Marinus Link Project

Minister's assessment under the Environment Effects Act 1978

April 2025

VICTORIA State Government | Department of Transport and Planning

Contents

Abbreviations ____ **4**

Executive Summary ____ **5**

1. Introduction ____ **8**

1.1. Purpose of this document ____ 8

1.2. Structure of the assessment ____ 9

2. Project description ____ **9**

2.1. Project staging ____ 9

2.2. Key areas defined in the EES ____ 12

3. Statutory processes ____ **13**

3.1. Environment Effects Act 1978 ____ 13

3.2. Planning and Environment Act 1987 ____ 13

3.3. Marine and Coastal Act 2018 ____ 14

3.4. Aboriginal Heritage Act 2006 ____ 14

3.5. Other Victorian statutory approvals ____ 14

4. Key matters, planning and environmental management framework ____ **15**

4.1. Planning scheme amendment ____ 15

4.2. Environmental management framework ____ 17

4.3. Alternatives and route selection ____ 22

5. Assessment of environmental effects ____ **24**

5.1. Terrestrial ecology ____ 25

5.2. Marine ecology ____ 48

5.3. Marine resource use ____ 57

5.4. Aboriginal cultural heritage ____ 60

5.5. Non-Aboriginal heritage ____ 62

5.6. Geology and geomorphology ____ 64

5.7. Surface water ____ 69

5.8. Groundwater ____ 71

5.9. Land use planning ____ 73

5.10. Economic ____ 76

5.11. Social ____ 78

5.12. Agriculture and forestry ____ 80

5.13. Landscape and visual ____ 85

5.14. Bushfire _____ 86
5.15. Other effects _____ 88

6. Conclusions _____ 96

Appendix A – Environmental Performance Requirements _____ 98

Abbreviations

AoD	Area of disturbance
AHA Act	*Aboriginal Heritage Act 2006* (Vic)
CEMP	Construction environmental management plan
CFA	Country Fire Authority
CHMP	Cultural heritage management plan
CVA	Cultural values assessment
DEECA	Department of Energy, Environment and Climate Action
DELWP	Department of Environment, Land, Water and Planning
EM	Electromagnetic
EES	Environment effects statement
EIS	Environmental impact statement
EMF	Environmental management framework
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPRs	Environmental performance requirements
EVCs	Ecological Vegetation Classes
FFG Act	*Flora and Fauna Guarantee Act 1988* (Vic)
IAC	Inquiry and advisory committee
HDD	Horizontal directional drilling
HVP	Hancock Victorian Plantations Pty Ltd
HVDC	High voltage direct current
KP	Kilometre post
MAC Act	*Marine and Coastal Act 2018* (Vic)
OEMP	Operations environmental management plan
planning schemes	Latrobe and South Gippsland Planning Schemes
PMP	Property management plan
project	Marinus Link project
proponent	Marinus Link Pty Ltd
MNES	Matters of national environmental significance
P&E Act	*Planning and Environment Act 1987* (Vic)
PSA	Planning scheme amendment
RAP	Registered Aboriginal Party
SCO	Specific controls overlay
SCO3	Specific Controls Overlay – Schedule 3

Executive Summary

It is my overall assessment that potential environmental effects of the Marinus Link project (the project) can be acceptably managed, provided there is effective implementation of the recommendations of this assessment, which largely support those of the joint inquiry and advisory committee (the IAC) and include refinements to proposed environmental management.

The project is a proposed undersea and underground electricity and data interconnector between Northwest Tasmania and the Australian mainland, connecting to the national electricity grid in the Latrobe Valley in Victoria. It will enable the flow of electricity in both directions. The project will allow the export of low-cost renewable energy, such as surplus solar to Tasmania and the import of hydropower from Tasmania for use in the National Electricity Market.

On 12 December 2021, the (then) Minister for Planning decided that an environment effects statement (EES), under the *Environment Effects Act 1978* (Vic), was required for the project to provide an integrated, robust and transparent process to assess the project's effects. Marinus Link Pty Ltd (the proponent) prepared an EES, which I authorised for public exhibition. The EES was exhibited for public comment from 31 May 2024 to 12 July 2024.

The IAC I appointed under the Environment Effects Act and *Planning and Environment Act 1987* (Vic), respectively, considered the exhibited EES, draft planning scheme amendment, 27 submissions received by Planning Panels Victoria and submissions and documents tabled at the public hearing. The IAC's report, together with the EES, submissions and documents tabled at the hearing have informed my assessment of the environmental effects of the project.

The project is also a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to likely impacts on matters of national environmental significance. As the project is located within and outside Victoria (in Bass Straight and Tasmania), the Commonwealth determined the entire project would be assessed by an environmental impact statement (EIS) under the EPBC Act. The project has also been subject to assessment under the Tasmanian *Environmental Management and Pollution Control Act 1994*.

Regardless of separate requirements and processes for each jurisdiction, the Victorian Department of Transport and Planning, the Tasmanian Environment Protection Authority and the Commonwealth Department of Climate Change, Energy, Environment and Water agreed to coordinate and align assessment processes, where possible. This resulted in a combined draft Commonwealth EIS and Victorian EES, which was exhibited for public comment. As my assessment relates to Victorian matters, I refer to the combined draft EIS/EES documents as the EES.

On 6 June 2024, I approved terms of reference for the IAC. I was not the role of the IAC to make findings on impacts to the Tasmanian environment, or controlled matters of national environmental significance under the EPBC Act (whether located in Victoria or elsewhere), unless they were also matters of relevance to the Victorian jurisdiction or in relation to potential for cumulative effects.

The EES assessed a concept, reference design and survey area. The survey area was a broad corridor within which the project could be located. A narrower area of disturbance (AoD) was then determined within the survey area that could accommodate all construction activities for the concept design. The concept design mostly considered the cables would be installed in trenches, with trenchless construction techniques (such as horizontal directional drilling (HDD)) proposed in several key areas to avoid potentially significant effects.

Due to the large project area and landowner access constraints in some areas, not all of the AoD was surveyed in detail. The EES was informed by both surveys and detailed desktop assessments.

The assessment of potential environmental effects in the EES (pre-mitigation) was conservative, adopting a worst-case approach for impacts within the AoD. Then residual impacts (post-mitigation) were determined

following feasible and potential adjustments to the AoD (micro-siting or reducing its width), as well as the potential use of trenchless construction and other mitigations.

The final project needs to be delivered in accordance with environmental performance requirements (EPRs) for final project design and delivery. For some aspects, detailed design and construction methods are to be informed by further, targeted surveys to update the conservative assessments of the EES.

The potential effects of the project are sufficiently understood through the EES, enabling findings on the significance and acceptability of the project's likely effects. My assessment has focused on refining and focusing the further detailed surveys to be undertaken and refining the environmental outcomes that need to be achieved through the EPRs in this next phase of the project.

Following years of planning and design refinement the proposed alignment largely avoids and minimises significant environmental effects. As a result of this, the land-based cable alignment predominantly traverses agricultural and forestry land, which has in large parts been cleared of native vegetation. The marine cable in the offshore environment avoids disturbance of rocky outcrops and reefs. Remnant patches of native vegetation exist along roadsides, waterways or as scattered trees in paddocks. Based on feasible mitigation measures it is expected the project will still result in some unavoidable impacts to native vegetation through the construction of the land and underwater cable.

The land-based cable alignment is predicted to result in the residual impact of the removal of 6.75 hectares of terrestrial native vegetation (reduced from conservative worst-case scenario of 21.25 hectares). I consider this potential loss of native vegetation to be acceptable, in the context of the continued application of the avoid and minimise principles. Priority areas for increased efforts to avoid and minimise ecological impacts, include threatened flora at Waratah Bay, threatened eucalypt species, threatened shorebirds and coastal dune habitat, waterways of high ecological value, threatened ecological communities and koala habitat.

Potential impacts on the FFG-listed critically endangered Bog Gum are considered significant for this species and would be unacceptable without appropriate mitigation. My assessment recommends that EPRs require any loss of Bog Gum be minimised to the extent necessary to not result in a significant impact on this species.

The subsea cable alignment is likely to result in the unavoidable removal of approximately 0.3 hectares of FFG-listed endangered Tasman grass-wrath sea grass. I acknowledge this loss is likely to be unavoidable and consider, such a loss will not result in a significant effect to this sea grass species which will likely regenerate post construction. It is recommended such loss is offset for as part of relevant statutory processes.

The concept design included HDD construction for several locations including the shore crossing at Waratah Bay to avoid potentially significant impacts on the intertidal area and coastal dunes. While avoiding surface impacts, HDD carries potential risk of impacts on the geology and stability of the coastal dunes. Such risks can be managed through design and construction with an appropriate understanding of ground conditions and appropriate HDD design, which is accommodated for in the proposed EPRs.

The project is in a geomorphically active landscape, prone to change through landslides and erosion. The exhibited EPRs recognised the need for further investigation and understanding of ground conditions to inform the detailed design and construction method to minimise induced ground movement. There was some residual uncertainty for Waratah Bay as to whether the potential risk of ground movement could be reduced to a tolerable level within the easement. If this is not possible, realignment will be necessary. I am confident the EPRs provide a suitable mechanism for this if it becomes necessary.

There are 82 designated waterways that are to be crossed by the land cable alignment. The concept design had assumed trenchless construction at some of these. The EPRs will require that the design and construction methodology for waterway crossings be informed by an integrated understanding of waterway values and aquatic habitats and other factors such as geology. My assessment makes recommendations to improve the EPRs and help ensure further detailed survey and integrated information underpins decisions and design on waterway crossings.

I recognise the impact the project will have on individual landowners hosting the easement and the disruption that will be felt during construction. I also recognise the impacts the project will have on plantation operations owned by Hancock Victorian Plantations Pty Ltd. I am satisfied that the EPRs, along with leasing agreements and compensation under other legislation, will ensure impacts to individual landowners are acceptable.

Boonwurrung Land and Sea Council, Bunurong Land Council Aboriginal Corporation and Gunaikurnai Land and Waters Aboriginal Corporation are the Traditional Owners groups with connection to Country in the project area. The project requires two approved cultural heritage management plans under the *Aboriginal Heritage Act 2006* to manage potential impacts to Aboriginal cultural heritage. A cultural values assessments program is also being supported by the proponent which will assess intangible cultural values and connection to land and sea country. These are appropriate mechanisms to enable cultural heritage values to be further considered in project development and delivery.

The project's environmental management framework, following adoption of the recommendations of the IAC and this assessment, provides a robust and transparent approach for the management of environmental risks and impacts.

I have considered all matters relevant to the environmental assessment of the project. My assessment includes specific findings and recommendations on effects and their mitigation, to inform the proponent and statutory decision-makers, responsible for approval decisions under Victorian law. Decision-makers need to consider this assessment before deciding whether and how the project should proceed. As a matter of good practice, I also expect decision-makers to write to me to advise how my assessment was considered and applied.

I thank the IAC for its considered report and advice. I also thank everyone who invested their time to make submissions and participate in the public hearing.

1. Introduction

In light of the potential for significant environmental effects, on 12 December 2021 the Minister for Planning determined under the *Environment Effects Act 1978* (Vic) (Environment Effects Act) that an environment effects statement (EES) was required for the proposed Marinus Link project (the project).

The procedures and requirements for the EES specified that the EES was to document investigation and avoidance of potential environmental effects (direct and/or indirect) of the project, including for any relevant alternatives, as well as associated avoidance, mitigation and management measures.

Following referral of the project under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) on 30 September 2021, it was determined on 4 November 2021 that the project (EPBC 2021/9053) is a controlled action requiring assessment and approval. This was because it was likely to have a significant impact on matters of national environmental significance, specifically listed threatened species and communities, listed migratory species and Commonwealth marine areas.

As the project is located within and outside the Victorian jurisdiction (in Commonwealth and Tasmanian jurisdictions), the Commonwealth is not able to rely upon an accredited state EES process as the sole means for assessing EPBC Act matters. As such, the Commonwealth determined that the entire project would be assessed through an environmental impact statement (EIS). In addition, the project requires assessment under the Tasmanian *Environmental Management and Pollution Control Act 1994*.

The Victorian Department of Transport and Planning, the Department of Climate Change, Energy, Environment and Water, and the Tasmanian Environment Protection Authority agreed to coordinate and integrate the three assessment processes. This resulted in a combined EES/EIS document that was exhibited for public comment from 31 May 2024 to 12 July 2024. As my assessment relates to Victorian matters only, I refer to the combined EIS/EES documents as the EES.

On 3 June 2024 I appointed a joint inquiry and advisory committee (IAC) to inquire into, and report on, the environmental effects of the project and the draft planning scheme amendment (draft PSA). The terms of reference for the IAC restricted the IAC's scope of assessment to the effects of the project components and works on the Victorian environment.

The IAC provided its report to me on 13 December 2024. The report, along with the EES, its supporting technical reports, public submissions, tabled documents (including supplementary technical reports), relevant legislation, policy and guidelines, have informed my assessment of the environmental effects of the project under the Environment Effects Act.

1.1. Purpose of this document

This document is my assessment of the environmental effects of the project under the Environment Effects Act. This assessment represents the final step in the EES process and provides authoritative advice to decision-makers, the proponent and all other stakeholders on the likely environmental effects of the project, their acceptability and how the effects are to be addressed in relevant statutory decisions and the delivery of the project.

This assessment will inform the decisions required under Victorian law for the proposal to proceed. Because the EES process is not accredited for the assessment purposes of the EPBC Act, it will not inform the decision to be made by the Commonwealth Minister for the Environment and Water under the EPBC Act about whether, and under what conditions, the project will be approved.

1.2. Structure of the assessment

The structure of my assessment is as follows:

- Chapter 2 provides a brief description of the project;
- Chapter 3 refers to key legislation and processes;
- Chapter 4 addresses the project's proposed planning controls, environmental management framework (EMF), alternatives and route selection process;
- Chapter 5 assesses the environmental effects of the project by environmental discipline;
- Chapter 6 presents my conclusions, including responses to the recommendations of the IAC; and
- Appendix A contains my recommendations about the environmental performance requirements (EPRs).

2. Project description

Marinus Link Pty Ltd (the proponent) proposes to construct and operate a 1500-megawatt high voltage direct current (HVDC) electricity interconnector between Heybridge in northwest Tasmania and the Latrobe Valley in Victoria.

The objective of the project is to support Australia's transition to renewable energy by providing Victoria and the National Electricity Market with greater access to Tasmanian-generated renewable energy. In addition, the project aims to improve energy security by providing a second link between Victoria and Tasmania (in addition to BassLink) and enabling the transmission of electricity in both directions between the two states.

The Victorian section of the project is located from the 3-nautical-mile limit of Victorian coastal waters to the greater Hazelwood area in the Latrobe Valley. The key project components proposed within Victoria include:

- subsea cables from the 3-nautical-mile limit to a shore crossing at Waratah Bay;
- a potential transition station and communications building located in Waratah Road compound (near the coast at Waratah Bay);
- underground cables continuing approximately 90 kilometres northwards to the Latrobe Valley; and
- the converter station site (comprising of a switching station; and two converter stations so there is one for each circuit) adjacent the existing Hazelwood terminal station.

Figure 1 shows the key project components diagrammatically and Figure 2 shows the cable route. The project is described in more detail where it is relevant for the discussion of environmental effects in Chapter 5 of the EES. Section 4.3 of this assessment discusses project alternatives.

2.1. Project staging

The project is proposed to be implemented in two stages. One complete 750-megawatt HVDC circuit between Tasmania and Victoria will be delivered for each stage. To minimise disruption (and to enable the efficient delivery of the second circuit in accordance with market demand), stage 1 will include civil works, trenching and installation of cable conduits and joint pits for both stages.

Stage 1 activities in Victoria includes:

- site establishment including laydown areas and foundations for the Hazelwood converter station site, a communications building and a potential transition station;
- all civil works, trenching, cable conduit installation and cable joint pits installation;
- access tracks, haul roads, horizontal directional drilling (HDD) locations and joint pits;
- installation of the first HVDC converter station at Hazelwood;
- laying of the stage 1 land-based and subsea cable;
- testing and commissioning; and
- site reinstatement and rehabilitation.

Stage 2 activities include:

- installation of second HVDC converter station at Hazelwood;
- laying stage 2 cables using conduits and joint pits installed as part of stage 1; and
- laying of the stage 2 land-based and subsea cables, using conduits and joint pits installed as part of stage 1 works.
- any remaining site rehabilitation.

The construction program provided in the EES indicated that stages 1 and 2 would overlap between 2025 and 2030, with stage 1 being operational by end of 2029 and stage 2 by the end of 2030. The EES also noted that the actual timeframe for stage 2 would be determined by market demand.

On 20 May 2024, the proponent updated its advice that while it would seek approval for both stages, stage 1 would still likely be commissioned by 2030, and this would be followed by a potential gap in construction with stage 2 being commissioned by 2033 (subject to market demand). Supplementary technical reports prepared by the proponent's specialist consultants considered whether a change in timing of stages 1 and 2 presented any changes to the impact assessments completed to support the EES and these were tabled at the hearing.[1] Operation and maintenance of the project will commence following commissioning of each stage. The project will operate 24 hours a day, 365 days per year over an anticipated minimum 40-year operating life.

Once the project is no longer required, it will be decommissioned. Above-ground works (such as the Hazelwood converter station site and Waratah Road compound (where communications building and potential transition station is to be located) will be removed and the ground reinstated consistent with the surrounding use. The cable may be salvaged or remain buried.

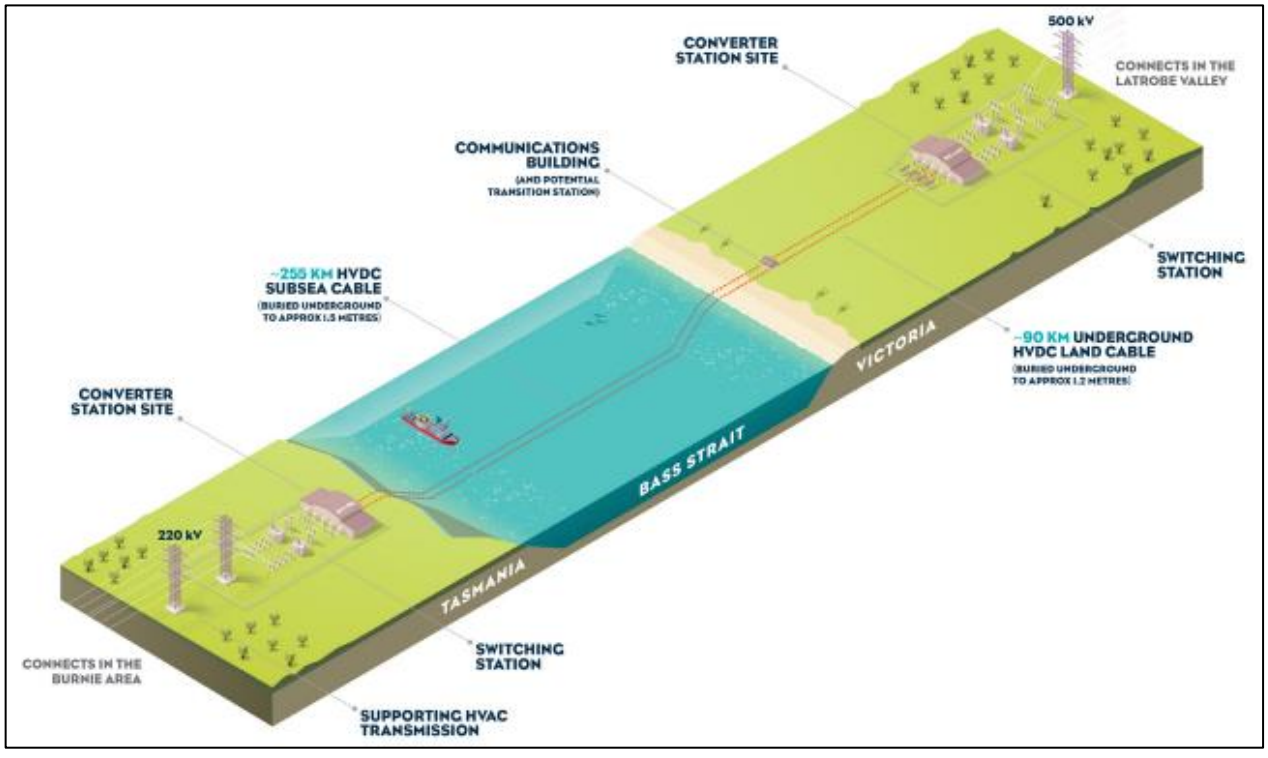

Figure 1: Key project components (source adapted from Volume 1, Chapter 6 Project description Figures 1-26)

Figure 2: Project alignment (source: Adapted from Volume 1, Chapter 6 Project Description Figure 1-23).

2.2. Key areas defined in the EES

Each of the technical studies referred to a survey area, area of disturbance (AoD) and easement. Definitions of each are provided in the following sections.

Survey area

The survey area defined the area within which all project components will be located, as follows:

- a 200-metre-wide marine corridor along each of the stage 1 and 2 alignments;
- an 800-metre-wide shore crossing area at Waratah Bay; and
- a 220-metre-wide corridor along the Victorian land cable alignment.

Not all of the survey area could be accessed for targeted field surveys due to land access constraints. Each of the technical studies also defined a study area, some of which were larger or smaller than the survey area. The study area defined by each technical specialist considered the local, regional, or state context needed to understand the issues and assess the impacts of the project relevant to their discipline.

The survey area also provides the basis for the Specific Controls Overlay – Schedule 3 (SCO3) to be introduced with the draft PSA (GC217) for the project (see Section 4.1).

The survey area is presented in more detail in Attachment 6 of the EES.

Area of disturbance

The AoD was defined as the area where construction activities will take place and it is contained within the survey area. The AoD includes:

- the cable routes, i.e.
  - a 10-metre-wide marine construction corridor for each stage, and
  - a 20 to 36-metre-wide land-based construction corridor for both stages;
- the Hazelwood converter station site;
- the Waratah Road compound
- drill pads for HDD sites; and
- laydown areas, haul roads and access tracks.

The AoD is presented in more detail in Attachment 6 of the EES.

Easement

The proponent will acquire an easement along the land cable alignment to provide access for maintenance and operational purposes and space for future cable replacement or additional capacity (subject to future approval). The easement will generally be 20-metres-wide except where the AoD has been reduced in width. Future activities in the easement are subject to restrictions to protect the integrity of the infrastructure. The EES identified permitted, conditional and prohibited activities within the easement[2]. For example, cropping and planting to a depth of 50 centimetres will be permitted, between 50 and 70 centimetres will be conditional and beyond this depth will be prohibited. Further, landholders will be prohibited from constructing a house, other substantial structure or dam on the easement.

[2] See Table 4.1 of Technical Appendix K

3. Statutory processes

This chapter identifies the key acts that are relevant to my assessment and delivery of the project. The proponent requires a variety of statutory approvals under Victorian, Tasmanian and Commonwealth law before it can proceed with the project. My assessment under the Environment Effects Act will inform Victorian approval decisions under the *Planning and Environment Act 1987* (Vic) (P&E Act), the *Marine and Coastal Act 2018* (Vic) (MAC Act) and the *Aboriginal Heritage Act 2006* (Vic) (AHA Act), as well as a range of other permits and consents.

3.1. Environment Effects Act 1978

The key steps preceding this assessment under the Environment Effects Act, and how the assessment will be considered, were set out in Chapter 1 above. In addition:

- Following exhibition of draft scoping requirements for public comment between 24 August to 19 September 2022, the Minister for Planning issued final scoping requirements in February 2023 specifying the range of matters to be addressed in the EES.
- The former Department of Environment, Land, Water and Planning (DELWP) convened a technical reference group for the project in accordance with standard EES practice to provide advice to the proponent and DELWP on the preparation of the EES.
- The EES was prepared by the proponent and placed on public exhibition from 31 May 2024 to 12 July 2024. A draft PSA was also published as part of the exhibited EES.

On 17 July 2024 I appointed an inquiry under section 9(1) of the Environment Effects Act and an advisory committee under part 7, section 151(1) of the P&E Act. The IAC was appointed to review submissions and inquire into the environmental effects of the proposal, in accordance with its published terms of reference, which I approved on 3 June 2024.

Planning Panels Victoria, on behalf of the IAC, received 27 submissions on the exhibited EES and on the draft PSA. The IAC held a public hearing for 13 sitting days between 19 September and 10 October 2024. The IAC tabled a total of 156 documents. The IAC provided its report to me on 13 December 2024. This assessment is the final step under the Environment Effects Act. It summarises the environmental effects of the proposed project for statutory decision-makers under Victorian law. Decision-makers must then consider this assessment before deciding whether and how the proposal should proceed. This assessment will inform approval decisions under the Victorian legislation outlined below.

3.2. Planning and Environment Act 1987

Various aspects of the project trigger planning approval under the Latrobe and South Gippsland Planning Schemes (the planning schemes). This includes approval for the use and development of land for a utility installation, as well as for earthworks, road construction, fencing, creation of easements, removal/destruction/lopping of vegetation, and for works proximate to major pipeline infrastructure, the Principal Road Network and waterways.

An amendment (GC217) to the planning schemes is proposed by the proponent to provide a single statutory planning approval for the project. The draft PSA (GC217) specifically seeks to introduce Clause 45.12 SCO to the South Gippsland Planning Scheme, and a new schedule (Schedule 3) to the SCO in both planning schemes to give effect to the specific controls contained in the *draft Marinus Link Project Incorporated Document dated 2 February 2024* (draft incorporated document).

The SCO3 would enable the project-specific controls in the draft incorporated document to override other requirements of the planning schemes. In the absence of such an amendment, the project would require multiple planning permits under various provisions of both planning schemes.

The draft amendment (GC217), including a draft incorporated document, was exhibited as Attachment 3 of the EES. The draft PSA exhibited with the EES is discussed in Section 4.1.

3.3. Marine and Coastal Act 2018

The MAC Act provides for the management of marine and coastal areas through the development of a state-wide marine and coastal strategy and through coastal action plans for specific areas.

Section 65 of the Act requires the consent of the Victorian Minister for Environment for the use and development of the coastal and marine environments and applies to land from the 3-nautical-mile limit of Victorian waters to 200 metres inland of the high-water mark. The proponent will make an application for consent for the use, development and works on marine and coastal Crown land under section 68 of the MAC Act. In considering an application for consent, under section 69 of the Act, the Minister for Environment must have regard to the Marine and Coastal Strategy and Marine and Coastal Policy.

3.4. Aboriginal Heritage Act 2006

The AHA Act requires an approved cultural heritage management plan (CHMP) to manage and protect cultural heritage values in Victoria and its waters for works for which an EES is required.

In country where a body has been appointed as the Registered Aboriginal Party (RAP) under the AHA Act, the appointed RAP is authorised to decide whether to approve a CHMP. For Country where no RAP has been appointed, First Peoples -State Relations exercises that statutory power.

The proponent has prepared two draft CHMPs (18201 and 18244) for the project. CHMP 18201 for the northern section (Mirboo North to Hazelwood) of the Victorian part of the project will be evaluated by Gunaikurnai Land and Waters Aboriginal Corporation, which is the RAP. CHMP 18244 for the southern section (Waratah Bay to Hazelwood) of the Victorian part of the project will be evaluated by First Peoples -State Relations.

3.5. Other Victorian statutory approvals

The project also requires a range of consents and permits that are likely to include the following:

- consent to disturb registered heritage sites under the *Heritage Act 2017*;
- permits or licences for waterway crossings and potentially to extract groundwater under the *Water Act 1989*;
- permit for the removal of listed flora from public or freehold land managed by a public authority under the *Flora and Fauna Guarantee Act 1988 (FFG Act)*;
- permit to take or handle wildlife under the *Wildlife Act 1975*;
- consent to undertake works on roads under the *Road Management Act 2004*;
- building permits for the converter station, the fibreoptic cable inspections building and the potential transition station under the *Building Act 1993*;
- consent for occupation under the *Land Act 1958*; and
- licences, consents or agreements related to land tenure under *Traditional Owner Settlement Act 2010, Land Act 1958, Crown Land (Reserves) Act 1978* and *Victorian Plantations Corporation Act 1993*.

Assessment under the Environment Effects Act requires that the following legislation be considered despite no approval being required:

- *Environment Protection Act 2017*; and
- *Climate Change Act 2017*.

A licence is also required to generate, transmit, supply, or sell electricity in Victoria. On 20 December 2023, the Essential Services Commission granted the proponent an electricity transmission licence to transmit electricity between Tasmania and Victoria and connect the project infrastructure into the existing

transmission network in Victoria. The transmission licence will also enable the proponent to access land in accordance with the *Electricity Industry Act 2000*. The proponent has however stated its commitment to seeking voluntary access agreements with all landholders where possible, both for investigations and for transmission easements.

4. Key matters, planning and environmental management framework

This section examines the proposed environmental management and planning control regime that have informed my assessment. It also sets out my analysis and findings in relation to some key matters, including alternatives and route selection.

4.1. Planning scheme amendment

The key approval for the land-based aspects of the project is a planning scheme amendment (PSA), which would introduce controls to facilitate the use and development of the project.

A draft PSA (Amendment GC217 to the South Gippsland and Latrobe Planning Schemes) was prepared by the proponent and included in Attachment 3 of the exhibited EES. The draft PSA seeks to:

- facilitate the delivery of the project in a timely, coordinated and consistent manner;
- establish a framework to manage environmental impacts during construction and operation; and,
- make the Minister for Planning the responsible authority for the administration and enforcement of the project.

The proponent's draft PSA:

- inserts a Specific Controls Overlay – Schedule 3 (SCO3) and associated incorporated document for the project into both planning schemes to allow the use and development of the project;
- amends the planning scheme maps in the planning schemes to identify the land to which the SCO3 applies; and,
- makes the Minister for Planning the Responsible Authority for the administration and enforcement of the incorporated document.

Amending the planning schemes to insert an SCO and an incorporated document allows the proponent to address a range of planning provisions in the two local planning schemes, without the need for a series of individual planning permits, provided the conditions in the incorporated document are met.

The draft PSA includes controls which give effect to the environmental mitigation measures to be implemented, including the approval and endorsement of the EMF under the draft incorporated document. The IAC was appointed under section 9(1) of the *Environment Effects Act 1978* (as an inquiry) and also under section 151(1) of the P&E Act (as an advisory committee) to provide me with advice as to the content and structure of the draft PSA.

The IAC outlined that they were generally satisfied with the structure and content of the draft PSA but made some recommendations for minor changes to the draft incorporated document which are supported as discussed below.

Specific controls overlay

The SCO, if approved, would allow the land to be used and developed in accordance with the specific clauses and requirements specified in the incorporated document.

The draft PSA seeks to apply the SCO to the planning scheme maps in the planning schemes ('subject land'). The subject land includes the:

- 'project land' (i.e. the survey area); and

– 'additional land', which has been identified as potentially being required to accommodate changes to the project alignment as a result of continuing landowner consultation. This land has generally not been surveyed or assessed in the EES to the same level of detail as the project land.

The clauses of the draft incorporated document include a requirement for the proponent to provide additional information and justification to the Minister for Planning if they seek to develop the project within an area of the additional land. This is intended to ensure that the responsible authority will have an opportunity to adequately examine any environmental effects of the use of the additional land, if that is required for the project.

Once the alignment of the project is confirmed and easement arrangements are finalised, the proponent has advised that they will apply to amend and reduce the extent of the SCO mapping. I consider that this is an appropriate approach to refining the extent of the SCO.

