchless methods for the construction of the shore crossing to avoid and reduce impacts to the sensitive dune system and coastal habitats • Increasing the air gap between the turbine blades and the surface of the water from 25 to 35 m to significantly reduce bird collision risk • Implementing a minimum spacing of 1,062 m between turbines to minimise potential displacement and barrier effects to marine and bird life • Implementing noise abatement systems, active monitoring processes and marine mammal observers aboard vessels to maintain precaution zones and minimise the impact of underwater noise on marine fauna during construction • Implementing measures to avoid vessel interactions with marine fauna, such as maintaining no-approach zones for separation from marine mammals and turtles • Implementing light pollution management measures to minimise the impacts of artificial light on marine fauna • Implementing measures to manage the risk of oil spills and introducing and spreading invasive marine species • For whole of environment matters (such as social and economic), the project proposes a number of mitigation measures to ensure impacts on the community, other users of the offshore marine area, business and tourism operators are minimised where practicable. These include: 	<ul style="list-style-type: none"> • <i>Chapter 6 – Assessment Framework</i> • Chapters 8 To 17 (Marine Environment Matters) • <i>Chapter 18 – Onshore Ecology (EPBC Matters)</i> <p>Technical Reports</p> <ul style="list-style-type: none"> • <i>Technical Report A - Coastal Processes and Sediment Transport</i> • <i>Technical Report B - Benthic Ecology</i> • <i>Technical Report C - Fish and Invertebrates</i> • <i>Technical Report D - Marine Mammals and Turtles</i> • <i>Technical Report E - Offshore Ornithology and Bats</i> • <i>Technical Report F - Marine Protected Areas</i> • <i>Technical Report G - Onshore Ecology</i>

Object	Assessment approach	Relevant part of EIS
	<ul style="list-style-type: none"> Stakeholder Engagement Plan Workforce Development Strategy Workforce Accommodation Strategy <p>Identified impacts that encompass the whole of the environment include positive economic impact on employment, local and regional economies, industries (agriculture and fisheries), and tourism. Workforce requirements may increase demand for housing and public services</p> <p>During construction, the project may result in disruptions to offshore fishing, demand for housing and community services, amenity and character of coastal settlements and access and amenity for landholders directly affected by the construction areas. At the same time, the project would have a substantial positive employment impact, with approximately 1,750 roles created during the peak period of construction, and 214 full-time roles created during the project's approximate 30 years of operation.</p>	
<p>b) To promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources</p>	<p>The project will harvest energy from the wind to provide electricity to the National Electricity Market. The impact assessment shows the extraction of this wind energy will have no or at most a negligible impact on natural systems linked to wind energy including coastal processes. The project therefore represents a sustainable use of natural resources.</p> <p>The project will promote ecologically sustainable development by reducing the need to generate electricity from sources that could result in a use of natural resources which is not ecologically sustainable – particularly fossil fuel generation which relies on the extraction and combustion of finite amounts of gas or coal resulting in unsustainable carbon emissions and impacts at the point of extraction.</p> <p>Star of the South has sought to integrate the principles of ecologically sustainable development through a commitment to the identification of key community values, analysis of alternative onshore transmission alignments, analysis of different design features and wind farm layouts and the mitigation of impacts affecting physical, biological, cultural, economic and social values.</p> <p>An outline of how the project addresses the principles of ecologically sustainable development is provided in Appendix C.</p>	<p>Refer to Appendix C</p>
<p>c) To promote the conservation of biodiversity</p>	<p>Renewable energy projects are designed to reduce greenhouse gas emissions from electricity generation, thereby lessening the trajectory of climate change. By decreasing reliance on fossil fuels, these projects help mitigate the habitat loss, species decline and ecosystem disruption caused by a warming climate and extraction of fossil fuels. As such, the project is an active contributor to the long-term conservation of biodiversity and the protection of ecological processes.</p> <p>The project will adopt avoidance and mitigation measures to minimise impacts on biodiversity in both the terrestrial and marine environments. These measures include, where appropriate:</p> <ul style="list-style-type: none"> Considered site selection for locating infrastructure, such as avoiding more diverse and species-rich sections of the coastline for the shore crossing Pre-construction assessments to identify opportunities to avoid impacts to native flora and fauna 	<ul style="list-style-type: none"> <i>Chapter 6 – Assessment Framework</i> Chapters 8 To 17 (Marine Environment Matters) <i>Chapter 18 – Onshore Ecology (EPBC Matters)</i> <i>Chapter 23 – Commonwealth Environmental Management Framework</i>

Object	Assessment approach	Relevant part of EIS
	<ul style="list-style-type: none"> • Measures to limit construction lighting and underwater noise • Refinement of the onshore transmission system design to further avoid and minimise impacts to terrestrial biodiversity values • Implementation of construction no-go zones to avoid and minimise impacts to terrestrial biodiversity values • Development of construction management plans to protect and manage interactions with native fauna • Avoidance of biodiverse rocky reefs during construction • Minimising interactions between vessels and marine mammals and turtles • Monitoring ecological values during construction and operation, including the seabed, birds, fish and mammals • The project will also explore ways to promote biodiversity through the design of infrastructure installed in the marine environment. This could include, for example, integrating design features into scour protection to support the settlement of benthic invertebrates and other marine organisms. 	
<p>d) To promote a co-operative approach to the protection and management of the environment involving governments, the community, landholders and indigenous peoples</p>	<p>Star of the South has engaged proactively and transparently with a wide range of stakeholders regarding the project's potential impacts. Local offices have also been established in Gippsland to enable direct engagement with the local community.</p> <p>Some of the key stakeholder groups that the project has actively engaged with over the last six years of development include:</p> <ul style="list-style-type: none"> • First Nations • Commonwealth, Victorian and local government departments, agencies and bodies • Education and training providers • Energy industry • Environmental groups • Fishers • Local communities and community groups • Landholders • Media • Peak bodies, associations and unions • Ports and shipping stakeholders • Supply chain and local businesses. 	<ul style="list-style-type: none"> • <i>Chapter 3 – Project Development</i> • <i>Chapter 6 – Assessment Framework</i> • <i>Chapter 7 – Community Engagement</i>