I note that if the project is approved, there may be a future situation where the proponent needs to seek an unforeseen change to part(s) of the alignment of the cable route or remove native vegetation in a location outside of the SCO boundary (that is, in a location that has not been assessed through the EES and not subject to any planning approval). In this situation, any relevant statutory requirements and consents would need to be addressed by the proponent and as such any request to construct works or impact native vegetation outside of the SCO area would be considered on its merits.

Incorporated document

The draft incorporated document in the draft PSA includes specific conditions which require plans and documents to be endorsed by the Minister for Planning at different specified times, but predominantly before the main construction works commence. The condition requirements are summarised as follows:

– Approval of alignment plans showing the final cable route, construction area and associated easements.
– Approval of development plans showing the location, design detail and elevations of the above-ground infrastructure.
– Approval of the Environmental Management Framework (EMF).
– Preparation of information and an avoid and minimise statement for the final amount native vegetation to be removed, to be prepared to the satisfaction of the Secretary to DEECA.
– Procurement of native vegetation offsets.

The draft incorporated document allows some minor preparatory works to commence prior to the satisfaction of the above conditions. This is consistent with the approval requirements of other large linear projects in Victoria.

In respect to my assessment of the project's environmental effects, I agree with the IAC and consider that the proposed SCO and associated draft incorporated document are an appropriate planning mechanism to facilitate the delivery of the project. However, the final content of the PSA and incorporated document will need to be resolved in light of this assessment and considered for approval in due course.

I note that the IAC recommended some minor changes to the clauses of the draft incorporated document, primarily to ensure that the communications building within Waratah Road compound is required to be considered and shown on any approved development plans and generally to improve its readability. Additionally, the IAC proposed changes to the preparatory works clause requiring additional application requirements under the *Guidelines for removal, destruction or lopping of native vegetation* to be addressed prior to clearing. This is discussed further in Section 5.1. I consider that the recommended changes to the draft incorporated document are appropriate, in the context of my assessment of the environmental effects of the project. My consideration of the PSA under the P&E Act is yet to occur and will not proceed until this assessment is considered, including by the proponent.

I understand that submitters suggested various changes to the Strategic Assessment Report (which supports the draft PSA) and the draft Explanatory Report. These proposed changes are administrative in nature and are not relevant to this assessment of the project's environmental effects. Such changes will be considered in the future when I consider approval of the PSA.

4.2. Environmental management framework

The EMF was presented in Chapter 2 of Volume 5 of the EES. The EMF was addressed in Chapter 21 of the IAC report with Chapter 8 specifically addressing the approach to EPRs in the EMF. While all EPRs form part of the EMF, the proponent proposed eight EPRs to deal with overarching environmental management. Two of these (EPRs EM03 and EM07) were subject of IAC recommendations. EPR EM07 is discussed in Section 5.15 and EPR EM03 is discussed here.

The EMF forms part of the governance framework for project delivery (see Figure 3). It establishes a transparent framework for the management of environmental effects to meet statutory requirements, achieve desired environmental outcomes, protect environmental values and sustain stakeholder confidence. The EMF includes a commitment by the proponent to monitor compliance with the EMF and EPRs through the implementation of an environmental management system and to require principal contractors to also implement environmental management systems. With the exclusion of preparatory works, the EMF must be submitted and approved to the Minister for Planning's satisfaction prior to the commencement of development (clause 5.3.1 of the draft incorporated document).

The EMF consolidated requirements for all jurisdictions in which works will occur. The EMF that would need to be prepared to the Minister for Planning's satisfaction under the clauses of the incorporated document would contain the EPRs that relate to works located on land within the SCO. The EMF and the EPRs that relate to Victorian coastal waters would be subject to approval by the Minister for Environment as part of a consent under the MAC Act. The EMF and EPRs that relate to Commonwealth matters, including the Commonwealth marine area and matters of national environmental significance, would be anticipated to form conditions under an EPBC Act approval. Whilst there will be differing approval mechanisms, decision makers and associated regulatory roles, the proponent and contractors engaged by the proponent are responsible for implementation of all the EPRs.

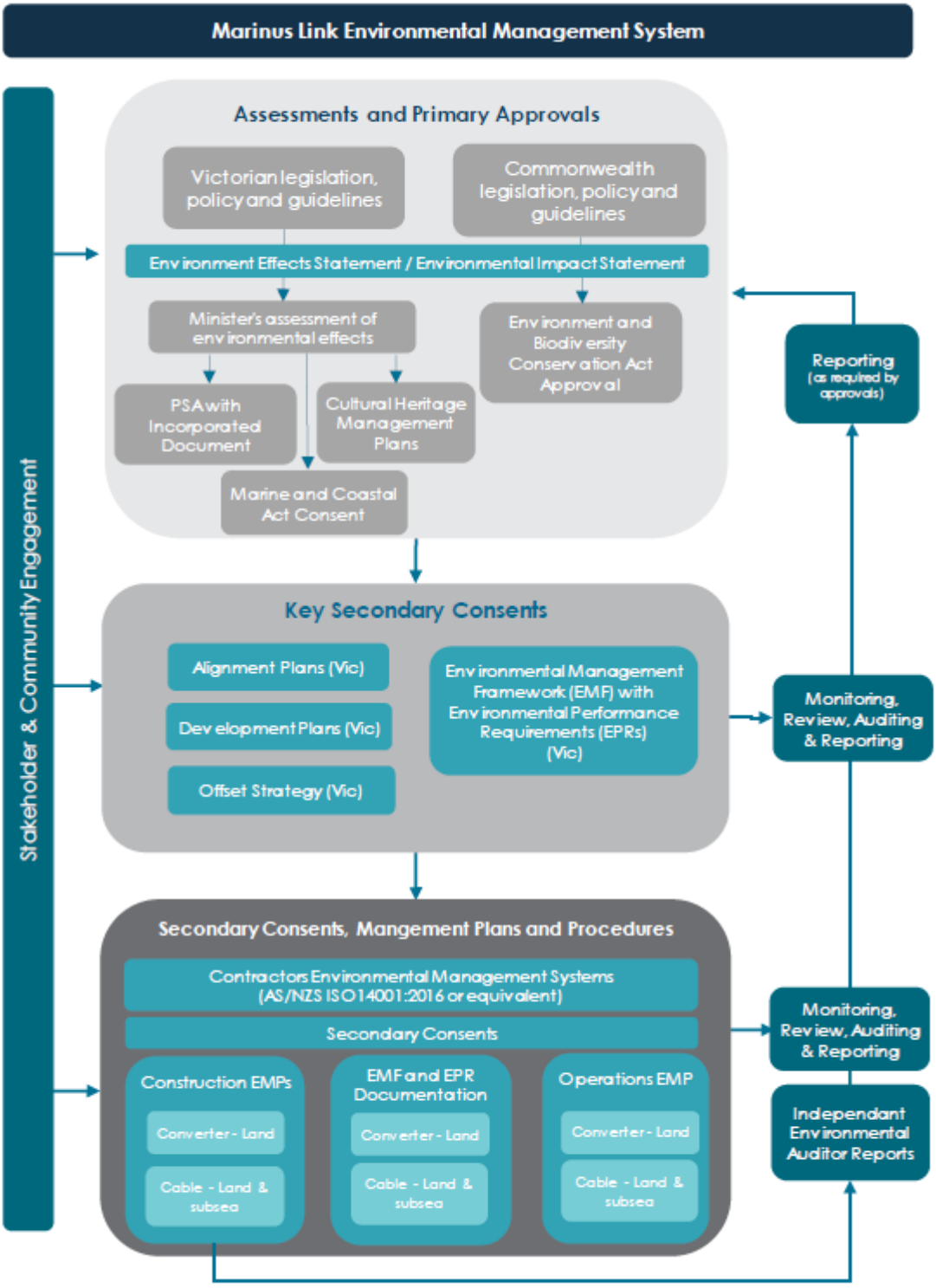

Figure 3: Marinus Link Environment Management Framework (source Figure 5-1 of the EES).

Transparent framework

As documented by the IAC, the proponent made some changes to the exhibited EMF (excluding the EPRs) to address submissions from the EPA and to respond to issues identified during legal review. The IAC supported the day 2 EMF proposed by the proponent[3] without change. The IAC found that the EMF provided a suitably transparent governance framework with clear accountabilities which will ensure effective management and monitoring of potential effects and risks.

I generally support this finding as elaborated further below.

The IAC concluded the draft PSA provided the appropriate framework for implementation of the EMF. The EMF clearly documented the change management procedure for any future proposed changes to the project alignment and infrastructure, which must comply with the EPRs. If within additional land, any such changes must be approved by the Minister for Planning and demonstrate this will not give rise to any material adverse increase in impacts. As discussed in Section 4.1 of this assessment, I consider this to be an appropriate procedure to ensure the adequate assessment of any environmental effects from the use of additional land. I make specific recommendations about the assessment of terrestrial ecology effects from potential works in additional land in Section 5.1 of this assessment.

In finalising the EMF for approval, I consider refinements could be made in the following areas to improve clarity and deliver a comprehensive framework:

- Requirements.
- Staging of works.
- Monitoring.

Clear requirements

The EMF sets out the process for the preparation and approval of key environmental documents including the secondary consents, management plans and procedures outlined in Figure 3. Each principal contractor will be responsible for developing and implementing a construction environment management plan (CEMP) with relevant subplans that will be applied during their construction works.

The EMF states that in order to provide flexibility for the proponent and its contractors in determining the most effective way to document impacts and mitigation measures, the EPRs do not specify the structure or title of subplans within the CEMP[4]. Despite this, I note that the majority of EPRs specifically refer to management plans by title – such as EPRs A03, CL02 and MERU05. In fewer cases (for example, EPR GM04), EPRs refer to measures or protocols to be in included in a subplan of the CEMP, with no title specified. The EMF does not provide a consolidated list of all management plans or subplans of the CEMP or operations environmental management plan (OEMP) required by the EMF.

EPR EM02 is an overarching EPR requiring the preparation and implementation of the CEMP. This EPR includes some requirements for the CEMP including listing several EPRs from which subplans are required. From review of the EPRs I note this list is only a sub-set of the number of management plans or subplans required by the EPRs to be developed 'prior to construction' or as a 'subplan of the CEMP'. It is not clear from current drafting as to why these EPRs are particularly mentioned in EPR EM02, and it does not seem to be that they are intended to be minimum requirements of any CEMP.

The EMF provides that during construction, compliance with the EMF and EPRs will be verified, audited and reported on by an independent environmental auditor. A key role of the independent environmental auditor

[3] Tabled document 142

[4] Table 2-6 of the EMF

will be to verify the CEMPs to be prepared by each principal contractor in accordance with EPR EM02[5]. As there is uncertainty as to which EPRs should be called up by EPR EM02 to be included in the CEMP, there is also uncertainty as to which plans and requirements will be verified by the independent environmental auditor.

EPR EM03 is the equivalent measure for the OEMP. As proposed by the proponent, this EPR only required the specific consideration of EPR CC01 with remaining management plans implemented during construction to be considered for relevance. The IAC recommended a new requirement within this EPR to specify plans prepared under EPRs MERU06 to MERU09 and MERU11 to be included in the OEMP. I consider these EPRs to represent a non-exhaustive list of requirements likely to be required for the OEMP. I do not support the IAC's recommendation to include this non-exhaustive list of EPRs required to be considered for the OEMP, which may detract from the work to be done by the EPR as drafted to 'consider the management plans implemented during construction and if any measures are relevant for operation'. Several EPRs specifically relate to the OEMP (for example, EPRs GM10 and NV05) however, as currently drafted, these would not be called up for consideration by EPR EM03.

The EMF states a Compliance Management Standard is to be developed by the proponent to document relevant requirements to project stages. It further states that: *"the Compliance Management Standard will assign the applicability and allocation of requirements to project stages. Applicability is further refined for relevance to current scope of works during development of CEMP and subplans. Where an EPR or other requirement is deemed not relevant to scope of works, it will be noted in the CEMP and/or relevant sub plan"*. It is unclear from the current wording if the Compliance Management Standard will assess all EPRs and indicate which are applicable to the CEMP or whether this is just in the CEMP. There is no corresponding approach documented in the EMF for the OEMP.

In finalising the EMF, I recommend the proponent make it clearer which specific management plans and EPRs will be required for each:

- jurisdiction
- project phase (that is, detailed design, construction, operation or decommissioning), and:
- construction stages (stage 1 and 2).

Flexibility in staging of works

The EMF anticipates the project may be delivered in stages, by multiple contractors and sub-contractors[6] and expressly permits a staged preparation of plans required to comply with project approvals, provided such plans are in place prior to the commencement of each stage. The EMF requires contractors to consider the requirements of the EPRs for each stage as applicable.

Staging of works is common in linear infrastructure projects where different contractors may deliver separate packages or linear sections of the project. In this case, in addition to linear staging, construction is now intended to be completed in two temporal stages, stage 1 and stage 2 over the same area. As described in Section 2.1, to minimise the disruption from construction activities, stage 1 will include the shore crossing at Waratah Bay and onshore construction works for stage 2. Stage 2 will include installing the cables, constructing the stage 2 converter stations at Hazelwood (and Heybridge) and final reinstatement. Several EPRs are required to be undertaken 'prior to construction'. It is considered likely management plans or procedures developed for stage 1 may need to be updated or reviewed prior to being implemented for stage 2. On the other hand, some EPRs will not be relevant for stage 2. Where specific potential risks have already been

[5] Table 2-6 of the EMF

[6] Section 2.2

identified, such as geomorphological changes, I have recommended the EPR specifically state review is required prior to stage 2 (see Section 5.6 of this assessment).

In finalising the EMF, I recommend the proponent examine the implications of the two-stage approach to project implementation, to clarify in the EMF which management plans and EPRs may require review prior to stage 2 and which, if any, EPRs will be closed out following stage 1.

Monitoring

The EMF[7] outlines EPRs that require monitoring with the collection and analysis of samples prior to and during construction. I note that there are EPRs that require monitoring that appear to be missing from this table (for instance, GM01, GW05, SW04 and SW05). I also note that the table is restricted to monitoring 'prior to and during construction' only, however there will also be monitoring required post construction and during operation. In finalising the EMF, I recommend this table be reviewed to include the full monitoring program for construction and operations.

Environmental performance requirements

The proponent submitted that in preparing the EPRs and considering wording changes at the hearing, it had been *"guided by sound principles intended to ensure appropriate drafting, structure and approach"*[8]. The proponent referred to 11 principles which had been submitted by the proponent of the North East Link project at that hearing[9].

The IAC noted the crucial role of the EPRs to the implementation of the EMF, particularly in providing: *"a framework for measuring and managing a project's environmental impacts consistent with the mitigation hierarchy (avoid, minimise, manage, rehabilitate, offset)"*.

The IAC was invited by the proponent to comment on the *"role of EPRs and drafting principles to provide guidance for future projects"*. In response, the IAC made overarching comments regarding the current wording of the EPRs. The IAC found, the EPRs would benefit from detailed drafting review to improve clarity, simplicity of language and reduce significant duplication between EPRs. With the intent of improving simplicity and clarity, the IAC recommended some EPRs be split out to provide logical sequencing of steps such as further assessment, mitigation and offsets.

The IAC expressed 11 principles which built on, but were different from, the 11 principles proposed by the proponent of the North East Link project and adopted by the proponent. The IAC recommended the exhibited EPRs be further reviewed to ensure final drafting is consistent with these principles.

To date, EPRs have been used in a number of large government infrastructure projects where they can provide a robust tool with both appropriate flexibility and accountability for environmental performance in response to a reference design. They can enable an outcome-focused approach to project regulation which enables a project delivery approach that is flexible and encourages innovation, while meeting environmental outcomes and objectives. Although outcomes are the focus, EPRs still need to be tailored for each project to consider its unique circumstances including for different effects, uncertainties, location, regulatory considerations and community expectations. For each project there is a need to reach an appropriate balance between providing detail and quantitative aspects with allowing sufficient flexibility to enable

[7] Table 2-8

[8] Tabled document 71

[9] Tabled document 411 to the North East Link Project IAC hearing

innovation. In drafting EPRs there needs to be measurable timeframes and outcomes for the required performance.

I commend the proponent and IAC for efforts to contribute to the continuous improvement of EPRs for EES projects in the future. I note the proponent has used previous lessons learnt to inform initial drafting of the EPRs and further reiterations during the hearing. The principles proposed are generally sound and will be considered in terms of the future analysis of EPRs for this and other projects.

I am comfortable the proponent was initially guided by sound overarching principles in its drafting of the initial EPRs. Further, the current EPRs have been subject to iterative and robust scrutiny and review throughout the EES process, in particular prior to exhibition by agencies and regulators that were on the Technical Reference Group. Since then, submitters and the proponent have commented on and refine the EPRs during the hearing. The current draft of the EPRs has resulted from this iterative and collaborative process with multiple stakeholders. Therefore, I do not support the IAC's recommendation for the proponent to undertake a "*detailed drafting review*[10]" to ensure the EPRs further apply the 11 principles. If this was to occur, without knowledge of the iterative changes and requests and requirements from agencies, that have occurred throughout the EES process, the review risks changing the intent and specifics of EPRs that have been settled throughout the process to date. Having said that, I support further refinement and review to enhance clarity, transparency and integrated assessment for the project moving forward, particularly as discussed in clarifying the proposed plans and measures for each overarching environmental management plan.

4.3. Alternatives and route selection

The EES was required to examine effects of feasible alternatives for the project's design, layout and construction. This included a comparative assessment of environmental effects of feasible alternatives, as well as the basis for the preferred alternative.

Transmission route selection

Volume 1, Chapter 3 of the EES identified seven potential transmission corridor options between feasible connection points in Tasmania and Victoria that were considered prior to the development of the EES (see Figure 4). Feasible Victorian connection points considered included Portland Alcoa, Moorabool, Cranbourne and Hazelwood terminal stations.

Within the seven potential transmission corridor options, further investigation was undertaken to identify the shortest, technically feasible route between connection points that minimised environmental effects. This route and site selection process was guided by criteria based on technical requirements, and environmental constraints and opportunities in the context of the project area. A short-list of two preferred routes were subject to further technical analysis and ground-truthing. The outcome was a preferred route from Burnie to Hazelwood with landfalls at Heybridge (Tasmania) and Waratah Bay (Victoria).

[10] Page 39, IAC Report.

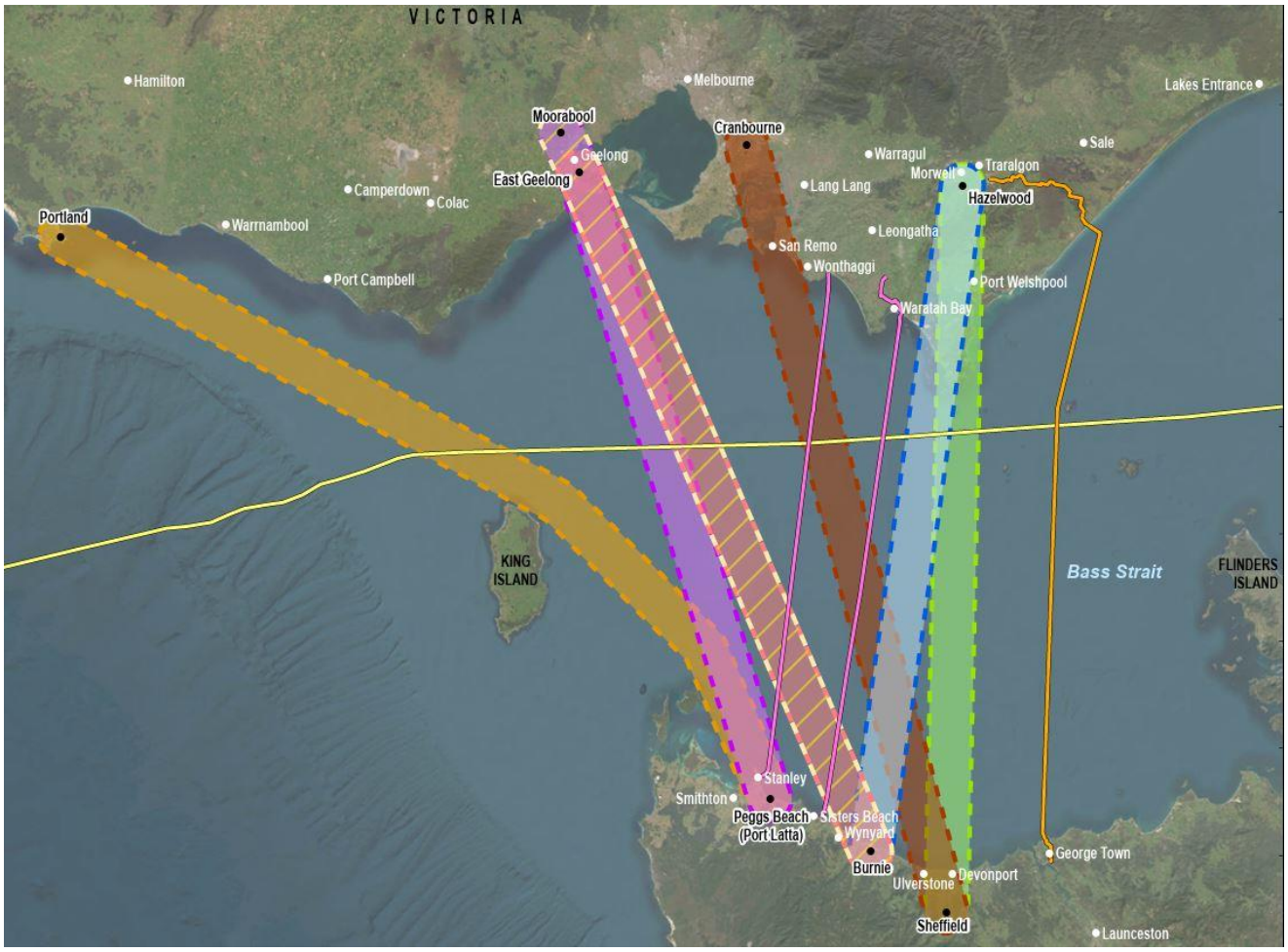

Figure 2: Alternative Marinus Link corridors considered between feasible Victorian and Tasmanian connection points (source: adapted from Volume 1, Chapter 3 Route Selection and Project Alternatives Figure 1-11).

Within this preferred prudent and feasible route from Burnie to Hazelwood, there was investigation of alternative Victorian land cable routes with six key alternatives, along with some variations in the Tarwin River valley and Strzelecki Ranges, being investigated.

The preferred route from Waratah Bay was located to the west of the Hoddle Range, up the Tarwin River valley, across the undulating plateau of the Strzelecki Ranges, and down the ranges to Driffield and Hazelwood. This preferred route avoided exposure to steep slopes and unstable landforms within the Hoddle and Strzelecki ranges, and would present fewer potential impacts to surface water, ecology, agriculture and forestry operations. This preferred route was the subject of technical assessments in the EES and it was further refined through the EES process, before the exhibition of the EES.

The IAC found the subsea and land cable alignments have been appropriately selected through a robust process that sought to avoid and minimise environmental effects whilst appropriately balancing these with other criteria including cost, land availability and constructability.

I support the IAC's findings that the route selection process was suitably balanced and robust.

Other alternatives

The EES assessed a number of project alternatives, with a particular focus on:

– the underwater cable route from the Victorian and Tasmanian shore crossings,
– location of Victorian converter stations, and

– cable installation and construction techniques.

The location of the shore crossing at Waratah Bay was chosen to avoid the rocky platforms and patch reefs extending east from Cape Liptrap and west from Wilsons Promontory National Park. Two alternative underwater cable alignments were considered in Waratah Bay throughout the development of the EES. The preferred alignment, approximately 2 kilometre west of the originally surveyed route, was selected due to geophysical surveys of physical seabed characteristics confirming avoidance of patches of rock outcrops.

Two locations were considered for the Victorian converter station, with the Hazelwood site the preferred site given geographical constraints and potential impacts to forestry and terrestrial ecology.

Different construction methods were considered to cross major watercourses, infrastructure, native vegetation and threatened habitat. Alternatives included cables laid in trenches, and trenchless construction methods involving cables being fed through conduits via HDD and auger boring. The proposed EPRs will require that micrositing and trenchless construction techniques be considered to further minimise effects (discussed further in Chapter 5 of this assessment).

The IAC recommended that EPRs include consideration of sulphur hexafluoride alternatives to improve outcomes for greenhouse gases. These recommendations are described in Section 5.15 of this assessment.

5. Assessment of environmental effects

To provide an integrated structure for this assessment, key aspects of legislation and statutory policy are reflected in evaluation objectives that were set out in the EES scoping requirements. My assessment has been made in reference to these evaluation objectives (see Table 1).

Table 1: Evaluation objectives

Evaluation objective	Relevant section of this report
Biodiversity and ecological values – *avoid, and where avoidance is not possible, minimise adverse effects on terrestrial, aquatic and marine biodiversity and ecology, including native vegetation, listed threatened species and ecological communities, other protected species and habitat for these species, and to address offset requirements consistent with state policies.*	Sections 5.1 and 5.2
Marine and catchment values – *avoid, and where avoidance is not possible, minimise adverse effects on land and water (including groundwater, surface water, waterway, wetland, and marine) quality, movement and availability.*	Sections 5.1, 5.2, 5.3, 5.6, 5.7 and 5.8
Cultural heritage – *protect, avoid and where avoidance is not possible, minimise adverse effects on historic heritage values, and tangible and intangible Aboriginal cultural heritage values, in partnership with Traditional Owners.*	Sections 5.4 and 5.5
Agriculture, land use and socioeconomic – *avoid and, where avoidance is not possible, minimise adverse effects on agriculture, forestry and other land uses, social fabric of communities, and local infrastructure, businesses and tourism.*	Sections 5.9, 5.10, 5.11 and 5.12

Evaluation objective	Relevant section of this report
Amenity, health, safety and transport – *avoid and, where avoidance is not possible, minimise adverse effects on community amenity, health and safety, with regard to noise, vibration,* air *quality including dust, the transport network, greenhouse gas emissions, fire risk and electromagnetic fields.*	Sections 5.14 and 5.15
Landscape and visual – *avoid and, where avoidance is not possible, minimise adverse effects on landscape and visual amenity.*	Section 5.13

Overall, it is my assessment that the project can meet the evaluation objectives, and that its environmental effects will be acceptable, subject to the implementation of the EPRs endorsed by the IAC and refined as per the findings and recommendations of this assessment.

My finding on the environmental acceptability of the project is based on the proponent implementing an avoidance and minimisation approach to the delivery of the project, informed by further survey and more detailed assessment in priority areas. I am satisfied that this further survey and information is not needed to inform this assessment under the Environment Effects Act on the acceptability of the project's environmental effects. However, this work should inform detailed design, secondary approvals, and mitigations to ensure that the effects of the project are minimised during project implementation.

The IAC made numerous findings and recommendations in respect of the project and its effects. My response to its findings and recommendations, along with my assessment of the environmental effects of the project, are detailed in the sections below.

Chapter 6 provides my main conclusions and recommendations about the environmental effects of the project and responds to the IAC's key recommendations. Appendix A summarises my recommendations for the EPRs.

5.1. Terrestrial ecology

Evaluation objective

Avoid, and where avoidance is not possible, minimise adverse effects on terrestrial, aquatic and marine biodiversity and ecology, including native vegetation, listed threatened species and ecological communities, other protected species and habitat for these species, and to address offset requirements consistent with state policies.

Assessment context

Terrestrial and freshwater ecology effects are addressed in Volume 4, Chapter 11, Technical Appendix V and Attachment 5 (Draft Offset Strategy) of the EES as well as in Chapter 9 of the IAC Report. The proponent had proposed three EPRs to deal with terrestrial and freshwater ecology effects (EC01-EC03). The IAC recommend changes to all EPRs, including splitting EPR EC01 into three separate EPRs (EC01A, ECO1B and ECO1C).

A supplementary technical report about implications of revised timing of stage 2 for terrestrial ecology was prepared for Technical Appendix V[11]. The report found that there would be no further impacts to terrestrial

[11] Tabled document 45q

ecology values if EPRs EC01 - EC03 (pre-hearing EPR version) were implemented during stage 2. EPRs were considered adequate and were not proposed to be updated.

The EES described the regions in which the project occurs in Victoria as predominantly agricultural, and as such mainly cleared of native vegetation for pastoral purpose or replaced with forestry plantations[12]. Remnant native vegetation and associated fauna habitat was characterised as primarily represented by small, fragmented patches along road reserves, waterways or property boundaries and scattered trees in cleared paddocks. Areas including Waratah Bay, the Great Southern Rail Reserve and the Strezlecki Ranges persist with larger patches of native vegetation, labelled by the EES assessment as 'Priority Habitat Extents.'

The key matters for the assessment of effects on biodiversity values examined by the EES and IAC are:

- The extent of loss or degradation of native vegetation or other habitat values due to construction or operational maintenance requirements;
- Direct or indirect loss, disturbance and/or degradation of listed or other protected species and nearby habitat that may support listed or other protected flora, fauna or ecological communities;
- Direct or indirect loss of faunal movement pathways (biolinks) and habitat; and
- Potential cumulative effects on listed threatened flora and fauna species, and their habitats, from the project in combination with other projects.

The key project activity that is likely to have direct impacts on terrestrial ecological values is the clearing of vegetation within the AoD. Consequential loss of vegetation has also been considered as an indirect impact, where soil excavation or compaction impacts on the roots of adjacent trees or shrubs cause death or decline. Other potential direct and indirect impacts to ecological values during construction are likely to occur from vehicle collision, noise, vibration, light, dust, and the introduction of weeds or pest species.

Native vegetation

The EES found that a total of 201.98 hectares (ha) of native vegetation was present within the survey area. This included 85.66 ha of Ecological Vegetation Classes (EVCs) with a bioregional conservation status of vulnerable and 102.85 ha of EVCs with an endangered bioregional conservation status.

Key locations supporting high-quality native remnants and habitats, as shown in Appendix 1 of Technical Appendix V, Figure 5 and Figure 6, include:

- Coastal scrub vegetation restricted to the foreshore and coastal dunes of Waratah Bay.
- Lowland forests between Waratah Road and Fish-Creek Walkerville Road and within private land north of Fish-Creek Walkerville Road.
- Swamp scrubs, swampy woodlands and lowland forest in the Great Southern Rail Trail reserve and intersecting waterways, including stony creek and adjoining private land.
- Lowland forests between Mirboo North and Stony Creek.
- Tall forests along Ten Mile Creek Road and Strzelecki Highway.
- Floodplain and grassy woodlands associated with Morwell River and nearby terraces.
- Grassy woodlands within McFarlane Road, road reserve.

The potential total extent of native vegetation loss (direct and indirect) was estimated by considering all native vegetation within the AoD or relatively adjacent to it (e.g. the AoD intersected ≥ 10% impact to a Tree Protection Zone) as impacted by the project. This assessment determined a total extent of 21.25 ha of native vegetation patch removal, with a loss of 184 large trees. This was named by the proponent as the pre-mitigation native vegetation loss and was presented in the EES as a worst-case scenario.

[12] Guidelines for the removal, destruction or lopping of native vegetation, Department of Environment, Land, Water and Planning, 2017).

The project then sought to further avoid and minimise native vegetation as loss as required under the Native Vegetation Guidelines[13] via the use of less invasive construction techniques at areas of sensitive ecological value, such as waterways and priority habitat areas. In particular, trenchless construction has been incorporated across the AoD and this construction technique was thoroughly discussed during the hearing. The project determined a post-mitigation impact (or best-case scenario) resulting in native vegetation loss of 6.75 ha and 51 large trees. The predicted combined direct and indirect loss of native vegetation is summarised below in Table 2.

Table 2: Combined direct and indirect loss of native vegetation.

Native vegetation classification	Total mapped in survey area (hectares)	Pre-mitigation impact	Post mitigation impact
Patch (hectares)	201.98	21.25	6.75
Total number of large trees	1084	184	51

The worst-case scenario adopted to determine native vegetation offset requirements assumed avoidance of impacts to the ecological community Forest Red Gum Grassy Woodland Community (post mitigation) and pre-mitigation impacts for all other values. Based on this scenario, Victorian state offset requirements for native vegetation loss would be: 0.984 general habitat units; 3.833 species units of habitat for Eastern Spider-orchid; 14.740 species units of habitat for Strzelecki Gum and 184 large trees. The proponent confirmed at the hearing that all potential state offset requirements are readily available for this worst-case scenario.

The EES reported that assuming the successful implementation of the EPRs and given the ability to further avoid and minimise impacts during design and implementation of the project, the significance of the post mitigation impact on native vegetation was rated as low.

Threatened species and communities

The EES identified the following threatened species and communities within the survey area:

- The ecological community, Forest Red Gum Grassy Woodland Community (and the associated EPBC Act threatened ecological community, Gippsland Red Gum (*Eucalyptus tereticornis subsp. mediana*) Grassy Woodland and Associated Native Grassland).
- Twenty-five flora species listed under the FFG Act (five of which are also listed under the EPBC Act. The threatened flora species were grouped into: Coastal dune species in Waratah Bay; Waratah Bay woodland flora; River swamp wallaby-grass; Threatened eucalyptus species; Strzelecki Ranges dry forest flora; and the Strzelecki Ranges damp or wet forest species.[14]
- Thirty-five threatened fauna species, including 25 species listed under the FFG Act (12 are also listed under the EPBC Act). The threatened fauna species were also grouped: Owls, raptors and other large mobile fauna; Ground dwelling fauna; Aquatic fauna; Shorebirds, Waterbirds and waders; and Woodland birds.[15]

[13] *Guidelines for the removal, destruction or lopping of native vegetation, Department of Environment, Land, Water and Planning, 2017*

[14] The FFG Act flora species likely to be present in the study area are listed in Table 4 of section 9.4 ii) of the IAC report.

[15] The species within each of these functional groups can be viewed in the IAC report; Section 9.5 - Table 5

Where presence or absence of FFG Act listed species or communities was uncertain due to land access constraints, a conservative approach was taken in the EES - where habitat was identified as potentially supporting threatened species or communities, it was included into the impact assessment.

The post mitigation impact on the Forest Red Gum Grassy Woodland Community was rated as moderate in the EES. The community was identified at a single location within the McFarlane Road, road reserve (Kilometre post (KP) 79.7). Impact to this community at this location has subsequently been avoided through design refinement and construction controls.

Of the six flora species groups, Waratah Bay woodland and River Swamp Wallaby-grass was considered to have a post mitigation impact rating of moderate and the threatened eucalypt species Bog Gum was considered to have a post mitigation impact of high. All other flora values were considered to have a low post mitigation rating.

Some areas of potential habitat for species of the Waratah Bay woodland flora group and River Swamp Wallaby grass have not been assessed on-ground. Therefore, a precautionary approach was taken, and these species were assumed to occur within habitat that may be impacted. Taking this uncertainty into account, the post-mitigation significance of impact for these species was moderate.

Potential impacts to Bog Gum include removal of numerous trees from multiple, large populations and potential for further losses in habitat not yet surveyed. The EES reported that the extent of habitat for Bog Gum in the survey area was 71.85 ha, with the pre mitigation impact being 2.21 ha and the post mitigation impact being 0.28 ha. The IAC noted that surveys to date had identified over 500 individuals within the survey area, indicating that Bog Gum may be more prevalent than initially expected. Whilst it is expected that impacts can be avoided through design refinement and construction controls, some uncertainty remains regarding the extent of the population and extent of likely avoidance and mitigation.

Of the six functional fauna groups, two were classed as having a moderate post-mitigation impact significance, being Ground-dwelling fauna and Shorebirds. All other fauna groups were considered to have a low post mitigation rating. The rating for Ground-dwelling faunal species was mainly due to the potential for priority habitat being present within areas that had not been subject to on ground survey (unsurveyed areas). For Shorebirds, the rating reflected the species' generally high sensitivity to disturbance, particularly for Eastern Curlew (FFG Act critically endangered).

Freshwater ecology

The EES reported that the survey area supports a range of aquatic habitats, including rivers and creeks, ephemeral and semi-permanent wetlands, and small dams. The project alignment intersects 82 waterways within Victoria (each waterway being crossed once). The project's interaction with surface water and waterways is further described in Section 5.7.

The proponent's expert witness Mr Garden confirmed that twenty-two of the 82 waterways were identified as supporting or potentially supporting sensitive ecological values, and the remaining 60 were gullies or drainage lines likely to have little aquatic value. Annexure D of Submission 32[16] tabulated these 22 waterways, providing a summary of their ecological values and noting if trenched or trenchless construction was proposed at the crossing.

Threatened aquatic fauna considered present in the survey area comprises Australian Grayling, Dwarf Galaxias, Flinders Pygmy Perch, Growling Grass Frog, Narracan Burrowing Crayfish, South Gippsland Spiny Crayfish and Platypus. These species are known to occur or are considered likely to occur in ephemeral

[16] Tabled document S32

wetlands, dams and other aquatic habitats throughout the survey area. A precautionary approach was taken, and presence had been assumed for these species. This is based on the desktop review and habitat assessments where applicable. Technical Appendix V detailed any key aquatic habitat values for threatened species as part of the '*priority habitat*' mapping in Figure 5.

The EES stated that if direct impacts to waterways are likely e.g., open trenching, then aquatic surveys are recommended to determine presence/absence of these values. The EES considered the post mitigation impact to aquatic fauna as low, on the basis that these species are unlikely to be significantly impacted due to the project avoiding priority habitats through design refinement and construction controls. For the functional group, waterbirds and waders, the assessment noted that wetland habitat impacts had largely been avoided and concluded a post-mitigation significance of impact of low. Disturbance from noise and light pollution was identified as a key, potential residual impact.

Cumulative impacts

Technical Appendix V assessed cumulative impacts in relation to the Delburn Wind Farm predicting a cumulative residual loss of 19.09 ha of native vegetation and 100 large trees. An updated assessment was tabled by the proponent[17], which added the VicRoads Strzelecki Hwy Widening project to the assessment of cumulative impacts and a revised understanding of the impacts of the Delburn Wind Farm. The predicted combined cumulative impact from the projects was updated to 30.53 ha. The proponent stated that this impact falls mostly within the Strzelecki Ranges, with Marinus Link contributing 1.87 ha of this extent post-mitigation.

Discussion

Key matters in relation to uncertainties and the extent of assessment included in the EES were:

- Portions of the survey area have not yet subject to on ground survey, owing to land access constraints. In this case, desktop information and incorporation of conservative, worst-case impact scenarios have been relied upon for the impact assessment.
- Comparison of the exhibited draft SCO extent to the study area utilised for field assessment.
- The continuation of design and construction method refinement and finalisation.

While I accept these matters can create uncertainties, the level of understanding and assessment at this stage and ability to continue project design and AoD refinement, creates opportunities for the project to further avoid and minimise ecological impacts. The EPRs presented and examined through the EES work to support this process of avoidance and minimisation.

There are three main methods proposed by the proponent to avoid and mitigate impacts; trenchless construction, micro siting and reduction in the AoD. Trenchless construction is presented as a key impact avoidance measure, which is to be utilised for values such as, threatened flora at Waratah Bay, Bog Gum, threatened shorebirds and coastal dune habitat, waterways of high ecological value and threatened ecological communities. The locations for trenchless constructions will require an understanding of local geotechnical conditions to confirm that the construction method is feasible at each location, with integrated assessment and management of groundwater, geomorphology and surface water. These matters are mainly discussed within the native vegetation section below but are applicable to the assessment of other effects on terrestrial and freshwater ecology.

I agree with the IAC that the assessments for native vegetation, threatened species and habitat undertaken for the EES, are adequate for the purposes of determining the significance and acceptability of the project's

[17] Tabled document S32

effects to inform statutory decision-making, noting there is further detail to come from design and associated assessment work. This will need to be done concurrently to finalise the design and select construction methodologies that further avoid and minimise impacts. While there are some uncertainties about the precise extent and so forth for some predicted impacts that stem from this approach, they do not prevent findings on significance and acceptability of relevant effects to be made within this assessment.

Native vegetation

The IAC noted the following issues raised by submitters in relation to quantifying native vegetation loss, which are discussed in detail below.

- Inappropriate inclusion of the Department of Energy, Environment and Climate Actions (DEECA's) current mapped wetlands layer[18] (referred to below as current wetlands).
- Inability to assess all native vegetation on the ground, due to access limitations within the survey area and the project not yet assessing all potential areas that could be disturbed within the SCO boundary.

Current wetlands

The IAC noted from DEECA's submission[19] that the extent of calculated native vegetation loss may not include current wetlands. The assessment of current wetlands is required to address the requirements of the Native Vegetation Guidelines[20] consistent with conditions in the draft incorporated document.

The proponent stated the aim of their field assessment of wetlands was to verify wetland presence and condition in real-time. The proponent asserted that if current wetlands were absent from Figure 6 of Technical Appendix V, this reflected their absence on-ground. However, under the guidelines the definition of a patch includes current wetlands. The Assessors Handbook[21] details that a current wetland can be excluded if the current wetland has been replaced with hard-stand materials, outside of consultation with DEECA. Technical Appendix V and tabled documents did not clarify whether any excluded current wetlands had been replaced by hard stand materials, nor had the proponent engaged with DEECA to commence the exclusion process. So, there is potential that correct consideration of current wetlands could increase the predicted extent of native vegetation clearance and, therefore, offset requirements. However, given the ability of the project to avoid impacts on any current wetlands through micro-siting and adjustments, and the commitment to further avoid and minimise impacts set out in EPRs, this is a low risk.

I support the IAC's conclusion that this will be addressed by the proponent when refining the native vegetation calculations, once the final AoD is selected as required by EPR EC01A.

Additional land

As detailed within Section 4.1, the project's draft PSA defines the 'subject land' of the proposed SCO3 area that will apply to the project. The subject land is inclusive of 'project land' and 'additional land.' Some areas of 'additional land' have not been captured within the biodiversity assessment survey area. The conditions presented in the draft PSA necessitate that any works proposed in additional land would need to be approved by the Minister for Planning and only on the basis that there are no material adverse impacts compared to those in the project land. Therefore, the extent of native vegetation and habitat loss is not expected to increase if additional land needs to be utilised by the project.

[18] WETLAND_CURRENT layer from the Victorian Wetland Inventory (Current), published 26/09/2023

[19] Tabled document D126

[20] *Guidelines for the removal, destruction or lopping of native vegetation, Department of Environment, Land, Water and Planning, 2017*

[21] Assessor's Handbook: Applications to remove, destroy or lop native vegetation, Department of Environment, Land, Water and Planning, 2018

If alignment plans (required by the incorporated document) seek works in additional land, any necessary ecological assessment required by EPR EC01A, should be completed to demonstrate "no material adverse impact". To this end, I require that EC01 name 'additional land', in addition to the listed Figures and that 'material adverse impacts' are considered by the proponent to be any direct, indirect or residual effects that are in addition to the presented worse-case scenario in the EES.

Unsurveyed areas

Technical Appendix V acknowledged the assessment limitations created from incomplete access to some properties within the survey area. Technical Appendix V described how aerial imagery was used to identify vegetation which couldn't be accessed on foot and accompanied this with information gathered from 'over the fence' photography. The proponent detailed a 'conservative approach' to the assessment and quantification of effects to native vegetation. Specifically, the approach to quantifying native vegetation loss included:

- assuming all vegetation viewable on aerial imagery was native vegetation;
- presenting the impact assessment for both scenarios, the pre-mitigation impact scenario (worse-case scenario) and post-mitigations scenario (best-case scenario); and
- presenting EPR EC01, which at a high-level detailed the further work required for site assessment and the avoidance and mitigation processes for unsurveyed areas prior to quantification of loss and offsets based on the final detailed design.

DEECA submitted that the unsurveyed areas and additional land created uncertainty and that the maximum native vegetation loss could not be verified and may be more than the presented worse-case scenario. The EES used aerial imagery and photographs to assess areas not surveyed. DEECA noted uncertainty with quantifying native vegetation loss based on this approach, particularly the inclusion of tree impacts and Tree Protection Zones. There had been some suggestion at the hearing that a maximum loss value should be incorporated into the EPRs to address this. The IAC's position for this project was that the EPRs and the Incorporated Document do not need to specify a maximum permissible amount of native vegetation loss.

While there is some inherent uncertainty with the use of aerial imagery and photographs, the approach to assessing vegetation impacts adopted in the EES had a degree of conservatism. Given the predominance of agricultural land uses, the extent of vegetation included as native within the AoD for the worse-case scenario could, in fact, be an over-estimation, with the likelihood of some of the included vegetation being planted or introduced species. This likely overestimation applies to both the worse-case and best-case scenarios for native vegetation loss extents presented in the EES.

I support the IAC's conclusion that the assessment of native vegetation impacts in EES Technical Appendix V is adequate for the purposes of determining the significance and acceptability of the project's likely impacts on native vegetation and biodiversity.

The IAC recommended splitting EPR EC01 into three EPRs – EC01A to deal with further survey and assessment to inform detailed design, EC01B to deal with avoid and minimise, and EC01C to deal with offsets. I support this change in the EPRs as it provides greater clarity regarding the requirement to complete native vegetation surveys to inform detailed design. Overall, I consider that the recommended changes to the EPRs by the IAC and within this assessment for EPR EC01A will ensure that additional survey work will provide sufficient information to address these uncertainties and provide a good basis for further avoidance and minimisation.

Further, I consider that the worst-case scenario of the loss of up to 21.25 ha of native vegetation and 184 large trees is significant at a regional scale but acceptable. My finding on this matter is in the context of the length of the project and that through the detailed design process and proposed amendments to the EPRs, it is likely that the extent of loss will be reduced considerably, much to closer to the predicted post-mitigation levels of 6.75 ha and 51 large trees.

This will be achieved through the alignment plans and development plan process described in Clause 5.2 of the incorporated document, which embeds a continued avoidance and minimisation process via design and AoD refinement.

I note that Figures 5 and 6 and Map Book 6 are expected to be updated following further field survey, with these plans to denote construction areas, such as HDD locations and no go-zones (see threatened species section).

Preparatory works

Clause 5.6.2 of the draft incorporated document defines some minor works (preparatory works) that can occur prior to obtaining secondary approvals for the main projects works. DEECA recommended that Clause 5.6.2 should specify that the Native Vegetation Removal Regulation application requirements 2, 4 and 10 apply.

The IAC recommended inclusion of these application requirements, following discussions at the hearing on land and waterway instability and uncertainties around ground conditions, including groundwater levels and surface water, and due to limitations accessing some land parcels. As noted by the IAC these application requirements need input of topographic information (requirement 2) and cumulative impacts (requirement 4) into a final site assessment report (requirement 10) that details final native vegetation removal numbers across the project.

I agree with the IAC that the potential footprint of these preparatory works is relatively extensive, and that application requirements 2, 4, and 10 should apply to preparatory works.

Constructability risks

Submitters raised concern about constructability risk pertaining to the use of trenchless construction (or often named HDD) and whether it could be feasibly implemented at the proposed locations. Technical Appendix V denotes the use of HDD within Figures 5 and 6, to avoid impacts to 'priority habitats,' mostly including major waterways.

DEECA submitted that EC01 should be updated to require that vegetation quality assessments be completed in areas proposed to be avoided by use of HDD owing to constructability risk. The proponent noted at the hearing that ground condition and surface water concerns, although valid, could be 'designed out' and this will be essential for reducing ecological effects. Further discussion about ground conditions and constructability risk is in Section 5.7.

The IAC concluded that further native vegetation surveys were not required for waterways 'confirmed' as being crossed using trenchless methods, unless it is found that there is a material risk of vegetation being impacted or disturbed. In this context, the IAC accepted 'Day 2' updates to EC01 made by the proponent and recommended further additions to EC01A to address unsurveyed areas.

In the absence of a definition of '*material*,' there are several matters that need to be considered:

- There is limited ability to predict where 'frac-out[22]' may occur.
- Native vegetation associated with HDD would be disturbed around the drill pads and the HDD entry and exit points.
- During the hearing, the proponent added new HDD locations (e.g. Little Morwell River) which had not been assessed within Technical Appendix V. The feasibility of HDD at new locations has not been confirmed.
- There is an element of uncertainty in HDD extent and sectioning lengths until final detailed design, and this can also alter during construction depending on ground conditions.

[22] Frac-out is the unintentional return of drilling fluids to the surface during HDD.

These uncertainties give rise to risks to the ecological values the project is seeking to avoid. While 'frac-out' is relatively rare, the geomorphology conditions in this region may give rise to risk of frac-out and bore collapse and have consequences for ecological values. These issues also highlight the necessity of integrated assessment and design development that takes account of terrestrial and aquatic ecology, geology and geomorphology, as well as surface water and groundwater. The cross-reference of EC03 to SW01 by the proponent supports this necessity for integration.

I support the IAC conclusion that further avoidance and minimisation to native vegetation in the design and construction phases of the project is essential for ensuring a reduction in the extent of native vegetation and threatened communities' loss. I support the IAC's inclusion of specifying in EC01B that appropriate construction methods including trenchless technologies such as HDD be used where feasible to avoid and minimise impacts on native vegetation, priority habitat or hollow bearing trees.

To address constructability risk and the consequential impact to ecological values, I recommend the following additions to the EPRs:

- Assessment is required where the risks lead to trenching being employed rather than the preferred HDD, or there is a material risk of frac-out. Material risk is defined via the outcomes of EPR GM05.
- EPR SW01 integrates frac-out contingency planning to address risks to ecological values, by adding reference to EPRs EC02 and EC03.

Threatened species and communities

For FFG Act listed threatened species and communities, the risks previously discussed within the native vegetation section above are applicable. The proponent presented a pre- and post-mitigation impact value for most threatened species likely to be present in the survey area, although this was not possible for some species due to a higher likelihood of suitable habitat being present in unsurveyed areas. As such, the discussion below is focused on the species where the residual uncertainty of impact is higher.

Overall, the ERP modifications I have recommended within the native vegetation section will also be applicable to FFG Act threatened species and communities, with the below sub-sections addressing any additional EPR amendment requirements to ensure an acceptable level of impact for the project.

Forest Red Gum Grassy Woodland FFG Act Community

The Forest Red Gum Grassy Woodland FFG Act Community is endemic to the Gippsland Bioregion. In 1992 DEECA estimated approximately 650 - 700 ha of the community exists primarily in isolated patched on public land[23]. It was noted in the EES that the community was identified at a single location, as a patch, within the McFarlane Road, road reserve at KP 79.7. The EES assessment concluded that no other mapped native vegetation met the condition qualifications to classify as this community, or any other FFG Act community.

At the hearing, the proponent presented an updated construction method for this area at McFarlane's Road; now utilising HDD to avoid removal of the community. This resulted in no net loss of the community, changing the post-mitigation impact rating from Moderate to Low. However, due to access constraints, there is potential for additional areas of Forest Red Gum Grassy Woodland Community and other FFG Act communities, such as Warm Temperate Rainforest (East Gippsland Alluvial Terraces) Community, as potentially occurring in the Strzelecki Ranges and within the final AoD. The proponent stated that they had assessed the modelled locations on ground within the study area, where it was ascertained that the vegetation present did not qualify as the communities. Mr Garden put forward that '*...field observations from adjoining land...*' at locations where the Forest Red Gum Grassy Woodland Community was modelled to be

[23] DEECA Final recommendation on a nomination for listing - Forest Red Gum Grassy Woodland Community (File no: 92/2235). Department of Energy, Environment and Climate Action, 1993.

present found that most of the environment could be described as predominantly agricultural. However, as highlighted within Table 1 of Technical Appendix V, surveys for FFG Act communities is to occur prior to construction in unsurveyed areas.

DEECA submitted that the assessment did not adequately describe the extent of the Forest Red Gum Grassy Woodland Community based on the DEECA FFG Act community modelling data.

The IAC concluded that completion of surveys specified in EPR EC01A would resolve uncertainty associated with this FFG Act community and the extent of its presence in unsurveyed areas. I support the IAC's recommendation to specify the Forest Red Gum Grassy Woodland Community in EC01A requiring that areas considered to have potential habitat for the community be subject to targeted survey if proposed to be impacted. I also support the IAC's recommendation to amend EPR EC01B to state that HDD is the preferred construction option for the Forest Red Gum Grassy Woodland Community extent at McFarlane Road.

In addition, I recommend the following amendments to EPRs to ensure appropriate ecological outcomes, given the residual uncertainty of potential FFG Act communities being present in unsurveyed areas:

- EC01A and EC01B is extended to cover any FFG Act communities that arise through additional survey, whereby avoidance via HDD, micro siting or narrowing of the AoD is the preferred option for all communities listed under the FFG Act.
- EC02 requires that mapping of FFG Act communities be updated (Figure 5 of Technical Appendix V), indicating the type of community, no-go zones and extents of HDD to be utilised to avoid impacts.

With the implementation of these recommended amendments to EPRs, I consider that significant impacts to FFG Act communities are unlikely and can be acceptably managed.

Additionally, I consider that the combined EPR amendments presented in this assessment will ensure reduced impacts to the functional flora groups, Waratah Bay woodland flora species and Strzelecki Ranges damp forest, particularly as the Waratah Bay woodland flora species group would be avoided through HDD of the shore crossing. I support the IAC's recommended amendments to EC01A and EC01B naming avoidance measures for the Waratah Bay woodland flora functional group and River swamp wallaby grass. I also support the IAC's finding that the design refinement and construction controls to be implemented by the project would avoid impacts to the Strzelecki Ranges damp forest flora functional group.

Threatened Eucalyptus species

The EES examined potential impacts to FFG Act threatened Eucalyptus species, including (but not limited to) Bog Gum (FFG Act critically endangered), Strzelecki Gum (FFG Act critically endangered) and Yarra Gum (FFG Act critically endangered). Of particular concern for submitters, such as DEECA and Latrobe Valley Field Naturalists Club, was the potential impact on Bog Gum, given the high residual impact risk assigned post-mitigation. A low residual risk of impact to Yarra Gum, Strzelecki Gum and others was determined, with a prescribed post-mitigation impacts noted as 'zero trees.' As such, this assessment focuses on the acceptability of effects to Bog Gum, while acknowledging the potential for other Eucalypt species to be present within unsurveyed areas.

At the hearing, the proponent acknowledged that the potential impact to Bog Gum is a key concern, with the number of lost trees unable to be quantified due to the uncertainty in the extent of species habitat and number of individuals in the unsurveyed areas. Instead, a general extent of habitat was provided in the EES. Technical Appendix V did provide a count of 500 individual trees within the survey area on accessed land. Major populations were recorded at the Great Southern Rail Trail reserve and the Dumbalk-Stony Creek Road reserve. However, the full extent of individual trees within the survey area is currently unknown.

The proponent advised that once further refinement of the project design occurred a final quantification of impact could be determined, however Mr Garden noted that he considered that the impacts from the project

would not likely result in a significant decline of the species at a regional scale.[24] The proponent noted that unsurveyed areas that may support Bog Gum are an area of focus for design refinement, approvals and construction.[25] The project presented EPR EC01 and EC02 as the key measures for minimising impacts to threatened Eucalypt species.

I support the IAC's conclusion that the high residual significance of impact on Bog Gum is unacceptable without appropriate mitigation. The species is listed as critically endangered under the FFG Act and has a restricted range to coastal lowlands[26]. Remaining populations exist as isolated, remnant patches, commonly in road reserves, across highly fragmented rural landscapes. EPR EC01A is essential for ensuring further field survey for the species and EC01B is critical to reduce the projects effects on the species. I support the recommended changes to EC01A and EC01B identified here by the IAC, which make it clear that detailed design and construction methods need to further avoid and minimise impacts on priority habitat for threatened flora species, including Bog Gum. I consider the following further amendments are required for EC01B and EC02 to help ensure the residual impact on Bog Gum is mitigated to an acceptable level:

- EC01B is amended to state that:
  - any loss of Bog Gum (inclusive of preparatory works) must be to the minimum extent necessary and not result in a significant impact to the species; and
  - sufficient evidence be provided to demonstrate how impacts to the species have been avoided and minimised to achieve this, to the satisfaction of DEECA.
- EC02 is amended to specify that mapping (Figure 5 of Technical Appendix V) is updated inclusive of Bog Gum, indicating the impact status of each tree and where measures to avoid impacts, such as HDD, are to be adopted.

The proponent confirmed the availability of state offsets for Bog Gum. Offsetting requirements are covered under EC01C. Species loss will also be accounted for via the FFG Act pathway.

Threatened fauna

The EES took a conservative approach to the assessment of threatened fauna by assuming threatened species and habitats were present in unsurveyed areas and in the case of cryptic and more mobile species that could not be effectively surveyed for at this stage. Mr Garden asserted that few threatened species or their habitats were likely to occur in the survey area. The IAC recommended amendments to the EPRs EC01A and ECO1B in addition to those proposed by the proponent, to address the uncertainty related to areas unsurveyed.

Concerns of submitters mainly related to the lack of field surveys in some areas of the project. DEECA highlighted the implications of this for the FFG Act permit applications, proposing EC01 include the requirement to obtain permits under the Act and that EC02 should prescribe the need for micrositing during pre-clearing surveys.

It is acknowledged the EES is potentially overestimating the suitable habitat in the study area and AoD, which stems from the precautionary delineation of suitable species habitats, consistent with the conservative approach to examining the potential loss of native vegetation, as set out above. The proponent will progress proposed avoidance and minimisation measures for priority habitats, leading to a final detailed design (and

[24] Tabled document 140b

[25] Tabled document 32

[26] Department of Environment Land Water and Planning 2021 - Threatened Species Assessment Bog Gum Taxon ID 501290

final AoD). Following this, the final impact extents for threatened species within the functional groups will be confirmed.

Through the EES, the proponent has sufficiently identified threatened species 'of concern' and adequately examined potential impacts, pre and post mitigation. The further design and detailed assessment that is to come, will refine mitigations and it is intended to reduce residual impacts. I support the IAC's conclusion that a sound process is in place to work through detailed design and construction methodologies and mitigations, as prescribed at EPRs EC01A-B and EC02, which will continue the avoidance and minimisation process for threatened species and priority habitat for these species.

Given their post-mitigation impact ratings, effects on shorebirds and ground-dwelling fauna as well as Koala are addressed below.

Shorebirds

The foreshore and dunes at Waratah Bay were identified in the EES as suitable habitat for shorebirds, including migratory shorebirds. Fourteen threatened shorebirds species were identified as potentially occurring within the study area, with a total of 18 ha of suitable habitat mapped (Technical Appendix V, Figure 5). The assessment noted the Waratah Bay foreshore area is utilised regularly for recreational purposes.

The EES relies on the following two measures to reduce the potential effects of the project on shorebirds and their habitats:

- HDD under the Waratah Bay foreshore and dunes, to avoid direct impacts to habitat; and
- using the densely vegetated dune ('80 m wide and 15 m high') near the alignment to act as a physical barrier to disturbance, particularly for noise.

The HDD extent of 16.1 km at Waratah Bay (trench sectors SC1-3) was applied to avoid direct impacts to shorebird habitat. HDD will extend from the offshore line and exit within farmland adjacent to the coastal reserve. The EES noted that the habitat at Waratah Bay was not optimal but could support shorebird foraging and breeding within the study area. The assessment found that Important habitat (as described under the EPBC Act for migratory shorebirds) was not present within the study area.

DEECA expressed concern over the potential for the project to have further impacts on shorebirds, although did not recommend any changes to terrestrial ecology EPRs for shorebirds or for any marine ecology EPRs. The IAC did not recommend any changes to EPR MERU10, which covers measures to further avoid and minimise effects of the project on shorebirds – see section 5.2 for further discussion.

The proponent noted at the hearing that approximately 350 metres of shorebird habitat would be impacted by the project, equating to 2% of the foraging and breeding habitat in Waratah Bay. So, while the utilisation of HDD helps minimise impacts, it does not avoid all impacts on shorebird habitat.

As outlined in the native vegetation section, there is residual uncertainty in HDD feasibility, particularly within the trench sectors at Waratah Bay. While avoiding surface impacts, HDD carries potential risk of impacts on the geomorphology and stability of the coastal dunes including subsidence and sinkhole development. Such risks can be managed with an appropriate understanding of ground conditions and HDD design. My recommendations on this matter are discussed further in Section 5.6.

While the EES lacked quantification of impact to shorebird habitat, the IAC considered that assessment of impacts for shorebirds is appropriate at this stage of project development. I support the IAC's conclusion. The residual impact to shorebirds post-mitigation, has an impact rating of low and can be managed to an acceptable level, given the loss of sub-optimal habitat will be no greater than 2% of habitat for shorebirds at Waratah Bay. To this end, I recommend that EPR EC01B encompass a maximum adverse outcome, i.e. direct impacts to shorebird sup-optimal habitat not increase beyond 2% in Waratah Bay and direct impact to optimal breeding and foraging habitat be avoided.

I support the IAC's assertion that uncertainties in the assessment are covered by EPR EC01A and further avoidance and minimisation processes implemented via EC01B and EC02, is likely to result in a residual impact of low to shorebirds. Further confidence is provided by EPR MERU10.

Noise and vibration effects on shorebirds

The EES did not contain an avian acoustic assessment to examine potential impacts of noise and vibration to shorebirds and relied heavily on the formation of the dunes as a mechanism to attenuate and minimise such noise impacts. EES Technical Appendix T predicted a reduction in noise levels of between 5 and 10 dB because of the dunes.

At the hearing, the proponent presented that the predicted construction noise levels of at the dunes and beach were proposed to be between 55 to 60 decibels (dB). Technical Appendix T determined the following predicted noise levels at reserves that support shorebird habitat near the shore crossing:

- Waratah Bay – Shallow Inlet Coastal Reserve (150 – 200 m from the Study area): 55 – 60 dB LAeq
- Cape Liptrap Coastal Park (4 – 6.5 km from the Study area): < 25 dB LAeq.

The EES (Technical Appendix T) did not assess the effects of these noise levels on birds specifically. The proponent presented that this 55- 60 dB LAeq range was lower than the behavioural response threshold for shorebirds (62.4 dB) shown by UK studies.

To further address noise concerns, the proponent proposed the following measures, as included within EPR EC02:

- Restriction of works within 100 m buffer of priority habitat
- Restriction of construction during sensitive life-stages, inclusive of August to March.

The IAC was satisfied that the dunes would act as a sufficient noise barrier and the IAC was satisfied that the residual impact of construction on shorebirds would be low.

Noise or vibration pollution have the potential to disrupt behaviours, including breeding. Long periods of extended noise above baseline noise levels can cause chronic stress in birds, which can produce altered behaviours[27]. Alternatively, foraging and roosting migratory shorebirds, sudden noise elevation or unpredictable noise spikes can cause greater stress triggers. A detailed assessment of the impact of noise on birds, including wetland birds, was presented for the Mordialloc Bypass EES, which utilised the avian acoustics assessment approach presented by the Californian Department of Transportation[28]. This technical guidance states that at around 60 A-weighted decibel (dB(A))[29], masking of communication signals can occur and may lead to chronic increased arousal in birds. However, these predictions incorporate a wide range of bird species and are not specific to shorebirds.