Object	Assessment approach	Relevant part of EIS
	<p>A Technical Reference Group was established by the Victorian Department of Transport and Planning to provide guidance and advice in the preparation of the project's EIS and Environment Effects Statement (EES) and to comment on whether the EIS/EES documentation addressed the key legislation, policies and guidelines of Technical Reference Group member agencies and organisations.</p> <p>The Technical Reference Group comprises relevant Commonwealth and Victorian government agencies, First Peoples (State Relations) and Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC), along with local councils. Group representatives, supported by internal experts on specific aspects of the technical reports, ensured a co-operative approach to the protection and management of the environment by the project.</p> <p>A consultation plan was prepared for the project, reviewed by the Technical Reference Group and placed on the Department of Transport and Planning's website. Engagement with project stakeholders is captured in a consultation report, including how and where feedback informed project design.</p> <p>To promote a co-operative approach to the protection and management of the environment, the project:</p> <ul style="list-style-type: none"> • Employed a First Nations engagement advisor who was embedded in the team and led engagement with First Nations Peoples and groups • Established a Community Advisory Group in 2020, providing a forum for regular two-way communication and engagement between the project, local community representatives and key stakeholders • Appointed a Fishing Liaison Officer in 2021 to be a dedicated point of contact and lead proactive and effective engagement with various fishing stakeholders who hold a wide range of perspectives • Established a dedicated Gippsland-based lands engagement team in 2020 to provide a consistent and direct point of contact for landholders. 	
<p>e) To assist in the co-operative implementation of Australia's international environmental responsibilities</p>	<p>Star of the South seeks to support Australia's legislated targets to achieve net zero emissions by 2050 (as a party to the Paris Agreement), by supporting Victoria's:</p> <ul style="list-style-type: none"> • Commitment to achieving 95% renewable electricity generation by 2035 • Offshore wind capacity goals of 2 GW by 2032, 4 GW by 2035 and 9 GW by 2040. <p>A detailed assessment of potential impacts to matters of national environmental significance, protected under international treaties to which Australia is a party, has been completed and can be found in the technical reports. The project will be delivered and operated in a manner that supports Australia's commitments to relevant international treaties and conventions that relate to threatened species and communities and migratory species, including:</p> <ul style="list-style-type: none"> • Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). • Convention on the Conservation of Migratory Species of Wild Animals 1979 (Bonn Convention). • China-Australia Migratory Bird Agreement (CAMBA). 	<ul style="list-style-type: none"> • <i>Chapter 2 – Project Rationale</i> • <i>Chapter 3 – Project Development</i> • Chapters 8 To 17 (Marine Environment Matters) • <i>Chapter 18 – Onshore Ecology (EPBC Matters)</i>

Object	Assessment approach	Relevant part of EIS
	<ul style="list-style-type: none"> • Japan-Australia Migratory Bird Agreement (JAMBA). • Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA). • Other treaties that have been considered in the technical assessments include, but not limited to, the following: <ul style="list-style-type: none"> • Apia Convention • United Nations Convention on Biological Diversity • Convention on International Trade in Endangered Species of Wild Fauna and Flora • East Asian – Australasian Flyway Partnership • Agreement on the Conservation of Albatrosses and Petrels • International Convention for the Prevention of Pollution from Ships 1973 (MARPOL) 	
<p>f) To recognise the role of indigenous peoples in the conservation and ecologically sustainable use of Australia's biodiversity</p>	<p>Star of the South holds a deep respect for the knowledge of, care for and connection to their Country and recognises the people of the Gunaikurnai Nation as the Traditional Owners of the Land and Sea Country where the project is proposed.</p> <p>Since 2017, the project has been working with Gunaikurnai peoples through GLaWAC, listening, learning and sharing to achieve common goals.</p> <p>The project is aware that anything human-made leaves a scar on their Country and will continue working with GLaWAC to identify potential risks and solutions.</p> <p>Star of the South is committed to a partnership based on mutual respect, trust and benefit. In 2025, Star of the South and GLaWAC signed an Engagement Agreement designed to facilitate GLaWAC's continued engagement with the project on behalf of the Gunaikurnai people.</p>	<ul style="list-style-type: none"> • <i>Chapter 7 – Community Engagement</i>
<p>g) To promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge</p>	<p>Since 2017, Star of the South and GLaWAC have undertaken a range of activities and discussions. This has provided valuable learnings for the project, as the relationship has developed with the sharing of ambitions and aspirations.</p> <p>Star of the South has sought to conduct discussions and undertake actions in a manner that aligns with GLaWAC's interests, knowledge, rights and self-determination aspirations.</p> <p>Consideration of Aboriginal cultural values has been an integral part of the EIS. A Cultural Values Assessment was also prepared in co-operation with the project's cultural heritage advisers and in consultation with GLaWAC. Preparation of the Cultural Values Assessment involved a literature review, site visits and consultation with GLaWAC as well as landowners with a long-term connection to the project area. The assessment addresses non-archaeological and intangible Aboriginal heritage values of the project area. Star of the South is committed to ongoing engagement with GLaWAC.</p>	<ul style="list-style-type: none"> • <i>Chapter 7 – Community Engagement</i>