The EPBC Act guidance on assessing impacts to migratory shorebirds notes that studies have utilised buffer zones of 165 – 255 m width to reduce construction noise impacts. The EPBC Act guidance also recommends limiting construction activities during the period between October and March when many migratory shorebirds are present within Australia.

[27] EPBC Act Policy Statement 3.21- Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species. Department of Energy and Environment, 2017.

[28] Technical Guidance for Assessment and Mitigation of the Effects of Traffic Noise and Road Construction Noise on Birds. California Department of Transportation, 2016.

[29] The predicted noise levels presented by Marinus Link could not be converted to dB(A), as the Frequency (Hz) at these locations is unknown.

Given that HDD will be utilised, and the construction timing restrictions and predicted construction noise levels, I support the IAC's conclusion that the EPRs are sufficient to address risks to shorebirds from noise and vibration. I consider the 100 m buffer in EC02 is appropriate to address potential noise effects on shorebird species, which is complimented by MERU10.

Habitat connectivity and movement

The IAC and this assessment refer to habitat essential for faunal movement as biolinks. Biolinks, and particularly the Strzelecki-Alpine Biolink, are discussed within the Land Use and Planning section (section 17.3) of the IAC report and within Section 5.9 of this assessment. Here, biolinks are discussed in the context of potential impacts to threatened faunal species.

The context for this section relates to potential impacts of the project to Koala and ground-dwelling fauna. The ability for fauna to move across a landscape and within an individual's population range is essential for the survivorship of a species and a population. The EES was required to assess potential impacts on habitat connectivity for listed or other protected species, as it's of particular concern due to the linear span of the project, crossing multiple regions.

Staging of works and rehabilitation

The proponent proposes to remove all native vegetation required for the project during stage 1. Rehabilitation works would be implemented following stage 1.[30]

The Terrestrial Ecology Supplementary technical report[31] noted that EPR EC01 is not expected to be relevant to stage 2 because no change in the AoD is expected. The biodiversity management plan (EPR EC02) will be relevant in both stages, and should be reviewed and revised, if necessary, prior to stage 2 to ensure priority habitats are identified prior to commencement of works and protected during construction.

The report[32] notes that there will be key construction areas identified for re-disturbance between stage 1 and stage 2, with '*temporary reinstatement works*' between stages. It is understood that the key construction areas for re-disturbance at stage 2 would be around joint pits. At this stage of the project, it is understandable that this detail may not be available, although ascertaining the practicality of vegetation removal within stage 1 and across stages is essential in the understanding potential effects to ecological values. It is likely that a staged, sectioned approach to removal within stage 1 will be required over the 5-years of construction. Fauna will continue to move across the landscape within the AoD during construction and operation.

The supplementary technical report did not provide a discussion on how potential regrowth of native vegetation, threatened flora species or communities would be managed across this extended timeframe. I note from the EES that rehabilitation of replanted vegetation will be monitored as part of regular easement inspections and in accordance with a rehabilitation strategy (EPR A04). Rehabilitation requirements would be agreed with landholders in property management plans (EPR A02). Noting that rehabilitation is commencing after stage 1, with finalisation of rehabilitation after stage 2, there is potential capacity for recolonisation of threatened species around pits required for stage 2 and across required access areas to these pits.

Technical Appendix V and the supplementary technical report do not discuss the issue of potential return and movement of faunal species across and within the final AoD during construction and between stage 1 and 2. To address this gap, the project should continue to work through avoidance and minimisations processes to inform final detailed design and construction methodology that mitigate risk to faunal species.

[30] Tabled document D45q

[31] Tabled document D45q

[32] Tabled document D45q

The terrestrial ecology EPRs remain applicable to stage 2 including avoiding and minimising further impacts following rehabilitation works, and potential regrowth of native vegetation and habitat. To address this, I recommend that EPR EC01A is amended to clarify applicability to all stages of the project, inclusive of operation, and in reference to stage 2 require:

– Site inspections of areas proposed to be disturbed at stage 2, such as joint pits, should be undertaken prior to any native vegetation and fauna habitat clearing, given any restoration or natural recolonisation following completion of stage 1.

I recommend that EPR EC02 requires the following:

– The BMP, required via EPR EC02, should include requirements for revegetation and this should also encompass contribution to habitat connectivity and biolinks.
– The BMP be prepared in consultation with DEECA - it is anticipated that DEECA may be able to advise on revegetation and its contribution to habitat connectivity and biolinks.
– Temporary reinstatement works and rehabilitation should consider fauna entry into the AoD and movement across it during stage 1 and stage 2 and during operation. Fencing utilised should be fauna-friendly, enabling Koala and other threatened species to maintain habitat connectivity.
– EPRs EC02 and A04 should be cross-referenced, with the rehabilitation strategy (EPR A04) to include consideration to opportunities for planting native vegetation and its contribution to habitat connectivity and biolinks.

There is the opportunity for existing vegetation to remain present within the easement, including trees and deep-rooted vegetation where HDD is occurring. I recommend this opportunity is recognised in the BMP, along with a statement supporting the maintenance of biolinks, including the reinstatement of trees where applicable at biolinks and priority habitats with species that match the existing EVC.

Koala

The EES described the distribution and regional significance of Koala in Gippsland but did not assess the potential impact of the project on the species. Mr Garden noted that assessment did not occur due to the species' lack of conservation listing but provided an additional assessment[33] in response to submitters concerns. The submission utilised the native vegetation assessment, stating the post-mitigation direct impacts to Koala within the Strezlecki Ranges is a loss of 1.87 ha of suitable habitat and 14 large trees. Indirect impacts to Koala were stated as 0.41 ha and 9 large trees. Submission 32 stated that a range of vegetation was not considered suitable habitat due its highly fragmented nature. Impacts to Koala habitat was also identified in the Tarwin Valley section of the project, inclusive of 0.21 ha of habitat loss.

Figure 5 of Technical Appendix V shows the locations of individual Koalas observed during the assessment, which were primarily within the Strzelecki Ranges and along the Great Southern Rail Trail.

At the hearing, the proponent concluded that based on the post-mitigation impacts to habitat, the project was not likely to lead to a long-term reduction in the size of the Strzelecki Ranges Koala population, nor reduce the area of occupancy of the population.[34]

Key concerns for submitters on Koala were habitat fragmentation and a lack of consideration of cumulative effects. Submitters raised the importance of the Strzelecki-Alpine Biolink within Gippsland for fauna species, including Koala. HVP submitted that biolinks suitable for Koala within their landholdings were being impacted

[33] Submission S32

[34] Tabled document D140b

by the project. The IAC noted that DEECA was satisfied that a significant impact was unlikely, but considered Koala could be locally affected.

The IAC considered the following factors as important in the assessment of Koala:

- as part of the Victorian Koala Management Strategy, DEECA is studying the significance of the unique Strzelecki/South Gippsland Koala genome;
- the Strzelecki-Alpine Biolink is delineated within the Latrobe Planning Scheme; and
- presence of habitat throughout the project study area.

The IAC determined that assessment for Koala should not be dependent on the species conservation listing status, recommending updates to ERP EC01A to ensure koala habitat and forestry property biolinks, as well as trees, are included in additional survey.

Whilst the estimated habitat loss for Koala indicates that the project's effects on Koala are not likely to be significant, the regionality of the species and the importance of connectivity for the species requires a clear understating of where the species' priority habitat is with respect to the project. The identified key areas for the species; Great Southern Rail Trail (KP 21.7 to KP 28.6) and Strzelecki Ranges (KP 61.4 and KP 73.1), should be included in a Koala specific examination of habitat and connectivity, prior to construction. This aligns with the IAC's recommended amendment for EPR EC01A, i.e. additional survey to occur for areas of potential Koala habitat that may be impacted by the project, including those identified by HVP.

Scattered trees are an important resource for Koala for foraging and landscape movement. As such, further examination of how Koala impacts are minimised to inform detailed design, should consider impacts to habitat connectivity due to tree loss in the landscape. Therefore, I recommend that EPR EC01A includes analysis of habitat connectivity for the species, to help inform detailed design and that EC01B names Koala in relation to the identification of priority habitat.

Ground-dwelling fauna

Technical Appendix V highlights uncertainty in potential effects to ground-dwelling fauna as it is predicted that suitable habitat is mostly present within unsurveyed areas. The assessment stated, '*Areas of potential habitat within the survey area for these species have not been assessed on-ground due to land access constraints*.' Despite this, for all species assigned under the ground-dwelling fauna group, Technical Appendix V determined that 0.28 ha of priority habitat would be impacted following the implementation of mitigation measures. At the hearing, Mr Garden stated that there was limited habitat in the study area for Swamp Skink (EPBC Act Endangered, FFG Act endangered) and Glossy Grass Skink (FFG Act endangered) and the likelihood of a significant impact on these species at final detailed design was low.

DEECA[35] was concerned about impacts to ground-dwelling fauna, particularly for threatened skink species. DEECA proposed micrositing as a mechanism to reduce impacts to threatened fauna, including those that are ground-dwelling.

The IAC recognised the issue of unsurveyed areas for ground-dwelling fauna. The IAC recommended EC01A name the requirement of further assessment for the ground-dwelling fauna functional group.

Ground-dwelling species, such as *Swamp Antechinus* (EPBC Act Vulnerable, FFG Act vulnerable) or skinks, have smaller home-ranges and are known to have quite specific habitat requirements. Being small, the species in this group cannot easily move across distances void of vegetation, such as through the easement and cannot easily relocate themselves to suitable habitat when disturbance occurs. For example, Swamp

[35] Submission S21

Skink have a home range of about 10 metres from their burrow, and juveniles disperse up to 200 metres[36]. *Swamp Antechinus* and *White-footed Dunnart* (FFG Act vulnerable) are also highly susceptible to disturbance, with Swamp Antechinus populations known to collapse following a disturbance event, such as habitat fragmentation[37]. The species included within this functional group also have very specific and different habitat requirements. It is therefore unclear as to how all could have the same extents of mapped suitable habitat at this stage. Through application of a precautionary approach to the ground-dwelling fauna assessment and the implementation of EPR EC01A and ECO1B, I am satisfied that the 0.28 ha determination of effects is currently the maximum loss extent proposed for each ground-dwelling species. It is understood that final impact will be less than 0.28 ha, and the project will need to work to reduce this. However, given the sensitivities of these species, any habitat loss, particularly if resulting in fragmentation, has the potential to be significant.

I support the IAC's amendment to EPR EC01A, to require further survey to inform detailed design for ground-dwelling fauna to further avoid and minimise impacts. I also note that during stage 2, placement of any required construction laydown and heavy vehicle access and parking requirements, should be located outside of any ground-dwelling fauna habitat. I support the IAC's conclusion that the changes to EPR EC01 A-B ensure the avoidance and mitigation process will be implemented.

Freshwater ecology

Examination of the significance and acceptability of the project's effects on freshwater ecology and associated biodiversity values relies on an understanding of interrelated assessments, across surface water (Section 5.7), ground water (Section 5.8), geomorphology (Section 5.5) and terrestrial ecology (Technical Appendix V). Relevant sections of the IAC report include section 11.4 (Waterway stability) and 9.7 (Impacts on aquatic habitat and biota). This section addresses how the issues identified throughout these associated disciplines, influence potential impacts. At the hearing, the proponent also acknowledged the interrelationship between ecology, waterways and surface water studies.

DEECA, HVP and other submitters raised concerns about the assessments of potential effects to freshwater ecological values. DEECA[38] recommended amendment to EPR EC03 to require aquatic surveys to be conducted prior to construction to inform detailed design and construction methodologies, if waterways cannot be avoided through HDD or project alignment changes. DEECA also requested amendment to EC03 to state the need for a permit to take protected fish species under the FFG Act, if potential temporary damming or works on waterways occurred. This stemmed from their concerns around trenched waterway crossings, including a lack of consideration of how reinstatement works may affect threatened species. HVP requested that waterways on their land be crossed via trenchless methods.

One submission put forward that the project presented unacceptable impacts to Little Morwell River and an associated nearby wetland system near Pleasant Valley Road, which supported threatened species, such as Platypus (FFG Act vulnerable) and Narracan Burrowing Crayfish (FFG Act endangered). Little Morwell River is a good example of the need for an integrated understanding to finalise avoidance and mitigation that sufficiently reduces overall impacts to ecological values. Section 11.2 of the IAC report summarises some notable unmitigated impacts associated with the slope instability of the Little Morwell River valley and

[36] Robertson P. (1980) Alcoa Portland Aluminium Smelter Environmental Studies Report No.1 Mourning Skink Survey. Report by Kinhill Planners Pty Ltd, for Department of Natural Resources & Environment, Victoria.

[37] Wilson, B. A. A., J. G (2006). Effects of landscape, habitat and fire and the distribution of the white-footed dunnart *Sminthopsis leucopus* (Marsupialia: Dasyuridae) in the Eastern Otways, Victoria. Australian Mammalogy (28): 27-38.

[38] Tabled document D126

recorded lateral migration of the river and as such, HDD constructability risks, including the potential for HDD to push through unknown sink holes or perched aquifers.

Technical Appendix Q assumed 15 waterways would be crossed via HDD, inclusive of 7 of the 8 major waterways (Little Morwell River was proposed to be crossed by trenching). Existing and continuing geomorphic processes at the major 8 waterways were highlighted by the proponent as a project risk (S139 – part c). Technical Appendix Q noted that the major waterways, apart from Morwell River, were currently migrating laterally. The assessment also noted risks to sedimentation loading and waterway instability following permanent waterway changes due to trenched crossings. Technical Appendix O gave Little Morwell River an unmitigated significance of impact rating of major and a rating of moderate post-mitigation (IAC report, section 11.3, Table 7). Technical Appendix V noted that Little Morwell River provided important aquatic and riparian habitat for '*birds, fish, crustaceans and amphibians*,' including the potential to support Growling Grass Frog (EPBC Act Vulnerable, FFG Act vulnerable). The proponent advised during the hearing that Little Morwell River was now to be crossed using HDD rather than trenched. [39]

Technical Appendix V deferred to the surface water technical assessment for an impact determination on waterways and primarily relied on the options of trenched vs trenchless construction at waterways to determine the extent of impact to aquatic and semi-aquatic threatened species. Uncertainties related to ground conditions are addressed via the geomorphology and geology EPRs (refer Section 5.6). Technical Appendix V did not consider the implication of these constructability issues for aquatic biota. The proponent also submitted at the hearing that although the crossing of Little Morwell River is now stated as trenchless, this is subject to the outcomes of further geotechnical assessment.

The native vegetation section of this assessment and the IAC report (Section 9.7) summarise uncertainties in the extent of impact due to unsurveyed areas and constructability risks, that are also applicable to this assessment of freshwater ecological values.

Additional issues in relation to freshwater ecology include uncertainties around water quality changes in relation to threatened species, limited assessment of riparian vegetation as connectivity pathways, as well as feasibility of HDD and related uncertainty of worse case scenarios for impact assessment on threatened species in the event that trenchless construction may not be possible.

Staging of works

The proponent's supplementary technical report for Appendix V indicated the revised timing of stage 2 would not result in any further impacts to threatened aquatic fauna or River Swamp Wallaby grass. However, the supplementary technical report for geomorphology and geology raised the potential for changes to ground conditions between stages 1 and 2. While this could influence freshwater ecology matters, I am satisfied that my recommendations for minor amendment to the geomorphology and geology EPRs appropriately addresses this risk.

Waterway crossing methods

The proponent proposed during the hearing that waterway constructability risk, was able to be '*designed-out*'. The proponent cited the Bass Link project as an example of how this process of 'designing-out' mitigated similar risks and provided an in-project example for Fish Creek. Due to erosion migration at Fish Creek design mitigation has been incorporated, with HDD confirmed to be at a depth of 6-8 metres, rather than 10 m for all other waterways, as described in the project description. The proponent determined that this design change would result in a reduced impact to Fish Creek.

[39] Tabled document 110

The proponent will utilise trenchless construction techniques at some waterways. The exhibited EPR EC03 listed the seven major waterways for which it was required that the project '*avoid and minimise impacts to aquatic habitat, through adopting preference for trenchless construction or project alignment changes where reasonably practicable*. Little Morwell River was subsequently added to this list in the Day 1 EPRs[40].

Technical Appendix V had assumed 13 of the 22 waterways that support or potentially support sensitive ecological values, would be crossed using trenchless methods. The IAC recommended the inclusion of five additional waterways that were considered to host ecological values to this list at EC03, following confirmation at the hearing by Mr Garden that 13 waterways would have trenchless crossings. This includes the following waterways:

- Amber Creek
- Ten Mile Creek
- Eel Hole Creek
- Tributary of Berrys Creek in the vicinity of KP54.8
- the unnamed waterway in the vicinity of KP 2.9.

I support the IAC's recommendation to add these five waterways listed above to EPR EC03, consistent with the proponent's information that trenchless construction has been confirmed for these waterways. I note that GM09 also lists the eight major waterways proposed to be crossed using trenchless methods. I recommend that GM09 is also expanded to match this amended list.

In addition, the IAC recommended amendment to EPR ECO3 to require that trenchless construction methods be preferred for any crossing of a waterway that provides potential habitat for threatened species. I support this addition consistent with Mr Garden's evidence presented during the hearing.[41]

Definition of waterways

The IAC identified inconsistency between the definition of major versus minor waterways, particularly between Technical Appendix V and Q. Technical Appendix Q identified waterways that are designated under the Water Act. The majority of the EES documentation takes the definition of waterways from Technical Appendix Q. The IAC's recommendations and my findings in relation to a consistent waterway referencing system for the project is discussed further in Section 5.6 Linkage across the EPRs, between surface water, geology and geomorphology and terrestrial ecology, and particularly across EC03, GM09, SW01 and EC01 presented in the Day 2 EPRs, is a key factor in ensuring risks and uncertainties are sufficiently addressed. There needs to be an integrated approach to further avoidance and minimisation of impacts for the project. A consistent framework for referencing waterways will be important in achieving this integrated approach.

Assessment for waterways proposed to be trenched

As noted by the IAC and DEECA, outside of threatened species assessments, Technical Appendix V did not examine freshwater ecological values in detail, including for threatened aquatic or semi-aquatic species. The further assessment in S32 provided a general overview of the potential ecological value of 'important' major and minor waterways in the context of supporting or not supporting aquatic values. However, it did not specifically identify habitat suitability for aquatic or semi-aquatic threatened species, including wetland and migratory wetland birds. Technical Appendix V did list some important waterways or areas that supported suitable habitat for threatened species, applying broad habitat suitability categories such as breeding or

[40] Tabled document 65

[41] Submission 32

foraging. S32 also noted that trenchless construction was the preferred construction method for all waterways supporting habitat.

The EES concluded there is a low post-mitigation significance of impact to the aquatic fauna functional group, based on the implementation of trenchless construction at major waterways. It determined a moderate post-mitigation significance to the FFG Act and EPBC Act threatened River Swamp Wallaby-grass. For the functional group, waterbirds and waders, the assessment noted that wetland habitat impacts had largely been avoided and concluded a post-mitigation significance of impact of low. Disturbance from noise and light pollution was identified as a key, potential residual impact.

This EES' conclusions rely heavily on HDD be used in areas of high sensitivity and on EPR EC02, which notes that a 100m work restriction buffer will be in place to reduce potential noise and lighting pollution adjacent to priority habitats. While the designation of all priority habitats is yet to be finalised, more work will be undertaken to update key project mapping, including Figure 5 and 6, to support meeting of EPRs.

Given the proponent commitment to HDD for Little Morwell River, and that the associated wetland will be further examined prior to construction (covered at EC01 and EC01A – 1C), I consider the impacts to Little Morwell River, associated wetlands and threatened species to be manageable and of low significance.

The EES considered there to be no suitable habitat for Australian Grayling and Dwarf Galaxias (EPBC Act Vulnerable, FFG Act endangered) to be impacted within the Study area, due to HDD being adopted. Dwarf Galaxias are known to persist in Central Gippsland and can reside in somewhat disturbed but isolated catchments, with habitat consisting of a series of small but connected pools[42]. Therefore, there is potential for the species to occur in some of the smaller waterways in the study area.

The EES provided a limited assessment of the impacts to riparian zones and waterway embankments, which can be critical habitat areas for some threatened aquatic and semi-aquatic species, such as Platypus and crayfish. Technical Appendix V details the undertaking of targeted Crayfish surveys. However, not all potential habitat areas were surveyed due to access constraints and the size of the alignment. So, the EES took a precautionary approach to assessing species presence. Mr Garden considered that trenching could impact riparian vegetation but would not consider this to infer a significant impact for aquatic ecosystems. Main concerns for both Platypus and Narracan Burrowing Crayfish had been related to Little Morwell River, however, impacts to these species are now proposed to be avoided via the use of a trenchless crossing.

Where threatened species persist, the blockage of a waterway, removal of habitat via trenching or embankment disturbance should be avoided, owing to risks to species such as Growling Grass Frog (addressed below) during the breeding season, Platypus and crayfish. To address residual risks to aquatic and semi-aquatic species, the IAC proposed amendments to EPRs EC03 and EC01 and EC01A - C. This, combined with EPRs SW01 (surface water management plan) and GM09 (waterway crossing plan), provide reassurance that impacts to freshwater aquatic values will be addressed and minimised to acceptable levels.

The IAC recommended amendment to EPR EC03 to require that for each waterway proposed to be trenched, a suitably qualified aquatic ecologist undertake a "high level assessment" that: documents the existing aquatic and riparian habitat and determines whether the waterway provides potential habitat for threatened species. If the assessment finds potential habitat for threatened species, a suitably qualified aquatic ecologist is to conduct field surveys to inform design and construction methods. I support the IAC's recommended amendment to EPR EC03 and I note that further understanding the presence of habitat for threatened species is essential for informing final construction methods for crossings. I recommend removing reference to

[42] National Recovery Plan for the Dwarf Galaxias *Galaxiella pusilla*. Department of Sustainability and Environment, 2010.

'high level' to describe what the ecologist needs to undertake in ECO3, as the further examination of potential habitat for threatened species needs to be sufficiently detailed.

The proponent described the proposed approach as follows:[43]

- Impacts on waterways supporting sensitive values would be avoided by trenchless construction.
- Waterways that are proposed to be trenched will be surveyed prior to construction, to inform detailed design and control measures.
- Where a risk remains to sensitive aquatic values, alternative approaches or controls will be considered, including trenchless construction, in accordance with EPR EC03.
- If subsequent inspections show sensitive values are present or if trenching at existing crossing points is found to be unfeasible, alternative treatments would be considered in accordance with EPR EC03.

I consider the proponent's approach outlined above to be an acceptable way of addressing the potential risks around HDD feasibility, and I note this approach has also been captured within the EPRs. I recommend the following additions to the EPRs:

- Map Book (appendix 6) be updated, following further surveys and finalisation of construction methodologies, to explicitly identify trenchless waterway crossings, naming the waterways and including the KP system.
- EPR EC03 be applied to stage 1, stage 2 and operation.
- EPR SW01 states that '„measures for revegetation and reinstatement of the beds, and banks and riparian zone of waterways…'
- EPR GM09's list of waterways matches that at EC03.

With the adoption of my recommendations, I am satisfied that impacts to aquatic ecology and associated biodiversity values can be appropriately avoided and minimised to acceptable levels.

Growling Grass Frog

The EES identified 0.43 ha of breeding and foraging habitat for Growling Grass Frog within the survey area and determined that none of this habitat would be removed post the application of mitigation measures. The species was included in the functional group 'aquatic species' and was given a post-mitigation significance of impact rating of low in the EES.

Given land access constraints, DEECA and other submitters raised concerns about the impact assessment for this species - not all potential habitat locations in the survey area were included in the EES surveys. Targeted surveys for the EES did not detect the species, although the EES noted previous surveys at Delburn Wind Farm confirmed the presence of the species around KP 67 (with 20-30 individuals observed) and had determined this was likely a key area of population connectivity for the species.

Most of the locations of potential habitat are designated for HDD, however, the waterway at KP 67, and nearby KP 66.7, is proposed to be trenched. Given the likely size of the population previously detected at this location, it is unclear why this area was not identified as known habitat area for this species.

As noted above, EPR EC03 is intended to mitigate ecological impacts associated with waterway crossings. EC03 states that there are existing, built-up crossing points/tracks where the trenches will be placed and that if the trench cannot remain within the existing crossing point, alternative design and construction approaches will be determined to avoid waterway disturbance. While this approach appears sound to reduce impacts for the species at KP 67, and nearby KP at 66.7, mapping of KP 67 Technical Appendix V (Figures 5.35 and 6.58) indicates there would be a residual loss of native vegetation, including loss of marked priority habitat (Damp

[43] Submission 32

Forest and Wetland 3). Mapping shows the two waterway crossings associated with KP 67, with a wetland also present to the south of the alignment. Part of the more western waterway has not been included as priority habitat to the north of the alignment, despite native vegetation being present. Figure 5.35 also indicates a previous record of Southern Toadlet (FFG Act endangered) at this location.

It is unclear from the EES how the uncertainty associated with determining potential impact on Growling Grass Frog at this location is to be addressed. Given the results of past surveys for the species (for Delburn Wind Farm), and residual loss of native vegetation likely, it seems reasonable to expect an impact to habitat for Growling Grass Frog, and Southern Toadlet.

Populations of Growling Grass Frog are often found where groups of neighbouring, permanent waterbodies are present, which are usually somewhat connected via tributaries or drainage lines, creating a dispersal-matrix throughout the local area.[44] Each cluster of Growling Grass Frog at each waterbody (permanent or ephemeral), make-up a larger grouping of the species, known at Meta-populations. As a pond-breeding species, recruitment is often less successful in ephemeral waterways, when compared to breeding in permanent waterbodies. As such, population persistence is reliant on permanent waterbodies, making movement within populations essential for informing conservation planning and mitigation. For this species, movement pathways are considered key habitat, along with permanent waterbodies (breeding). Technical Appendix V does not explicitly examine the potential for the 82 waterways in the study area to act as movement pathways for the species and if suitable 'priority' habitat or permanent waterbodies within the species distribution range are nearby. Drainage lines and gullies can act as key breeding dispersal pathways, despite little native vegetation, within a Growling Grass Frog Meta-population.

As highlighted by the IAC, the lack of inclusion of Chytrid fungus (*Batrachochytrium dendrobatidis*) procedures in EC02 should be rectified. DEECA raised this concern, particularly for managing impacts to Growling Grass Frog. Chytrid fungus protocols are not a standard 'pathogen' requirement. Controls require specific washdown procedure of vehicles, as well as humans when interacting with waterways and waterbodies as detailed within DCCEEW's *Hygiene protocols for the control of diseases in Australian frogs*.[45] Technical Appendix V recommended the inclusion of Chytrid fungus controls although it had not been included in the EPRs. I support the IAC's recommendation to include Chytrid fungus controls in EC02.

To address the residual uncertainties for Growling Grass Frog, I recommend the following amendment to EPRs, to ensure impact to this species is minimised to an acceptable level:

- Field survey for Growling Grass Frog occurs in areas where habitat suitability is currently uncertain, including at KP 67 and KP 66.7.
- Identify area of potential habitat areas or areas that are critical for maintaining habitat connectivity for the species to inform finalisation of the waterways crossing design, reinstatement plans and management measures for Growling Grass Frog in consultation with DEECA and West Gippsland CMA and incorporate measures into the SEMP.
- Potential habitat areas or key movement habitat are to be included in EC01A and EC01B, with habitat updated in Figure 5 as required.
- In finalising waterway crossing design, consider construction methods that minimise impacts to wetlands and waterways, such as HDD, to avoid and minimise any identified potential habitat or key movement pathways for Growling Grass Frog.

[44] Hale, J. M., G. W. Heard, K. L. Smith, K. M. Parris, J. J. Austin, M. Kearney and J. Melville (2013). Structure and fragmentation of growling grass frog metapopulations. Conservation Genetics 14(2): 313-322

[45] Murray, K., Skerratt, L., Marantelli, G., Berger, L., Hunter, D., Mahony, M. and Hines, H. Hygiene protocols for the control of diseases in Australian frogs. Department of Sustainability, Environment, Water, Population and Communities, 2011.

– SEMPs required for trenched waterways (EC03) should consider the importance of riparian vegetation for faunal movement and integrate associated species management outcomes with the BMP (EC02).

Considering the above recommendations, and the low likelihood of significant impact to critical breeding habitat (permanent waterbodies), I consider that the project is unlikely to have a significant impact on Growling Grass Frog.

Groundwater dependent ecosystems

The EES identified the potential presence of Groundwater dependent ecosystems (GDEs) across the study area including native vegetation that may be dependent on these systems. Technical Appendix P (Groundwater) identified 12 locations that were moderately likely to support GDEs, including 10 waterways and two adjacent wetlands. Technical Appendix P identified five areas where terrestrial GDEs were present (Appendix 1 – Figure 6). These included vegetation at:

– KP 2.2 to 2.9: Swamp Scrub (EVC 53)
– KP 19.1: Swampy Riparian Woodland (EVC 83)
– KP 22.5 to 28.7: Floodplain Riparian Woodland (EVC 56), EVC 83, Damp Heathy Woodland (EVC 793)
– KP 34.5 to KP 35: Riparian Forest (EVC 18), EVC 83, EVC 53
– KP 40.6: EVC 56, EVC 83.

Technical Appendix P acknowledged that there would be some temporary diversion or blockage of GDEs during construction and some dewatering of GDEs would occur. The proponent's groundwater expert witness, Mr Sweeney, found there was a low residual risk of groundwater dewatering impacts on GDEs and that dewatering would mainly result in groundwater level fluctuations within natural variation ranges. It was also concluded that temporary dewatering was unlikely to have significant impact on surface water levels and flow. I consider that impact to GDEs can be managed through the groundwater EPRs, particularly GW01 and GW06, which necessitate further detailed assessment of GDEs, analysis of their ecological significance and water quality monitoring. As such, I do not recommend additions to the ecology EPRs and note that any offsetting requirements for native vegetation removal associated with GDE loss is covered under EC01C.

Cumulative impacts

Submitters, including Delburn Windfarm, raised project design interface issues that were yet to be addressed. In response, the proponent presented at the hearing that they would continue to work with Delburn Wind Farm and other submitters intersecting Marinus Link, to align design and construction areas. Delburn Wind farm acknowledged they'd been working through partial co-location and co-design with Marinus Link and would expect to have further communications to address project overlap. Submitters, including Latrobe Valley Field Naturalists Club (S15), were also concerned around the potential cumulative effects of the project on threatened EVCs and Koala, naming Delburn Wind Farm and the Strzelecki Highway works as key projects.

The IAC's discussion on native vegetation loss, including cumulative impacts, concluded that further avoidance and minimisation measures through design refinement and construction methodologies were important, highlighting the large tree at the corner of Smiths Road and the Strzelecki Highway as an example to work through with Delburn Wind Farm.

The IAC also commented on cumulative impacts in relation to preparatory works. The IAC stated that due to the extent of cumulative impacts '…of other projects and activities in the near vicinity…' application requirements 4 of the Native Vegetation Guidelines is relevant and information on nearby vegetation proposed or approved to be removed is required to be included in the project's application for preparatory works (see the preparatory works section).

Based on the hearing outcomes, I am satisfied that the concerns raised by submitters will be addressed. Given the size and extent of the project and additional assessment to come, I conclude that the cumulative impacts of the projects are a worse-case scenario, and that loss can be further reduced. I consider that although a

significant cumulative loss for the Strzelecki Ranges, the limited contribution of the Marinus Link project itself is an acceptable impact, with further avoidance and mitigation measures to be applied and with project interface discussions to continue.

Similarly, I conclude cumulative impacts on the regional Koala population can be acceptably managed via EPRs EC01A and EC01B.

Assessment

It is my assessment that:

- The project has appropriately avoided and minimised impacts through project development and design and used a level of conservatism to predict and assess potential impacts (pre and post mitigation).
- The terrestrial ecology EPRs are adequate to sufficiently avoid, mitigate and manage the project's terrestrial ecology effects subject to the recommendations made to EPRs EC01A, EC01B, EC01C, EC02 and EC03.
- The worst-case scenario of the loss of up to 21.25 ha of native vegetation and 184 large trees is significant at a regional scale but acceptable. My finding on this matter is in the context of the length of the project and that through detailed design and application of the EPRs, it is likely that the extent of loss will be reduced considerably, much closer to the residual impact level of 6.75 ha and 51 large trees.
- Potential impacts on the FFG-listed critically endangered Bog Gum are considered significant for this species and unacceptable without appropriate mitigation. Therefore, I recommend the EPRs require the project to demonstrate how unavoidable loss is minimised to the extent possible, such that it is will not have a significant impact on the species, and that sufficient evidence is provided to demonstrate this.
- Potential impacts to all other threatened species and communities and Koala, are also acceptable subject to implementation of the EPRs.
- The EPRs will require further survey to occur in some priority areas, to inform detailed design. Avoidance and minimisation of impacts to priority areas can be achieved through design refinement, micro-siting and the selection of construction methods (i.e. trenchless construction to avoid priority areas).

5.2. Marine ecology

Evaluation objective

Avoid, and where avoidance is not possible, minimise adverse effects on terrestrial, aquatic and marine biodiversity and ecology, including native vegetation, listed threatened species and ecological communities, other protected species and habitat for these species, and to address offset requirements consistent with state policies.

Avoid and, where avoidance is not possible, minimise adverse effects on land and water (including groundwater, surface water, waterway, wetland, and marine) quality, movement and availability).

Assessment context

Marine Ecology effects were discussed in Chapter 2, 3 and 5 of Volume 3, Chapter 10 of Volume 1, as well as Technical Reports A, G and H of the EES, as well as in Chapter 10 and 13 of the IAC report. The proponent has proposed eight EPRs specifically addressing potential effects on marine ecology in Victorian coastal waters. Three EPRs have been the subject of recommendations by the IAC. In addition, the IAC recommended a new EPR to manage impacts during operation of the project.

Supplementary technical reports about implications of revised timing of stage 2 were prepared for Technical Appendix A[46] and Technical Appendix H.[47] Both supplementary technical reports indicated no change to marine ecology effects.

Several potential effects of the project for marine biodiversity values were examined through the EES and IAC process, in particular:

- effects during construction, including
  - loss or degradation of native vegetation and/or habitat for marine biota due to cable-laying construction activity,
  - underwater noise effects to listed fauna species from marine construction vessels and equipment,
  - underwater disturbance effects to marine biota from changes in water quality and introduction of invasive species, contaminants and pollutants, and
  - effects from marine construction vessels at the water surface, such as light emissions and vessel strikes; and
- effects during operation, including
  - potential underwater disturbance effects from electromagnetic (EM) and thermal fields emitted from operating undersea cables, and
  - potential underwater disturbance effects during inspection, maintenance and repair activities.

The EES proposed management measures (such as EPRs MERU02 and MERU03) to avoid and minimise impacts to rock and reef outcrops with higher biological productivity. Aside from grapnel run and jet trenching disturbance to marine flora habitat throughout the sandy seabed, most effects from construction activity will stem from the construction footprint overlapping with areas of significant marine habitat for threatened fauna species in the water column above the sea floor.

The EES indicated that the pace of cable-laying from HDD exit holes would be between 400 and 800 metres per hour. Given this fast pace, construction effects on marine fauna are expected to be transient and temporary in nature. The potential effects of construction activity overlapping habitat of listed species of particular concern is examined further below.

Table 3 sets out the protected FFG-listed flora and fauna marine species likely to occur within the survey area and the nature of the species' habitat intersected by the project.

Table 3: FFG-listed flora and fauna marine species habitat type likely to occur within the survey area.

Species	FFG-listing	Habitat type intersected
Tasman grass-wrack	Endangered	Extends 4 kilometre west and 8 kilometre east of the project alignment covering an area of 11 square kilometres, predominantly at a depth of 10 – 15 metres.
Southern Right whale	Endangered	Migration or resting on migration Biological Important Area[48], throughout Victorian coastal waters

[46] Tabled document 45b

[47] Tabled document 45e

[48] A Biologically Important Area is an area used by protected marine species for carrying out critical life functions.

Species	FFG-listing	Habitat type intersected
Humpback whale	Endangered	Migration
Leatherback turtle	Critical	Foraging
White shark	Endangered	Foraging Biological Important Area, surrounding Wilson's Promontory and Kanowna Island. Low-density distribution Biological Important Area, in Victorian coastal waters between Wilson's Promontory and Phillip Island.

In addition to the marine species listed above, the EES also identified 20 FFG-listed bird species likely to occur in Victorian coastal waters of relevance to the project. The EES appropriately identified nationally and internationally significant habitats for marine bird species known to inhabit or directly rely upon the nearshore marine habitats of Waratah Bay and concluded that impacts to them would be avoided due to HDD underneath the Waratah Bay shore crossing.

The EES did not identify any threatened marine invertebrates in Victorian coastal waters.

Discussion

Construction impacts

The EES identified that threatened cetaceans, pinnipeds, marine invertebrates, bird, fish and turtle species could be impacted by underwater construction noise, vessel strikes, artificial lighting, physical disturbance to the seabed, and introduction of invasive species. The potential effects of construction on all these species are examined collectively in the following sections.

Seabed disturbance

The EES identified 18 square metres of habitat that would be impacted by HDD exit holes and 3,100 square metres of habitat impacted from the combination of grapnel run, and cable trenching and burial.

Technical constraints limit the distance offshore that HDD can reach from drill pads. Siting the HDD drill pad behind the coastal dunes to avoid the sensitive shore and dune system therefore determines the depth of the HDD exit hole and its distance from the shoreline. The EES concluded it was not possible to completely avoid effects to Tasman grass-wrack seagrass habitat occurring within a 10 to 15 metre water depth given these technical constraints. The IAC accepted Mr Balloch's advice that avoidance of impacts to seagrass habitat was not possible because it occurs continuously across a specific water depth zone in Waratah Bay. I support the IAC's view that complete avoidance of construction effects is not possible due to the limited distance HDD could reach offshore from the HDD drill pad.

Seagrass is captured within the definition of native vegetation in Victorian planning schemes as a grass indigenous to Victoria and this was confirmed in the Department of Energy, Environment and Climate Action's (DEECA) submission to the IAC. Therefore, the Native Vegetation Guidelines is the policy to be considered in decision making for the removal of this native vegetation under relevant approvals via FFG Act permit and MAC Act consent processes, including the Native Vegetation Guidelines' three-step approach (i.e. avoid, minimise, offset).

DEECA proposed an amendment to EPR MERU02 to require the final subsea project alignment to be located "*in areas of sparse cover of seagrass*". The proponent responded to DEECA's submission that this would unnecessarily constrain the location of subsea alignment. The potential effect on the Tasman grass-wrack habitat is not predicted to be significant (being 0.028 per cent of the total 11 square kilometres). In addition,

expert advice was that the species would likely re-colonise the impacted seafloor following a relatively short period of disturbance during construction.

The IAC agreed in principle with DEECA's submission, but preferred wording requiring avoidance of areas with moderate or dense cover of seagrass, to be consistent with the three-step approach of the Native Vegetation Guidelines.

I consider that given the limited magnitude and likely temporary nature of the potential effects to Tasman grass-wrack, additional mitigation via an amended EPR is not warranted in this circumstance. DEECA will have the authority to require all reasonable steps to be explored to avoid the impacts of the proposal on the Tasman grass-wrack habitat through the proponent's applications for approval under the FFG Act and MAC Act. In considering the wording of EPR MERU02 and the relevant policy guidance, the emphasis of the EPR should be on avoidance and minimisation of benthic habitat impacts when determining the final subsea project alignment. I have recommended redrafting EPR MERU02 with this focus.

As noted in the EES, 0.028 per cent of Tasman grass-wrack habitat affected by construction activity in Waratah Bay represents a very small portion of the total area of Tasman grass-wrack seagrass habitat extending east and west of Waratah Bay. Tasman grass-wrack are well adapted to the high-energy hydrodynamic environment of nearshore Waratah Bay and likely to recover rapidly following construction. I support DEECA's view that predicted impacts across 3,000 square metres of Tasman grass-wrack seagrass habitat would not result in the long-term reduction in the extent of occurrence of the species within Waratah Bay and that significant effects on Tasman grass-wrack are unlikely. I therefore consider construction effects of the project on Tasman grass-wrack in Victorian coastal waters would be acceptable, subject to compensation applied through the FFG Act permit or MAC Act consent processes.

Under the Native Vegetation Guidelines, biodiversity loss from the removal of native vegetation is required to be offset. However, the South Gippsland Planning Scheme does not extend beyond the shoreline of Waratah Bay and, therefore, it is not clear how offsetting under the Native Vegetation Guidelines would be achieved. The provision of offsets for a marine flora species that is solely located on Crown land is novel and so I support the view of the IAC that the appropriate mechanism for requiring compensation for impacts on this marine flora species should be through approvals from DEECA under the FFG Act or MAC Act.

As only two marine ecology EPRs relate to operation impacts (EPRs MERU 10 and MERU11), the IAC recommended an additional mitigation measure (EPR MERU14) that requires avoidance and minimisation of effects to seagrass from inspection, maintenance and repair activities during operation. I support the IAC's recommendation for EPR MERU14 to require effects on seagrass to be avoided and minimised where practicable. I am satisfied that operation of the project would be unlikely to have significant effects to Tasman grass-wrack and EPR MERU14 is appropriate for any minor disruptive effects to be appropriately avoided and compensated for throughout any required inspection, maintenance and repair activities over the life of the project.

Noise

The EES identified that underwater noise impacts will be most significant in nearshore areas of Waratah Bay where cable pulling by the cable-laying vessel would require operating in a dynamic positioning control mode. Underwater noise impacts above HDD exit holes where cable pulling is proposed would occur at approximately 15 metres water depth, with impacts expected to last 10 days. The worst-case scenario for underwater noise emissions is 185 decibels of sound pressure relative to a reference pressure of 1 microPascal measured at a distance of 1 metre from the sound source, in circumstances where the cable-laying vessel maintains its position using thrusters for dynamic positioning.

Underwater construction noise from routine cable-laying along the sea floor and from cable-laying vessel thrusters would be continuous in sound volume and the source would be mobile as the cable-laying vessel progressively lays the cables along the seafloor of Bass Strait between Victoria and Tasmania.

Potential impacts to marine fauna from underwater noise generated during construction include permanent threshold shift injury or hearing loss, temporary threshold shift hearing loss, behavioural disturbance, and auditory masking. These are discussed below for potentially impacted species.

Permanent threshold shift injury or hearing loss

High frequency cetaceans such as Dusky Dolphin, Pygmy Sperm and Pygmy Right Whale, possess biosonar capabilities involving high frequency impulsive clicks to feed and navigate. High frequency cetaceans are the only marine fauna at risk of auditory damage in the form of a permanent and irreversible injury or hearing loss (known as permanent threshold shift). The EES does not identify any FFG-listed high frequency cetacean species likely to occur in Victorian coastal waters, and this was not challenged by submitters.

I support the findings of the EES that only when the cable-laying vessel is laying cable in a dynamic positioning mode would it result in noise levels exceeding thresholds where permanent threshold shift could occur for high frequency cetaceans, and all other marine fauna would not be at risk of permanent threshold shift effects.

The IAC considered risk of permanent threshold shift to high frequency cetaceans impacts was not appropriately incorporated into the EPR MERU08, and recommended that requirements of the cetacean interaction management plan should include powering down of dynamic positioning thrusters when EPBC migratory listed Pygmy Right Whale and non-listed Pygmy Sperm Whale are detected within a distance of the vessel where noise levels exceed the onset of permanent threshold shift. Although I consider that Pygmy Right Whale and Pygmy Sperm Whale are highly unlikely to forage in the shallow Victorian coastal waters of Waratah Bay due to their preference for deeper water over the edge of the Bass Strait continental shelf, I support this recommendation as a precautionary measure.

Temporary threshold shift

The EES identified that all (that is, low, mid and high frequency) cetaceans and one FFG-listed non-cetacean species (Australian Sea Lion) have the potential for temporary threshold shift (or temporary hearing loss) should they encounter and remain near the noise being emitted from the cable-laying vessel operating in a dynamic positioning mode.

The IAC recommended that EPR MERU08 be amended to include background underwater noise in defining separation distances from cable-laying vessels to cetaceans. I consider the persistent underwater noise associated with cable construction would result in a very unlikely circumstance where cetaceans would persist at the temporary threshold shift onset radiuses for longer than an hour when they possess the ability to avoid construction noise in other areas of Bass Straight. As EPR MERU08 requires the cetacean interaction management plan to be developed in accordance with the *Wildlife (Marine Mammals) Regulations 2019*, which prescribe minimum distances of construction vessels from cetaceans and pinnipeds, I consider the IAC's recommendation to be an unnecessary duplication and, therefore, I do not support it.

I accept the conclusion of the EES that there is only a remote possibility Australian Sea Lion would encounter the cable-laying vessel operating in a dynamic positioning mode at a significant distance from known sightings of the species. I am satisfied that any temporary threshold shift hearing loss effects to marine fauna associated with underwater construction would be unlikely, reversible, and acceptable if managed in accordance with the day 2 EPRs and my assessment. For example, EPR MERU07 requires the marine fauna management plan to be developed in accordance with the wildlife (marine mammals) regulations, recovery plan for the White Shark (DSEWPaC 2013a), and recovery plan for the Australian Sea Lion (DSEWPaC 2013b).

Behavioural disturbance

The EES identified that underwater noise emitted from underwater construction activities would have the potential to cause lower and upper threshold behavioural disturbance to all marine fauna, which includes alterations in swimming speeds, disruption to foraging, and area avoidance. Several submitters raised

concern underwater noise emissions would result in behavioural disturbance and interruption of foraging by marine fauna.

The IAC accepted that underwater noise effects from construction vessels and equipment would have minor impacts to marine fauna. To further avoid and minimise temporary threshold shift and behavioural effects from underwater noise to marine fauna, the IAC recommended that EPR MERU07 be amended to ensure that underwater noise emissions do not exceed worst-case scenario of the cable lay ship operating in dynamic positioning mode (i.e. 185 decibels relative to reference pressure of 1 microPascal at 1 metre from source). Based on the maximum noise source used in underwater noise modelling to evaluate underwater noise impacts to marine fauna, I agree with the IAC's findings that construction vessels and equipment will have minor underwater noise effects on marine fauna. Although I generally do not consider it appropriate to include a limit in the EPRs that essentially allows a proponent to pollute up to that limit, in this circumstance I agree with the IAC that a cable-laying vessel should not be used by the proponent if it could emit underwater noise in excess of 185 decibels relative to reference pressure of 1 microPascal at 1 metre from source. I therefore support the IAC's recommendation for EPR MERU07 to require underwater noise not to exceed 185 decibels relative to reference pressure of 1 microPascal at 1 metre from source to the extent reasonably practicable.

Considering the close proximity to cable ship thrusters operating in a dynamic positioning mode needed for marine fauna to experience upper threshold behavioural disturbance, I am generally satisfied that the development of marine fauna management plan, cetacean interaction management plan, and Sea Turtle interaction management plans are appropriate for any effects to marine fauna behaviour to be appropriately avoided and minimised. I am satisfied that any behavioural disturbance effects to marine fauna from underwater noise would be acceptable, subject to the requirements of EPRs MERU07, MERU08 and MERU09 that ensure construction vessels monitor, maintain separation distances, and power down construction equipment during any encounters with marine fauna.

I am satisfied effects to marine birds associated with terrestrial construction activities (such as from HDD drill pads) would be acceptable if managed in accordance with EPR EC02. In particular, work restrictions during sensitive life-stages (e.g. breeding and nesting) will serve to appropriately avoid and minimise potential effects on marine bird survival in coastal dune habitat.

Auditory masking

The EES found that underwater noise generated by the cable-laying vessel overlaps with the hearing frequency range of low frequency cetaceans, such as Humpback Whales and Southern Right Whales.

The EES concluded the risk of auditory, acoustic and communication masking effects is low for cetaceans. I accept the EES findings that migratory low frequency cetaceans can counter auditory masking effects, and that construction noise would be temporary and transient within Victorian coastal waters.

I accept the EES findings that cable-laying vessels would be unlikely to interfere with or 'mask' vocal communication of high frequency cetaceans, such as Pygmy Sperm Whales. I accept the EES conclusion that there is unlikely to be any overlap between communicating frequency range of high frequency cetaceans with the frequency of the noise generated by the thrusters.

I also accept the EES findings that underwater noise generated by the cable-laying vessel partially overlaps the frequency range of mid frequency cetaceans, such as Common Bottlenose Dolphins and Killer Whales. However, I consider that auditory masking effects to mid and high frequency cetaceans will be minimal given that auditory masking would only be likely to occur near the cable-laying vessel.

I consider that the mitigation measure EPR MERU08, which would ensure monitoring and establishment of buffers, can appropriately avoid cetaceans approaching in close proximity to the cable-laying vessel. I consider that any minor disruptive effects to all cetaceans (i.e., low, mid and high frequency) would be sufficiently minimised through the powering down of construction equipment in the unlikely event those buffers are breached.

I accept the findings of the EES that Sea Turtles are uncommon in Victorian waters and would typically occur as solitary individuals who are unlikely to communicate with other turtles through their marine migrations. I therefore consider it unlikely turtles would experience auditory masking of biologically relevant sounds.

The EES also identified that noise from construction activities could cause auditory masking effects to non-cetacean marine fauna. I am generally satisfied that non-cetacean marine fauna, including Little Penguins and bony fishes, would not be significantly impacted due to their ability to move away from noise vertically and horizontally within Bass Strait, and the requirements in the marine fauna management plan (i.e. EPR MERU07) would be appropriate to appropriately manage interactions with marine fauna.

Vessel strikes

The EES identified migrating marine fauna, such as cetaceans and Sea Turtles, to be most vulnerable to collisions with construction vessels during underwater cable-laying activities.

The EES found that the project alignment does not traverse known feeding, calving or breeding areas for Humpback or Southern Right Whales, and therefore the Victorian coastal waters of Waratah Bay would not be significant habitat for these cetaceans. I support the EES findings that there is a low likelihood of these threatened migratory cetaceans occurring in the shallow waters of Waratah Bay, particularly outside their peak migratory seasons. Should Humpback and Southern Right Whales happen to use Waratah Bay for resting while on their annual migrations, I consider the temporary construction activity unlikely to affect them given resting is also transient and temporary. I consider mitigation measures (such as EPR MERU08) include appropriate mechanisms to monitor marine mammal presence and apply precaution zones and avoidance measures that will protect any individuals that temporarily rest in the Victorian coastal waters during construction works. Given the slow movement of cable-laying vessels would be unlikely to result in cetacean vessel strikes, I am satisfied that EPR MERU08 reduces any risk of cetacean vessel strikes to an acceptable level.

DEECA expressed concern that the marine fauna management plan (EPR MERU07) did not include specific mention of pinnipeds. The IAC recommended that EPR MERU07 be amended to manage risks of vessel collisions with marine megafauna, noting that appropriate guidelines and regulations are referenced only in the marine fauna management plan for cetaceans (EPR MERU08). Although I accept the findings of the EES that faster, more agile marine fauna such as pinnipeds would be less susceptible to collision strikes from construction vessels, I support the IAC's recommendation for the inclusion of a requirement for the marine fauna management plan (EPR MERU07) to be in accordance with the Wildlife (Marine Mammals) Regulations and *A guide to boating and swimming around whales, dolphins and seals*. This will ensure marine fauna observations, reporting, and delineation of caution and no approach zones are maintained throughout project construction. Further, I consider it appropriate that the requirement for marine mammal observers on construction vessels in the cetacean interaction management plan is also implemented as a procedure within the marine fauna management plan (i.e. EPR MERU07). I consider that with the implementation of these measures, construction activity would be unlikely to result in significant effects from vessel collisions on all marine fauna, including pinnipeds.

I support the findings of the EES that there is a low likelihood of threatened Sea Turtles occurring in Waratah Bay. I consider the delineation of visual monitoring and buffer zones in the Sea Turtle interaction management plan (EPR MERU09) would appropriately require construction vessels to monitor, maintain separation distance, and power down construction equipment throughout any encounters with Sea Turtles, to further reduce risks of vessels impacting Sea Turtles.

Water quality

The EES identified the underwater cable route traverses mostly soft seabed sediments. Jet trenching through these sediments would result in temporary decreases in water quality and increased turbidity as seabed sediments are mobilised to bury the cable. Unavoidable changes in water quality would also occur as non-

toxic drilling fluids are released when HDD boreholes break through the seafloor. Short-term water quality effects would be localised to areas where the cable is buried in the seabed and where HDD exits the seabed.

A submitter expressed concern that the project would contaminate marine invertebrates targeted by the Victorian fishing industry. The EES did not identify any past or present industrial discharges or marine outfalls to Waratah Bay. I support the EES findings that disturbing or mobilising seabed sediments in Waratah Bay during project construction would be highly unlikely to be toxic to marine biota and, therefore, the residual impacts will be low.

A submitter expressed concern that offshore construction over an extended period of time will result in increased turbidity. I support the conclusion of the EES that the jet trenching construction method is internationally recognised as causing the least environmental impact to water quality. HDD would avoid negative effects in the nearshore waters of Waratah Bay. I support the EES findings that residual drilling fluids and cuttings would be inert, and suspended sediments would be quickly remobilised and distributed within the high-energy hydrodynamic environment of Waratah Bay. I agree with the IAC that the temporary and localised effects from increases in turbidity and suspended sediment concentrations would be unlikely to have significant impacts on habitat suitability for marine biota, including Tasman grass-wrack, and the proposed mitigation measures (such as EPRs MERU01 and MERU02) are appropriate to manage any minor disruptive effects to benthic habitat.

Invasive marine species

The EES identified introduction of invasive marine species has the potential to infect, outcompete, and prey on native marine species in Victorian coastal waters. This species could be released in ballast water or from hull fouling and colonise subsea cable protection construction materials (such as rock mattresses).

I support the findings of the EES that there is a low risk of invasive marine species from equatorial ballast water surviving and being able to persist in the cooler temperatures of Waratah Bay. I consider that existing invasive marine species, including European shore crab, would be unlikely to outcompete native benthic fauna on rock mattresses over the cable. I agree with the IAC's assessment that these low risks will be appropriately avoided and minimised in accordance with the best practice national and international standard management measures listed in EPR MERU11.

Artificial lighting

The EES identified the greatest potential for artificial lighting to affect migratory, shore, wetland and marine birds would be through collision injuries, as well as disturbance of migration paths and roosting and foraging sites.

Effects on avian species in Victorian coastal waters during HDD and duct installation from artificial lighting at the HDD drill site would be appropriately minimised by its distance from the Waratah Bay shoreline and buffering of light by the coastal dunes. I support the findings of the EES that minimal maritime navigation lighting is required throughout cable pulling outside of daylight hours in Waratah Bay and this lighting would largely be short-term and transient as construction progresses across Bass Strait. Considering the temporary and transient nature of artificial lighting from construction in the marine environment, I support the EES findings that its impact on marine birds are likely to be negligible.

The EES also identified artificial lighting from construction vessels could attract marine invertebrates, fishes and cephalopods, leading to attraction of larger predatory fish and cephalopods. The effects of artificial lighting was not expected to be significant for these marine species. I consider effects on marine fauna from artificial lighting would be acceptable, subject to the implementation of lighting minimisation measures contained in EPR MERU10, which include reduced lighting intensity, redirection of light spill, and monitoring in accordance with relevant light pollution guidelines and standards.

Operation impacts

Operation of the project may affect threatened marine biota as a result of impacts from underwater noise, thermal and EM fields, artificial lighting, introduced invasive marine species and reduced water quality.

The potential effects on all species from project operation are examined collectively below.

Thermal fields

The EES identified heat generated from operating undersea cables within seabed sediments would have the potential to cause minor and localised effects to benthic fauna within 50 centimetres of the buried cable.

The EES identified marine infauna[49] would live mainly in the top 10 centimetres of seabed surficial sediments. I consider the project alignment to be a significant distance (25 kilometres away) from the nearest known threatened species of seabed benthic and epibenthic fauna and infauna. I agree with the IAC that a cable burial depth of one metre would result in minor localised impacts to marine biota and also agree that EPR MERU12 will appropriately minimise thermal field effects through the burial depth requirements for HVDC cables.

Electromagnetic fields

The EES identified turtles, pinnipeds, bony fish and cartilaginous fish as marine fauna reliant on geomagnetic fields for orientation and navigation most likely to be impacted by EM fields emanating from operating underwater cables.

I support the EES findings that the subsea operation of cables would emit similar EM fields as background geomagnetic fields in the upper water column for surface-swimming marine fauna, such as the White Shark. I therefore consider EM fields would not negatively affect the two known foraging areas of the White Shark transected by the project, nor migration routes of threatened cetaceans or Sea Turtles.

A submitter expressed concern regarding the uncertainty of effects to marine invertebrates behaviour, migration and recruitment from EM fields. Based on the cable alignment's distance to known habitat of threatened marine invertebrate species, I support the findings of the EES that residual impacts to bottom-dwelling marine fauna, such as invertebrates and crustaceans, from EM fields being emitted from operating cables will be low.

I support the IAC's findings that the project would be unlikely to have significant EM field effects on marine birds and marina biota, including White Shark and cetaceans. I agree with the IAC that potential effects from EM fields would be very minor and localised and can be appropriately minimised by cable design and installation measures in EPR MERU12.

Water quality

Submitters raised a concern that operating or decommissioned cable infrastructure could introduce pollutants into the marine environment. I support the findings of the EES that there would not be significant effects to marine ecology due to the cable infrastructure itself in the seabed, and the proposed mitigation measures (such as EPR EM06) are appropriate to avoid and minimise any minor disruptive effects to benthic habitat during project decommissioning.

Operation and maintenance EPRs

Eight of the 13 marine and resource use EPRs relate to avoidance and management of effects on Victorian marine ecology. All eight apply during construction, with only two (EPRs MERU10 and MERU11) also applying

[49] Infauna are creatures that live in sediments at the bottom of a water body.

during project operation. I support the IAC's recommendation that an additional mitigation measure (EPR MERU14) is required for project operation to continue implementation of artificial lighting, marine species management plans and invasive marine species management measures during inspection, maintenance and repair of cable infrastructure. I am satisfied that operation of the project would be unlikely to have significant effects to marine ecology, and EPR MERU14 would appropriately avoid and manage any minor disruptive effects on marine ecology during operations.

Cumulative impacts

The EES identified that cumulative impacts would not occur between the project and offshore gas and wind projects being developed within Bass Strait. A submitter expressed concern about cumulative impacts considering an additional submarine cable project in development. I support with the IAC's findings that cumulative impacts from construction and operation of the project would be minor given the distance from other future offshore projects in Bass Strait and their projected timing. Further, any such proposals would go through further assessments and approvals processes that would consider cumulative impacts.

Assessment

It is my assessment that:

- The marine ecology EPRs are adequate to sufficiently avoid, mitigate and manage the project's marine ecology effects subject to the recommendations made to EPRs MERU02, MERU07, MERU08 and for an additional MERU14.
- Effects of cable-laying construction activities on native vegetation and habitat for marine biota can be appropriately managed and are acceptable.
- Underwater disturbance effects to marine biota from construction activities and effects from marine construction vessels at the water surface can be appropriately managed and are acceptable.
- Underwater disturbance effects to marine biota from operation of the project can be appropriately managed and are acceptable.

5.3. Marine resource use

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on land and water (including groundwater, surface water, waterway, wetland, and marine) quality, movement and availability.

Assessment context

Marine resource use effects are addressed in Volume 3, Chapter 3 and Technical Appendix H of the EES and in Chapter 17 of the IAC Report. The proponent has proposed four EPRs to deal with marine resource use effects in Victorian coastal waters. The IAC did not recommend any changes to these.

A supplementary technical report about the revised timing for stage 2 was prepared for Technical Appendix H[50]. This report indicated no change to marine resource use effects from this change.

Marine resource use in Victorian coastal waters encompasses diverse activities and industries, including maritime traffic and navigation, commercial and recreational fishing, and existing underwater telecommunication cables.

[50] Tabled document 45e

Several potential effects of the project for marine resource use were examined through the EES and IAC process, in particular the:

- potential access constraints to commercial recreational fishing grounds from exclusion zones;
- potential effects on fisheries from EM fields and habitat disturbance;
- potential effects on existing subsea infrastructure and offshore industries; and
- potential effects to maritime traffic and marine navigation systems.

Discussion

Commercial fisheries

The EES assessed effects from the project to commercial fisheries, including from exclusion zones and habitat disturbance during project construction. Exclusion zones required for cable pulling at HDD exit holes would occur at a depth and within an environment that is not significant to commercial fishing operators. Jet trenching would travel at a speed of approximately 400 metres per hour along the sandy seafloor of Waratah Bay. Therefore, construction of the project in Victorian coastal waters is predicted to cause only a minor deviation to commercial fisheries over a small number of days due to cable-laying. I support the IAC's findings that project construction is unlikely to unreasonably or significantly constrain commercial fisheries, and that implementation of EPR MERU06 would appropriately inform and engage with commercial fisheries operators about the dates, durations and locations of construction activity.

I consider the IAC's recommended additional EPR MERU14 would be appropriate to avoid and manage any disruptive effects to commercial fishing operations during inspections, maintenance and repair of the subsea cable infrastructure. EPR MERU06 requires a marine communication plan to be developed and implemented prior to construction. I consider it appropriate for this plan to also be implemented during project operation to inform and consult commercial fishing operators about required inspection, maintenance and repair activities over the life of the project.

The EES assessed potential effects on commercial and recreational fishing vessels from hook-ups by anchor or bottom-trawling fishing gear. It concluded that exclusion zones over the buried cables would not be required for operation or decommissioning of the project, on the basis that the cable would be buried a minimum of 1 metre below the seafloor. The proponent's proposed day 2 EPR MERU12 requires cable burial up to 1.5 metres in depth to minimise EM fields and heat emitted from the subsea cable. I understand this is the maximum burial depth that can be achieved by a typical jet trencher. To minimise potential effects on vessels from hook-ups with anchors and fishing gear, I consider it appropriate that EPR MERU12 is amended to include a minimum cable burial depth of 1 metre, where practicable, as assessed in the EES. I am satisfied that an operating cable buried at a depth of 1 metre or greater would be unlikely to have any significant effects on marine species targeted by commercial fishing operations, or the seabed habitat and benthic communities.

Electromagnetic fields – commercial fisheries

Submitters expressed concerns about for potential EM fields from the operating transmission cable to impact marine species targeted by commercial fishing operators such as Southern Rock Lobster, Giant Crab, Shortfin Eel, Longfin Eel, Gummy Shark and School Shark. Although the proponent's marine ecology expert, Mr Balloch, acknowledged there was some uncertainty about effects on these seafloor-dependant marine species from exposure to EM fields at close range, both Mr Balloch and the proponent's EM interference expert, Dr Urban, agreed that any effects were unlikely to be significant.

The EM fields modelling assumed a minimum burial depth of one metre consistent with the assessment of potential effects to vessels from hook-ups with anchors and fishing gear. This is an additional reason for recommending EPR MERU12 be amended to include a minimum one metre cable burial depth, rather than referencing a maximum burial depth. I accept the IAC's finding that EM fields associated with operating underwater cable bundles will have a very minor and localised impact on marine biota. It is my assessment

that subject to the amendment to EPR MERU12, that commercial and recreational fisheries would not be significantly impacted from EM fields from the operating transmission cable.

Existing subsea infrastructure and offshore industries

The EES assessed effects from underwater cables crossing existing telecommunications cables on the seabed and concluded existing underwater infrastructure will not be affected by the project, and the cable crossing management plan will ensure the project does not effect existing underwater infrastructure which it traverses. I am generally satisfied that EPR MERU05 ensures appropriate consultation with existing cable infrastructure owners to avoid any damage to third-party infrastructure. Given the International Cable Protection Committee does not have established guidelines for cable crossings, I consider it appropriate that EPR MERU05 is amended to require the cable crossing management plan to be informed by International Cable Protection Committee recommendations, rather than guidelines. To ensure consistency with other EPRs, I also recommend that EPR MERU05 specifically requires the cable crossing management plan to be implemented during construction.

Electromagnetic fields – navigation

The EES assessed maritime vessel navigation system impacts from EM fields, including disruptions to marine vessels relying on magnetic compass readings for navigation. I am satisfied with the EES conclusion that the most significant EM fields will emanate from the shore crossing at Waratah Bay where cables are separately fed through HDD ducts before being re-bundled around the HDD exit holes on the seafloor. I consider any compass deviation effect would therefore be greatest in shallow water where marine vessels would be most likely to rely upon visual navigation rather than compass navigation.

I am generally satisfied that mitigation measure EPR MERU12 ensures EM field interactions are minimised acceptably through bundling of HVDC cables, and the separation of cable bundles. I am also satisfied EPR MERU13 is appropriate to inform maritime users of the location of the seabed power cables for the operation phase of the project. I consider impacts to marine vessel navigation from operating cables would be negligible due to the requirements of EPRs MERU12 and MERU13, and the increasing water depth over buried cables with distance from the shoreline. My assessment is that maritime vessel navigation would not be significantly impacted by EM fields from operating cable infrastructure.

Maritime traffic and navigation systems

The EES assessed maritime traffic and navigation system impacts from construction and operation of the project, which included disruption or modification of existing maritime routes. I accept the EES and IAC findings that the project would not intersect established shipping lanes for large shipping ports and harbours in Victorian coastal waters.

I support the IAC's finding that the project is unlikely to unreasonably or significantly constrain marine traffic and navigation. I consider EPR MERU06, subject to my recommendations, is appropriate to identify and engage with relevant stakeholders and establish protocols to ensure project construction and operation does not significantly impact marine traffic between smaller ports and harbours.

Recreational fishing

The EES assessed impacts on recreational fishing from the shoreline as well as from recreational and tourism-based boats. HDD underneath the shoreline completely avoids the need for restrictions on recreational fishing activity being undertaken from the shoreline of Waratah Bay.

I accept the EES findings that minor, short term restrictions to recreational fishing boats may occur during project construction in the nearshore Victorian coastal waters of Waratah Bay. I am satisfied with the EES conclusion that the residual construction impacts to recreational fishing are very low. Specifically, EPR

MERU06 and EPR S03 provide for appropriate engagement with marine-based recreational fishermen. I consider that restrictions to recreational fishing boats from construction exclusion zones are of such a minor scale and short duration that impacts will not be significant.

Assessment

It is my assessment that:

- The marine resource use EPRs are adequate to sufficiently avoid, minimise and manage the project's marine resource use effects subject to my recommendations for EPRs MERU05, MERU06, MERU12 and for the additional EPR MERU14.
- Effects on commercial and recreational maritime activities from construction can be appropriately managed and are acceptable.
- Effects on commercial and recreational maritime activities from operation and maintenance of the project can be appropriately managed and are acceptable.

5.4. Aboriginal cultural heritage

Evaluation objective

Protect, avoid and where avoidance is not possible, minimise adverse effects on historic heritage values, and tangible and intangible Aboriginal cultural heritage values, in partnership with Traditional Owners.

Assessment context

Terrestrial cultural heritage effects are addressed in Volume 4 Chapter 13 and Technical Appendix J of the EES and in Chapter 16 of the IAC's report. Underwater Aboriginal cultural heritage effects are addressed in Volume 3 Chapter 4 and Technical Appendix I of the EES and in Chapter 16 of the IAC's report.

The proponent proposed two EPRs (CH02 and CH03) which deal with both land and sea country and four EPRs (UCH01 – UCH04) to deal specifically with underwater cultural heritage encompassing both First Peoples and maritime heritage effects. In addition, EPR EM08 requires MLPL to develop and implement a strategy for ongoing engagement with First Peoples. The IAC did not recommend any amendments to these EPRs.

Supplementary technical reports in relation to revised timing for stage 2 were prepared for Technical Appendix I[51] and Technical Appendix J[52] . Both reports indicated no change to Aboriginal cultural heritage effects because of the revised timing of stage 2.

Assessments have been informed by consultation with Boonwurrung Land and Sea Council, Bunurong Land Council Aboriginal Corporation, Gunaikurnai Land and Waters Aboriginal Corporation and First Peoples – State Relations. The project requires two approved CHMPs under the AHA Act as discussed in Section 3.4 of this assessment.

The EES only assessed tangible cultural heritage values. The proponent proposed assessing intangible values and connection to land and sea country through a CVAs program, which was ongoing at the time of the EES. The CVAs are intended to inform the two CHMPs. Bunurong Land Council Aboriginal Corporation provided a copy of the recommendations from its CVA, which was tabled with the IAC in May 2024.[53]

[51] Tabled document 45f

[52] Tabled document 45g

[53] Tabled document 5

Terrestrial cultural heritage

Impacts to Aboriginal cultural heritage may occur when project activities intersect tangible or intangible cultural heritage sites or artefacts within the AoD.

An assessment of tangible cultural heritage values completed for the EES (which included desktop assessment and archaeological fieldwork where properties could be accessed) identified:

- 13 previously registered Aboriginal cultural heritage places, including seven artefact scatters, five low-density artefact distributions and one multicomponent artefact scatter/ochre quarry site; and
- 15 newly recorded Aboriginal cultural heritage places, including three artefact scatters and 12 low-density artefact distributions.

These 28 places were considered to have low to moderate cultural heritage significance. The overall residual impact of the project on terrestrial cultural heritage values was considered to be low.

Sites or artefacts of cultural heritage significance may exist in areas not yet surveyed. Further subsurface testing will inform the CHMPs.

The overall potential for cumulative effects on terrestrial cultural heritage was considered to be very low.

Underwater cultural heritage

Impacts on underwater cultural heritage could occur when project activities intersect archaeologically significant sites and objects on or under the seabed. Bass Strait was once a land bridge between Victoria and Tasmania, known as the Bassian Plain. A large ephemeral lake, Bass Lake, formed within the Bassian Plain's broad central basin. People occupied the Bassian Plain prior to its submergence from 20,000 to 11,000-years-ago. These Pleistocene landscapes, now submerged, can host archaeological material that can reveal much about how people lived, and they are a link to culture for First Peoples.

The EES utilised a predictive submerged terrestrial landscapes model, informed by geophysical and geotechnical survey data, to identify landforms with potential cultural heritage value in the study area. Three submerged landforms with potential to contain artefacts were identified in the Victorian and Commonwealth waters of the study area – a beach ridge strandplain in Victorian coastal waters approximately 3 kilometres from the shoreline, and an estuarine channel and beach ridges in Commonwealth and Tasmanian waters.

In Victorian coastal waters, the assessment found that it is highly unlikely that any Aboriginal cultural heritage artefacts remain in the beach ridge strandplain, and that the archaeological integrity of any remaining artefacts will have been significantly reduced due to expected exposure to high energy waves, erosion and inundation energy. As this landform is rocky in nature the project will tend to avoid it. Also, proposed works were considered unlikely to penetrate modern sediments through to the Pleistocene landform. Consequently, impacts to Aboriginal cultural heritage artefacts in this landform were assessed as being almost impossible and the predicted residual impact was very low. No EPRs or mitigation measures were recommended in relation to this landform.

No cumulative effects on underwater cultural heritage from the project and other future projects are expected.

Discussion

As noted by the IAC, South Gippsland is rich in Aboriginal cultural heritage and, hence, the project will intersect sites of cultural heritage significance. While noting that further investigations of the terrestrial study area are continuing for the CHMPs, the IAC found that the assessments completed to date were adequate to determine that the project appropriately avoids and minimises impacts on Aboriginal cultural heritage. I support these findings.

The EPRs defer to the CHMP to regulate the detailed management of Aboriginal cultural heritage (EPR CH02). I agree with the IAC that this is consistent with the approach taken for similar infrastructure projects and support this approach.

The IAC was satisfied that potential impacts on underwater cultural heritage would be limited. EPR UCH01 requires further survey if the alignment is revised to be outside the study area and EPR UCH04 requires an underwater cultural heritage management plan to manage any unexpected finds. I am satisfied that the EPRs are appropriate to manage impacts to underwater cultural heritage.

The IAC acknowledged the extent of engagement with the First Peoples undertaken by the proponent to date. This included the appointment of First Peoples engagement advisors whose feedback informed the social impact assessments, CHMPs, CVAs, the Marinus Link Sustainability Framework, the community benefits scheme and the industry participation target setting. The IAC found that EPR EM08 provided confidence that engagement would continue, and appropriate cultural heritage considerations would be embedded into project implementation.

While it is regrettable that the CVAs could not be progressed sufficiently to inform the EES, I am satisfied that the EPRs, in particular EPR EM08 and EPR CH03, provide an appropriate approach to ensuring that intangible land and sea country cultural heritage values are considered in the development and delivery of the project.

The IAC was satisfied that impacts on Aboriginal cultural heritage, for both land and sea country, can be acceptably managed through the proposed EPRs. I support this conclusion.

Assessment

It is my assessment that:

- Effects on tangible and intangible terrestrial and underwater cultural heritage values will be appropriately managed through proposed EPRs, CVAs and CHMPs 18201 (as evaluated by Gunaikurnai Land and Waters Aboriginal Corporation) and 18244 (as evaluated by First Peoples – State Relations).
- The proponent has established a good basis for meaningful engagement with First Peoples by engaging early and in progressing CVAs. The consultation process underpinned by EPRs CH02, CH03, UCH04 and EM08 will provide a suitable framework for advancing the CVAs and CHMPs and enabling cultural heritage values to be appropriately addressed in the further development and delivery of the project.

5.5. Non-Aboriginal heritage

Evaluation objective

Protect, avoid and where avoidance is not possible, minimise adverse effects on historic heritage values, and tangible and intangible Aboriginal cultural heritage values, in partnership with Traditional Owners.

Assessment context

Terrestrial heritage effects are addressed in Volume 4 Chapter 14 and Technical Appendix J of the EES and in Chapter 16 of the IAC's report. Maritime heritage effects are addressed in Volume 3 Chapter 4 and Technical Appendix I of the EES and in Chapter 16 of the IAC's report.

The proponent proposed one EPR to deal with terrestrial heritage effects (EPR CH01) and four EPRs to deal with underwater cultural heritage encompassing both First People's and maritime heritage effects (EPRs UCH01-UCH04). The IAC did not recommend any amendments to these EPRs.

Supplementary technical reports in relation to revised timing for stage 2 were prepared for Technical Appendix I[54]and Technical Appendix J[55]. Both supplementary technical reports indicated no change to heritage impacts because of the revised timing of stage 2.

A desktop search of Commonwealth, state and local government registers did not identify any recorded historical heritage values in the terrestrial study area. Only one location was identified during field assessments - a brick cistern likely used for water storage in a paddock near the township of Buffalo. The cultural heritage significance of the cistern was assessed to be moderate. As the cistern is located outside of the AoD, vibration generated by construction activities was identified as the key pathway for potential impact.

Potential historical heritage values may exist in areas where land access was restricted at the time of the survey. The unsurveyed portion of the study area supports open farmland and forest plantation. The EES reported that these areas are unlikely to contain aboveground built heritage and potential values. However, if these values did exist, they would likely occur as subsurface archaeological deposits.

With regards to maritime heritage, Waratah Bay is listed on the Victorian Heritage Register and by the National Trust. Due to historical activities, sites of potential maritime heritage significance, including shipwrecks, dumping sites and vessel discard could be present within the Victorian waters of Waratah Bay.

The project's cable-laying activities and scouring from the cable could impact sites of potential maritime heritage significance if present. Marine geophysical survey data was reviewed by a qualified maritime archaeologist to identify potential underwater heritage features, and these features were inspected by divers. This assessment found no maritime cultural heritage in the study area within Victorian waters. Geophysical anomalies, which can indicate the presence of sites of maritime heritage significance, were identified near, but outside of the proposed AoD.

The EES found that the potential for cumulative impacts to terrestrial heritage from the project and other projects in the region is very low. With regards to maritime heritage, the assessment found that no cumulative impacts on maritime heritage from the project and other future projects are

Discussion

With regards to terrestrial non-Aboriginal heritage, EPR CH01 requires the preparation of a historic heritage management plan in consultation with Heritage Victoria. This plan must include measures to protect and monitor the brick cistern during project construction and operation. Required measures include a barrier to protect the cistern from direct impacts, monitoring of vibration-related impacts (if required under EPR NV02) during construction to ensure they are within acceptable levels that will not adversely impact the fabric or integrity of the cistern, and induction and training of site staff. The EES concluded that impacts to the cistern could be successfully mitigated through EPR CH01.

The historic heritage management plan (EPR CH01) would include contingency responses in the event of any additional non-Aboriginal heritage material being encountered during the construction of the project. This would manage impacts to non-Aboriginal heritage material in areas that were not surveyed due to access restrictions and/or any other unexpected finds during construction.

In relation to maritime heritage, the EES concluded that it is highly improbable that any maritime heritage sites in Victorian waters, including shipwrecks, will be impacted by construction or operation of the project. If heritage values were to be found, impacts can be managed through the EPRs:

[54] Tabled document 45f

[55] Tabled document 45g

- EPR UCH01 requires further geophysical surveys for the final Victorian shore-crossing project alignment and magnetometer surveys if the alignment is revised to be outside the study area to find any heritage features on the sea floor.
- EPR UCH02 requires avoidance of any newly identified seabed geophysical anomalies.
- EPR UCH04 requires an underwater cultural heritage management plan, informed through consultation, which also includes an unexpected finds protocol, to manage any impacts on potential shipwrecks and vessel discards.

The IAC was satisfied that both terrestrial and maritime non-Aboriginal effects are minimal and can be appropriately managed through the proposed EPRs. I support these conclusions.

Assessment

It is my assessment that the terrestrial and maritime heritage EPRs will adequately minimise the potential negative effects on known and any unknown historic heritage sites and values to acceptable levels.

5.6. Geology and geomorphology

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on land and water (including groundwater, surface water, waterway, wetland and marine) quality, movement and availability.

Assessment Context

Geology and Geomorphology effects were discussed in Chapter 2 Geomorphology and geology of Volume 4, as well as Technical Appendix O Terrestrial geomorphology and geology of the EES. Waterway geomorphology and stability in Technical Appendix Q Surface water and Waratah Bay shoreline stability in Technical Appendix H Marine ecology and resource use, are also relevant. Geomorphology and geology effects were addressed in Chapter 11 of the IAC report. The proponent proposed 10 EPRs to specifically address geology and geomorphology effects. Of these, five EPRs have been the subject of recommendations by the IAC.

The 90-kilometre alignment between Waratah Bay and Hazelwood is in a geomorphically active landscape, prone to change through landslides and erosion.

The project area was assessed by identifying discrete geomorphic divisions along the alignment using LiDAR Digital Elevation Model, aerial photography and open-source spatial information. These divisions were called trench sectors and were identified by a combination of soil-landform units, geology and geomorphic processes. A change in geomorphic attributes determined the boundary of each trench sector. The trench sectors provide high resolution recognition for changes in key landforms within the boarder soil-landform units. A total of 187 trench sectors were identified and assigned a ranking based on the sensitivity of each geomorphic attributes in that sector. The sensitivity and significance of impact assessment for each of the 187 trench sectors are listed in Appendix A of Technical Appendix O.

The EES identified that the engineering activities of the project without mitigation had the potential for major, high and moderate impact on much of the terrain, which has several significantly sensitive geomorphic attributes. These potential impacts stem directly from trench excavation and other ground disturbance that:

- exposes subsurface materials of variable strength at angles steeper than natural stable repose;
- intersects slopes that display active or developing landslides or other forms of slope instability;
- crosses stream channels with exposed regolith on bed and banks and incised thread channels; and
- alters local surface and groundwater conditions.

Tables 6.3, 6.4 and 6.5 of Technical Appendix O summarise the significance of impact for each of the general trench alignment, Waratah Bay shore crossing and Hazelwood converter station trench sectors. The residual

impact was assessed as high for 12 out of 183 general alignment trench sectors and one out of three trench sectors at the Waratah Bay shore crossing. The Hazelwood converter station trench sector was assessed as moderate.

The EES found that the residual impact rating could be reduced further by design measures following detailed field investigations to confirm ground conditions and constructability outcomes. If design measures were unable to address risks of landslide, realignment would be required with EPRs re-applied to reduce the risks to an acceptable level. A framework for this additional work is captured in the geomorphology and soil EPRs.

The supplementary technical report for geomorphology and geology[56] indicated that there is potential for changes to ground conditions to occur between stages 1 and 2. Potential causes of such changes could include: responses to engineering works of stage 1, climatic events, tectonic activity or human induced changes. The report recommended additional investigations prior to stage 2 to determine whether changes have occurred, and if necessary, develop measures to comply with EPRs to manage impacts.

No significant cumulative effects on geomorphology and soils were identified.

Discussion

Staging of works

I note that EPR GM01 states that targeted surveys and site assessments are required 'prior to commencement of project work', however it does not consider the findings of the relevant supplementary technical report. I suggest minor amendments to EPR GM01 are required to make it clear that investigations are required prior to stage 1 and stage 2. Specifically, further visual (ground and aerial) inspection of the route is required prior to stage 2 to establish if the (then) existing conditions need to be further assessed and relevant management measures modified under the EPRs.

Impacts on landform stability

The EES found that trench excavation and other ground disturbance works could have significant impacts on landform stability. Further site investigation and testing was recommended for the 12 general alignment trench sectors assigned a high residual impact rating to inform design measures to address ground conditions and maintain land stability, with the aim of protecting the project from causing geomorphological impacts such as a landslide or subsidence.

Mr Darras, a geotechnical engineer, undertook a peer review of Technical Appendix O on behalf of the proponent. He supported the EES' recommendations for further site investigation at these 12 general alignment trench sectors[57]. Based on his engineering expertise, he considered the high ratings in the EES resulted from an overly cautious approach in the geomorphology assessment which did not consider potential engineering solutions that could ameliorate the potential risks.

It was his assessment that the 12 trench sectors assigned a high residual impact rating could achieve a moderate or lower residual impact rating using field investigation, stability assessment, specific mitigation design measures and by employing a qualified and capable construction contractor. He gave evidence such mitigation techniques could be contained within the easement. A detailed rationale for his revised ratings were presented at the hearing[58].

[56] Tabled document 45k

[57] Tabled document 34

[58] Tabled document 110

Mr Darras and Mr Rosengren (lead author of Technical Appendix O) both attended an expert constructability workshop for the project on 2 August 2024, which resulted in changes to the exhibited geomorphology and soil EPRs. Key changes included strengthening the geotechnical engineering considerations (EPR GM01 and GM02), and the insertion of a new EPR GW10, which requires measures to manage potential impacts on ground stability during operation. I support the IAC's finding that the improvements made to the EPRs will ensure landform stability impacts can be reduced to a satisfactory level.

Mr Darras was not aware of any specific instances of sodic or dispersive soils in the project area but advised their occurrence is possible and recommended the potential for sodic or dispersive soils be addressed by routine soil testing at the time of the detailed site investigations required under EPR GM01[59]. Mr Rosengren advised tunnel erosion may be a component of sensitivity for four trench sectors (S18, S29, S78 and S128). I support the IAC's recommendation for EPR GM01 to include a requirement for testing for sodic and dispersive soils to ensure related risks are appropriately addressed.

Submitter 12 was concerned about land stability and erosion impacts on her family's property near Darlimurla, which featured steep slopes and landslips. Little Morwell River passes through the property, which includes land on both sides of the Little Morwell River valley. The EES identified trench sectors (S123 to S126) with moderate to high significant unmitigated geomorphological impact in this region. Given the high significance of unmitigated impact for these trench sectors and complex geomorphological setting, I support the IAC's recommendation that EPR GM01 be amended to include property 380 Darlimurla Road, Darlimurla in the locations requiring further geomorphological surveys and detailed site investigation.

HVP was concerned that risks of ground stability, erosion and landslip within the context of their forestry operations had not been sufficiently explored in the EES (S27). HVP submitted that without careful management of these risks on their land, productive plantation can be impacted, and significant environmental impacts can occur, for example through loss of native vegetation and increased sedimentation of waterways. HVP also highlighted that the proposed project construction activities including trenching and installation of underground cabling will pose a significant risk of soil erosion on HVP land[60].

HVP sought changes to GM02, GM09 and GM10 to ensure the forestry context is adequately considered, and consistent with the *Code of Practice for Timber Production 2014* (as amended in 2022), which it must comply with. The code of practice sets out six guiding principles for sustainable forestry operations and has extensive requirements for managing soil erosion and landslip impacts arising from forestry equipment, log storage, plant and equipment use. Although the code of practice would not technically apply to the construction of the project, it provides context for understanding the land use activities conducted by HVP. I support the IAC's finding that the potential cumulative effects of the project and forestry operations on land stability should be addressed by EPRs GM02 and GM10 and include specific requirements to consider forestry operations during the lifespan of the project. I also recognise that the proposed project infrastructure and maintenance activities must successfully coexist with HVP forestry operations, therefore, I support the IAC's recommendation for EPRs GM02 and GM10 to make specific reference to the land stability requirements in the Code of Practice for Timber Production.

Impacts of the shore crossing at Waratah Bay

The geomorphology of the shore crossing at Waratah Bay is characterised by steeply undulating coastal dunes and a flat tidal channel.

[59] Tabled document 84

[60] Tabled document 112

The EES considered trenchless construction methods, such as HDD, for the underground cable at the shore crossing. Potential risks arising from HDD include interception of perched aquifers and subsidence caused by overpressure during drilling, which could lead to sinkholes along the borehole alignment. Frac-out is the unintentional return of drilling fluids to the surface from HDD and has potentially significant impacts on the geomorphology and stability of the coastal dunes including subsidence and sinkhole development.

Technical Appendix O assessed the unmitigated significance of impact rating as major for the 3 shore crossing sectors. The residual mitigated significance of impact was assessed as moderate for SC1 (subtidal zone) and SC2 (intertidal zone). SC3 (coastal dunes) was assessed as high based on an incident during the Basslink shore crossing HDD at McGaurans Beach, Victoria in May 2004, that had a similar geomorphological setting to SC3. This incident resulted in four ground subsidence sinkholes and drilling fluid discharge. Technical Appendix O concluded 'confirmation of sub surface materials and appropriate HDD implementation is required to minimise the risk of an HDD incident occurring at this shore crossing, as required by EPRs, GM01, GM02 and GM05'.

Mr Darras[61] downgraded the mitigated significance of impact rating to moderate at SC3. He stated that the risks of subsidence due to over pressure/frac-out can be managed with an appropriate understanding of ground conditions, appropriate HDD design and employing a qualified and capable HDD contractor. I note that unlike his assessment for other trench sectors, Mr Darras did not indicate if specific mitigation techniques for this trench sector could be accommodated 'within the easement'. I find there is residual uncertainty as to whether realignment may be needed at this location to mitigate risks. Chapter 2 of Volume 4 of the EES stated that if the detailed design is not able to address landslide risks, the project alignment must be revised, and measures to comply with EPRs reapplied at the revised location/s to reduce landslide risks to a tolerable level in accordance with AGS2007. I recommend that GM02 be amended to include a feedback loop that requires updating risk assessment for the landslide hazard following further investigations to demonstrate the risk is within tolerable level. If a tolerable level cannot be achieved, realignment options need consideration, and the process outlined in GM01 is repeated.

To manage the risk of frac-out, Mr Darras gave evidence that 'careful attention to pressures during drilling was important, and risks could be mitigated by continuously drilling until each hole is completed to avoid risks associated with falls in pressure when drilling is paused'.

The proponent confirmed[62] that HDD works will be undertaken continuously (24 hours a day) at both the shore crossing at Waratah Bay and the Morwell River crossing to mitigate potential risks posed by the respective geological conditions and proposed length of HDD.

I consider that EPR GM01 and GM02 provide a suitable framework for the project to undertake targeted surveys and site assessment at the shore crossing at Waratah Bay to confirm ground conditions and inform an appropriate HDD design. However, I do not support the IAC's recommendation for EPR GM05 to simply include a statement to minimise the risk of frac-out. EPR GM05 considers trenchless construction methods such as HDD following an assessment of ground conditions (EPR GM01). I recommend that EPR GM05 be amended to outline the potential risks of HDD construction and provide for the development of appropriate mitigation strategies to minimise ground subsidence and sinkholes, as well as frac-out. EPR GM05 should also state that the HDD works at the shore crossing at Waratah Bay and Morwell River crossing will be 24 hours a day and must be carried out by a suitably qualified and capable contractor, consistent with Mr Darras' advice.

[61] Tabled document 110, Attachment 4

[62] Tabled document 110

I support the IAC's recommendation for EPR GM05 to include a requirement for HDD drill pads to avoid waterways, including minor waterways, where practicable, in accordance with the proponent's expert witness, Mr Cleven's, evidence[63]. I consider this to be a practical solution to avoid waterway instability.

Impacts on waterway stability

Submitters raised concerns about how the project could impact on waterway stability including risks of erosion and sedimentation at crossings of gullies and waterways that intersect the project. Submitter 12 expressed concerns about the impacts of the proposed trenched crossing of the Little Morwell River. The proponent advised[64] that the preferred construction methodology for the Little Morwell River crossing had changed from trenched to HDD, subject to the outcomes of further investigations required by the EPRs. This preference was expressed in GM09 which added Little Morwell River to the list of relevant waterways for which an assessment would be required to confirm that trenchless construction remains the preferred methodology.

Technical Appendix O considered waterways along the project alignment within the 183 general alignment trench sectors. These sectors were identified in Appendix A of Technical Appendix O as 'channels'. Of the 13 high residual significance of impact trench sectors, one (S82) was associated with a 'channel' within the Strzelecki soil-landform unit.

Attachment 4 of Technical Appendix Q considered risks to the project presented by existing hydrological conditions and processes. The assessment identified that the major waterways are currently laterally active, except the Morwell River, which is subject to potential long-term changes including gradual meander lengthening. All the major waterways were assessed as vertically stable, except Fish Creek. Fish Creek was assessed as being at high risk of large-scale incision. Moderate risks of large-scale avulsion at tributaries of Tarwin River East Branch and Fish Creek were also identified.

Both assessments indicated that project construction and operation impact on waterway stability would be determined by the inherent attributes of the ground surface and shallow subsurface and the response to mechanical disturbance and loading. I consider that the additional survey and investigations required by EPR GM01, to inform detailed construction methodologies and design (EPR GM02) provide a suitable framework for managing risks associated with waterway stability. In addition, EPR GM09 requires a waterway crossing plan to be developed and implemented. I support the IAC's recommendation for this plan to include high level geomorphological and stability assessments of each waterway crossing to ensure the design and construction method for waterway crossings has regard to geomorphological conditions and ensures waterway stability. I also note that the erosion and surface water management plan (EPR SW01) and flood risk management plan (EPR SW03) will be important instruments to manage waterway stability effects.

The IAC observed that a lack of a common framework for identifying waterways in Technical Appendix O and Q made it difficult to cross reference between assessments and was compounded by specific waterways generally not being identified by name in Technical Appendix O. I support the IAC's recommendation that EPR GM09 be amended to include a consistent waterway referencing system for all 82 waterway crossings.

Conclusion

The project is in a geomorphically active landscape, prone to change through landslides and erosion. Subject to the changes recommended by the IAC and as varied within this assessment, the EPRs proposed in the EMF are acceptable to sufficiently avoid, mitigate or manage landform and waterway stability effects. I consider

[63] Tabled document 43

[64] Tabled document 110

that the geomorphology EPRs provide an appropriate framework for undertaking site investigations to design construction methods that minimise landform and waterway stability effects.

Assessment

It is my assessment that:

- The geomorphology and soils EPRs are adequate to sufficiently avoid, mitigate and manage the project's landform and waterway stability effects, subject to the recommended changes for EPRs GM01, GM02, GM05, GM09 and GM10.
- Impacts of construction and operations on slope stability and landsliding are acceptable with the adoption of the EPRs.
- The geomorphological impacts of construction of the shore crossing at Waratah Bay are acceptable with the application of the EPRs.
- The impacts of construction and operations on waterway stability are acceptable, with the implementation of EPRs, as modified through the recommendation of the IAC and this assessment.

5.7. Surface water

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on land and water (including groundwater, surface water, waterway, wetland and marine) quality, movement and availability.

Assessment context

Surface water effects were discussed in Chapter 5 Surface water of Volume 4, as well as Technical Appendix Q Surface water of the EES. Surface water effects were addressed in Chapter 12 of the IAC report. The proponent proposed five EPRs to specifically address surface water effects. Of these, one EPR has been the subject of recommendations by the IAC.

The project alignment will intersect 82 waterways within Victoria, with each waterway being crossed once. The need for detailed assessment of each of the 82 crossings was determined based on their topographic definition and VicMap categorisation and hierarchy attributes (VicMap Lite 1:250,000 to 1:5,000,000 waterways network layer and VicMap Hydro 1:25,000 waterways network layer).

Eight of the 82 waterway crossings were defined as 'major', having a catchment area of more than five square kilometres, and were the focus of the EES. The remaining 74 waterway crossings were small, ephemeral, had smaller catchments and of low or minor importance according to VicMap. The proposed surface water EPRs apply to all 82 waterway crossings.

The EES proposed that 15 of the 82 waterways would be crossed using HDD, while the remaining 67 waterways would be crossed using open-cut trenching. All 'major' waterways were proposed to be crossed using HDD, except for Little Morwell River, which was proposed to be trenched. The proponent revised its position during the hearing and proposed that Little Morwell River also be crossed using HDD, subject to further assessment as outlined in EPR GM09.

The EES examined the potential impacts on surface water from the eight 'major' waterway crossings, as well as from the Hazelwood converter station site and potential transition station. The report considered three key potential impacts in relation to surface water:

- Flooding: the potential for the project to affect flood water movement and flood levels.
- Water quality: the potential for contaminated runoff or sediment to be transported into surface water.
- Geomorphology: the potential for the project to impact the stability of waterway beds and banks through erosion.

The EES found that surface water effects of the project were largely due to construction activities, such as excavation, and temporary stockpiling, which may impact floodplain capacity to store and or transport floodwaters for key waterways. Other activities, such as construction of joint pits, HDD drill pads, access roads and trenches, may also cause inundation of assets, loss of habitat and vegetation, reduced waterway stability and, in turn, sediment movement where an open excavation or exposed soil is inundated in a flood event.

A cumulative impact assessment identified four projects that could affect surface water values near the project. The EES found that while these projects have the potential to impact waterways in their vicinity during construction, they were not expected to impact the waterways in the project area.

The EES found that the residual risks for both open-cut trenching and HDD on waterway crossings would be low following application of the EPRs.

The proponent's supplementary technical report for surface water[65] to address the change in timing for stage 2 work indicated that the delay between stage 1 and stage 2 would extend the time over which access tracks would be required.

Discussion

Submitters raised concerns about increased flooding and waterway instability leading to soil erosion and water quality effects due to project construction and operation activities.

The proponent's expert witness, Mr Cleven[66], proposed several changes to the day 1 surface water EPRs SW01 to SW05 based on issues raised in submissions and evidence, as well as the outcomes of the constructability workshop held on 2 August 2024. These changes included removing the reference to consultation with EPA Victoria in SW04 in response to EPA's submission. These changes were supported by the proponent. Mr Cleven advised that, with the implementation of the surface water EPRs, all identified surface water effects would be reduced to low residual risk rating.

All 82 waterway crossings are on 'designated waterways' and, therefore, require works on waterways permits from the West Gippsland Catchment Management Authority. It will be responsible for determining whether the proponent's proposed construction methodology, associated controls and reinstatement proposal is acceptable in terms of river health. The West Gippsland Catchment Management Authority[67] confirmed support of the day 1 EPRs.

The IAC supported the day 2 EPRs subject to an additional change to day 2 EPR SW01 to include a requirement for the erosion and surface water management plan to consider the Code of Practice for Timber Production 2014 (as amended 2022) in the design and construction of roads and works on or near waterways within forestry properties. I support this recommendation.

The need for integrated assessment of waterway crossings to inform the selection of appropriate construction methods is discussed in Section 5.1 (regarding aquatic health effects) and in Section 5.6 (regarding geomorphology effects) of this assessment.

I support the findings of the EES and evidence of Mr Cleven that with the implementation of the EPRs, subject to changes recommended by the IAC, residual risks for surface water effects will be reduced to low. To ameliorate potential impacts on flooding from the project's temporary and permanent works, EPR SW02 requires that permanent infrastructure be designed in accordance with the *Guidelines for Development in*

[65] Tabled document 45l

[66] Tabled document 43

[67] Tabled document 144

Flood Prone Areas (West Gippsland Catchment Management Authority, 2020). EPRs SW04 and SW05 provide for a surface water monitoring program to be developed and implemented for the project. I am satisfied these EPRs will provide an appropriate framework for establishing baseline conditions and a suitable monitoring program to avoid and minimise the project's surface water effects.

Assessment

It is my assessment that:

- The EPRs provide an appropriate framework for undertaking site-specific assessments of the 82 proposed waterway crossings to inform detailed design, to ensure surface water effects are appropriately avoided and minimised.
- Subject to changes recommended by the IAC, the proposed EPRs will reduce the residual risk surface water effects to low.

5.8. Groundwater

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on land and water (including groundwater, surface water, waterway, wetland and marine) quality, movement and availability.

Assessment context

Groundwater effects were discussed in Chapter 4 Groundwater of Volume 4, as well as Technical Appendix P Groundwater of the EES. Groundwater effects are addressed in Chapter 12 of the IAC report. The proponent proposed 10 EPRs to specifically address groundwater effects. The IAC supported these EPRs as proposed.

The groundwater study area comprised a 500-metre buffer from the centreline of the land cable alignment and other infrastructure between Waratah Bay and Hazelwood. A nominal 10 metre vertical study area was considered to address potential effects from excavating the cable trench, cable joint pits and HDD crossings of waterways and the shore crossing (3 metres depth).

Regional assessment of the depth to groundwater was completed using published modelling results. It identified six sections of the cable trench alignment that might encounter groundwater during construction and operation, thus requiring dewatering[68] .

Key potential effects relating to groundwater were mainly associated with project construction activities. These impacts included: potential removal and replacement of groundwater bores, dewatering of aquifers, saline intrusion of groundwater and potential acidification due to oxidation of acid sulfate soils. A potential impact of project operation was changes to groundwater recharge due to lower or higher conductivity material used in trench backfilling causing either aquifer damming or enhanced recharge from stormwater. The groundwater effects were assessed as being localised, short term and manageable with the application of standard mitigation and environmental management measures.

EPR GM01 requires investigation of groundwater conditions to inform detailed design and site-specific construction methods.

[68] Table 6-1 of Technical Appendix P of the EES

Hazelwood rehabilitation project and Delburn windfarm project were assessed for their cumulative impact due to their proximity to the project alignment and their potential to affect groundwater. The residual impact was assessed as low given the effect of the project on groundwater values would be temporary and localised.

The EES found that residual impacts during construction and operation on groundwater would be low following application of all the EPRs.

The supplementary technical report[69] indicated that further studies were required to assess whether the conclusions of the groundwater assessment were still valid due to the proposed changes to stage 2 construction timing. Mr Sweeney's expert witness statement[70] presented additional transient modelling to assess this change and concluded there was no increased risk to groundwater from the extended project staging.

Discussion

Submitters raised concerns about dewatering and waterflow impacts, the health of the aquatic ecosystem and forestry production. Mr Sweeney[71], addressed these concerns in his evidence.

Mr Sweeney also advised that because the cable trench is not watertight, the trench may provide a preferential pathway for groundwater flow where it is located below the water table. This has the potential to give rise to three additional impacts that were not assessed in the EES:

- unintended water discharge to the surface and waterlogging of soils;
- water eroding the trench and causing erosion and slope stability issues; and
- trenches acting as pathways for contaminants should the trench pass through a contaminated site.

Mr Sweeney[72] made several changes to the day 1 groundwater EPRs to address these impacts, as well as the outcomes of the constructability workshop. He also recommended the addition of EPR GW10 to address the potential movement of water and transfer of hydraulic pressure along the cable conduit due to gravity.

At the request of EPA, EPRs GW05 and GW06 were also amended to remove the requirement for consultation with EPA Victoria about extracted groundwater disposal and monitoring requirements.

Mr Sweeney advised that, with the implementation of the groundwater EPRs, all identified groundwater impacts would be reduced to low residual risk rating. The IAC supported the changes to the EPRs and considered them appropriate for managing the groundwater effects of the project. I also support the day 2 EPRs.

I support the IAC's finding that for most of the land cable alignment, trenches will not intercept groundwater. For those areas where trenches encounter groundwater and where groundwater needs to be extracted to keep the trench or connection pits dry, groundwater drawdown will be limited in both distance from the trench and duration of impact.

Further, the IAC noted that existing groundwater bores within the AoD will need to be decommissioned. These bores are all groundwater investigation or monitoring bores, mainly installed by the former State Electricity Commission. I note that EPR GW08 requires a replacement bore to be installed, if required.

[69] Tabled document 45l

[70] Tabled document 33

[71] Tabled document 33

[72] Tabled document 33

Most of the groundwater EPRs refer to a groundwater management plan as a subplan to the CEMP. However, no EPR has been drafted requiring a groundwater management plan. Therefore, I recommend that an additional groundwater EPR be drafted to include the development and implementation of a groundwater management plan. This plan needs to provide a clear framework for the additional assessments that are required to inform the construction methodology, and for monitoring groundwater effects during the life of the project. The groundwater management plan would need to be verified by the independent environmental auditor as per other subplans under EPR EM02.

Assessment

It is my assessment that:

- No significant groundwater effects from the project were identified in the EES or by the IAC and residual effects are acceptable.
- The EPRs provide an appropriate framework for site-specific assessments to inform detailed design so that it appropriately avoids and minimises groundwater effects.
- A new groundwater EPR require the development and implementation of a groundwater management plan that would be verified by the independent environmental auditor along with other CEMP subplans.

5.9. Land use planning

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on agriculture, forestry and other land uses, social fabric of communities, and local infrastructure, businesses and tourism.

Assessment context

Land use and planning issues are addressed in Chapter 15 and Technical Appendix S of the EES and in Section 17.3 of the IAC report. The draft PSA is found at Attachment 3 of the EES.

The proponent proposed four EPRs to specifically address land use and planning effects. The IAC did not recommend any changes to these exhibited EPRs. The project area and surrounds are broadly characterised by agricultural, forestry, rural residential, transport and conservation land use on both freehold and Crown land subject to the Latrobe and South Gippsland Planning Schemes. The EES identified the project route as commencing under coastal Crown land before proceeding through agricultural, rural living and forestry plantation land, bypassing key townships.

The EES identified temporary land use effects during construction including temporary occupation of land (mainly a 20 to 36-metre construction corridor with some larger laydown areas), amenity impacts and changes to access. For additional details of the construction of the project refer to chapter 2.

The easement will be 20-metres-wide, reflected on property titles and include restrictions for any works that would compromise the integrity of the cable infrastructure. Access will also be required for monitoring and maintenance. The following ongoing land use issues were identified:

- Agricultural land cropping and grazing will still be permitted across the easement, however restrictions will remain for activities such as earthworks, dam construction and deep-rooted plantings.
- Forestry plantations will not be able to resume over the approximate 35-hectare easement affecting forestry land (Section 5.12 of this assessment).
- Two locations (one at either end of the project) will require permanent acquisition and exclusive use.

A supplementary technical report[73] was prepared in relation to the changes to the timing of stage 2 in Technical Appendix S. The supplementary technical report found, although some construction impacts on land uses would be prolonged with the two-stage timing, they would remain temporary and therefore there were no changes to the assessment outcomes or proposed EPRs as a result.

The key issues in my assessment of the project's planning and land use effects are:

- whether the project is broadly consistent with the relevant planning policy;
- whether the project's effects on existing land uses are reasonable and acceptable; and,
- whether the project will unreasonably impact potential future land uses.

The proponent prepared a draft PSA intended to facilitate the approval of the project under the P&E Act. The draft PSA seeks to introduce a SCO and associated incorporated document to facilitate project delivery (Section 4.1 of this assessment).

Discussion

Consistency with strategic planning policy

The relevant objectives of planning in Victoria, as specified in the P&E Act, seek to:

- provide for the fair, orderly, economic and sustainable use and development of the land;
- provide for the protection of natural and manmade resources and the maintenance of ecological process and genetic diversity;
- to protect public utilities and other assets and enable the orderly provision and coordination of public utilities and other facilities for the benefit of the community;
- facilitate development in accordance with these objectives; and
- balance the present and future interest of all Victorians.

These objectives have informed the Victoria Planning Provisions and the planning policy framework of the South Gippsland and Latrobe Planning Schemes. All decision making under the P&E Act must support these objectives.

The following key clauses of the Planning Policy Framework (PPF) of the Planning Schemes are relevant to my assessment of the project's strategic land use suitability:

- Clause 12.01-1S (protection of biodiversity)
- Clause 12.01-2S (native vegetation management)
- Clause 13.02-1S (bushfire)
- Clause 14.01-1S (protection of agricultural land)
- Clause 14.01-3S (forestry and timber production)
- Clause 19.01-1S (energy supply)
- Clause 19.01-1S (energy supply - Gippsland)
- Clause 19.01-2L (alternative energy sources – South Gippsland).

The EES concluded the project would be 'broadly consistent with existing land use planning policy which supports the timely provision of energy distribution infrastructure to meet community demand for energy services'. The project supports development and investment in energy supply infrastructure in Victoria, as sought by Clause 19.01-1S (energy supply). If constructed, the project will also support Victoria's transition to

[73] Tabled document 45n

renewable energy and a low-carbon economy, by supporting the movement of renewable energy generated in Tasmania into the grid, as sought by Clause 19.01-2S (renewable energy).

I support the IAC's finding that the project appropriately maximises the use of the existing Hazelwood terminal station and surrounds, enhancing its strategic importance as an energy hub for the State of Victoria as envisioned in the Gippsland Regional Plan 2020-2025. The project is also supported by Victoria's Climate Change Strategy (DELWP 2021) and will help achieved the State's vision for net-zero emissions.

Effects on existing land uses

Permanent land acquisition will be required for the potential transition station and Hazelwood converter station.

For the Waratah Road compound, there would be a small loss of agricultural land because of the project, as well as a long-term change to the land use to be a utility installation in this location. The proposed Waratah Road compound is located approximately 750m from the Waratah Bay shore crossing and is expected to have a footprint of approximately 75m x 50m. This would be fenced and screened by vegetation to minimise visual amenity impacts. This proposed change in land-use is reasonable given the small amount of agricultural land impacted, the proposed screening and its location adjacent to the bend in Waratah Road. Once construction is complete, the majority of the landholdings would be able to continue operating as farmland.

For the Hazelwood converter station, the existing agricultural land (used for cropping) and the associated dwelling has been acquired by the proponent, and if the project is approved, the current land agricultural land use would cease. While this impact is acknowledged, the proposed location of the Hazelwood converter station is reasonable as it leverages off the location of the existing Hazelwood terminal station and associated 500kV and 220kV powerlines surrounding the site. The amenity impacts associated with the Hazelwood converter station including air quality, noise, and vibration are discussed in more detail throughout this assessment.

I support the IAC's conclusion that the project will have minimal direct effects on townships, rural living areas and tourism land uses, with most impacts being temporary during the construction of the project. The CEMP required by EPR EM02 assists in minimising land use disruptions during the construction of the project.

Impacts on agricultural and forestry land uses can be appropriately managed through the EPRs, as discussed in Section 5.12 of this assessment. The cable alignment has been designed to be underground to minimise impacts on significant views and vistas that contribute to the character of the coastal and hinterland region, as discussed further in Section 5.13 of this assessment.

The proponent has identified the following:

- The area surveyed contains 308 land parcels, including 183 freehold parcels and 125 Crown land parcels.
- The proposed easement contains 263 land parcels, including 159 freehold parcels and 104 Crown land parcels.
- There are 90 freeholder landowners and six Crown land managers who would be affected by the proposed easement.

The easement will impose some restrictions on existing land uses, given the large landholdings of the predominantly agricultural land impacted. However, the impacts of the easements will be localised and activities such as grazing, cropping, irrigation, gardening and vehicle access will still be permitted in the easement. EPR LUP02 will ensure that the project is designed to minimise disruption to properties as a result of the easement acquisition.

Effects on potential future land uses

Submitters raised concerns about the potential effects of the project on several future projects including the Strzelecki-Alpine biolink, Delburn wind farm and future nuclear energy activity in Gippsland.

The IAC concluded that the biolink will not be compromised by the development of the project. While there is support in the Latrobe Planning Scheme for the creation of the biolink at a regional strategic level, there are currently no specific planning controls in place on the project land to facilitate the establishment of the biolink. EPR LUP01 will satisfactorily ensure that any relevant strategic land use plans in relation to the biolink will be appropriately considered in the alignment plans endorsed for the project (if approved).

Delburn Wind Farm Pty Ltd were supportive of the project, however raised some concerns regarding:

- unconfirmed lease arrangements;
- separation of cable crossings and minimisation of heat impacts;
- potential impact of a proposed laydown area on the location of the wind farm's site operations centre; and
- impacts on a tree proposed to be retained by the wind farm.

In response, the proponent agreed to do further consultation with Delburn Wind Farm Pty Ltd, relocate the laydown area and retain the potentially impacted tree. I support the IAC that EPRs LUP01, LUP02 and LUP03 provide the appropriate mechanisms to address these concerns and any other future energy projects sought to be developed in proximity to the project alignment.

In relation to the potential for future nuclear activity in Gippsland, there are currently no strategic plans or planning policy seeking to facilitate nuclear energy in the Latrobe Valley (or anywhere in Victoria). I agree with the IAC that the project would be able to co-exist with a range of energy activities, including nuclear generation, in the future if required.

Finally, while recognising the two-staged approach to construction will prolong some temporary land use effects, I agree that it will not change the overall land use impacts and the proposed EPRs are suitable.

Assessment

It is my assessment that:

- The project is broadly consistent with strategic land use and planning policies, which seek to facilitate investment in energy supply infrastructure in Victoria.
- The proposed land use effects are generally minimal and temporary in nature, given the underground cable alignment
- All above-ground infrastructure has been appropriately sited to avoid and minimise unreasonable effects.
- The project will not unreasonably impact the development of future projects in the region.
- The residual land use effects of the project, if approved, can be appropriately managed through the provisions of the incorporated document and the EPRs contained within the EMF.

5.10. Economic

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on agriculture, forestry and other land uses, the social fabric of communities, and local infrastructure, businesses and tourism.

Assessment context

Economic effects are addressed in EES Volume 1 Chapter 7 and Technical Appendix B of the EES and in Chapter 17 of the IAC Report.

The proponent did not propose any EPRs to specifically address economic impacts. Technical Appendix B identified 10 EPRs (A01 to A02, LUP01 to LUP04 and S01 to S05) sourced from Technical Appendices K, S and U that were considered relevant in the economic impact assessment. There were no changes proposed to these EPRs for economic reasons.

The EES identified positive economic effects of the project during construction, from the generation of jobs directly in the construction industry and benefits for the tourism, health care and rental sectors. Negative effects were predicted for the region's existing agricultural, manufacturing and mining industries, with increased competition for workers. During operations positive effects for the construction industry are predicted to continue, with continued negative economic effects to the agricultural industry though to a lesser extent than during construction. Reduced demand for healthcare services from the project during operations was predicted to reduce jobs in health care.

The EES noted that EPRs proposed to manage social effects would also be leveraged to reduce negative, and increase positive, effects of the project. For example, the industry participation plan (EPR S02) will help to realise the economic outcomes in terms of extending increased employment opportunities out to potentially economically marginalised groups, and implementing community benefits sharing scheme (EPR S04) will also help to minimise the negative economic impact associated with predicted full-time equivalent job-year losses in some sectors across Victoria.

The EES assessed economic impacts to be low to very low in the long-term, with the application of the 10 EPRs. From an overall economic perspective, the project is predicted to deliver significant benefits to the regional and economies of Gippsland and Victoria.

The computable general equilibrium model (CGE) predictions and veracity of modelling inputs were the subject of submissions and examined by the IAC.

The supplementary technical report[19] concluded the change in timing of stage 2 may prolong some impacts on tourism, land values and housing but would not change the conclusions or recommendations of Technical Appendix B. The supplementary technical report included updated expenditure and job predictions, both which increased due to the two stages of construction and the rising cost of materials. This resulted in an increase of the total economic value add to Victoria to $3 billion.

A peer review of Technical Appendix B was completed, which concluded the methodology applied to the economic analysis, including modelling and associated assumptions, were fit for purpose, utilised well known approaches and were reasonable.

Discussion

The IAC supported the EES conclusions that the project will deliver overall economic benefits in Gippsland and State of Victoria. The construction of the project will provide employment and training opportunities for the region, including the workforce transitioning out of the Latrobe Valley coal power sector. The project's construction will support local businesses through purchasing goods and services required to support the project's construction. I support these conclusions.

The IAC acknowledged the competition the project would generate for employment resources and worker accommodation and noted these effects may intensify as other projects commence in the area. The IAC was satisfied the social EPRs would mitigate these effects to an acceptable level. I support this conclusion, in particular:

- EPR S02 workforce and accommodation strategy will alleviate the potential effects of the project's workforce and accommodation requirements on local short-term accommodation.
- EPR S04 community benefits sharing scheme and EPR S05 industry participation and social inclusion plan will appropriately leverage procurement processes to expand local supply chains and stimulate further business development, spending and investment.

– EPR S03 community and stakeholder engagement framework embeds sufficient consultation requirements for the proponent to continue to address the economic concerns during the life of the project.

Assessment

It is my assessment that:

– The project is likely to result in overall significant economic benefit for the local and regional economies.
– The EPRs will adequately minimise the potential negative economic effects of employment and worker accommodation to acceptable levels.

5.11. Social

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on agriculture, forestry and other land uses, the social fabric of communities, and local infrastructure, businesses and tourism.

Assessment context

Social effects are addressed in EES Volume 4 Chapter 16 and Technical Appendix U of the EES and in Chapter 17 of the IAC Report. The proponent proposed six EPRs to deal with social effects. Of these, one (EPR S06) was the subject of recommendations by the IAC. In addition, one (EPR S01) was amended by the proponent in response to expert evidence.

Review of relevant supplementary technical reports concluded that that other than for agriculture and forestry, the revised timing of stage 2 was not expected to increase impacts. Agriculture and forestry impacts would not be increased in magnitude, but the duration of impacts (with the longer gap between stages 1 and 2) would be extended. On this basis, the proponent did not prepare a supplementary technical report for the EES to examine social impacts of the revised timing of stage 2.

The EES focused on the local study area, including the 18 suburbs from the shore crossing at Waratah Bay to the Hazelwood converter station site, and a regional study area, comprising the South Gippsland and Latrobe City local government areas. The EES and IAC identified the local and regional community may benefit from the following during construction:

– creation of short-term employment;
– local business opportunities to supply good and services;
– local and regional training and development of the construction workforce;
– use of short-term accommodation for construction workers; and
– employment opportunities for First Peoples, women, youth and socially vulnerable groups; and creation of new opportunities for First Peoples businesses.

Similar effects were expected during operations, though to a lesser extent, reflective of the smaller operational workforce. During operations ongoing employment benefits would be more subdued with ongoing benefits related to the broader economic activity generated by the project and opportunities created for further investment in community infrastructure.

Key potential negative effects were related to the use of short-term accommodation which could affect the availability and affordability of the local rental market and have implications for the tourism industry.

The EPRs proposed management plans and schemes to minimise negative and increase positive effects of the project effects:

– social impact management plan (EPR S01);
– workforce and accommodation strategy (EPR S02);

– community and stakeholder engagement framework (EPR S03);
– community benefits sharing scheme (EPR S04); and
– industry participation plan (EPR S05).

The EES found the most significant residual effect (rated high) from the project was related to the use of short-term accommodation, which could affect the availability and affordability of the local rental market. This would be influenced by the timing of construction and the extent to which it overlaps with other projects (such as the Delburn wind farm, Star of the South offshore wind farm, Hazelwood rehabilitation project and Wooreen energy storage system). The residual effect on short-term accommodation may be further exacerbated (from high to major), if there is overlap with these projects. Additionally, there could be moderate residual cumulative effects associated with:

– increased demand for skilled labour resources, which would impact on agricultural, forestry and fisheries sectors; and
– impacts on health and emergency service providers, which may compromise the service provided to the existing regional population.

Discussion

The proponent's day 1 version of EPRs[20] proposed the removal of the social impact management plan required by EPR S01, given that construction impacts will be managed through the plans and strategies required under other EPRs. EPR S01 was replaced with a new requirement to minimise impacts on local health services by providing first response medical capabilities for potential workplace incidents during construction. The proponent also proposed a new EPR S06 to outline engagement to be reflected in the project's emergency response plan and procedures. The IAC agreed with these additional EPRs and recommended additions to the proposed EPR S06 to ensure local councils were appropriately engaged in the preparation of the project's emergency response plans and procedures. I support the proponent's proposed EPRs S01 and EPR S06, as amended by the IAC's recommendation.

The IAC heard from the proponent's expert witness Ms Sommerville, that the EES assessment in Technical Appendix U was conservative in adopting a worst-case approach, and while subjective in nature, was consistent with assessments for similar projects. The IAC was satisfied Technical Appendix U adopted a standard industry methodology and had been appropriately informed by the consultation process undertaken by the project.

The IAC was satisfied that social effects are not likely to be significant, with the exception of housing affordability and availability, and can be appropriately managed through the proposed EPRs. I support this conclusion, as elaborated below.

Short term accommodation impacts

The project's anticipated construction workforce may require up to 350 personnel at any one time. It is expected that half of this workforce will be sourced locally within the Gippsland region. The remainder of the workforce is expected to be sourced from other areas of Victoria and from outside of Victoria.

Construction workers sourced from outside the region are likely to create additional demand for temporary and short-term accommodation in Gippsland and the broader region during the construction period of stage 1 and stage 2. This has the potential to affect the availability of such accommodation for other users. The EES noted that the rental vacancy rates in Fish Creek, Sandy Point, Mirboo North, and Yinnar are below one per cent. This indicates a shortage of rental properties, which can result in increased rent prices and low-income households being priced out of the market. This is a particular issue because the average income in the regional study area is 28 per cent lower than the state average, which means that households will be more sensitive to rental price increases. Consultation during the EES process further highlighted the concern from the community about the availability of rental supply.

The IAC noted that impacts on housing availability and affordability are difficult to avoid, part of a broader problem, and there is little that any individual project can be expected to do in response other than to develop a worker and accommodation strategy as required under EPR S02.

I support the IAC's finding that there will some impacts from workforce accommodation from the project that need to be adequately addressed through development and implementation of the EPR S02 workforce accommodation strategy.

Other social effects of the project

A range of temporary, short-term effects will occur during construction, when community members may experience property impacts, traffic disruptions, reduced access to recreational areas, and amenity effects. The IAC considered these social effects were manageable and would be appropriately avoided and minimised through the EPRs. I agree with this finding. The EPRs formalise the proponent's approach to ongoing community consultation, in particular EPR S03 the community and stakeholder engagement framework which includes a complaint handing system which will ensure ongoing communication with stakeholders regarding the timing and duration of potential effects and enable the appropriate response to community concerns.

Given the low ongoing social effects of the project to the community, the IAC questioned the need for the proponent's community benefit sharing scheme required under EPR S04. Ms Sommerville considered such a scheme would likely focus on construction-related impacts and may include initiatives such as sponsorship, investment or employment and training specific to the project. The IAC was satisfied this EPR should remain, and I support this.

Cumulative effects

The influx of project construction workers has the potential to contribute to cumulative social effects, if the project coincides with construction of other projects. In this case, likely cumulative social effects would be housing affordability and availability, demand and competition for skilled labour impacting the agricultural, forestry and fisheries sector and increased demand for health and emergency services. In conjunction with mitigation measures proposed by the proponent in its EPRs, the EES concludes these effects will need to be mitigated by measures developed for each of the other projects.

Ongoing stakeholder engagement and consultation will be important for managing the social cumulative impacts of each of these projects during construction and operation. I am satisfied the mitigation measures proposed by the proponent (including recommended changes by the IAC) embed sufficient consultation requirements for the proponent to continue to address the cumulative effects during the life of the project.

Assessment

It is my assessment that:

- The project's residual impacts on housing availability and affordability have been appropriately avoided and minimised through the workforce implementation strategy and are acceptable.
- Remaining residual social impacts are minimal and can be appropriately managed through the social EPRs S01 – S06, subject to changes recommended by the IAC.

5.12. Agriculture and forestry

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on agriculture, forestry and other land uses, social fabric of communities, and local infrastructure, businesses and tourism.

Assessment context

Agriculture and forestry effects are addressed in Volume 4 Chapter 6 and Technical Appendix K of the EES and in Chapter 17 of the IAC's report. The proponent proposed six EPRs (A01 – A06) in response to agriculture and forestry effects and five (A01 to A04; A06) of these have been the subject of recommendations by the IAC.

There are three key agricultural industries operating along the project corridor: dairying, beef production and horticulture (primarily potatoes). Less prevalent but also present are racehorse training and agistment facilities. The project corridor also supports forestry plantations owned by Hancock Victorian Plantations Pty Ltd (HVP). Beef (136.5 hectares of the project's AoD), dairying (93.8 hectares) and forestry plantations (41.02 hectares) are most impacted by the project's footprint.

The potential effects on agricultural values from the construction and operation of the project examined in the EES were reduced production, yield and farm income from:

- amenity impacts and disruption during construction;
- degraded soil structure, soil moisture content and fertility;
- ineffective biosecurity controls leading to introduction or spread of animal or plant pathogens or a noxious weed infestation;
- the need to modify or adopt alternative agricultural practices due to easement restrictions (for example, no structures or deep-rooted planting); and
- changes to operations and constraints on farm development plans.

The potential effects on forestry values were loss or reduced production from:

- temporary restrictions on access and harvesting activities during construction;
- long-term restrictions on and changes to operational practices;
- the pre-mature harvesting of trees in the AoD;
- loss of productive plantation land within the easement; and
- introduced diseases during construction and operation (plant pathogens such as *Phytophthora cinnamomi*).

Further impacts not examined in the EES, but highlighted by HVP[74] included:

- 'windthrow effects' on newly created edge trees and the creation of suboptimal sliver areas; and
- increased fire risk during construction owing to greater numbers of personnel and vehicles and disruption to fire suppression activities.

Agriculture and forestry effects were proposed to be managed through property condition surveys prior to construction (EPR A01), property management plans (PMPs), which would outline property-specific measures to avoid or minimise disruption (EPR A02), soil management plans (EPR A03), the progressive rehabilitation of disturbed areas via a rehabilitation strategy (EPR A04), avoidance of impact to organic farming certification (EPR A05) and measures in the OEMP to avoid or minimise impacts during project operation (EPR A06).

Impacts on agriculture and forestry would also be mitigated through the land use planning EPRs including designing the project to minimise the footprint and impacts on agriculture, rural industry and forestry properties (EPR LUP01), requiring engagement with landholders to negotiate property and easement acquisition and the terms of access (EPR LUP02) and minimising temporary land use impacts due to construction and post construction (EPR LUP03).

[74] Tabled document 112

Access licences and construction leases will be negotiated with landholders under the Electricity Industry Act (Section 3.5 of this assessment). These agreements will include compensation for landholders.

With the implementation of the EPRs, the EES found the residual impacts on agriculture during construction was found to be low to moderate in the construction phase and low to very low in the operation phase for all agriculture types. The residual impact on forestry operations was considered moderate.

The IAC directed the proponent's agriculture, forestry and geotechnical experts, Mr Gallienne and Mr Darras, to meet with HVP's forestry expert, Mr Morton, to consider any drafting changes to the EPRs relating to forestry and clarify easement use restrictions. Some of the agreed changes were incorporated into the proponent's day 2 version of the EPRs[75]. The proponent's day 2 version of the easement restrictions[76] clarified the forestry vehicle types and uses permitted in the easement, that forestry log-landing areas are permitted above the cables but not above joint pits, and that subsurface activities, such as drainage and road repairs, are permitted.

A supplementary technical report was prepared in relation to revised timing for stage 2 for Technical Appendix K[77]. The supplementary technical report concluded that there would not be additional impacts to agricultural and forestry due to the revised timing of stage 2. However, timing between stage 1 and stage 2 was considered important for determining whether construction haul roads would be retained, and planning of any temporary reinstatement works. This report recommended that PMPs (EPR A02) be updated prior to stage 2 based on an understanding of the appropriate documentation for each landholding and the conditions existing at the time of the stage 2 works.

No significant cumulative effects on agriculture or forestry values were identified.

Discussion

Agriculture

The IAC heard from submitters that agriculture makes an important contribution to the region's economy and landscape character and is supported and encouraged through local planning policy. South Gippsland Shire Council's submission asserted that the municipality contains some of the most productive land in Australia.

The IAC found that the project is not anticipated to have a significant impact at a regional scale on availability of land for agricultural production, overall agricultural productivity or its economic contribution. I support these findings, and I consider that residual impacts on agriculture at a broad landscape level are acceptable and the project would not impact the long-term vision for agricultural land use planning in the broader Gippsland region.

During construction, landowners will experience temporary disruption of agricultural activities. The IAC agreed with Mr Gallienne that landowner impacts during construction can be managed adequately via the agriculture EPRs. The IAC found that EPRs A01 and A02 provide appropriate mechanisms to identify existing property conditions, infrastructure and activities that may be impacted during construction and to prepare and implement property-specific PMPs in consultation with landholders. I agree that the EPRs provide a sound basis for understanding property impacts and implementing property-specific requirements to avoid and minimise construction impacts.

I concur with the IAC that the most significant long-term residual impacts are:

[75] Tabled document 82

[76] Tabled document 140a

[77] Tabled document 45s

– loss of agricultural production from changes to soil conditions including landslip, soil ecology, and groundwater and surface water conditions; and
– limitations on agricultural activities and production associated with the easement restrictions, including cropping that requires ploughing or tilling deeper than 0.5 metres, and constructing dams or fixed-pivot irrigation.

The IAC considered day 1 changes to EPRs relating to geomorphology, groundwater and biosecurity were appropriate to prevent changes to soil conditions that could reduce agricultural production. These included day 1 changes to EPR GM01 that provided measures to appropriately manage soil erosion and landslip risks to farming properties during construction and ensure ongoing residual impacts during operation are acceptable. Day 1 changes to EPR GW08 required landholders to be engaged in identifying and managing impacts on private bores or spring-fed dams used for agriculture. Day 1 changes to EPR A02 referenced soil-borne pathogens to manage biosecurity risks during construction. The IAC was satisfied that these EPRs in combination with EPR A03 (requires a soil management plan to be developed in consultation with the landholder to avoid or minimise impacts on soil fertility and soil horizons) can appropriately manage losses of agricultural production from project-induced changes to soil conditions. I support this conclusion.

The IAC noted that easement restrictions post construction were unlikely to limit beef and dairy farming operations, which make up 80 per cent of the agricultural properties along the alignment. Pasture grasses could continue to be cultivated over the easement post construction, assuming successful reinstatement and rehabilitation (EPRs A03 and A04). The IAC noted however, that restrictions to tilling depths could limit horticultural activities at the three properties along the alignment. The IAC was satisfied that impacts to these properties could be mitigated through the EPRs and any easement negotiations. Micrositing of the alignment (as per EPR LUP01) in consultation with landowners during detailed design, in response to farm development plans and other landowner preferences outlined in PMPs, will also be important to minimising long-term impacts. I am satisfied that limitations on agricultural activities and production associated with easement restrictions during project operation can be managed to an acceptable level via the EPRs and easement agreements.

In relation to the revised timing for stage 2, Mr Gallienne noted that by extending the construction time of the project there will likely be changes in land ownership, agricultural land use and farm management practices. I recommend that EPR A02 be amended to require the PMP to be reviewed and updated in consultation with the landowner prior to stage 2. Any updates to the PMP would inform any property-specific requirements during stage 2 works.

Forestry

The IAC heard from HVP that its Thorpdale Plantation will be significantly impacted by project construction and that there will be significant ongoing impacts during operation[78]. The IAC agreed that impacts on forestry operations 'are not insubstantial'.

The IAC found that the key impacts on forestry were:

– loss of production from early removal of immature logs on a permanent basis within the easement or through the creation of unproductive isolated smaller plantation area pockets or slivers; and
– loss of heavy machinery access for harvesting, log storage and haulage within the easement.

The IAC noted that the project alignment had been designed to reduce impacts on productive plantation land by locating the cables under existing roads and firebreaks where possible, co-locating with the proposed Delburn wind farm access tracks, following property boundaries or coupe edges where possible, and

[78] Tabled document 112

minimising the creation of land slivers or large areas vulnerable to windthrow. Micrositing can further minimise the creation of land slivers including by narrowing the construction zone in certain locations (EPR LP01).

Clarification of easement restrictions during the hearing addressed uncertainty about use of heavy equipment and log storage within the easement. The IAC found that the day 2 changes to the easement restrictions provided greater clarity and flexibility for critical forestry (and agricultural) operations, as well as an appropriate basis for preparing PMPs (EPR A02).

The IAC was satisfied that the EPRs, in combination with the design of the project alignment, will avoid and mitigate impacts on forestry operations and minimise long-term impacts to an acceptable level. I am satisfied that the EPRs will require the proponent to work with HVP to refine the alignment through micrositing thereby further minimising the long-term impacts during project construction and operation. I support the IAC's finding that the project design has reduced forestry impacts and the EPRs are appropriate to ensure further mitigation of residual impacts to acceptable levels.

HVP sought stand-alone forestry EPRs with a higher level of prescription. While the IAC acknowledged that forestry operations are more complex than other forms of agriculture and governance arrangements are considerably different, the IAC did not agree that stand-alone or highly prescriptive forestry EPRs were needed. While forestry-specific requirements were not well captured in the exhibited EPRs, the proponent's day 1 and day 2 versions sought to remedy these gaps by incorporating requirements for forestry coupes, age classes and practices, log storage and landings, water points and supply, and bushfire management, as well as a stronger emphasis on landowner consultation.

The IAC recommended that stand-alone forestry EPRs were not needed and, in addition, proposed minor wording changes to day 4 EPRs A01, A02, A04 and A06 based on HVP's preferred day 2 version[79] to improve clarity and provide additional references to forestry activities and related infrastructure. I am also satisfied, as was the IAC, that developing the PMPs in consultation with the forestry operator will provide the basis for additional detailed mitigation measures to be developed. Further, my recommendation that EPR A02 be amended to require the PMP to be reviewed and updated in consultation with the agricultural landowners prior to stage 2 equally applies to the PMP prepared in consultation with the forest operator.

Assessment

It is my assessment that:

- The project will give rise to some unavoidable disruption and impacts to individual landowners and forestry operations.
- The project has sought to avoid and minimise impacts though design, and there is opportunity to further avoid and reduce impacts through micrositing that will be informed by consultation with landowners.
- The agriculture and forestry EPRs are adequate to sufficiently avoid, minimise and manage the project's effects on agriculture and forestry operations to acceptable levels, subject to the changes recommended by the IAC and my recommendations for EPRs A01 and A02.

[79] Tabled document 155

5.13. Landscape and visual

Evaluation objective

Avoid and, where avoidance is not possible, minimise potential adverse effects on landscape and visual amenity.

Assessment context

Landscape and visual impact matters are addressed in Volume 4 Chapter 7 and Technical Appendix R of the EES and in Section 18.3 of the IAC report. The proponent has proposed four EPRs to manage landscape and visual impacts, one of which was the subject of recommendations by the IAC.

The EES recognised six different landscape character areas in the project area:

- coastal dunes and beaches
- townships and rural residential
- cleared flat farmland and cleared hilly farmland
- plantations
- waterbodies and waterways
- national parks, state parks and state forests

Most the project's onshore visual and landscape effects have been avoided through the selection of an underground transmission line. These impacts can be divided into two groups; temporary impacts during construction of the cable alignment and the permanent impacts of the above-ground infrastructure located at Hazelwood converter station and Waratah Road compound.

The key issues for the assessment of the project's landscape and visual effects are:

- if above-ground infrastructure impacts have been adequately identified and assessed;
- whether these impacts of the project are acceptable, when considered against the relevant policy and guidelines; and,
- whether the relevant mitigation measures proposed in the EMF are acceptable.

A supplementary technical report[80] was prepared by the proponent in relation to revised timing for stage 2. The report indicated the change in timing would not impact the recommendations in Technical Appendix R.

Discussion

The EES concluded that the project's landscape and visual effects will be low due to most of the infrastructure being located underground and through the avoidance of residential areas.

Much of the project land is located within agricultural areas in the Farming Zone (FZ), which does not seek to prioritise views to landscapes.

I am satisfied, as was the IAC, that the temporary construction effects of the project have been minimised through the adoption of an underground alignment, including HDD in coastal areas and sensitive landscapes, such as Waratah Bay. I consider that the location of laydown areas has been appropriately located away from sensitive viewpoints. Further, the EPRs will ensure that the final design of the project minimises the landscape and visual effects from the project, as well as any temporary impacts during construction through progressive rehabilitation and revegetation.

[80] Tabled document 45m

Submitters raised concerns regarding landscape and visual effects of the project, including:

- the integrity of the photomontages presented in the EES; and
- consistency with the values, aims and strategies of Parks Victoria for Cape Liptrap Coastal Park and the Gippsland Plains and Strezlecki Ranges.

The IAC was satisfied the assessment undertaken for the EES adopted an appropriate methodology to examine landscape and visual impacts. They considered the use of HDD as an appropriate means of largely avoiding impacts on highly visually sensitive locations, such as those identified in planning policy and overlays. While trenched construction would have greater visual effects, it will be temporary, localised and not inconsistent with landscape outcomes sought in both planning schemes. The IAC concluded the residual landscape and visual effects to be acceptable and consistent with Clause 12.02-1S and the Siting and *Design Guidelines for Structures on the Victorian Coast, May 2020*.

The project will result in permanent visual effects at the Hazelwood converter station site and the Waratah Road compound. The IAC found that although the Hazelwood converter station will be highly visible, it's co-location with existing transmission infrastructure minimises its visual prominence. Visual effects of the above-ground infrastructure at Waratah Road compound will also be minimised by siting and design, including low rise buildings and vegetation screening at both sites will ensure that the visual effects are softened for the duration of the project. I support the IACs conclusions and findings and note the proposed sheds at the Hazelwood converter station are not dissimilar to other large agricultural sheds that can be commonly found in farming regions. The IAC noted the exhibited EPRs LV01, LV02 and LV03 did not refer to the communications building at Waratah Road compound. The proponent addressed this issue in its day 2 version of LV02. The IAC recommended LV03 also be amended to apply to the communication building. I support this change.

The cumulative visual effects of the project, in combination with the Delburn wind farm and Hazelwood rehabilitation project were examined in the EES. I support the IAC's view that the co-location of the project with the existing Hazelwood terminal station and the nearby proposed location of the wind farm is reasonable, reduces its visual prominence and supports strategic importance of Hazelwood as an energy hub for the State.

Assessment

It is my assessment that:

- The siting and design of the project and the adoption of an underground cable, using HDD in some locations, satisfactorily minimises the landscape and visual impacts of the project to acceptable levels.
- The proposed EPRs will be suitable to manage the residual visual effects of the above-ground infrastructure, and the construction impacts of the project, subject to the changes proposed by the IAC.

5.14. Bushfire

Evaluation objective

Avoid and, where avoidance is not possible, minimise adverse effects on community amenity, health and safety, with regard to noise, vibration, air quality including dust, the transport network, greenhouse gas emissions, fire risk and electromagnetic fields.

Assessment context

Bushfire effects are discussed in Volume 4 Chapter 12 and Technical Appendix M of the EES, as well as in Section 18.4 of the IAC report. The proponent proposed four EPRs to deal with bushfire risks and these were all subject to recommendations by the IAC.

A supplementary technical report[81] for Technical Appendix M concluded that the changes to the timing of stage 2 would not impact the conclusions or recommendations in Technical Appendix M.

The project is in a Bushfire Prone Area (BPA) and Bushfire Management Overlay (BMO), Clause 13.02-1S (bushfire planning) of the South Gippsland and Latrobe Planning Schemes. Clause 13.02-1S requires the consideration of bushfire risk, with the objective to strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life. Additionally, *AS/NZS 31000:2018 Risk Management – Principals and Guidelines* is also relevant in the assessment of the project's bushfire risk.

The EES outlined the key fire ignition sources and risk scenarios to be considered for the above-ground infrastructure sites at Hazelwood converter station and Waratah Road compound, being:

- bushfires impacting on the site (that is, from an outside source), including the worst-case scenario of a large grassfire starting to the northwest within un-grazed paddocks, with winds from the north-west; and
- fires originating from within the site, including the scenario of an electrical fault igniting unmanaged grass with a westerly wind direction.

The key issues examined by the IAC and discussed in my assessment in relation to bushfire are:

- Has the risk of bushfire been adequately identified and assessed?
- Has the project been developed to be generally in accordance with the objectives of Clause 13.02-1S?
- Can the proposed bushfire EPRs satisfactorily manage bushfire risk during the construction, operation and decommissioning of the project?

Discussion

The EES assessed the overall initial bushfire risk of the project as 'minor to insignificant' across all vulnerability risk criteria, given the bushfire hazard context, fire history, landscape profile, siting and surrounding land uses. With the implementation of the proposed EPRs, the EES concluded that the residual risk was reduced to insignificant.

The proponent engaged with the Country Fire Authority (CFA) on the proposed EPRs ahead of the public hearing, following which the CFA provided advice (on the exhibited EPRs) stating that:

- the EES lacked an assessment of bushfire policy and appropriate recommendations to inform the draft PSA;
- a bushfire emergency management plan should be prepared in consultation with the CFA before works commence, and should be reviewed annually; and
- the draft incorporated document should be amended to address:
    - exposure risks for radiant heat exposure at the Hazelwood and Waratah Road sites and laydown areas; and
    - detailed vegetation management outcomes.

The proponent updated its bushfire EPRs in their day 2 submission by including requirements to:

- engage with the CFA in preparing a bushfire protocol and bushfire emergency management plan;
- consult with industry brigades;
- refer to bushfire management protocols for forestry properties; and
- clarify the requirement to prepare a bushfire emergency management plan.

[81] Tabled document 45i

In response to the day 2 EPRs, the CFA submitted it remained of the view that "*there is limited information available that addresses the amendment and its ability to satisfy bushfire policy*". CFA's preference was for an additional bushfire report to be prepared. In lieu of the preparation of an additional bushfire report, it was suggested the day 2 EPRs should be amended to require the following detailed design requirements:

- setbacks to development to ensure radiant heat exposure will not be greater than 12.5 kilowatt per square metre.
- vegetation management in the setbacks for defendable space purposes.
- requirements regarding the location and access of static water supply to the satisfaction of the CFA.

The IAC concluded that the bushfire risks from the construction of the project will be low to minimal and can be appropriately managed with the day 2 EPRs in place. Further, the application of radiant heat exposure limits as suggested by the CFA is appropriate to mitigate bushfire risks at the Hazelwood converter station and Waratah Road compound during operation. Therefore, the IAC supported the proponent's day 2 EPR's subject to changes to EPRs BF01-BF04:

- require consideration of forest operator bushfire emergency management plan;
- ensure the firefighting capacity of landholders is not impacted;
- require communication with landholders in the event of an outbreak of fire;
- require vehicle access for industry brigades to be maintained; and
- require engagement with relevant councils in relation to municipal emergency management plans (S06).

I support the IAC recommended changes to the EPRs and I am satisfied that the bushfire risk of the project has been appropriately examined for the EES. The methodology adopted in the EES aligns with AS/NZS 31000:2018 Risk Management – Principles and Guidelines. The decision guidelines of Clause 13.02-1S have been appropriately addressed in the EES, including the consideration of:

- identification of bushfire hazards and fire history;
- establishing the bushfire risk context;
- prioritising the protection of human life and property assets during construction, operation and decommissioning; and
- reducing the vulnerability of the project and surrounding land to bushfire.

During operation, most of the infrastructure proposed is underground (e.g. cabling route), and is at low risk of being impacted by bushfire. Further, the Hazelwood converter station and Waratah Road compound are also at minor risk, due to the dispersed building assets and low human population around these sites. The EPRs (with the changes proposed by the IAC) will enable the project to implement measures to avoid and manage fires during construction. I support the IAC's recommendation to exclude the CFA's proposed detailed design requirements from the EPR's. The bushfire protocol (BF01) is to be developed in consultation with the CFA as relevant fire authority and the bushfire emergency management plan (BF03) is to be developed to the satisfaction of the CFA. These are the appropriate processes for the CFA to discuss its detailed design requirements with the proponent.

Assessment

It is my assessment that:

- The project has been designed and developed in accordance with the objectives of Clause 13.02-1S.
- The risk of bushfire impacts associated with the project can be acceptably managed by EPRs, subject to the changes recommended by the IAC.

5.15. Other effects

As noted in my published reasons for requiring an EES and the EES scoping requirements, the EES was to focus on potentially significant effects of the project including those related to terrestrial and aquatic

biodiversity, waterways, Aboriginal cultural heritage and socioeconomic values. The EES, submissions and IAC carefully examined potential effects associated with these values, these effects are considered in Sections 5.1 – 5.14 of this assessment.

Other less significant effects also examined by the EES and inquiry process were air quality, climate change, contaminated land and acid sulphate soils, electromagnetic fields, greenhouse gas emissions, noise and vibration; and traffic and transport.

Table *4* outlines the IAC's findings regarding these other effects and discusses their significance, the proposed EMF and EPRs, and my response to these conclusions. Generally, I support the findings of the EES and IAC in relation to these effects and consider that they can be effectively managed through well-established practices including the recommended EPRs.

Table 4: Other effects

IAC Findings	Minister's response
Air quality	
The proponent proposed two EPRs. The IAC recommended changes to one of these. The EES identified dust from construction activities to be the primary effect on air quality, through earthworks and trackout[82] . To minimise potential effects a construction dust management plan (AQ01) was recommended, as well as AQ02 to include appropriate measures to manage emissions to air within the OEMP. A supplementary technical report in relation to revised timing for stage 2 was prepared for Technical Appendix[83], which concluded air quality effects would not change as a result of the revised timing of stage 2. The EPA submitted AQ01 should be updated to include assessment of the effectiveness of air quality measures and associated continuous improvement of management practices. The IAC accepted EPAs submission and recommended relevant changes to AQ01. The IAC found the EES had appropriately assessed air quality. The IAC considered air quality risks associated with construction activities were well understood and the proposed measures were commonly used and proven to be effective. In addition, most impacts were likely to be of short duration.	I accept the IAC's findings that residual effects will be low and the effects on receivers, such as residences, can be acceptably managed with the recommended EPRs. I support recommended changes to AQ01 to include a reference to continuous improvement.

[82] Trackout is the transport of dust and dirt from the construction site onto the public road network

[83] Tabled document 45h

IAC Findings	Minister's response
Climate change The EES identified that climate change risks applying to the project include increased frequency of extreme heat, storm events, flooding, bushfires, drought, and coastal erosion and inundation. This may result in additional risks during construction, such as delays and fire. During operations, design standards for infrastructure may be exceeded in extreme weather. To minimise these potential effects, CC01 was proposed to address effects of climate change through the design process, as well as inform the CEMP and OEMP for managing extreme weather events. Other EPRs, for bushfire, surface water and social effects, will also address some climate change risks. A supplementary technical report[84] in relation to revised timing for stage 2 was prepared for Technical Appendix C which concluded climate change effects would not change because of the revised timing of stage 2. Some submitters raised concerns regarding climate change and extreme weather events affecting the viability and appropriateness of the project. The IAC concluded the project design and EPRs would adequately respond to the risks posed by climate-induced events; and the need for climate resilience**.**	I accept the IAC's findings that the project design and EPRs respond appropriately to climate change risks.
Contaminated land and acid sulphate soils The proponent proposed four EPRs. The IAC supported these EPRs. The EES undertook a risk assessment based on conservative assumptions to assess potential effects from disturbed contaminated land and acid sulfate soils. Site inspections and targeted soil sampling were informed by a desktop review and a conceptual site model to understand potential contamination sources, pathways and receivers. Field investigations were limited due to access constraints. The assessment concluded most of the study area was unlikely to contain acid sulfate soils, except for Waratah Bay, Hazelwood pondage[85], mapped areas of shallow groundwater and waterway crossings.	I support the IAC findings that the residual risk from areas of potential contaminated land and acid sulfate soils will be low and can be acceptably managed with the recommended EPRs. I support the IAC's amendment to EPR EM07 to include an inventory of waste generated by the project. I agree with Mr Tiddy and the IAC's findings that a separate spoil management plan is not required. I also acknowledge that spoil that is waste will be managed in accordance with the waste management plan (EPR

[84] Tabled document 45c

[85] Hazelwood pondage area refers an area occupied by Hazelwood cooling pond and Gippsland water reservoir, near Hazelwood converter station

IAC Findings	Minister's response
The EES did not identify any areas of contamination that presented a significant risk to human health or the environment, given adoption of standard mitigation measures. The project will generate large volumes of surplus soils, including up to 250,000 cubic metres of gravels for temporary haul roads. This material would likely be classified as clean fill material in accordance with EPA Publication 1828.2. EPA requested several changes to the contaminated land EPRs to align waste management protocols, transport and permissions with the *Environment Protection Act 2017*. Other updates regarding terminology, references and consultation were suggested. Most of EPA's submissions were accepted by the proponent and IAC, except for two recommendations, which are discussed further here. The EPA recommended changes to EPR CL02 to require the development of a spoil management plan as a subplan of the contaminated land management plan. EPA submitted the contaminated land management plan required by EPR CL02 should be prepared in accordance with requirements of EPR EM07. The proponent submitted the amount of spoil did not warrant a separate management plan and instead proposed to develop a protocol to manage useable spoil material. Spoil that was waste, would be managed in the waste management plan required by EPR EM07. The proponent's expert witness, Mr Tiddy and the IAC agreed that including another plan to address spoil requirements would be an unnecessary duplication. EPA submitted the contaminated land management plan (EPR CL02) should also include measures to minimise dust generation, sediment and stormwater runoff and seepage from stockpiled materials. The IAC did not explicitly address this submission however, it had made general recommendations regarding the need for EPRs to include appropriate linkages between EPRs. The IAC found the risk from disturbance of areas of potential contaminated land and acid sulfate soils can be suitably managed through the implementation of the EPRs, with the changes recommended in response to EPA's comments.	EM07). However, for clarity, the reuse protocol proposed in EPR CL02 should refer to EPR EM07 so that it is clear the waste hierarchy and characterisation in EPR EM07 will apply to spoil prior to determining suitability for spoil reuse. I support the EPA's recommendation that EPR CL02 should include measures to minimise dust generation, sediment and stormwater runoff and seepage from stockpiled materials in accordance with EPRs AQ01, SW01 and GW11 (new requirement). Further, I have made minor changes to EPR CL03 to include specific details regarding potential acid sulfate soils assessments and reporting requirements.

IAC Findings	Minister's response
Additionally, the IAC recommended EPR EM07 be amended to require the waste management plan include an inventory of waste produced by the project.	
Electromagnetic fields The proponent proposed two EPRs. The IAC recommended changes to one of these. The EES identified the most likely worst case magnetic field scenario on land was at Waratah Bay shore crossing where there is the largest separation of land cables, hence generating a larger magnetic field of 194 micro tesla. This calculated maximum magnetic field strength would not exceed exposure reference levels for humans, livestock, wildlife or medical and radio devices; however, it is above the reference level for apiaries of 2 micro tesla. The EES identified that underground land high-voltage direct current cables will cause heating of the surrounding soil, which could lead to drying and thermal resistivity. A supplementary technical report[86] in relation to revised timing for stage 2 was prepared for Technical Appendix A which concluded electromagnetic field effects would not change because of the revised timing of stage 2. The cumulative impacts of the co-located Delburn wind farm cable was not investigated in the EES. The IAC found that the EES had appropriately assessed Electromagnetic fields and that EMF01 and EMF02 were adequate to minimise and manage cumulative impacts. The IAC recommended EMF01 be revised to include reference to heating effects.	I accept the IAC's findings that the residual effects for electromagnetic fields will be low and agree that the effects on receivers such as honeybees can be acceptably managed with the recommended EPRs. I support the amendment to EMF01 recommended by the IAC to include a reference to heat effects of proposed cables.
Greenhouse gases The EES identified that during construction, one of the largest indicative sources of emissions was land disturbance and clearing, whereas during operations electricity loss through transmission is the largest indirect emission source. Sulphur hexafluoride (SF6) gas, used as insulation for the high-performance transformers, is an extremely potent greenhouse gas. Potential leakage of SF6 is the highest direct source of emissions during operations. EPRs GHG01 and GHG02 were proposed to minimise	I accept the IAC's findings that the project's greenhouse gas effects will be appropriately managed with the recommended EPRs. I support the IAC's recommended changes to EPRs GHG01 and GHG02.

[86] Tabled document 45b

IAC Findings	Minister's response
greenhouse gas emissions during construction and operations, respectively. A supplementary technical report[87] in relation to revised timing for stage 2 was prepared for Technical Appendix D which concluded greenhouse gas effects would not change as a result of the revised timing of stage 2. The IAC found that the EES had appropriately assessed greenhouse gas effects. The IAC revised EPRs GHG01 and GHG02 to include consideration of SF6 alternatives, should they become reasonably practicable and commercially available. Additionally, the IAC recommended EPR GHG02 be amended to require ongoing review and consideration of emissions reduction opportunities.	
Noise and vibration The proponent proposed six EPRs. The IAC recommended changes to three of these. The EES indicated that construction activities would generate the most noise and vibration effects. Most construction activities are proposed during normal working hours. HDD works are proposed to occur 24 hours per day, seven days per week to minimise the risk of frac-out as discussed in Section 5.6 of this assessment. The HDD shore crossing at Waratah Bay is proposed to occur over a 12-month period, with smaller sites such as the Morwell River crossing expected to last two weeks. However, these works are typically undertaken at larger distances from sensitive receivers, with the closest receiver to the Mowell River crossing approximately 600m southeast. During the night works for the Morwell River HDD, 16 sensitive receivers are predicted to experience noise above reference levels. Whereas for the shore crossing HDD construction only one sensitive receiver is predicted to experience noise levels above reference levels during the day, and 15 receivers above reference levels during night works The EES stated access track construction, topsoil stripping and stockpiling, and trenching are likely to result in the highest predicted levels of noise across the largest area. These works will occur during normal working hours and are predicted to move 100 meters per day, therefore limiting the duration exposure and extent of impacts to nearby sensitive receivers.	I support the IAC's findings that the residual effects for noise and vibration are likely to be low and can be acceptably managed with the recommended EPRs, subject to changes recommended by the IAC to NV02, NV04 and NV05.

[87] Tabled document 45d

IAC Findings	Minister's response
The converter station could take five-years for construction. Only four sensitive receivers are predicted to experience levels above the reference levels during normal working hours, stemming from converter station earthworks, civil and infrastructure construction. Noise and vibration effects from these works are being confined to normal working hours to avoid impacts during most sensitive periods. To minimise effects, a construction noise and vibration plan (EPR NV02) and developing impact assessments for construction at specific sites (EPR NV03) were proposed. The converter station is likely to be the source of most operational effects. However, the predicted noise levels are likely to be lower than background noise levels for sensitive receivers. EPRs NV04 and NV05 were proposed to minimise converter station effects to sensitive receivers through the design and an operational management plan, respectively. A supplementary technical report[88] in relation to revised timing for stage 2 was prepared for Technical Appendix T. The supplementary technical report indicated no change to noise and vibration effects as a result of the revised timing of stage 2. Among other topics, the EPA submitted concerns for the lack of assessment of noise effects to natural areas and low frequency noise effects from the construction and operation of Hazelwood converter station and potential transition station sites. The IAC found that the EES had appropriately assessed noise and vibration effects. The IAC supported the EPA's recommendations, to revise EPR NV02 to further minimise effects to natural areas, as well as EPRs NV04 and NV05 to include consideration of low frequency noise. I support the amendments recommended by the IAC.	
Traffic and Transport The proponent proposed two EPRs. The IAC did not recommend changes to these. The EES identified most traffic and transport effects will likely be limited to construction. The highest number of vehicle movements generated was expected to be for the construction of the converter station which will likely	I accept the IAC's findings that the residual effects for traffic and transport will be suitably minimised and managed to acceptable levels and agree the EPRs as proposed are appropriate.

[88] Tabled document 45o

IAC Findings	Minister's response
generate 400 vehicle movements per day, six days per week over the 35-month construction period. A supplementary technical report[89] in relation to revised timing for stage 2 was prepared for Technical Appendix W which concluded traffic and transport effects would not change as a result of the revised timing of stage 2. HVP expressed concerns regarding estimations of effects on forestry roads, particularly during harvesting periods and cumulative impacts of the Delburn wind farm. HVP sought changes to the EPRs to specifically mention forestry interactions and consultation. The IAC found EPRs TP01 and TP02 adequately provided for vehicle interactions with forestry activities, cumulative impacts and consultation with HVP as a road manager. The IAC concluded with the implementation of the EPRs traffic effects can be acceptably managed during construction and will be negligible during operations.	

[89] Tabled document 45r

6. Conclusions

It is my overall assessment that the environmental effects of the proposed project examined through the EES are acceptable, provided the recommendations of the IAC and this assessment are implemented effectively through the EMF and amended EPRs.

Consistent with the findings of the IAC, it is my assessment that, while there are some significant environmental effects likely to result from the project they can be further minimised and acceptably managed, through the effective implementation of the recommendations of this assessment.

I acknowledge the project included a robust corridor and route selection process which achieved an appropriate balance between the avoidance and minimisation of effects with other criteria such as cost and constructability.

The EPRs, as recommended by the IAC (and refined through my assessment) will enable the project to improve understanding that helps further avoid and minimise effects through micrositing and implementing different construction techniques including HDD.

In particular, the EPRs will enable the additional survey and data required for ecology and geomorphology to inform detailed design and final alignment plans to further avoid and minimise effects.

Decision-makers need to consider this assessment before deciding whether and how the project should proceed. As a matter of good practice, I also expect decision-makers to write to me and advise how my assessment was considered and applied.

Table 5 summarises my response to the IAC's key recommendations as provided in the Executive Summary of the IAC report. My detailed recommendations relating to the EPRs are outlined in Appendix A.

Table 5: Response to IACs recommendations

	IAC key recommendations	Minister's response	Chapter or Section of this assessment
1	Amend the EPRs as shown in Appendix E:1 of the IAC report.	Generally supported subject to the recommendations of my assessment that have refined the EPRs.	Chapter 5 and Appendix A.
2	Further review the EPRs to ensure they are drafted consistent with the principles outlined in Chapter 8 of this report.@	In principle I support the further refinement and review of EPRs to enhance clarity, transparency and integrated assessment, particularly clarifying the proposed management plans and measures for each overarching environmental management plan. However, I do not support a detailed drafting review to ensure EPRs are consistent with the 11 principles, apart from enhancing clarity, transparency or integrated assessment. Detailed review beyond that risks changing the intent and specifics of EPRs that have been arrived at through the EES process, following multiple collaborative	Chapters 4 and 5.

	IAC key recommendations	Minister's response	Chapter or Section of this assessment
		iterations with many stakeholders, including requests and requirements from agencies.	
3	Amend the exhibited draft incorporated document proposed to be introduced by draft Amendment GC217 to the Latrobe and South Gippsland Planning Scheme as shown in Appendix E:2 (of the IAC report)	In my assessment of the environmental effects of the project, I consider that the changes to the draft incorporated document are appropriate, noting that my assessment of the draft PSA under the P&E Act, will not occur until after this assessment.	Section 4.1 and Chapter 5.

In considering the draft EMF, I make the recommendations outlined in Table 6 for the finalisation of this framework for my consideration and approval as required by the draft incorporated document.

Table 6: Minister for Planning's additional primary recommendations

Primary recommendations for EMF	Chapter or Section of this assessment
In finalising the EMF: – provide further clarity as to which EPRs and management plans are relevant and applicable for each jurisdiction, project phase and construction stages (stage 1 and 2). – consider the implication of the two-stage approach to project implementation and clarify which management plans and EPRs may require review and which, if any will be closed out following stage 1. – include the full monitoring program for construction and operations. In doing so, consider if the following EPRs should also be included: GM01, GM05, SW04 and SW05.	Section 4.2

HON SONYA KILKENNY MP

Minister for Planning

Date: 18/5/2025

Appendix A – Environmental Performance Requirements

See separate document


VICTORIA
State
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